

Commercial Thermal Solutions, Inc.



TIGER FOAM™
INSULATION

THE PREMIER PROVIDER OF
SPRAY POLYURETHANE FOAM INSULATION



Tiger Foam™ Insulation

Commercial Thermal Solutions, Inc. has been serving the building and construction industries since 2001 as a corporate entity. Its founders and key partners have been manufacturing and providing products and services to the industry since 1995. We have a proud history of commercial introductions of environmentally friendly products and manufacturing practices years ahead of regulatory requirements. Tiger foam is a quick curing, fire-rated, disposable, two-component, spray polyurethane, available as a self contained kit, requiring no additional equipment to operate. Tiger foam Products are designed for ease of application and to answer the energy saving needs of our customers.

Commercial Thermal Solutions, Inc. is a registered 100% Veteran Owned Enterprise.

Not only will we offer you a premier product that's unmatched in quality and performance but we'll also provide the required documentation and samples necessary to help your approvals and acquisition processes go smoothly.

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Portable, Fast And Easy To Use

Completely self-contained kits come with everything you need to apply our innovative product. Our kits are also completely recyclable when you are finished. Our Kits come complete with gun and hose assembly, extra nozzle tips, and require no outside power source or additional machinery.

Choose between our two formulas depending on your project – fast-rise and slow-rise.

Our fast-rise, fire-rated, moisture-resistant insulation is designed to spray on exposed surfaces. It's ideal for insulating new homes, commercial structures, boats, vehicles, aircraft, around plumbing, on bridges and other structures – the application possibilities are endless because Tiger Foam™ conforms to any shape or surface easily and efficiently.

Our slow-rise formula is designed for safely injecting into hard-to-reach areas and closed cavities. It's perfect for insulating behind existing drywall or plaster without causing damage.

Keeping the Environment in Mind

We are proud of our commitment to provide a product that does not contain chlorofluorocarbons (CFCs), volatile organic compounds (VOCs), Octa, Penta BDEs, or formaldehyde.

Tiger Foam™ Insulation is the leading provider of the highest quality, cost-effective, energy-efficient, two-part, closed-cell spray polyurethane insulation to government, commercial and professional customers.

We offer the most innovative total solution that outperforms all other insulation products available today.

Why Tiger Foam Is Superior

Tiger Foam's two-part, closed-cell spray polyurethane insulation has multiple uses and can be applied to a wide range of materials and surfaces.

The main cause of energy waste is air leakage due to inadequate or poor-performing insulation.

Unlike traditional fiberglass and cellulose insulations, Tiger Foam's remarkable formula, when applied properly, expands to create a seal protecting against air infiltration. Tiger Foam™ won't sag or settle and provides a water-resistant barrier, shielding against moisture and mold.

Tiger Foam™ insulation increases energy efficiency and can lower heating and cooling costs.

Our superior insulation solution protects against dust, pests, and sound. Tiger Foam™ is fire retardant (**ASTM-E84 approved**) and reinforces structures, increasing wind shear strength while reducing wall vibration and movement.

Over time, Tiger Foam™ can dramatically lower your utility bills so our product practically pays for itself!

True Air Quality Control

Spray Foam Insulation helps eliminate drafts and provides improved humidity control due to its closed cell structure that is impervious to moisture and reduces dust and pollen allergens within the structure.

It does not emit anything, good or bad. It does not disintegrate, unlike fiberglass. It does not shrink or settle or crack. It simply performs for the lifetime of the building without needing service, maintenance or upgrade.

Your investment in Tiger Foam™ Insulation will reap long term returns in saved energy dollars, comfort, control of indoor air quality, and health and safety for the life of your home. Because polyurethane foam is a closed cell insulation material delivering the highest R-value per inch, your heating and cooling equipment works more efficiently, uses less fuel and maintains consistent and uniform temperatures.

Stops Air Infiltration

- Minimizes air flow
- Helps eliminate drafts and provides for comfortable, even heat
- Provides better humidity control

High Insulation Value

- Best R-value per inch of any readily available insulation allows you to fit more insulation in a tighter space
- Performs in hot as well as cold temperatures

Moisture Resistant

- Stops moisture driven elements due to its closed cell salability
- Dries with minimal insulation value loss

Spray Applied

- Seals cracks and crevices
- Insulates hard to reach areas
- Quick, easy application by professionals
- Provides a seamless layer of insulation

Rigid

- Will not settle
- Adds structural strength
- Solid nature inhibits insect penetration
- Seals cracks from unwanted gas and odor penetration

Light Weight

- Does not sag
- High degree of strength to weight ratio
- Adds very little weight to ceiling or roof areas

Excellent Adhesion

- Does not need fasteners to hold it into place

Code Approved

- Materials meet building code requirements and are accepted nationwide

Safe

- Building code listed
- Contains no urea formaldehyde

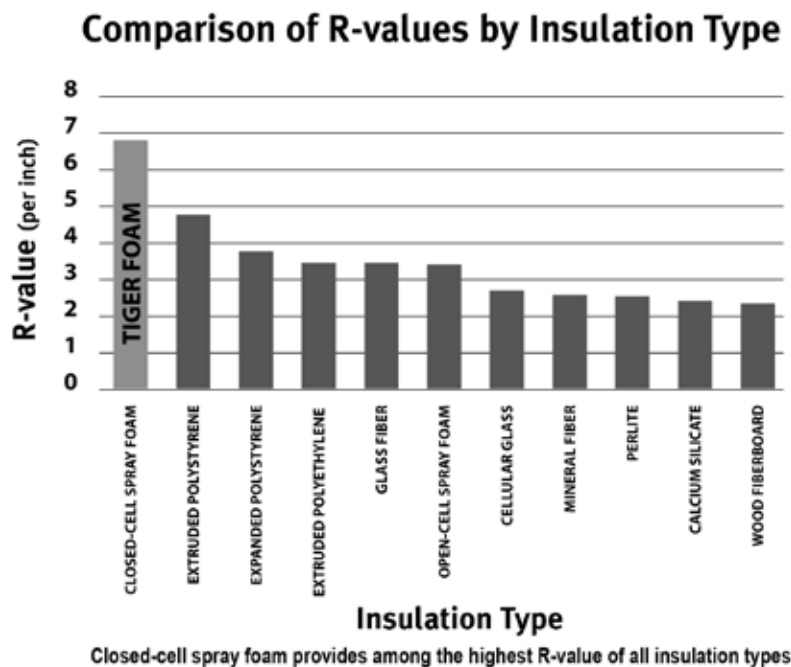


Tiger Foam Polyurethane Spray Foam Insulation can contribute credits to the Leadership in Environmental Energy and Design (LEED) green building rating system. Although individual products cannot be “LEED certified”, they may contribute to points under the rating system, which is administered by the U.S. Green Building Council (www.usgbc.org).

For the Indoor Environmental Quality LEED credit (EQ Credit 4), Tiger Foam contains no CFC’s or HCFC’s , and does not emit VOC’s. The HFC blowing agent, besides being completely non-ozone depleting and non-VOC, is non-flammable and a portion remains in the foam to contribute to the excellent thermal insulating characteristics (EA Prerequisite 2 and EA Credit 1 for optimizing energy performance (1-19 credits possible).

In addition, use of Tiger Foam Polyurethane Spray Foam Insulation may contribute to various other LEED credits, including EQ Credit 7 for thermal comfort, ID Credit 1 for innovation in design, MR Credit 5 for local/regional materials (Tiger Foam is manufactured in Norton and/or Akron, Ohio) and MR Credit 2 for construction waste management, as Tiger Foam can expand and seal any shape without trimming, thus reducing potential trimming debris disposal.

Note: This information is provided as a service, and is not necessarily meant to reflect any recommendation, guideline or position of Commercial Thermal Solutions. Each individual user must determine product suitability by consulting the individual product Technical Data Sheet, and the USGBC website.



- General Kit Basics
- When to use and how to calculate the slow rise formula
- When to use and how to calculate the fast rise formula
- Crawl spaces and metal buildings
- Spas & Hot tubs/ Filling liquid tanks

General Kit Basics

- The density Tiger Foam Fast Rise Foam is 1.75lb per cubic foot and Tiger Foam Slow Rise Foam is 2 lbs. per cubic foot.
- Tiger Foam 2 Component foams are rated at R-6 per inch (aged value) is one of the highest in the industry.
- The size of the kit, i.e. TF600 or TF200 is indicative of the board foot coverage or expanded yield for that kit. A TF600FR kit will cover approximately 600 square feet at 1" thick. A board foot as it relates to this product is a square foot one inch thick. The kit size is yield of the foam after foam has cured.
- Cubic Feet: Conversion to cubic foot yield for these kits is the TF200SR will fill 13 cubic feet and the TF600SR will fill 43 cubic feet. Filling liquid tanks, flotation devices, etc.: to convert gallons to cubic feet, multiply gallons X 0.1337 i.e. a 400 gallon tank would be $400 \times 0.1337 = 53.48$ cu. ft. To fill this tank you would need to use 1 TF600SR and 1 TF200SR.
- Tiger Foam contains NO Penta-BDEs as a fire retardant.

The 4 formulas available are:

1. E-84 Fire Rated: Formulated as a fast rise product with additional self extinguishing fire retardants.
2. Fast Rise Non Fire Rated: Formulated for surface spraying.
3. Slow Rise: Formulated for safely injecting into closed cavities.
4. Closed Cell

Polyurethane foam can be used in outdoor conditions. Foam exposed to sunlight must be painted with any latex or elastomeric paint or other coating to protect it from UV light, which makes the foam turn bright yellow and brittle.

Optimal tank temperature of the kits is 75-85 degrees F. That means the metal tanks should be warm to the touch before and while you are spraying. If the tank temperature falls below 55 degrees F, they won't spray foam. The ambient temperature should be at least 50 degrees F or warmer. You can warm the tanks up by keeping them next to a heat source or in a warm place. You can also blow hot air from a forced air heater onto the tanks for a day or two prior to application. Be sure to closely monitor the temperature of the tanks when spraying in cold weather conditions. We suggest purchasing an infrared thermometer to be certain the tanks retain the optimal temperature during application. They are \$50 at Sears. If you are spending 4

figures on foam, the infrared thermometer may be a good investment to ensure you have the tanks at optimal temperature.

All of these kits come with extra tips. Tips should be changed every 8 minutes of spray time and if you stop spraying for more than 30 seconds. The reason for frequent tip changes is foam inside the nozzle tip will cure and harden and might compromise the ratio between the A and B tanks. The tips snap on and off easy. There are 10 tips with the TF600 and 8 tips with the TF200. You can order extra tips as a suggested item in the shopping cart when you order a kit. Generally, the tips included are all you need unless you anticipate stopping and starting often.

These kits are very easy to use and effective if you just remember two things: Tank Temperature & Change Nozzle Tips! Our nozzle tips are very easy to clean if they are placed in acetone immediately after they are changed. If you wait too long to place tips in the acetone the foam will harden and tips will not clean well. Yes, you can stop spraying and continue on another day. Once the kit has been opened you want to make sure you finish the kit within a few weeks time. You can store a partially used kit for up to 30 days with continued maintenance (see operating instructions). Just make sure to take off the old tip, put plenty of petroleum jelly over the prongs on the gun face (petroleum jelly included with kit) put the old tip back on until you are ready to use it again. When you are ready to start again, make sure the tanks are warmed, shake the tanks for a couple of minutes each, clean off excess petroleum jelly from gun, snap a new tip on, and start spraying again.

To get the most out of your kits it is important to understand how the nozzle/gun delivery system works. You'll notice at the end of the gun, where the nozzle tip clips on, there are 2 small metal jets. This is where the two components come out of the gun and enter into the nozzle tip where they spin around in a vortex before they shoot out. The chemicals mix here to make the foam. The trigger on the gun is metered. This means the further you pull back on the trigger, the faster the foam comes out. These kits, especially the larger ones, are under high pressure. When you first start spraying the kit you don't want to jerk back on the trigger. Slowly increase your pull on the trigger to get the gun primed and the foam flowing through the tip, so the product mixes well. If not done correctly you might end up spraying 'flat' foam. When this happens the foam doesn't expand well and the yields are less. You really don't need to pull the trigger back any more than a quarter of the way for best control, at least until you get below half a tank. Then you'll have to pull back further on the trigger to get the same flow rate since there will be less propellant left. To put an inch on, you'll just pull back a quarter of the way on the trigger and move your arm at a pretty good speed to get a $\frac{3}{4}$ " application of foam. $\frac{3}{4}$ " of wet foam will cure to 1" of cured foam.

We take pride in our products and only offer the best in the industry.

Technical support is available 7 days a week at 1-800-664.0063.

Important steps to remember

Your application will go well if you remember these 5 simple things:

1. The tank temperature needs to be optimally between 75 degrees F and 85 degrees F. A good rule of thumb is if the metal tank is warm to the touch, you are good to go.
2. Rock the tanks for a few minutes or so before you start spraying to mix the propellant well. Otherwise, you'll leave about 5% in the bottom of the tanks. If you rock the tanks before you start, they'll empty completely.
3. Change your tips every 8 minutes of continuous spray time and if you stop spraying for more than 30 seconds. The frequent tip changes are because over time you will get a slight build up of cured foam in the tip. This build up of foam might make you get off ratio between the tanks. We give you extra tips with each kit for this purpose. Use them and your application will go well.
4. Start out slow and gradual with the trigger when you first start spraying. This will prime the gun and create smooth flow and good mixing in the nozzle.
5. Cover up. Spray foam is extremely adhesive and will stick to everything. Nothing will remove it...it has to wear off. When spraying there may be a fine mist of back-spray. This is why it is important to always wear PPE (Personal Protective Equipment): gloves, goggles, respirator, and a Tyvek suit.

If we may be of further service, please don't hesitate to give us a call. We have thousands of satisfied customers all around the globe and are always available to answer your questions.

When to use and how to calculate the Slow Rise formula

(Note: This is a narrative overview of product applications by product formula.

Please read entire narrative for the product you are considering. Gaining a general overview of the product's strengths and limitations will help you make an informed decision regarding your application).

Framed Houses and Structures: The wall is intact with no insulation and you want to leave the wall intact.

Closed Wall Cavities: Slow Rise (SR) Formula

Tiger Foam's Slow Rise (SR) formula is low-expansion foam that is made to expand slowly and fill existing plastered or drywall covered walls completely without the risk of creating too much pressure and blowing the drywall halfway across the room! This product is especially suited to insulating homes that were built without insulation in the outside walls or as a soundproofing for common walls in condominiums, apartments, and to isolate family rooms, bathrooms, laundry rooms from excess noise.

Common uses:

- The common wall between apartments and condos for sound control
- Soundproofing offices and conference rooms
- The common wall between an unheated garage and the main house for thermal insulation. (Also good for soundproofing!)
- To insulate outside walls on older homes that lack insulation in the exterior walls.
- Boat hulls, pontoons and flotation devices. The SR product is approved as flotation foam by the U.S. Coast Guard.

Calculating how much you need of Slow Rise Foam:

- Measure Length x Height of the wall to be filled
- Subtract the square feet of doors and windows in that wall
- Subtract 6% for the studs (which you won't be spraying)
- Take that total and multiply by 3.5" for a 2"x 4" wall, or 5.5" if it is a 2"x 6" wall
- The result is the number of board feet you need to install to complete your project.

Example:

- 10' long x 8' tall wall is 80 square feet
- It has one door 3' x 7' (21 sq. ft.) and 2 windows 2.5' x 3' x 2 (15 sq. ft.) for a total of 36 sq. ft.
- Take the 80 sq. ft. and subtract the 36 sq. ft. and you are left with 44 sq. ft.
- Take the 44 sq. ft. and subtract 6% ($44 \times .06 = 2.64$) which is rounded to 2.6 sq. ft. and you are left with 41.4 sq. ft.
- The 2"x 4" cavity is really 3.5" deep. You multiply $41.4 \times 3.5 = 149.9$ board feet to insulate.
- You would need to order a 200SR kit to insulate this wall

The price of the kits are less expensive the more you buy. A 600 board foot kit is almost the same price as 2 of the 200s, so buying a large 600 kit is 30% free product over buying 2 of the 200 bd. ft. kits.

A simple way to figure how much you will need of the Slow Rise Foam is that the TF600SR kit will cover approximately 148sqft of wall at a 3.5" stud depth. If the wall is a 4" depth the kits will cover approximately 129sqft of wall and if a 5.5" wall approximately 94sqft.

Pontoons:

Your average 16 foot pontoon set requires a 600SR and a 200SR to fill both pontoons. The calculation for filling a cylinder is:

- $\pi r^2 L$
- $3.14 = \pi$ (ρ)
- r^2 (r = radius, which is half the diameter) r^2 means the radius is squared (you multiply the radius by itself)
- L = length of the pontoon

Example

The pontoon is 18" in diameter and 16ft long

- $\pi r^2 \times L$
- The radius is 9" or .75' $.75 \times .75 = 0.5625$
- $3.14 \times 0.5625 = 1.76625$
- $1.76625 \times 16' = 28.26 \times 2$ (for both pontoons) = 56.52 cubic feet in both pontoons.
- One TF600SR (43 cubic feet) and one TF200FR (13 cubic feet) will do the application

Installation of the Slow Rise Foam

The installation of the Slow Rise foam is done on a timed basis. Speak with our Sales or Technical Teams to help figure out how to approach your specific application.

When to use and how to calculate the Fast Rise formula

Framed Houses and Structures: New construction, open wall cavities, use Fast Rise Formula

Figuring how much you need depends on your application. Let's take a common application whereby you are building a new house or have stripped the drywall or plaster and lathe off the walls in a remodel job.

Commonly, you will want to apply 1" of foam to the interior of the outside walls and add a batt to fill in the rest of the cavity. You can also solely use the foam to achieve the desired R value.

Calculating how much you need:

- Measure your outside walls length x height to get your raw square feet of wall area
- Measure the doors and windows and get the total square feet of door and window area
- Subtract window and door area from the total wall area
- Subtract 10% from this figure to account for stud space

Example:

A house that measures 40'x 20' with 8' walls:

- $40L + 20W \times 2 = 120 \times 8' = 960$ total square feet of wall area in the outside walls
- You have 120 square feet of windows and doors area
- $960 - 120 = 840$ square feet of wall
- Subtract 6% (for stud space) of 840, which is rounded to 50 sq. ft. $840 - 50 = 790$ square feet of wall area
- You have a total of 790 square feet of wall area to foam
- This job would require one TF600FR kit and one TF200FR kit for a 1" application

Crawl spaces

Crawl spaces and basement ceilings, including rim joists are calculated at simple board footage. For instance, if your crawlspace is 20'x 30', that equals 600 sq. ft. One TF600FR kit will do that job and you'll have warm floors and less or no draftiness from air infiltration coming up the walls from the crawlspace or basement.

Example:

A 20 x 30 metal building with 10 foot walls:

- $30L + 20W \times 2 = 100 \times 10' \text{ wall height} = 1000$ total square feet of wall area
- You have 145 square feet of window and door area
- $1000 - 145 = 855$ square feet of wall
- The gable is 2' above the wall to the peak $2' \times 20 = 40$ square feet of gable. This gets added to the wall square feet. $855 + 40 = 895$
- The roof is $11' \times 30' \times 2 = 660$ square feet of roof area
- $895 + 660 = 1555$ square feet
- Add 10% to account for the corrugations in the metal. $1555 \times .10 = 155.5$
- $1555 + 155.5 = 1710.5$ total square feet
- Three of the TF600FR kits will do the application

Spas and Hot Tubs

Foam is sprayed directly to the hot tub and plumbing usually at a 3" application.

Filling Liquid Tanks

Slow Rise foam is used to fill buried gas and oil tanks, flotation devices, etc. To convert gallons to cubic feet, multiply gallons X 0.1337 i.e. a 400 gallon tank would be $400 \times 0.1337 = 53.48$ cu. ft. to fill this tank (or very close to it) you would need to use the Slow Rise (SR) formula. A TF600SR will Fill 43 cu. ft. and a TF200SR 13 cubic feet for a total of 56 cu. ft. yield, you would have a bit left over.

55 gallon drums commonly used to make floating platforms requires 7.53 cu. ft. of foam to fill.

A TF600SR kit is 43 cubic feet, and will fill 5.5 - 55 gallon drums

A TF200SR kit is 13 cubic feet, and will fill 1.7 - 55-gallon drums

For different size drums or tanks: 1 gallon = approximately 0.1337 cubic feet.

If it is below 65 degrees outside where you live, you really need to put a heat source on these tanks to get the full yield. A ceramic heater or electric heater with a fan works well. The warmer they are, the better the yield. If you don't keep the tanks warm, you will not get the yield out of the kits and will run out of foam. Maximum yield is achieved when tanks are between 75 and 85 degrees. If you are doing a large project, it would pay to invest in a infrared thermometer for \$50 at Sears or Home Depot. If a TF600 gets below 60 degrees, you can lose 30% of the yield, so the thermometer would be a good investment. If the tank temperature gets below 55 degrees F, the foam doesn't expand and will run.

We recommend that you leave them in the house or a heated space. Many folks don't realize that if its cold weather and you keep your house temperature at 68 to 70 degrees F, then the tank temperature is only going to be about 61 degrees if you set it on the floor in the house.

BEST BET: Put a heat source on these kits before you use them and remember they need to be warm to the touch to get the full yield. In the summer, put them in the sun for a couple of hours then rock the tanks for a couple minutes or so to distribute the propellant and the heat evenly. This foam expands and adheres great within its proscribed temperature ranges.

KEY WORDS: TANKS WARM TO THE TOUCH!

Pre-warm the kits 1-2 days prior to your application to ensure the core temperature of the tanks are within range. They also take time to cool down. You don't have to keep heat on them while you are spraying. Just get them warm before you start. Unless it's below 20 degrees outside, they won't cool down in the time it takes to spray a kit. A little common sense when using these kits really makes them work well.

Do not subject them to an open flame to warm them up. Never use a blowtorch to warm the tanks up! (Sorry, that was a real question called into us, so we thought we'd address it before it was asked again)

These kits are a dream to use in the summer, but they do take special attention to tank temperatures in the winter months. We appreciate you taking the time to understand this.

CRITICAL TIP CHANGE RULE

TWO-COMPONENT FOAM OVERVIEW

- quick tack-free time
- cuttable in 5 minutes
- fully cures within 1 hour
- use to fill, seal and insulate
- R-value of 6.2 per inch



TIP CHANGE RULE



Change nozzles frequently!

Foam will cure inside the nozzle in the same amount of time the foam becomes tack-free in the air.

Tack-free time at 75°F (24°C) = 30-45 seconds.

To insure trouble-free operation, change nozzle tips every **8 minutes** of continuous spray time and/or if you stop spraying for longer than **30 seconds**

Personal Protective Equipment for Low Pressure Foams (PPE)

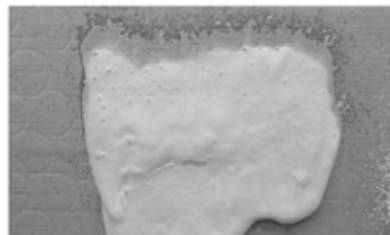
Routes of Exposure	Recommended PPE
EYES	Safety Glasses or Goggles  
SKIN	Covers Skin 
HANDS	Nitrile Gloves 
LUNGS	Respirator and/or Vapor Respirator OV/Pre-filter Provide Good Ventilation  

TROUBLESHOOTING GUIDE

Equivalent flow of both A-component and B-component is required with all two-component polyurethane systems in order to obtain proper performance, curing and optimum yields. If a problem occurs, the cause is typically due to uneven chemical flow that is caused by a blockage of one of the chemicals.

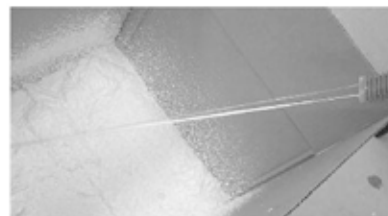
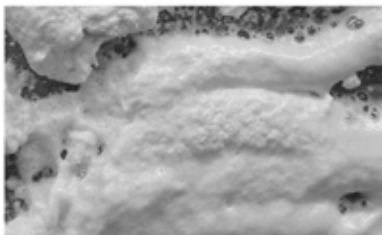
"A-Rich" Foam:

Crunchy, friable, slow or non curing. Darker brown in color.



"B-Rich" Foam:

Softer, white colored foam, with shrinkage.



With the nozzle removed, check that both chemicals flow with equivalent force.



Partial or complete blockage of one chemical port will result in off-ratio foam.

Nozzle Care and Usage

Apply a small amount of petroleum jelly, which is provided with each kit, to help keep the gun face clean from cured foam or contamination that could block one of the chemical ports.



Change nozzles frequently! Foam will cure inside the nozzle in the same amount of time that foam becomes tack-free in the air.

Cone Tip Nozzle

- conical flow pattern
- directed, high-velocity flow
- solvent cleanable



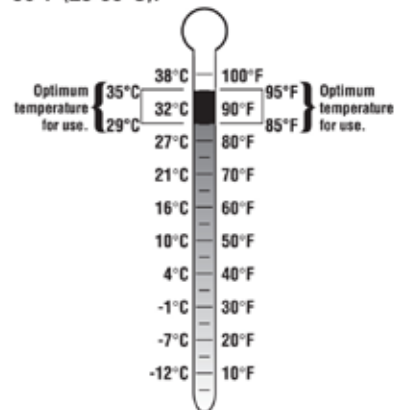
Use Solvents!



Tiger Foam™ nozzles are easily cleanable and solvent resistant. To clean nozzles, liquid chemical must be dissolved prior to its complete chemical reaction by flushing the nozzle with a suitable solvent. Gun face can be kept clean with the use of petroleum jelly on the face or with a soft cloth to remove residue. Cleaning a nozzle more than twice is not recommended.

Temperatures and Storage

Chemical temperature is very important, store kits above 85°F (29°C) prior to use. Cold chemical may lead to off-ratio flow. Optimum chemical temperature is 85-95°F (29-35°C).



A-component chemical may eventually harden and clog the hose if stored for too long. Gun is disposable and is not intended for continuous re-use. For best results, dispense liquid from hose at least once every 3 days. Use contents within 30 days of initial use.

INSTRUCTIONS FOR USE



Make sure the kits are warmed up to between 75-85°F (24-29°C) prior to application. In winter months make sure to warm tanks up 1-2 days prior to the application to assure the core temperature of tanks have warmed to 75-85°F (24-29°C).

Clean grease, oil, dirt and water off surfaces to be foamed.

Always wear respirator, protective eyewear, impervious gloves, suitable work clothes or Tyvek suit, during use. You do not want the foam to get on your skin. It is helpful to apply a moisturizing lotion to face prior to spraying, as the lotion will help keep the foam from sticking to any exposed skin the goggles and respirator won't cover. Use with adequate ventilation, with certified respiratory equipment (Consult Material Safety Data Sheet). Tiger Foam Insulation is low-pressure spray foam using chemical temperatures close to room temperature, which significantly reduces any overspray or airborne contaminant level. The installer should provide adequate ventilation to maintain exposure levels below ACGIH, OSHA, or other applicable limits. In poorly ventilated areas or temperatures above 85°F, additional proper respiratory protection may be required. Use an approved air purifying respirator equipped with an organic vapor cartridge with particle pre-filters, or a supplied air respirator. Cover and protect all surrounding surfaces.

If you want to reuse the nozzle tips be sure to acquire the acetone solvent.

SET UP

Kit should be pre-warmed between 75-85°F (24-29°C). In winter months warm kit 1-2 days prior to the application. Take tanks out of the box (TF600 kits will be in 2 separate boxes) and shake them before using. To shake, roll tanks on their side and rock back and forth vigorously for 3 minutes each. Tanks can be placed back in box during the application as this will help keep them upright and will be easier to move around during the application.

Remove nozzle packet (TF600 kits the nozzles are in the "A" box) and read enclosed instruction booklet.

SAFETY: Always have trigger safety lock "On" when setting the kit up.

Attach the hoses to the tanks using the wrench provided. The hose and gun of the TF600 kits are in the "A" box. The wrench can be found in the nozzle pack. Attach Red hose to the "A" tank, and black hose to the "B" tank. Hand tighten with wrench, but do not over tighten. The TF200 kits have the hoses pre- attached.

Apply thin layer of the enclosed petroleum jelly on the face of the gun and then attach nozzle tip. This thin layer of petroleum jelly helps keep the seating ports and gun face clean.

To Attach Nozzles

- Insert bottom tab of nozzle into bottom slot on gun face
- Attach top latch by pushing towards back of unit until an audible "snap" is heard.

Cone Tip Nozzle (Round Tip End)

- Conical spray pattern
- Directed, high-velocity flow
- Clear and solvent cleanable
- Easily adapted for pour-in-place applications
- Better tip choice for overhead applications

Fan Tip Nozzle (Flat Tip end)

- Wide vertical spray pattern for large area coverage
- Improved uniformity and surface appearance
- Speeds application and productivity
- Clear and solvent cleanable

All nozzle tips are easily cleaned and solvent resistant. To reuse nozzles, have a container of acetone ready to drop the dirty tip in at the time of the tip change. The dirty tip must be placed in the acetone prior to its completely curing or the tip will not clean well. **Cleaning nozzle tips more than twice is not recommended.** Gun face can be kept clean by applying a thin layer of petroleum jelly to the face of the gun. This area can be cleaned with a soft cloth to remove any residue that may accumulate.

With tanks upright, open both tank A & B valves completely. Tanks must be upright during use.

When spraying for the first time and with each new kit, dispense foam by squeezing the trigger only 1/4 to 3/4 open until desired output and spray pattern is achieved. This controllable metering is an advantage of the gun assembly, allowing the user complete control of the flow rate and spray pattern that best suits the application.

Once the trigger is squeezed it must be reactivated within 30 seconds or a new nozzle must be installed. Tips need to be changed every 8 minutes of continuous spray time and also if you stop spraying for more than 30 seconds. Failure to do this could result in getting off ratio between the A and B tanks. It can also result in chemical leakage that can ruin the gun and hoses.

IMPORTANT: After releasing trigger, you can activate the trigger safety lock to prevent accidental discharge.

Do not remove hoses from tanks. Do not flush or clean hoses with air, water or solvent as this may compromise gun assembly, which might affect foam quality.

Test Spray

Now you are ready to spray a test area on a piece of cardboard or into receptacle to ensure proper mixing. 3/4" of wet foam will cure to 1" of cured foam. If a thicker application is desired always layer the foam to achieve the depth of foam needed. When spraying foam, allow a minimum of 1 minute before applying more foam over freshly sprayed foam. Spray in layers 1-2" thick (2.5-5.1 cm) with each application. Trying to apply more than 2" (5.1 cm) in a single spray will pack the foam and may result in lower expansion and lower yields.

IMPORTANT APPLICATION NOTES:

1. Product item numbers are designed to approximate the theoretical yields obtainable from each product. For example, TF600FR refers to 600 board feet optimum foam yield, (a board foot is a measurement term equal to 12"x12"x 1"). Actual yields will vary depending on factors such as ambient conditions, application technique, foam density, etc. See Technical Data Sheet for additional theoretical yield information.
2. Various U.S. and foreign patents cover the dispensing system.

3. Suitability of this product for any particular purpose, such as achieving desired structural properties, performance specifications or application requirements must be determined by the end user, prior to use. Verification that product is properly applied and installed is also the responsibility of the end user.
4. If you have any questions about this product, please contact your Sales Rep.

WARNINGS:

Follow safety precautions and wear protective equipment as recommended.

This equipment includes respirator, goggles, and impervious gloves, and protective clothing such as a tyvek suit. Consult Material Safety Data Sheet (MSDS) for specific information.

Use only with adequate ventilation or certified respiratory equipment. NIOSH approved positive pressure supplied air respirator or a negative pressure half mask with organic vapor cartridge with particle pre-filters are recommended if exposure guidelines may be exceeded. Foam is very sticky and may be irritating to skin and eyes: therefore, wear impervious gloves, protective eyewear and suitable work clothes during use.

It is helpful to apply a moisturizing lotion to face prior to spraying, as the lotion will help keep the foam from sticking to your skin. If liquid chemical comes in contact with skin, first wipe thoroughly with dry cloth, then rinse affected area with water. Wash with soap and water afterwards. Apply lotion if desired. If liquid comes in contact with eyes, immediately flush with large volume of clean water for at least 15 minutes and get medical help at once. If liquid chemical is swallowed, drink one to three glasses of water or milk and obtain immediate medical attention.

STORAGE OF KIT

1. Close tank valves.
2. Do not store at temperatures above 120°F (49°C) or below 50°F (10°C). Kits stored below 75°F must be given sufficient time (1-2 days) for the chemical to warm up to 75-85°F (24-29°C). Optimal storage temperatures are between 60-80°F (15-26°C).
3. Cover the prongs of the gun with petroleum jelly and a nozzle tip. This protects gun assembly from air exposure during storage. The nozzle tip should be left on during storage to keep the gun face clean.

SAFETY: Always have trigger safety lock "On" and close all supply valves during storage.

4. This is a good time to rinse any tips that were placed in the acetone for reuse. Simply rinse tip in water and make sure all residue is clear from tip before drying. **Cleaning a nozzle more than twice is not recommended.**
5. **Do not remove hoses from tanks. Do not flush or clean hoses with air, water or solvent. Removing or cleaning hoses may compromise gun assembly, which might affect foam quality.** The hose and gun is a disposable unit not designed for prolonged storage or continuous re-use. To help extend the storage life, it is recommended to dispense a minimal amount of foam from unit at least once every 3 days to ensure optimum flow of chemical through hoses. Use of contents within 30 days of initial use is recommended. Make certain valves are in upright position when storing, opening them, and operating the unit.

REUSE OF KIT AFTER STORAGE

1. Before disengaging the trigger safety lock, remove the nozzle.
2. Clean off excess petroleum jelly and check that gun face is free from dirt, chemical or other debris. If necessary, use a soft cloth or rag to remove any cured foam or chemical from the gun face. Apply a thin layer of petroleum jelly to cover the face of the gun. This thin layer of petroleum jelly helps keep the seating ports and gun face clean.
3. Follow the Set Up instructions at the top of the Operating Instructions.

DISPOSAL PROCEDURES

1. DO NOT INCINERATE TANKS.

2. After tanks are empty, they must be vented (depressurized). **CAUTION:** Tanks will still be under pressure. Respirator, protective eyewear and impervious gloves **MUST** be worn during the procedure. With tank inverted, slowly open tank valve, point tank **AWAY** from face and allow pressure to completely vent. This is best done into a garbage receptacle.

CAUTION: Empty tank could contain potential toxic vapor hazard. Respirator, protective eyewear and impervious gloves **MUST** be worn during the procedure. (Consult MSDS).

3. **DISPOSE OF EMPTY CYLINDERS ACCORDING TO APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.** Always read all operating, application and safety instructions before using any products. Use in conformance with all local, state and federal regulations and safety requirements. Failure to strictly adhere to any recommended procedures and reasonable safety precautions shall release the manufacturer of all liability with respect to the materials or the use thereof. For additional information contact your Sales Rep.

NOTE: Physical properties shown are typical and are to serve only as a guide for engineering design. Results are obtained from specimens under ideal conditions and may vary upon use, temperature and ambient conditions. Right to change physical properties as a result of technical progress is reserved. This information supersedes all previously published data. Yields shown are optimum and will vary slightly depending on ambient condition and particular application. Read all product directions and safety information before use. This product is organic, therefore combustible. Consult local building codes for specific requirements regarding the use of cellular plastics or urethane foam in construction.

Troubleshooting

- **Poor chemical flow** - (*Note: when injecting foam into an enclosed cavity, it is important to check frequently that chemical is flowing*

properly and to replace any nozzle that has become clogged.)

This problem could be that tank valves are not fully open or tanks opened in the wrong position, allowing only propellant gas to escape. Tanks are too cold.

- **Slow cure** - This problem could be that the unit is out of shelf life, chemical or substrate too cold or the kit is dispensing off ratio.

- **Dark crunchy foam** - This is a sign that the foam has become **"A" rich**.

The system is off-ratio causing more of the "A" chemical to be sprayed than the "B" chemical.

- **Foam shrinkage within 24 hours** - This is a sign that the foam was sprayed off-ratio and is **"B" rich**.

- **White spongy foam** - This is a sign that the foam has become **"B" rich**.

The system is off-ratio causing more of the "B" chemical to be sprayed than the "A" chemical. Foam that visibly shrinks within 24

hours after application may be an indication of "B" rich foam.

- **Sputtering from nozzle** - This is a sign of empty tanks, clogged nozzle, or a blockage in the system.

- **Lack of expansion in sprayed foam** - This problem could be associated with tank temperatures, clogged nozzles or spraying technique.

- **Foam leaking from hose connections** – Hoses not tightened enough.

Solution: STOP SPRAYING and follow instructions below

1. Remove nozzle and spray chemical into a plastic garbage bag. Check to see that both chemicals are being

dispensed from the gun

in approximately equal streams.

2. Make sure all valves from the tank to the dispensing unit are fully open.

3. For optimum results, the chemical temperature must be between 75-85°F (24-29°C). During colder months tanks up 1-2 days

prior to the application to make sure the core temperature of the tanks have warmed to 75-85°F(24-29°C), especially if the tanks

have recently been transported or stored in an unheated environment.

4. Replace nozzle. If the nozzle has become clogged, the foam may become off-ratio.

5. Make sure tanks are not empty and all valves are fully open. Shake tanks back and forth to determine that they contain chemical.

6. When spraying foam, allow a minimum of 1 minute before applying more foam over freshly sprayed foam. Spray in layers of 1-2”

thick (2.5-5.1 cm.) with each application. Trying to apply more than 2” (5.1 cm) in a single spray will pack the foam and may result

in lower expansion and lower yields.

7. Foam may be outdated and unusable. Check the expiration date.

Two Component Low Pressure Spray Polyurethane Foam (SPF) Requirements
Tiger Foam® Insulation should only be used in a well ventilated area and with the proper health and safety personal protective equipment. Before using this product consult the Material Safety Data Sheet (MSDS) enclosed.

Safety Glasses or Goggles: To protect eyes from chemicals or solvents that may splash backwards, always wear safety goggles or glasses with side shields.



Protective Clothing: Always wear nitrile gloves and clothing covering all skin to protect against dermal exposure.

NIOSH-Approved Respirator: Low pressure spray polyurethane foams should always be used in conjunction with a certified respiratory program using a NIOSH approved respirator. **The following are recommended:**

1. a negative pressure half mask respirator with organic vapor cartridges and particulate prefilter (example - 3M® 6000-Series NIOSH/MSHA respirator), or
2. a PAPR (powered air purifying respirator) with an organic vapor cartridge for enclosed spaces without mechanical ventilation (example - 3M® GV-Series).

Intended for professional use. To learn more, visit our website. www.tigerfoam.com

ATIGFOM2.1 revised: March 2012

Instructions for Use

When spraying the dispensing unit for the first time or when starting a new kit, it is recommended to trigger the gun only 1/2 to 3/4 open, until the desired output is achieved. This controllable metering ability is a major advantage of this dispensing unit. It allows the user complete control of the flow rate that best fits the application.

Spraying Foam

1. Wear protective glasses with side shields or goggles, nitrile gloves, and clothing that protect skin from exposure. It is helpful to apply a moisturizing lotion to face prior to spraying, as the lotion will help keep the foam from sticking to any exposed skin the goggles and respirator won't cover. Use only in a well ventilated area with certified respiratory protection or a powered air purifying respirator (PAPR). See MSDS (available inside packaging and at www.tigerfoam.com).
2. For best results, use when material is between 85-95°F (29-35°C). Clean grease, oil, dirt and water off surfaces to be foamed. Take tanks out of the box and shake them before using. To shake, roll tanks on their side and rock back and forth vigorously for 3 minutes each. Tanks can be placed back in box during the application as this will help keep them upright and will be easier to move around during the application. For large kits, thread hose to tank and tighten with supplied 9/16" wrench. In winter months make sure to warm tanks up 1-2 days prior to the application to assure the core temperature of tanks have warmed thoroughly.
3. Open both tank (A & B) valves. Tanks must be upright during use.
4. Attach nozzle to the dispensing unit. Apply a thin layer of petroleum jelly to cover the face of the gun. This thin layer of petroleum jelly helps keep the seating ports and gun face clean. (Detailed instructions for attaching nozzle shown on separate page of this document.)
To Attach Nozzles, Insert bottom tab of nozzle into bottom slot on gun face then attach top latch by pushing towards back of unit until an audible "snap" is heard.
5. When spraying the dispensing unit for the first time and with each new kit, dispense foam by squeezing the trigger only 1/2 to 3/4 open until desired output is achieved. This controllable metering is a major advantage of the dispensing unit, allowing the user complete control of the flow rate that best suits the application.
6. **Once the trigger is squeezed it must be reactivated within 30 seconds or a new nozzle must be installed. Tips need to be changed every 8 minutes of continuous spray time and also if you stop spraying for more than 30 seconds. Failure to do this could result in getting off ratio between the A and B tanks. It can also result in chemical leakage that can ruin the gun and hoses.**
7. **IMPORTANT:** After releasing trigger, activate the trigger safety to prevent accidental discharge.
8. All nozzle tips are easily cleaned and solvent resistant. To reuse nozzles, have a container of acetone ready to drop the dirty tip in at the time of the tip change. The dirty tip must be placed in the acetone prior to its completely curing or the tip will not clean well. **Cleaning nozzle tips more than twice is not recommended.** Gun face can be kept clean by applying a thin layer of petroleum jelly to the face of the gun. This area can be cleaned with a soft cloth to remove any residue that may accumulate.
9. Do not remove hoses from tanks. Do not flush/clean hoses with air, water or solvent. Removing and/or cleaning hoses may compromise the foam.

IMPORTANT APPLICATION NOTES:

1. Product item numbers are designed to approximate the theoretical yields obtainable from each product. For example, TF1350 refers to 1,350 board feet optimum foam yield, (a board foot is a measurement term equal to 12"x12"x 1"). Actual yields will vary depending on factors such as ambient conditions, application technique, foam density, etc. See Technical Data Sheet for additional theoretical yield information.
2. Various U.S. and foreign patents cover the dispensing system.
3. Suitability of this product for any particular purpose, such as achieving desired sound or insulation properties, performance specifications or application requirements must be determined by the end user, prior to use. Verification that product is properly applied and installed is also the responsibility of the end user.
4. If you have any questions about this product, please contact your Sales Rep.

WARNINGS:

Follow safety precautions and wear protective equipment as recommended.

This equipment includes respirator, safety glasses with side shields or goggles, and impervious gloves, and protective clothing such as a tyvek suit. Consult Material Safety Data Sheet (MSDS) for specific information. Use only with adequate ventilation or certified respiratory equipment. NIOSH approved positive pressure supplied air respirator or a negative pressure half mask with organic vapor cartridge with particle pre-filters are recommended if exposure guidelines may be exceeded. Foam is very sticky and may be irritating to skin and eyes: therefore, wear impervious gloves, protective eyewear and suitable work clothes during use. It is helpful to apply a moisturizing lotion to face prior to spraying, as the lotion will help keep the foam from sticking to your skin. If liquid chemical comes in contact with skin, first wipe thoroughly with dry cloth, then rinse affected area with water. Wash with soap and water afterwards. Apply lotion if desired. If liquid comes in contact with eyes, immediately flush with large volume of clean water for at least 15 minutes and get medical help at once. If liquid chemical is swallowed, drink one to three glasses of water or milk and obtain immediate medical attention.

KEEP OUT OF REACH OF CHILDREN.

Storage and Re-Use

1. Close tank valves.
2. Do not store at temperatures above 120°F (49°C) or below 50°F (10°C). Kits stored below 85°F must be given sufficient time (1-2 days) for the chemical to warm up to 85-95°F (29-35°C).
3. The used nozzle should be left on the dispensing unit during storage in order to help keep the outlet ports of the dispensing unit clean and free from any dust, dirt or chemical that can affect the proper sealing of the nozzle.

SAFETY: Always engage the trigger safety and close all supply valves during storage.

4. All dispensing unit nozzles are easily cleanable and solvent resistant. To clean nozzles, liquid chemical must be dissolved prior to its complete chemical reaction by flushing the nozzle with a suitable solvent such as acetone. Gun face can be kept clean with the use of petroleum jelly on the face or with a soft cloth to remove residue.
5. Do not remove hoses from tanks. Do not flush/clean hoses with air, water or solvent. Removing and/or cleaning hoses may compromise the foam.

The dispensing unit is a disposable unit not designed for prolonged storage or continuous re-use. To help extend the storage life, it is recommended to dispense a minimal amount of foam from unit at least once every three (3) days to ensure optimum flow of chemical through hoses. Use of contents within 30 days of initial use is recommended. Make certain valves are in upright position when opening them and operating the unit.

Re-use of Dispensing Unit After Storage

1. Before disengaging the trigger safety, remove the used nozzle.
2. Check the face of the dispensing unit to make sure the outlet ports are clear and the face of the unit is free from dirt, chemical or other debris. If necessary, use a soft cloth or rag to remove any cured foam or chemical from the face of the dispensing unit. Apply a thin layer of petroleum jelly to cover the face of the gun. This thin layer of petroleum jelly helps keep the seating ports and gun face clean.
3. Follow the Set Up instructions at the top of the Operating Instructions.

All dispensing unit nozzles are easily cleanable and solvent resistant. To clean nozzles, liquid chemical must be dissolved prior to its complete chemical reaction by flushing the nozzle with a suitable solvent such as acetone. Gun face can be kept clean with the use of petroleum jelly on the face or with a soft cloth to remove residue.

Disposal Procedures

1. DO NOT INCINERATE TANKS.
2. After tanks are empty, the hose must be removed and the tanks must be vented (depressurized).

CAUTION: Tanks will still be under pressure. Turn valves to the off position before removing the hoses. Safety glasses with side shields or goggles, nitrile gloves, clothing that protects against dermal exposure, and a certified respirator must be worn during this procedure. With tank inverted, slowly open tank valve, point tank away from face and allow pressure to completely vent. **CAUTION:** Empty tank could contain potential vapor toxicity hazard. Dispose Cylinders in a well ventilated area with certified respiratory protection.

3. DISPOSE OF EMPTY CYLINDERS ACCORDING TO APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS. CHECK WITH YOUR LOCAL WASTE DISPOSAL SERVICE FOR GUIDANCE.

Troubleshooting

- **Poor chemical flow**- *(Note: when injecting foam into an enclosed cavity, it is important to check frequently that chemical is flowing properly and to replace any nozzle that has become clogged.)*
This problem could be that tank valves are not fully open or tanks opened in the wrong position, allowing only propellant gas to escape. Tanks are too cold.
- **Slow cure** - This problem could be that the unit is out of shelf life, chemical or substrate too cold or the kit is dispensing off ratio.
- **Dark crunchy foam** -This is a sign that the foam has become **"A" rich**.
The system is off-ratio causing more of the "A" chemical to be sprayed than the "B" chemical.
- **Foam shrinkage within 24 hours** - This is a sign that the foam was sprayed off-ratio and is **"B" rich**.
- **White spongy foam** - This is a sign that the foam has become **"B" rich**.
The system is off-ratio causing more of the "B" chemical to be sprayed than the "A" chemical. Foam that visibly shrinks within 24 hours after application may be an indication of "B" rich foam.
- **Sputtering from nozzle** - This is a sign of empty tanks, clogged nozzle, or a blockage in the system.
- **Lack of expansion in sprayed foam** - This problem could be associated with tank temperatures, clogged nozzles or spraying technique.
- **Foam leaking from hose connections** – Hoses not tightened enough.

Solution: STOP SPRAYING and follow instructions below

1. Remove nozzle and spray chemical into a plastic garbage bag. Check to see that both chemicals are being dispensed from the gun in approximately equal streams.
2. Make sure all valves from the tank to the dispensing unit are fully open.
3. For optimum results, the chemical temperature must be between 85- 95°F (29-35°C). During colder months tanks up 1-2 days prior to the application to make sure the core temperature of the tanks have warmed to 85- 95°F (29-35°C), especially if the tanks have recently been transported or stored in an unheated environment.

4. Replace nozzle. If the nozzle has become clogged, the foam may become off-ratio.
5. Make sure tanks are not empty and all valves are fully open. Shake tanks back and forth to determine that they contain chemical.
6. When spraying foam, allow a minimum of 1 minute before applying more foam over freshly sprayed foam. Spray in layers of 1-2" thick (2.5-5.1 cm.) with each application. Trying to apply more than 2"(5.1 cm) in a single spray will pack the foam and may result in lower expansion and lower yields.
7. Foam may be outdated and unusable. Check the expiration date.

Temperatures and Storage

Chemical temperature is very important, store kits above 85°F (29°C) prior to use. Cold chemical may lead to off-ratio flow. Optimum chemical temperature is 85- 95°F (29-35°C).

A-component chemical may eventually harden and clog the hose if stored for too long. Gun is disposable and is not intended for continuous re-use. For best results, dispense liquid from hose at least once every 3 days. Use contents within 30 days of initial use.

Tiger Foam™ Spray Foam products are composed of a diisocyanate, hydrofluorocarbon blowing agent and polyol. Consult the product's MSDS (available inside packaging and at www.tigerfoam.com) for specific information. The urethane foam produced from these ingredients will support combustion and may present a fire hazard if exposed to a fire or excessive heat about 240°F (116°C). Wear protective glasses with side shields or goggles, nitrile gloves, and clothing that protects against dermal exposure. Use only in a well ventilated area with certified respiratory protection or a powered air purifying respirator (PAPR). See MSDS (available inside packaging and at www.fomo.com) for specific information.

Component Dispensing Unit

U.S. Patent #6,345,776

Other Patents Pending

Injection of Tiger Foam into Closed Walls



Many houses were built in the 1950s through the 1980s were constructed with hollow walls, wooden exterior siding and plastered or plasterboard interior walls.

This construction does not provide very efficient insulation from both the weather and from sound.

Adding expandable foam insulation in the voids between the interior and exterior walls is an excellent and relatively low cost method of adding insulation to the home.

Tiger Foam Kits provide an easy solution to injecting this insulation between the walls, however, we have found that the insulation must be injected under very controlled conditions. If too much material is injected, there is a risk of buckling or bowing-in the interior walls, if too little material is injected, there will be voids in the insulation.

Here is the method that we have developed that works, and is relatively easy.

1. Prepare a block of wood $5/8$ " thick x $3/4$ " wide and about 1-1/4" long.
2. Tape the block to the trigger to limit the trigger travel to about 50% of full on.
3. Obtain several 8" lengths of thin wall $1/4$ " ID Teflon tubing.
4. Attach the tubing to several mixer nozzles. See Photo below for a view of the modified gun.



Keep one 8" length of tubing aside for a "feeler"; its use will be described later.

Also prepare a coat hanger with one end 10" long nearly straight, but bent at about 45° from the remainder; this will also be used as a different "feeler", described below.

8"

Preparation of the house for insulated foam injection:

The injection may be performed from either inside or outside the home. Keep in mind that the liquid foam must be at 75° to 85° F for best results.

Inside injection: pros are warm/controlled temperature, ease of finding studs; cons: possibility of getting foam

on walls, floors and carpets, difficult access to some walls because of furniture, windows, and wall accessories.

Outside Injection: Pros; ease of access, less worry about spillage and stray foam, ease of covering up access holes; cons; difficult to control temperature and weather.

Choose which injection side of the wall that best fits your situation.

Materials Required:

- Tape measure
- Black Marking pen
- Electric Drill
- 3/8" Drill bit
- Watch with sweep second hand, or stop-watch
- Above mentioned bent coat hanger.

Procedure:

A. Preparation of the home walls for insulation:

If between stud voids are 3.5" x 14.5" x 96" the volume is about 2.8 cubic feet, so without windows or obstructions, 50 cubic feet of foam should fill about 27 linear feet of wall.

Plan on preparing about 30 to 50 linear feet of wall at a time

Locate and mark the location of all studs if possible by using a stud finder

Halfway between each stud mark a hole location about 48" from the floor and another about 88" from the floor.

If unsure of stud location, this is where the bent coat hanger comes in handy.

Choose a guesstimate hole location and drill a 3/8" hole in the wall about 48" from the floor and aimed down at about 30°

Insert the bent coat hanger thru the hole and rotate it to the left and to the right to "feel" about where the studs are located.

Once the studs are found, estimate the center between, then drill a second hole either 16" to the left or to the right of the expected center between the studs aimed 30° down; repeat the coat hanger feeler routine.

If the holes are a little off-center from the studs, there is no problem.

Continue drilling holes between the studs for the entire 30 to 50 foot section.

If you hit a stud with your drill, mark it as "NO Hole", measure about 8" from that hole and re-drill. Drill all the 48" high holes, each with about a 30° downward incline.

Repeat drilling above each acceptable hole location, but about 88" from the floor.

Each drilled hole should slant down about 30°. You should now have about a 30' to 50' wall section with two holes between each stud set and placed at 48" & 88" above the floor.

B. Foam Tank and Gun Preparation

1. Place the two foam tanks onto a small wagon or cart for ease in transporting from hole to hole as you proceed. Tape the tanks together and to the cart with duct tape.
2. Connect the hoses to the tanks, observe the red striped hose is on tank "A" and the black striped hose is on tank "B". Tighten the hose nuts securely.
3. Use the injector gun with the modified trigger as described above.
4. Connect a mixer nozzle (with the 8" length of Teflon tubing) onto the gun.
5. Don gloves, goggles and old long-sleeve shirt.

C. Insulation Injection into wall

1. Insert the gun tubing about 6" into the lower hole on the first wall section to be treated.
2. Pull the gun trigger to the stop (about 50%) of full on, and start timing the fill.
3. Allow the fill to proceed for 40 seconds, then stop.
4. Repeat steps 1-3 for all of the lower (48" high) holes.
5. Once all the lower sections are filled, start filling the higher (88" high) holes starting at the same section as chosen in step 1 above.
6. Pull the gun trigger to the stop (about 50%) of full on, and start timing the fill.
7. Allow the fill to proceed for 40 seconds, then stop.
8. Repeat steps 6, 7 for all of the higher (88" high) holes.

Once complete, use the above mentioned spare piece of ¼" tubing to "feel" the expanded foam level of each filled section.

If there are sections that are not completely full, top them off with a 5 or 10 second dose of foam chemicals.

If you over-fill a little bit, no worry, the foam will stream out the hole like a worm. Do not try to catch it, its sticky, instead allow it to cure about 30 minutes or so, and by using a sharp putty knife, you can easily scrape off the excess dried foam that has streamed out

D. Filling the access holes.

If the access holes are on the outside wall, purchase several 3' or 4' lengths of 3/8" diameter wooden dowel rod and cut them into 1-1/4" long pieces at 30° to be used to fill each hole. You will need one short dowel for each hole.

Coat each 1-1/4" rod with a little Elmer's Wood Glue and drive into each hole until flush.

Allow 24 hours for the glue to cure; then sand flush and repaint.

If the access holes are on the interior walls, drill out the excess foam from each hole and fill the holes with patching plaster, then sand flush and repaint.

A standard Tiger Foam 50 cubic foot kit will provide enough foam for about 40 to 60 linear feet of wall insulation (depending on wall thickness and window areas).


If there is chemical left over after the first section of wall, prepare another 10 or 20 feet of wall as per above and repeat filling until the tanks are empty, i.e. blowing excess air into the mixing gun.

TECHNICAL DATA SHEET

Tiger Foam™ E-84 Low Pressure HFC Spray Foam



LOW PRESSURE POLYURETHANE HFC SPRAY FOAM INFORMATION

Description	Low pressure, medium density, two-component spray polyurethane foam
SPF	Spray Polyurethane Foam
Applications	Designed to fill and seal various size voids, deaden sound or reduce vibration. Conforms to the requirements of ASTM E84 as a Class 1 (A) system.
Preparation for use	Substrate must be clean, dry, firm, free of loose particles, and free of dust, grease and mold release agents. Protect surfaces not to be foamed. Read SDS, Operating Instructions, and Product Stewardship Guidelines. For additional information go to www.tigerfoam.com
Use	Condition chemical to 75-85°F (24-29°C). Follow instructions for set-up found in the operating instructions.
PPE	 <p>Recommend using in a well-ventilated area with certified respiratory protection or a powered air purifying respirator (PAPR). Wear protective glasses with side shields or goggles, nitrile gloves, and clothing that protects against dermal exposure. Read all instructions and SDS (Section 8) prior to use of any product.</p>
Note	FOR PROFESSIONAL USE ONLY. Always check the local building code before use. Cured low pressure polyurethane foam is non-toxic and inert.
Temperature	Please see chart located on page 2
Product Storage	Store in a dry area. Do not expose the kits or tanks to open flame or temperatures above 90°F (32°C). Excessive heat can cause premature aging of components resulting in a shorter shelf-life.
Disposal	Refer to SDS (Section 13) for instructions. Always dispose of empty cylinders according to applicable federal, state, provincial and local regulations.
Shelf-life	12 months
Compatibility	Cured low pressure polyurethane foam is chemically inert and non-reactive in approved applications, and will not harm electrical wire insulations, extruded polystyrene foams, Romex®, rubber, PVC, polyethylene (i.e. PEX) or other plastics. The product is not resistant to UV rays; if left exposed the product should be coated or painted.

TECHNICAL DATA

STANDARD

RESULTS

TECHNICAL DATA	STANDARD	RESULTS
Density Free Rise	ASTM D1622	1.75 lbs/ft ³ (28 kg/m ³)
Density In-place		2.12 lbs/ft ³ (34 kg/m ³)
K-factor - Initial	ASTM C518	0.139 BTU·inch/ft ² ·h·°F
Aged 90 days 140°F (60°C)		0.166 BTU·inch/ft ² ·h·°F
Aged 90 days 140°F (60°C)		0.083 BTU·inch/ft ² ·h·°F
R-Value - Initial	ASTM C518	7.2 at 1 inch thickness
Aged 90 days 140°F (60°C)		6.0 at 1 inch thickness
Aged 90 days 140°F (60°C)		12.0 at 2 inch thickness
Air Barrier Properties	ASTM E283	0.003 cfm/ft ² (0.02 L/s/m ²)
Tested at 1 inch thickness @1.57 psf (75Pa)		
Air Permeance	ASTM E2178	0.02 L/s/m ²
Tested at 2 Inch Beads		
Compressive Strength	ASTM D1621	26 lbf/in ² (182 kPa) Parallel
		16 lbf/in ² (110 kPa) Perpendicular
Dimensional Stability	ASTM D2126	+/- 5%
Tack-Free/Expansion Time	Tack-Free/Expansion Time	30-60 seconds
Closed-Cell Content	ASTM D2856	95%

TECHNICAL DATA (Continued)

STANDARD

RESULTS

Tiger Foam™ E84 Class 1(A) Spray Foam

Tensile Strength	ASTM D1623	OSB 20 lbf/in2 (137 kPa) CMU 25 lbf/in2 (172 kPa) Steel 22 lbf/in2 (152 kPa)
Cuttable		2-5 minutes
Fungi Resistance	ASTM G21	No Growth
Perm Rating- Method A 1" Thick (2.54 cm) 2" Thick (5.08 cm) 3" Thick (7.62 cm)	ASTM E96	1.67 (100 ng/(m ² ·Pa·s))- Class III Vapor Retarder 1.44 (82 ng/(m ² ·Pa·s))- Class III Vapor Retarder 1.00 (57 ng/(m ² ·Pa·s))- Class II Vapor Retarder
Water Absorption	ASTM D2842	2.9%
Fire Rating- Tested at 2" Thickness	ASTM E84	Flame Spread Index 20 Smoke Developed 400
Fire Rating- Tested at 2" Beads	CAN/ULC S102	Flame Spread Index 9 Smoke Developed 43
Fire Rating	FMVSS 302/ CMVSS 302	Meets/ Burn Rate 0/00 min

APPROVALS/STANDARDS/CLASSIFICATIONS

ESR- 2717	Conforms to the requirements of AC 377
CCMC #13455-L	Conforms to the requirements of CAN/ULC S711.01
NFPA 286	Testing for use in roof/wall junctions and attic/wall penetrations at 2" thickness x 6" wide with unlimited length without a thermal barrier.
NFPA 286-Modified	Tested with No Burn Plus XD Ignition Barrier. Can be used in attic and crawlspace applications when certain qualifying conditions are met.
ULe GREENGUARD	Gold Certification



TEMPERATURE GUIDELINES

Chemical Storage Temperature	Optimum 75-85°F (24-29°C) but not <60°F (16°C) or >90°F (32°C)
Outside Application Temperature	40-100°F (4-38°C)
Process Core Chemical Temperature	75-85°F (24-29°C)
Surface Temperature (Substrate)	40-100°F (4-38°C)
Cured Foam	200°F to +240°F (-129°C to +116°C)

DIMENSIONS & YIELD (1.75 Density)

	Weight (Including packaging)	Dimensions (Including Packaging)	Board Feet	Cubic Feet	Linear Feet	Linear Feet
TF200FR	41 lbs	16" x 16" x 9"	205 (19 m ²)	17 ft ³ (.48 m ³)	3132 at 1 inch bead	783 at 2 inch bead
TF600FR	115.7 lbs	18" x 18" x 13"	605 (56.2 m ²)	50 ft ³ (1.42 m ³)	9236 at 1 inch bead	2309 at 2 inch bead

¹ Yield is based on free-rise density. We state our core density/free-rise density when describing the foam. Applying foam into a cavity may result in higher in-place densities due to packing effects. These higher densities may result in lower yields.

NOTE: Physical properties shown are typical and are to serve only as a guide for engineering design. Results are obtained from specimens under ideal laboratory conditions and may vary upon use, temperature and ambient conditions. Right to change physical properties as a result of technical progress is reserved. Yields shown are optimum and will vary slightly depending on ambient conditions and application. This information supersedes all previously published data. The Customer is responsible for deciding whether products and associated TDS information are appropriate for customer's use.

WARNING:

Tiger Foam low pressure one-component polyurethane foam sealants and adhesives (OCF), low pressure spray polyurethane foams and foam adhesives (SPF), and low pressure pour-in-place polyurethane foams (PIP) are composed of diisocyanate, hydrofluorocarbon, hydrocarbon or hydrofluoroolefin blowing agent, and a polyol blend. The urethane foam produced from these ingredients will support combustion and may present a fire hazard if exposed to a fire or excessive heat about 240°F (116°C). Read all instructions, TDS and SDS prior to use of any product. Products are intended for professional use only.

Before using any OCF, SPF or PIP product, read the SDS and instructions carefully before use (www.tigerfoam.com). **OCF Products:** wear protective glasses with side shields or goggles, nitrile gloves, and clothing that protects against dermal exposure. Recommend using in a well-ventilated area. Avoid breathing vapors. **SPF/PIP Products:** wear protective glasses with side shields or goggles unless using a full-face respirator, nitrile gloves, and clothing that protects against dermal exposure. Recommend dispensing product in a well-ventilated area and with certified respiratory protection or a powered air purifying respirator (PAPR); however, well ventilated exterior applications may not need respiratory protection. It is the responsibility of the employer to complete a PPE evaluation and/or exposure assessment to determine if respiratory protection is required.

Refer to each product's TDS for specifications, testing results, and other attributes. The customer is ultimately responsible for deciding whether products and associated TDS information are appropriate for customer's use. For professional use only. Building practices unrelated to materials can lead to potential mold issues. Material suppliers cannot provide assurance that mold will not develop in any specific system. Product uses a non-flammable compressed gas. Keep away from heat. Smoking and open flames, including hot work, should be prohibited in the vicinity of a foaming operation. Avoid contact with skin and eyes. May cause sensitization by inhalation and/or direct skin contact. Persons previously sensitized to Isocyanates may develop a cross-sensitization reaction to other isocyanates. Avoid prolonged or repeated breathing of vapor. Use in conformance with all local, state and federal regulations and safety requirements. Failure to strictly adhere to any recommended procedures and reasonable safety precautions shall release Commercial Thermal Solutions of all liability with respect to the materials or the use thereof. For additional information and location of your nearest distributor, call Commercial Thermal Solutions 1-800-664-0063.

LIMITED WARRANTY and LIMITATION OF DAMAGES: Commercial Thermal Solutions, Inc. warrants only that the product shall meet Commercial Thermal Solutions' specifications for the product when shipped by Commercial Thermal Solutions.. NO OTHER EXPRESSED OR IMPLIED WARRANTIES APPLY AND ANY IMPLIED WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT OUTSIDE THE U.S. AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. Buyer and users assume all risks of use, handling and storage of the product. Failure to strictly adhere to any recommended procedures shall release Commercial Thermal Solutions from all liability. The user of the product is responsible to determine suitability of the product for the particular use. The exclusive remedy as to any breach of warranty, negligence or other claim is limited to the replacement of the product. Liability for any indirect, incidental or consequential damage or loss is specifically excluded.

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TECHNICAL DATA SHEET

Tiger Foam™ Slow Rise Low Pressure HFC Spray Foam



LOW PRESSURE POLYURETHANE HFC SPRAY FOAM INFORMATION

Description	Low pressure, medium density, two-component pour-in-place (PIP) polyurethane foam system
PIP	Pour-in-place designation refers to slow tack-free time, more pourable properties
Applications	Designed to fill cavities, molds, fixtures, holes, or voids. The foam can be dispensed into clean and dry voids of various size to fill, seal, insulate, provide buoyancy, strengthen, reduce vibration or deaden sound. Residential wall assemblies that use drywall or gypsum board may be prone to cracking or buckling due to either overfilling the cavity or plugging the pressure relief holes.
Preparation for use	Area to be filled must have minimal obstructions and have no existing insulation. Before using, determine the structural stability of the area to be filled, certain applications may require clamping or bracing to provide uniform support against foaming pressure. Read SDS, Operating Instructions, and Product Stewardship Guidelines. For additional information go to www.tigerfoam.com .
Use	Warm/Cool chemical to 75-85°F (24-29°C). Follow instructions for set-up found in the operating instructions.
PPE	 <p>Recommend using in a well-ventilated area with certified respiratory protection or a powered air purifying respirator (PAPR). Wear protective glasses with side shields or goggles, nitrile gloves, and clothing that protects against dermal exposure. Read all instructions and SDS prior to use of any product.</p>
Note	FOR PROFESSIONAL USE ONLY. Always check the local building code before use. Cured foam is inert and non-toxic. Amount (weight) of foam needed in pounds = cavity size (ft ³) x desired density (lb/ft ³)
Temperature Guidelines	See chart located on page 2
Disposal	Refer to SDS (Section 13) for instructions. Always dispose of empty cylinders in accordance to applicable federal, state, provincial and local regulations.
Shelf-life	12 months
Compatibility	Cured low pressure polyurethane foam is chemically inert and non-reactive in approved applications, and will not harm electrical wire insulations, Romex®, rubber, PVC, polyethylene (i.e. PEX) or other plastics. The product is not resistant to UV rays, if left exposed the product should be coated or painted.

TECHNICAL DATA

STANDARD

RESULTS

TECHNICAL DATA	STANDARD	RESULTS
Density In-place	ASTM D1622	2.0 lbs/ft ³ (32 kg/m ³)
Density Free-Rise		1.75 lbs/ft ³ (28 kg/m ³)
K-factor - Aged 28 days 70°F (21°C)	ASTM C518	0.168 BTU·inch/ft ² ·h·°F
R-Value - Aged 28 days 70°F (21°C)	ASTM C518	5.9 at 1 inch thickness
Compressive Strength	ASTM D1621	14 lbf/in ² (96 kPa) Parallel
		15 lbf/in ² (103 kPa) Perpendicular
Tensile Strength	ASTM D1623	42 lbf/in ² (263 kPa)
Dimensional Stability	ASTM D2126	+/- 5%
Tack-Free/Expansion Time	Tack-Free/Expansion Time	60-90 seconds
Closed-Cell Content	ASTM D2856	>90%
Cutable		5-10 minutes
Title 33	33 CFR 183.114	Meets the requirements for flotation
DIN 4102.1		B2

APPROVALS/STANDARDS/CLASSIFICATIONS

Title 33	Tiger Foam Slow Rise Systems meet the specification requirements for flotation in Title 33 Code of Federal Regulations, paragraph 183.114
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TEMPERATURE

Chemical Storage Temperature	Optimum 75-85°F (24-29°C) but not <60°F (16°C) or >90°F (32°C)
Outside Application Temperature	40-100°F (4-38°C)
Process Core Chemical Temperature	75-85°F (24-29°C)
Surface Temperature (Substrate/Mold)	40-100°F (4-38°C)
Cured Foam	-200°F to +240°F (-129°C to +116°C)

DIMENSIONS & YIELD¹ (2.00 Density)

	Weight (Including Packaging)	Dimensions (Including Packaging)	Yield (Cubic Feet)
TF200SR	41 lbs	16" x 16" x 9"	13 ft ³ (.37 m ³)
TF600SR	115.7 lbs	18" x 18" x 13"	43 ft ³ (1.22 m ³)

¹Theoretical Yield is based on 2.0 pcf in-place density. Applying foam into a cavity may result in higher in-place densities due to packing effects. These higher densities may result in lower yields.

Always read all operating, application and safety instructions before using any products. Use in conformance with all local, state and federal regulations and safety requirements. Failure to strictly adhere to any recommended procedures and reasonable safety precautions shall release Commercial Thermal Solutions, Inc. of all liability with respect to the materials or the use thereof. For additional information and location of your nearest distributor, call Commercial Thermal Solutions, Inc. 1-800-664-0063.

NOTE: Physical properties shown are typical and are to serve only as a guide for engineering design. Results are obtained from specimens under ideal laboratory conditions and may vary upon use, temperature and ambient conditions. Right to change physical properties as a result of technical progress is reserved. This information supersedes all previously published data. The Customer is responsible for deciding whether products and associated TDS information are appropriate for customer's use.

Tiger Foam low pressure one-component polyurethane foam sealants and adhesives (OCF), low pressure spray polyurethane foams (SPF), and low pressure pour-in-place polyurethane foams (PIP) are composed of a diisocyanate, hydrofluorocarbon or hydrocarbon blowing agent, and polyol. For polyurethane foam sealants/adhesives: wear protective glasses with side shields or goggles, nitrile gloves, and clothing that protects against dermal exposure. Recommend using in a well-ventilated area. Avoid breathing vapors. Read the SDS and instructions carefully before use (www.tigerfoam.com). For spray polyurethane foams and pour-in-place polyurethane foams: wear protective glasses with side shields or goggles, nitrile gloves, and clothing that protects against dermal exposure. Use only in a well-ventilated area and with certified respiratory protection or a powered air purifying respirator (PAPR). Additional information on ventilation can be found in the Product Stewardship Guide (www.tigerfoam.com). Read the SDS (www.tigerfoam.com) and instructions carefully before use. The urethane foam produced from these ingredients will support combustion and may present a fire hazard if exposed to a fire or excessive heat about 240°F (116°C). Refer to each product's TDS for specifications, testing results, and other attributes. The customer is ultimately responsible for deciding whether products and associated TDS information are appropriate for customer's use. Refer to the products' SDS, ICP Adhesives & Sealants' Product Stewardship Guidelines, and operating instructions for guidance on the safe and proper application of the product (www.tigerfoam.com). For professional use only. Building practices unrelated to materials can lead to potential mold issues. Material suppliers cannot provide assurance that mold will not develop in any specific system.

WARNINGS: Follow safety precautions and wear protective equipment as recommended. Prolonged inhalation exposure may cause respiratory irritation/sensitization and/or reduce pulmonary function in susceptible individuals. Onset may be delayed. Pre-existing respiratory conditions may be aggravated. We recommend that the product is used in a well-ventilated area and with certified respiratory protection. NIOSH approved positive pressure supplied air respirator is recommended if exposure guidelines may be exceeded. Contents may be very sticky and irritating to skin and eyes, therefore wear safety glasses with side shields or goggles, nitrile gloves, and clothing that protects against dermal exposure when operating. If liquid chemical comes in contact with skin, first wipe thoroughly with dry cloth, then rinse affected area with water. Wash with soap and water afterwards, and apply hand lotion if desired. If liquid comes in contact with eyes, immediately flush with large volume of clean water for at least 15 minutes and get medical help at once. If liquid is swallowed, get immediate medical attention. Do not induce vomiting. If breathing is difficult, give oxygen. If breathing has stopped give artificial respiration. Products manufactured or produced from these chemicals are organic and, therefore, combustible. Each user of any product should carefully determine whether there is a potential fire hazard associated with such product in a specific usage. **KEEP OUT OF REACH OF CHILDREN.**

LIMITED WARRANTY and LIMITATION OF DAMAGES: Commercial Thermal Solutions, Inc. warrants only that the product shall meet Commercial Thermal Solutions, Inc. specifications for the product when shipped by Commercial Thermal Solutions, Inc. NO OTHER EXPRESSED OR IMPLIED WARRANTIES APPLY AND ANY IMPLIED WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT OUTSIDE THE U.S. AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. Buyer and users assume all risks of use, handling and storage of the product. Failure to strictly adhere to any recommended procedures shall release Commercial Thermal Solutions, Inc. from all liability. The user of the product is responsible to determine suitability of the product for the particular use. The exclusive remedy as to any breach of warranty, negligence or other claim is limited to the replacement of the product. Liability for any indirect, incidental or consequential damage or loss is specifically excluded.

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TECHNICAL DATA SHEET

Tiger Foam™ Open Cell Low Pressure HFC Spray Foam



OPEN CELL LOW PRESSURE SPRAY POLYURETHANE FOAM INFORMATION

Description	Low pressure, low density, two-component spray polyurethane foam
SPF	Spray Polyurethane Foam
Applications	Designed to fill and seal various size voids, deaden sound or reduce vibration.
Preparation for use	Substrate must be clean, dry, firm, free of loose particles, and free of dust, grease and mold release agents. Protect surfaces not to be foamed. Read SDS, Operating Instructions and Product Stewardship Guidelines. For additional information go to www.tigerfoam.com
Use	Warm/Cool chemicals to 75-85°F (24-29°C). Follow instructions for set-up found in the operating instructions.
PPE	 <p>Recommend using in a well-ventilated area with certified respiratory protection or a powered air purifying respirator (PAPR). Wear protective glasses with side shields or goggles, nitrile gloves, and clothing that protects against dermal exposure. Read SDS, Operating Instructions, and Product Stewardship Guidelines. For additional information go to www.tigerfoam.com</p>
Note	FOR PROFESSIONAL USE ONLY. Always check the local building code before use. Cured low pressure polyurethane foam is non-toxic and inert.
Temperature	See chart on page 2
Disposal	Refer to SDS (Section 13) for instructions. Always dispose of empty cylinders in accordance with all applicable federal, state, provincial and local regulations.
Shelf-life	12 months
Compatibility	Cured low pressure polyurethane foam is chemically inert and non-reactive in approved applications, and will not harm electrical wire insulations, Romex®, rubber, PVC, polyethylene (i.e. PEX) or other plastics. The product is not resistant to UV rays, if left exposed the product should be coated or painted.
Product Storage	See temperature chart located on page 2

TECHNICAL DATA

STANDARD

RESULTS

Density Free Rise	ASTM D1622	.75 lbs/ft ³ (12 kg/m ³)
Density In-place		1.12 lbs/ft ³ (18 kg/m ³)
K-factor - Aged 90 days 140°F (60°C)	ASTM C518	0.233 BTU·inch/ft ² ·h·°F
R-Value - Aged 90 days 140°F (60°C)	ASTM C518	4.3 at 1 inch thickness
Air Barrier Properties -Estimated	ASTM E283	
@1.57 psf (75 Pa)		<0.0025 cfm/ft ² (<0.0125 L/s/m ²)
@6.24 psf (300 Pa)		<0.01 cfm/ft ² (<0.05 L/s/m ²)
Compressive Strength	ASTM D1621	<5 lbf/in ² (35 kPa)
Dimensional Stability	ASTM D2126	+/- 5%
Tack-Free/Expansion Time	Tack-Free/Expansion Time	30-45 seconds
Closed-Cell Content	ASTM D2856	5%
Cutable		3-5 minutes
Fungi Resistance	ASTM G21	No Growth
Sound Transmission Class	ASTM E90	STC 35
Noise Reduction Coefficient	ASTM C423	NRC .70
Fire Rating - Tested at 4" Thickness	ASTM E84	Flame Spread Index 50 Smoke Developed 400

APPROVALS/STANDARDS/CLASSIFICATIONS

ASTM E84	Conforms to the requirements of ASTM E84 and is classified as a class 2 (B) material. Tested at 4 inch thickness
STC 35	The STC rating indicates how well a wall assembly blocks airborne sound. Our wall assembly was comprised of 5/8" OSB (exterior), one layer of type X gypsum wallboard (interior), 2" x 4" studs with 3 inches of Tiger Foam Low Density Spray Foam
NRC.70	The NRC is a single number index for rating how absorptive a material is. Tiger Foam Low Density Spray Foam has an NRC of .70 at 3 inches in thickness. It will absorb 70% of the sound that comes into contact with it and will reflect 30% of the sound back into space.



TEMPERATURE

Chemical Storage Temperature	Optimum 75-85°F (24-29°C) but not <60°F (16°C) or >90°F (32°C)
Outside Application Temperature	40-100°F (4-38°C)
Process Core Chemical Temperature	75-85°F (24-29°C)
Surface Temperature (Substrate)	40-100°F (4-38°C)
Cured Foam	200°F to +240°F (-129°C to +116°C)

DIMENSIONS & YIELD¹ (.75 Density)

	Weight (Including packaging)	Dimensions (Including Packaging)	Board Feet	Cubic Feet
TF1350	115.7 lbs	17"x17"x10	1350 (125.5 m ²)	112.5 ft ³ (3.18 m ³)

¹ Yield is based on free-rise density. We state our core density/free-rise density when describing the foam. Applying foam into a cavity may result in higher in-place densities due to packing effects. These higher densities may result in lower yields.

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WARNINGS: Follow safety precautions and wear protective equipment as recommended. Prolonged inhalation exposure may cause respiratory irritation/sensitization and/or reduce pulmonary function in susceptible individuals. Onset may be delayed. Pre-existing respiratory conditions may be aggravated. We recommend that the product is used in a well-ventilated area and with certified respiratory protection. NIOSH approved positive pressure supplied air respirator is recommended if exposure guidelines may be exceeded. Contents may be very sticky and irritating to skin and eyes, therefore wear safety glasses with side shields or goggles, nitrile gloves, and clothing that protects against dermal exposure when operating. If liquid chemical comes in contact with skin, first wipe thoroughly with dry cloth, then rinse affected area with water. Wash with soap and water afterwards, and apply hand lotion if desired. If liquid comes in contact with eyes, immediately flush with large volume of clean water for at least 15 minutes and get medical help at once. If liquid is swallowed, get immediate medical attention. Do not induce vomiting. If breathing is difficult, give oxygen. If breathing has stopped give artificial respiration. Products manufactured or produced from these chemicals are organic and, therefore, combustible. Each user of any product should carefully determine whether there is a potential fire hazard associated with such product in a specific usage. **KEEP OUT OF REACH OF CHILDREN.**

LIMITED WARRANTY and LIMITATION OF DAMAGES: Commercial Thermal Solutions, Inc. warrants only that the product shall meet Commercial Thermal Solutions, Inc. specifications for the product when shipped by Commercial Thermal Solutions, Inc. NO OTHER EXPRESSED OR IMPLIED WARRANTIES APPLY AND ANY IMPLIED WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT OUTSIDE THE U.S. AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. Buyer and users assume all risks of use, handling and storage of the product. Failure to strictly adhere to any recommended procedures shall release Commercial Thermal Solutions, Inc. from all liability. The user of the product is responsible to determine suitability of the product for the particular use. The exclusive remedy as to any breach of warranty, negligence or other claim is limited to the replacement of the product. Liability for any indirect, incidental or consequential damage or loss is specifically excluded.

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Tiger Foam™ E84 Fast Rise (TF200FR, TF600FR) A-side

Commercial Thermal Solutions, Inc.

Version No: 3.2
Safety Data Sheet according to OSHA HazCom Standard (2012) requirements

Issue Date: 01/30/2023
Print Date: 01/30/2023
S.GHS.USA.EN

SECTION 1 Identification

Product Identifier

Product name	Tiger Foam™ E84 Fast Rise (TF200FR, TF600FR) A-side
Synonyms	Not Available
Proper shipping name	Chemical under pressure, n.o.s. (Hydrofluoroolefin, Nitrogen)
Other means of identification	Not Available

Recommended use of the chemical and restrictions on use

Relevant identified uses	Low pressure polyurethane foam. Side A Component. For PROFESSIONAL USE ONLY
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Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party

Registered company name	Commercial Thermal Solutions, Inc.
Address	2812 SW 29th Ct. Cape Coral, FL 33914 United States
Telephone	1-800-664-0063
Fax	Not Available
Website	www.tigerfoam.com
Email	customerservice@tigerfoam.com

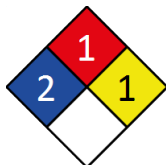
Emergency phone number

Association / Organisation	CHEMTREC
Emergency telephone numbers	1-800-424-9300
Other emergency telephone numbers	1-703-527-3887

SECTION 2 Hazard(s) identification

Classification of the substance or mixture

NFPA 704 diamond



Note: The hazard category numbers found in GHS classification in section 2 of this SDSs are NOT to be used to fill in the NFPA 704 diamond. Blue = Health Red = Fire Yellow = Reactivity White = Special (Oxidizer or water reactive substances)

Classification	Serious Eye Damage/Eye Irritation Category 2A, Sensitisation (Respiratory) Category 1, Specific Target Organ Toxicity - Repeated Exposure Category 2, Acute Toxicity (Inhalation) Category 4, Specific Target Organ Toxicity - Single Exposure (Respiratory Tract Irritation) Category 3, Skin Corrosion/Irritation Category 2, Gases Under Pressure (Compressed Gas), Sensitisation (Skin) Category 1, Carcinogenicity Category 2
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Label elements

Hazard pictogram(s)	
Signal word	Danger

Hazard statement(s)

Tiger Foam™ E84 Fast Rise (TF200FR, TF600FR) A-side

H319	Causes serious eye irritation.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H373	May cause damage to organs through prolonged or repeated exposure.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H315	Causes skin irritation.
H280	Contains gas under pressure; may explode if heated.
H317	May cause an allergic skin reaction.
H351	Suspected of causing cancer.

Hazard(s) not otherwise classified

Not Applicable

Precautionary statement(s) Prevention

P201	Obtain special instructions before use.
P260	Do not breathe gas.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves, protective clothing, eye protection and face protection.
P284	[In case of inadequate ventilation] wear respiratory protection.
P261	Avoid breathing gas.
P202	Do not handle until all safety precautions have been read and understood.
P264	Wash all exposed external body areas thoroughly after handling.
P272	Contaminated work clothing must not be allowed out of the workplace.

Precautionary statement(s) Response

P308+P313	IF exposed or concerned: Get medical advice/ attention.
P342+P311	If experiencing respiratory symptoms: Call a POISON CENTER/doctor/physician/first aider.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312	Call a POISON CENTER/doctor/physician/first aider/if you feel unwell.
P314	Get medical advice/attention if you feel unwell.
P333+P313	If skin irritation or rash occurs: Get medical advice/attention.
P337+P313	If eye irritation persists: Get medical advice/attention.
P302+P352	IF ON SKIN: Wash with plenty of water.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P332+P313	If skin irritation occurs: Get medical advice/attention.
P362+P364	Take off contaminated clothing and wash it before reuse.

Precautionary statement(s) Storage

P405	Store locked up.
P410+P403	Protect from sunlight. Store in a well-ventilated place.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.

Precautionary statement(s) Disposal

P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.
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SECTION 3 Composition / information on ingredients**Substances**

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
101-68-8	30-60	<u>4,4'-diphenylmethane diisocyanate (MDI)</u>
9016-87-9	30-60	<u>polymeric diphenylmethane diisocyanate</u>
29118-24-9	5-10	<u>1,3,3,3-tetrafluoropropene</u>
7727-37-9.	<5	<u>nitrogen</u>

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

SECTION 4 First-aid measures**Description of first aid measures**

Continued...

Tiger Foam™ E84 Fast Rise (TF200FR, TF600FR) A-side

<p>Eye Contact</p>	<ul style="list-style-type: none"> ▶ If product comes in contact with eyes remove the patient from gas source or contaminated area. ▶ Take the patient to the nearest eye wash, shower or other source of clean water. ▶ Open the eyelid(s) wide to allow the material to evaporate. ▶ Gently rinse the affected eye(s) with clean, cool water for at least 15 minutes. Have the patient lie or sit down and tilt the head back. Hold the eyelid(s) open and pour water slowly over the eyeball(s) at the inner corners, letting the water run out of the outer corners. ▶ The patient may be in great pain and wish to keep the eyes closed. It is important that the material is rinsed from the eyes to prevent further damage. ▶ Ensure that the patient looks up, and side to side as the eye is rinsed in order to better reach all parts of the eye(s) ▶ Transport to hospital or doctor. ▶ Even when no pain persists and vision is good, a doctor should examine the eye as delayed damage may occur. ▶ If the patient cannot tolerate light, protect the eyes with a clean, loosely tied bandage. ▶ Ensure verbal communication and physical contact with the patient. <p>DO NOT allow the patient to rub the eyes DO NOT allow the patient to tightly shut the eyes DO NOT introduce oil or ointment into the eye(s) without medical advice DO NOT use hot or tepid water.</p>
<p>Skin Contact</p>	<p>If skin or hair contact occurs:</p> <ul style="list-style-type: none"> ▶ Immediately flush body and clothes with large amounts of water, using safety shower if available. ▶ Quickly remove all contaminated clothing, including footwear. ▶ Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre. ▶ Transport to hospital, or doctor.
<p>Inhalation</p>	<p>Following uptake by inhalation, move person to an area free from risk of further exposure. Oxygen or artificial respiration should be administered as needed. Asthmatic-type symptoms may develop and may be immediate or delayed up to several hours. Treatment is essentially symptomatic. A physician should be consulted.</p> <ul style="list-style-type: none"> ▶ Following exposure to gas, remove the patient from the gas source or contaminated area. ▶ NOTE: Personal Protective Equipment (PPE), including positive pressure self-contained breathing apparatus may be required to assure the safety of the rescuer. ▶ Prostheses such as false teeth, which may block the airway, should be removed, where possible, prior to initiating first aid procedures. ▶ If the patient is not breathing spontaneously, administer rescue breathing. ▶ If the patient does not have a pulse, administer CPR. ▶ If medical oxygen and appropriately trained personnel are available, administer 100% oxygen. ▶ Summon an emergency ambulance. If an ambulance is not available, contact a physician, hospital, or Poison Control Centre for further instruction. ▶ Keep the patient warm, comfortable and at rest while awaiting medical care. ▶ MONITOR THE BREATHING AND PULSE, CONTINUOUSLY. ▶ Administer rescue breathing (preferably with a demand-valve resuscitator, bag-valve mask-device, or pocket mask as trained) or CPR if necessary.
<p>Ingestion</p>	<p>Not considered a normal route of entry.</p>

Most important symptoms and effects, both acute and delayed

See Section 11

Indication of any immediate medical attention and special treatment needed

For gas exposures:

BASIC TREATMENT

- ▶ Establish a patent airway with suction where necessary.
- ▶ Watch for signs of respiratory insufficiency and assist ventilation as necessary.
- ▶ Administer oxygen by non-rebreather mask at 10 to 15 l/min.
- ▶ Monitor and treat, where necessary, for pulmonary oedema .
- ▶ Monitor and treat, where necessary, for shock.
- ▶ Anticipate seizures.

ADVANCED TREATMENT

- ▶ Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.
- ▶ Positive-pressure ventilation using a bag-valve mask might be of use.
- ▶ Monitor and treat, where necessary, for arrhythmias.
- ▶ Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.
- ▶ Drug therapy should be considered for pulmonary oedema.
- ▶ Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications.
- ▶ Treat seizures with diazepam.
- ▶ Proparacaine hydrochloride should be used to assist eye irrigation.

BRONSTEIN, A.C. and CURRANCE, P.L.

EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994

For sub-chronic and chronic exposures to isocyanates:

- ▶ This material may be a potent pulmonary sensitiser which causes bronchospasm even in patients without prior airway hyperreactivity.
- ▶ Clinical symptoms of exposure involve mucosal irritation of respiratory and gastrointestinal tracts.
- ▶ Conjunctival irritation, skin inflammation (erythema, pain vesiculation) and gastrointestinal disturbances occur soon after exposure.
- ▶ Pulmonary symptoms include cough, burning, substernal pain and dyspnoea.
- ▶ Some cross-sensitivity occurs between different isocyanates.
- ▶ Noncardiogenic pulmonary oedema and bronchospasm are the most serious consequences of exposure. Markedly symptomatic patients should receive oxygen, ventilatory support and an intravenous line.
- ▶ Treatment for asthma includes inhaled sympathomimetics (epinephrine [adrenalin], terbutaline) and steroids.
- ▶ Activated charcoal (1 g/kg) and a cathartic (sorbitol, magnesium citrate) may be useful for ingestion.
- ▶ Mydriatics, systemic analgesics and topical antibiotics (Sulamyd) may be used for corneal abrasions.
- ▶ There is no effective therapy for sensitised workers.

[Ellenhorn and Barceloux; Medical Toxicology]

NOTE: Isocyanates cause airway restriction in naive individuals with the degree of response dependant on the concentration and duration of exposure. They induce smooth muscle contraction which leads to bronchoconstrictive episodes. Acute changes in lung function, such as decreased FEV1, may not represent sensitivity.

[Karol & Jin, Frontiers in Molecular Toxicology, pp 56-61, 1992]

Continued...

Tiger Foam™ E84 Fast Rise (TF200FR, TF600FR) A-side

Personnel who work with isocyanates, isocyanate prepolymers or polyisocyanates should have a pre-placement medical examination and periodic examinations thereafter, including a pulmonary function test. Anyone with a medical history of chronic respiratory disease, asthmatic or bronchial attacks, indications of allergic responses, recurrent eczema or sensitisation conditions of the skin should not handle or work with isocyanates. Anyone who develops chronic respiratory distress when working with isocyanates should be removed from exposure and examined by a physician. Further exposure must be avoided if a sensitivity to isocyanates or polyisocyanates has developed.

SECTION 5 Fire-fighting measures

Extinguishing media

- ▶ Small quantities of water in contact with hot liquid may react violently with generation of a large volume of rapidly expanding hot sticky semi-solid foam.
- ▶ Presents additional hazard when fire fighting in a confined space.
- ▶ Cooling with flooding quantities of water reduces this risk.
- ▶ Dry chemical powder.
- ▶ BCF (where regulations permit).
- ▶ Carbon dioxide.

Special hazards arising from the substrate or mixture

Fire Incompatibility	▶ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result
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Special protective equipment and precautions for fire-fighters

Fire Fighting	<p style="text-align: center;">----- GENERAL -----</p> <ul style="list-style-type: none"> ▶ Alert Fire Brigade and tell them location and nature of hazard. ▶ Wear full body protective clothing with breathing apparatus. ▶ Fight fire from a safe distance, with adequate cover.
Fire/Explosion Hazard	<ul style="list-style-type: none"> - Combustible. - Moderate fire hazard when exposed to heat or flame. - When heated to high temperatures decomposes rapidly generating vapour which pressures and may then rupture containers with release of flammable and highly toxic isocyanate vapour. <ul style="list-style-type: none"> ▶ Containers may explode when heated - Ruptured cylinders may rocket ▶ May burn but does not ignite easily. ▶ Fire exposed cylinders may vent contents through pressure relief devices thereby increasing vapour concentration.. ▶ Fire may produce irritating, poisonous or corrosive gases. <p>Decomposition may produce toxic fumes of: carbon monoxide (CO) carbon dioxide (CO₂) isocyanates hydrogen cyanide and minor amounts of nitrogen oxides (NO_x) other pyrolysis products typical of burning organic material.</p>

SECTION 6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	<ul style="list-style-type: none"> ▶ Avoid breathing vapour and any contact with liquid or gas. Protective equipment including respirator should be used. ▶ DO NOT enter confined spaces where gas may have accumulated.
Major Spills	<p>For isocyanate spills of less than 40 litres (2 m²):</p> <ul style="list-style-type: none"> ▶ Evacuate area from everybody not dealing with the emergency, keep them upwind and prevent further access, remove ignition sources and, if inside building, ventilate area as well as possible. ▶ Notify supervision and others as necessary. ▶ Put on personal protective equipment (suitable respiratory protection, face and eye protection, protective suit, gloves and impermeable boots). ▶ Avoid contamination with water, alkalis and detergent solutions. ▶ Material reacts with water and generates gas, pressurises containers with even drum rupture resulting. ▶ DO NOT reseal container if contamination is suspected. ▶ DO NOT touch the spill material ▶ Clear area of all unprotected personnel and move upwind. ▶ Alert Emergency Authority and advise them of the location and nature of hazard. ▶ Wear full body clothing with breathing apparatus. ▶ Remove leaking cylinders to a safe place. ▶ Fit vent pipes. Release pressure under safe, controlled conditions ▶ Burn issuing gas at vent pipes. ▶ DO NOT exert excessive pressure on valve; DO NOT attempt to operate damaged valve.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 Handling and storage

Precautions for safe handling

Continued...

Tiger Foam™ E84 Fast Rise (TF200FR, TF600FR) A-side

Safe handling	<ul style="list-style-type: none"> · Consider use in closed pressurised systems, fitted with temperature, pressure and safety relief valves which are vented for safe dispersal. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature · The tubing network design connecting gas cylinders to the delivery system should include appropriate pressure indicators and vacuum or suction lines. · Fully-welded types of pressure gauges, where the bourdon tube sensing element is welded to the gauge body, are recommended. <ul style="list-style-type: none"> ▶ DO NOT transfer gas from one cylinder to another.
Other information	<p>Consider storage under inert gas.</p> <ul style="list-style-type: none"> ▶ Cylinders should be stored in a purpose-built compound with good ventilation, preferably in the open. ▶ Such compounds should be sited and built in accordance with statutory requirements. ▶ The storage compound should be kept clear and access restricted to authorised personnel only.

Conditions for safe storage, including any incompatibilities

Suitable container	<ul style="list-style-type: none"> ▶ Cylinder: ▶ Ensure the use of equipment rated for cylinder pressure. ▶ Ensure the use of compatible materials of construction. ▶ Valve protection cap to be in place until cylinder is secured, connected.
Storage incompatibility	<ul style="list-style-type: none"> · Avoid reaction with water, alcohols and detergent solutions. Isocyanates are electrophiles, and as such they are reactive toward a variety of nucleophiles including alcohols, amines, and even water. Upon treatment with an alcohol, an isocyanate forms a urethane linkage. <ul style="list-style-type: none"> ▶ A range of exothermic decomposition energies for isocyanates is given as 20-30 kJ/mol. ▶ The relationship between energy of decomposition and processing hazards has been the subject of discussion; it is suggested that values of energy released per unit of mass, rather than on a molar basis (J/g) be used in the assessment. ▶ For example, in "open vessel processes" (with man-hole size openings, in an industrial setting), substances with exothermic decomposition energies below 500 J/g are unlikely to present a danger, whilst those in "closed vessel processes" (opening is a safety valve or bursting disk) present some danger where the decomposition energy exceeds 150 J/g. ▶ Compressed gases may contain a large amount of kinetic energy over and above that potentially available from the energy of reaction produced by the gas in chemical reaction with other substances

SECTION 8 Exposure controls / personal protection**Control parameters****Occupational Exposure Limits (OEL)****INGREDIENT DATA**

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
US OSHA Permissible Exposure Limits (PELs) Table Z-1	4,4'-diphenylmethane diisocyanate (MDI)	Methylene bisphenyl isocyanate (MDI)	Not Available	Not Available	0.02 ppm / 0.2 mg/m3	Not Available
US NIOSH Recommended Exposure Limits (RELs)	4,4'-diphenylmethane diisocyanate (MDI)	Methylene bisphenyl isocyanate	0.005 ppm / 0.05 mg/m3	Not Available	0.020 (10-minute) ppm / 0.2 (10-minute) mg/m3	Not Available

Emergency Limits

Ingredient	TEEL-1	TEEL-2	TEEL-3
4,4'-diphenylmethane diisocyanate (MDI)	0.45 mg/m3	Not Available	Not Available
4,4'-diphenylmethane diisocyanate (MDI)	29 mg/m3	40 mg/m3	240 mg/m3
polymeric diphenylmethane diisocyanate	0.15 mg/m3	3.6 mg/m3	22 mg/m3
1,3,3,3-tetrafluoropropene	1,400 ppm	Not Available	Not Available
nitrogen	7.96E+05 ppm	8.32E+05 ppm	8.69E+05 ppm

Ingredient	Original IDLH	Revised IDLH
4,4'-diphenylmethane diisocyanate (MDI)	75 mg/m3	Not Available
polymeric diphenylmethane diisocyanate	Not Available	Not Available
1,3,3,3-tetrafluoropropene	Not Available	Not Available
nitrogen	Not Available	Not Available

Occupational Exposure Banding

Ingredient	Occupational Exposure Band Rating	Occupational Exposure Band Limit
polymeric diphenylmethane diisocyanate	E	≤ 0.1 ppm


Notes:

Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health.

Exposure controls

Appropriate engineering controls	<p>Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. The basic types of engineering controls are:</p> <p>Process controls which involve changing the way a job activity or process is done to reduce the risk.</p>
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Personal protection	
Eye and face protection	<ul style="list-style-type: none"> ▶ Safety glasses with side shields. ▶ Chemical goggles. ▶ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants.
Skin protection	See Hand protection below
Hands/feet protection	<p>NOTE:</p> <ul style="list-style-type: none"> ▶ The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact. ▶ Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed. ▶ Isocyanate resistant materials include Teflon, Viton, nitrile rubber and some PVA gloves. ▶ Protective gloves and overalls should be worn as specified in the appropriate national standard. ▶ Contaminated garments should be removed promptly and should not be re-used until they have been decontaminated. ▶ When handling sealed and suitably insulated cylinders wear cloth or leather gloves.
Body protection	See Other protection below
Other protection	<ul style="list-style-type: none"> ▶ Protective overalls, closely fitted at neck and wrist. ▶ Eye-wash unit. ▶ Ensure availability of lifeline in confined spaces.

Respiratory protection

Full face respirator with supplied air.

- ▶ Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content.
- ▶ The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.
- ▶ Cartridge performance is affected by humidity. Cartridges should be changed after 2 hr of continuous use unless it is determined that the humidity is less than 75%, in which case, cartridges can be used for 4 hr. Used cartridges should be discarded daily, regardless of the length of time used
- ▶ Positive pressure, full face, air-supplied breathing apparatus should be used for work in enclosed spaces if a leak is suspected or the primary containment is to be opened (e.g. for a cylinder change)
- ▶ Air-supplied breathing apparatus is required where release of gas from primary containment is either suspected or demonstrated.

SECTION 9 Physical and chemical properties**Information on basic physical and chemical properties**

Appearance	Moisture sensitive.		
Physical state	Compressed Gas	Relative density (Water = 1)	1.2
Odour	Not Available	Partition coefficient n-octanol / water	Not Available
Odour threshold	Not Available	Auto-ignition temperature (°C)	Not Available
pH (as supplied)	Not Available	Decomposition temperature (°C)	Not Available
Melting point / freezing point (°C)	Not Available	Viscosity (cSt)	Not Available
Initial boiling point and boiling range (°C)	208	Molecular weight (g/mol)	Not Available
Flash point (°C)	>199	Taste	Not Available
Evaporation rate	Not Available	Explosive properties	Not Available
Flammability	Not Applicable	Oxidising properties	Not Available
Upper Explosive Limit (%)	Not Available	Surface Tension (dyn/cm or mN/m)	Not Available
Lower Explosive Limit (%)	Not Available	Volatile Component (%vol)	Not Available
Vapour pressure (kPa)	Not Available	Gas group	Not Available
Solubility in water	Partly miscible	pH as a solution (1%)	Not Available
Vapour density (Air = 1)	Not Available	VOC g/L	Not Available

SECTION 10 Stability and reactivity

Reactivity	See section 7
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Tiger Foam™ E84 Fast Rise (TF200FR, TF600FR) A-side

Chemical stability	<ul style="list-style-type: none"> ▶ Unstable in the presence of incompatible materials. ▶ Product is considered stable. ▶ Hazardous polymerisation will not occur. ▶ Presence of elevated temperatures.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 Toxicological information

Information on toxicological effects

Inhaled	<p>The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage. Inhalation of the vapour is hazardous and may even be fatal</p> <p>The use of a quantity of material in an unventilated or confined space may result in increased exposure and an irritating atmosphere developing. Before starting consider control of exposure by mechanical ventilation.</p> <p>Inhalation of toxic gases may cause:</p> <ul style="list-style-type: none"> ▶ Central Nervous System effects including depression, headache, confusion, dizziness, stupor, coma and seizures; ▶ respiratory: acute lung swellings, shortness of breath, wheezing, rapid breathing, other symptoms and respiratory arrest; ▶ heart: collapse, irregular heartbeats and cardiac arrest; ▶ gastrointestinal: irritation, ulcers, nausea and vomiting (may be bloody), and abdominal pain. <p>The vapour/mist may be highly irritating to the upper respiratory tract and lungs; the response may be severe enough to produce bronchitis and pulmonary oedema. Possible neurological symptoms arising from isocyanate exposure include headache, insomnia, euphoria, ataxia, anxiety neurosis, depression and paranoia. Gastrointestinal disturbances are characterised by nausea and vomiting.</p> <p>Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may produce severely toxic effects. Relatively small amounts absorbed from the lungs may prove fatal.</p> <p>There is strong evidence to suggest that this material can cause, if inhaled once, very serious, irreversible damage of organs.</p>
Ingestion	<p>Not normally a hazard due to physical form of product.</p> <p>Considered an unlikely route of entry in commercial/industrial environments</p> <p>Accidental ingestion of the material may be seriously damaging to the health of the individual; animal experiments indicate that ingestion of less than 40 gram may be fatal.</p>
Skin Contact	<p>This material can cause inflammation of the skin on contact in some persons.</p> <p>The material may accentuate any pre-existing dermatitis condition</p> <p>Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.</p> <p>Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.</p>
Eye	<p>Not considered to be a risk because of the extreme volatility of the gas.</p> <p>This material may produce eye irritation in some persons and produce eye damage 24 hours or more after instillation. Moderate inflammation may be expected with redness; conjunctivitis may occur with prolonged exposure.</p>
Chronic	<p>There has been concern that this material can cause cancer or mutations, but there is not enough data to make an assessment.</p> <p>Long-term exposure to respiratory irritants may result in airways disease, involving difficulty breathing and related whole-body problems. Inhaling this product is more likely to cause a sensitisation reaction in some persons compared to the general population.</p> <p>Skin contact with the material is more likely to cause a sensitisation reaction in some persons compared to the general population.</p> <p>Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.</p> <p>This material can cause serious damage if one is exposed to it for long periods. It can be assumed that it contains a substance which can produce severe defects.</p> <p>This product contains a polymer with a functional group considered to be of high concern. Isothiocyanates may cause hypersensitivity of the skin and airways.</p> <p>The reactivity of an epoxide intermediate may be the reason for the cancer-causing properties of halogenated oxiranes. It is reported that 1,1-dichloroethyne, vinyl chloride, trichloroethylene, tetrachloroethylene and chloroprene all cause cancer.</p> <p>Generally speaking, substances with one halogen substitution show higher potential to cause cancer compared to substances with two.</p> <p>Main route of exposure to the gas in the workplace is by inhalation.</p> <p>Persons with a history of asthma or other respiratory problems or are known to be sensitised, should not be engaged in any work involving the handling of isocyanates.</p> <p>The chemistry of reaction of isocyanates, as evidenced by MDI, in biological milieu is such that in the event of a true exposure of small MDI doses to the mouth, reactions will commence at once with biological macromolecules in the buccal region and will continue along the digestive tract prior to reaching the stomach. Reaction products will be a variety of polyureas and macromolecular conjugates with for example mucus, proteins and cell components.</p> <p>Animal testing shows that polymeric MDI can damage the nasal cavities and lungs, causing inflammation and increased cell growth.</p>

TigerFoam E84 Fast Rise (TF200FR, TF600FR) A-side	TOXICITY	IRRITATION
	Not Available	Not Available
4,4'-diphenylmethane diisocyanate (MDI)	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: >6200 mg/kg ^[2]	Eye: no adverse effect observed (not irritating) ^[1]
	Inhalation(Rat) LC50: 0.368 mg/L4h ^[1]	Skin (rabbit): 500 mg /24 hours Dermal Sensitiser *Respiratory Sensitiser (g.pig) *[* = Bayer CCINFO 2133615]
	Oral (Mouse) LD50; 2200 mg/kg ^[2]	Skin: adverse effect observed (irritating) ^[1]

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polymeric diphenylmethane diisocyanate	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: >9400 mg/kg ^[2]	Eye (rabbit): 100 mg - mild
	Inhalation(Rat) LC50: 0.49 mg/L4h ^[2]	
	Oral (Rat) LD50: 43000 mg/kg ^[2]	
1,3,3,3-tetrafluoropropene	TOXICITY	IRRITATION
	Inhalation(Rat) LC50: >1157.752 ppm4h ^[2]	Not Available
nitrogen	TOXICITY	IRRITATION
	Not Available	Not Available
Legend:	1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances	

4,4'-DIPHENYLMETHANE DIISOCYANATE (MDI)	Inhalation (human) TCLo: 0.13 ppm/30 mins Eye (rabbit): 0.10 mg moderate
POLYMERIC DIPHENYLMETHANE DIISOCYANATE	product
1,3,3,3-TETRAFLUOROPROPENE	Inhalation (rat) NOEL (28 days): >1.5 mg/l * * Vendor HFO-1234ze is not likely to accumulate in the bodies of humans or animals HFO-1234ze is practically non-toxic. Short-term exposures at levels higher than 10% have not induced cardiac sensitization to adrenalin nor induced serious toxic effects. Rats and rabbits did not exhibit any serious toxic, developmental or reproductive effects even with exposures to high levels of HFO-1234ze. Based on a series of mutagenicity and genomics studies, the cancer risk for HFO-1234ze is low, no cardiac sensitisation was observed in dogs with exposures up to 120,000 ppm; repeated dose toxicity in rats (13-wk) found mild effects on the heart (NOEL 5,000ppm); in vitro genotoxicity findings include negative Ames Test and negative human lymphocyte chromosome aberration test; in vivo genotoxicity findings in the mouse micronucleus test were negative (inhalation, mammalian bone-marrow cytogenetic test with chromosomal analysis). Inhalation of perfluoroalkenes can cause lung injury, kidney damage, brain changes and death. Repeated exposures may alter blood pressure and the production of blood cells. The potential for causing cancer is the subject of speculation.
NITROGEN	No significant acute toxicological data identified in literature search.
TigerFoam E84 Fast Rise (TF200FR, TF600FR) A-side & 4,4'-DIPHENYLMETHANE DIISOCYANATE (MDI) & POLYMERIC DIPHENYLMETHANE DIISOCYANATE	Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Allergic reactions involving the respiratory tract are usually due to interactions between IgE antibodies and allergens and occur rapidly. Allergic potential of the allergen and period of exposure often determine the severity of symptoms. Some people may be genetically more prone than others, and exposure to other irritants may aggravate symptoms. Attention should be paid to atopic diathesis, characterised by increased susceptibility to nasal inflammation, asthma and eczema. Exogenous allergic alveolitis is induced essentially by allergen specific immune-complexes of the IgG type; cell-mediated reactions (T lymphocytes) may be involved. Such allergy is of the delayed type with onset up to four hours following exposure. The following information refers to contact allergens as a group and may not be specific to this product. Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type.
TigerFoam E84 Fast Rise (TF200FR, TF600FR) A-side & 1,3,3,3-TETRAFLUOROPROPENE	Disinfection byproducts (DBPs) are formed when disinfectants such as chlorine, chloramines and ozone react with organic and inorganic matter in water. Animal studies have shown that some DBPs cause cancer. To date, several hundred DBPs have been identified. Numerous haloalkanes and haloalkenes have been tested for cancer-causing and mutation-causing activities.
4,4'-DIPHENYLMETHANE DIISOCYANATE (MDI) & POLYMERIC DIPHENYLMETHANE DIISOCYANATE	The substance is classified by IARC as Group 3: NOT classifiable as to its carcinogenicity to humans. Evidence of carcinogenicity may be inadequate or limited in animal testing. Isocyanate vapours are irritating to the airways and can cause their inflammation, with wheezing, gasping, severe distress, even loss of consciousness and fluid in the lungs. Nervous system symptoms that may occur include headache, sleep disturbance, euphoria, inco-ordination, anxiety, depression and paranoia. The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. Aromatic and aliphatic diisocyanates may cause airway toxicity and skin sensitization. Monomers and prepolymers exhibit similar respiratory effect. Of the several members of diisocyanates tested on experimental animals by inhalation and oral exposure, some caused cancer while others produced a harmless outcome.

Acute Toxicity	✓	Carcinogenicity	✓
Skin Irritation/Corrosion	✓	Reproductivity	✗
Serious Eye Damage/Irritation	✓	STOT - Single Exposure	✓
Respiratory or Skin sensitisation	✓	STOT - Repeated Exposure	✓
Mutagenicity	✗	Aspiration Hazard	✗

Legend: ✗ – Data either not available or does not fill the criteria for classification
 ✓ – Data available to make classification

SECTION 12 Ecological information

Toxicity

	Endpoint	Test Duration (hr)	Species	Value	Source
TigerFoam E84 Fast Rise (TF200FR, TF600FR) A-side	Not Available	Not Available	Not Available	Not Available	Not Available

Continued...

Tiger Foam™ E84 Fast Rise (TF200FR, TF600FR) A-side

	Endpoint	Test Duration (hr)	Species	Value	Source
	4,4'-diphenylmethane diisocyanate (MDI)	LC50	96h	Fish	95.24-134.37mg/l
BCF		672h	Fish	61-150	7
EC50		48h	Crustacea	>100mg/l	2
NOEC(ECx)		504h	Crustacea	>=10mg/l	2
polymeric diphenylmethane diisocyanate	Endpoint	Test Duration (hr)	Species	Value	Source
	Not Available	Not Available	Not Available	Not Available	Not Available
1,3,3,3-tetrafluoropropene	Endpoint	Test Duration (hr)	Species	Value	Source
	LC50	96h	Fish	>117mg/l	2
	EC50	72h	Algae or other aquatic plants	>170mg/l	2
	EC50	48h	Crustacea	>160mg/l	2
	EC50(ECx)	48h	Crustacea	>160mg/l	2
	EC50(ECx)	72h	Algae or other aquatic plants	>10mg/l	2
nitrogen	Endpoint	Test Duration (hr)	Species	Value	Source
	Not Available	Not Available	Not Available	Not Available	Not Available
Legend:	Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data				

for polyisocyanates:

Polyisocyanates are not readily biodegradable. However, due to other elimination mechanisms (hydrolysis, adsorption), long retention times in water are not to be expected. The resulting polyurea is more or less inert and, due to its molecular size, not bioavailable.

For Isocyanate Monomers:

Environmental Fate: Isocyanates, (di- and polyfunctional isocyanates), are commonly used to make various polymers, such as polyurethanes. Polyurethanes find significant application in the manufacture of rigid and flexible foams. They are also used in the production of adhesives, elastomers, and coatings.

DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
4,4'-diphenylmethane diisocyanate (MDI)	LOW (Half-life = 1 days)	LOW (Half-life = 0.24 days)

Bioaccumulative potential

Ingredient	Bioaccumulation
4,4'-diphenylmethane diisocyanate (MDI)	LOW (BCF = 15)

Mobility in soil

Ingredient	Mobility
4,4'-diphenylmethane diisocyanate (MDI)	LOW (KOC = 376200)

SECTION 13 Disposal considerations

Waste treatment methods

Product / Packaging disposal	<ul style="list-style-type: none"> ▶ DO NOT allow wash water from cleaning or process equipment to enter drains. ▶ It may be necessary to collect all wash water for treatment before disposal. ▶ In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first. ▶ Evaporate residue at an approved site. ▶ Return empty containers to supplier. If containers are marked non-returnable establish means of disposal with manufacturer prior to purchase.
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SECTION 14 Transport information

Labels Required

	
Marine Pollutant	NO

Continued...

Tiger Foam™ E84 Fast Rise (TF200FR, TF600FR) A-side

Land transport (DOT)

UN number	3500	
UN proper shipping name	Chemical under pressure, n.o.s. (Hydrofluoroolefin, Nitrogen)	
Transport hazard class(es)	Class	2.2
	Subrisk	Not Applicable
Packing group	Not Applicable	
Environmental hazard	Not Applicable	
Special precautions for user	Hazard Label	2.2
	Special provisions	362, T50, TP40

Air transport (ICAO-IATA / DGR)

UN number	3500	
UN proper shipping name	Chemical under pressure, n.o.s. * (Hydrofluoroolefin, Nitrogen)	
Transport hazard class(es)	ICAO/IATA Class	2.2
	ICAO / IATA Subrisk	Not Applicable
	ERG Code	2L
Packing group	Not Applicable	
Environmental hazard	Not Applicable	
Special precautions for user	Special provisions	A187
	Cargo Only Packing Instructions	218
	Cargo Only Maximum Qty / Pack	150 kg
	Passenger and Cargo Packing Instructions	218
	Passenger and Cargo Maximum Qty / Pack	75 kg
	Passenger and Cargo Limited Quantity Packing Instructions	Forbidden
	Passenger and Cargo Limited Maximum Qty / Pack	Forbidden

Sea transport (IMDG-Code / GGVSee)

UN number	3500	
UN proper shipping name	CHEMICAL UNDER PRESSURE, N.O.S. (Hydrofluoroolefin, Nitrogen)	
Transport hazard class(es)	IMDG Class	2.2
	IMDG Subrisk	Not Applicable
Packing group	Not Applicable	
Environmental hazard	Not Applicable	
Special precautions for user	EMS Number	F-C, S-V
	Special provisions	274 362
	Limited Quantities	0

Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

Product name	Group
4,4'-diphenylmethane diisocyanate (MDI)	Not Available
polymeric diphenylmethane diisocyanate	Not Available
1,3,3,3-tetrafluoropropene	Not Available
nitrogen	Not Available

Transport in bulk in accordance with the ICG Code

Product name	Ship Type
4,4'-diphenylmethane diisocyanate (MDI)	Not Available
polymeric diphenylmethane diisocyanate	Not Available
1,3,3,3-tetrafluoropropene	Not Available
nitrogen	Not Available

Continued...

Tiger Foam™ E84 Fast Rise (TF200FR, TF600FR) A-side

SECTION 15 Regulatory information

Safety, health and environmental regulations / legislation specific for the substance or mixture

4,4'-diphenylmethane diisocyanate (MDI) is found on the following regulatory lists

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Not Classified as Carcinogenic
 US - California Hazardous Air Pollutants Identified as Toxic Air Contaminants
 US - Massachusetts - Right To Know Listed Chemicals
 US Clean Air Act - Hazardous Air Pollutants
 US DOE Temporary Emergency Exposure Limits (TEELs)
 US EPA Integrated Risk Information System (IRIS)

US EPCRA Section 313 Chemical List
 US NIOSH Recommended Exposure Limits (RELs)
 US OSHA Permissible Exposure Limits (PELs) Table Z-1
 US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
 US TSCA Chemical Substance Inventory - Interim List of Active Substances
 US TSCA New Chemical Exposure Limits (NCEL)

polymeric diphenylmethane diisocyanate is found on the following regulatory lists

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Not Classified as Carcinogenic
 US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)
 US DOE Temporary Emergency Exposure Limits (TEELs)

US EPCRA Section 313 Chemical List
 US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
 US TSCA Chemical Substance Inventory - Interim List of Active Substances

1,3,3,3-tetrafluoropropene is found on the following regulatory lists

US AIHA Workplace Environmental Exposure Levels (WEELs)
 US DOE Temporary Emergency Exposure Limits (TEELs)
 US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

US Toxicology Excellence for Risk Assessment (TERA) Workplace Environmental Exposure Levels (WEEL)
 US TSCA Chemical Substance Inventory - Interim List of Active Substances

nitrogen is found on the following regulatory lists

US - Massachusetts - Right To Know Listed Chemicals
 US DOE Temporary Emergency Exposure Limits (TEELs)

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
 US TSCA Chemical Substance Inventory - Interim List of Active Substances

Federal Regulations

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Section 311/312 hazard categories

Flammable (Gases, Aerosols, Liquids, or Solids)	No
Gas under pressure	Yes
Explosive	No
Self-heating	No
Pyrophoric (Liquid or Solid)	No
Pyrophoric Gas	No
Corrosive to metal	No
Oxidizer (Liquid, Solid or Gas)	No
Organic Peroxide	No
Self-reactive	No
In contact with water emits flammable gas	No
Combustible Dust	No
Carcinogenicity	Yes
Acute toxicity (any route of exposure)	Yes
Reproductive toxicity	No
Skin Corrosion or Irritation	Yes
Respiratory or Skin Sensitization	Yes
Serious eye damage or eye irritation	Yes
Specific target organ toxicity (single or repeated exposure)	Yes
Aspiration Hazard	No
Germ cell mutagenicity	No
Simple Asphyxiant	No
Hazards Not Otherwise Classified	No

US. EPA CERCLA Hazardous Substances and Reportable Quantities (40 CFR 302.4)

Name	Reportable Quantity in Pounds (lb)	Reportable Quantity in kg
4,4'-diphenylmethane diisocyanate (MDI)	5000	2270

State Regulations

US. California Proposition 65

None Reported

National Inventory Status

National Inventory	Status
Australia - AIIIC / Australia Non-Industrial Use	Yes

Continued...

Tiger Foam™ E84 Fast Rise (TF200FR, TF600FR) A-side

National Inventory	Status
Canada - DSL	Yes
Canada - NDSL	No (4,4'-diphenylmethane diisocyanate (MDI); polymeric diphenylmethane diisocyanate; nitrogen)
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	No (polymeric diphenylmethane diisocyanate; 1,3,3,3-tetrafluoropropene)
Japan - ENCS	No (nitrogen)
Korea - KECI	Yes
New Zealand - NZIoC	No (1,3,3,3-tetrafluoropropene)
Philippines - PICCS	No (1,3,3,3-tetrafluoropropene)
USA - TSCA	Yes
Taiwan - TCSI	Yes
Mexico - INSQ	No (1,3,3,3-tetrafluoropropene)
Vietnam - NCI	Yes
Russia - FBEPH	No (1,3,3,3-tetrafluoropropene)
Legend:	Yes = All CAS declared ingredients are on the inventory No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.

SECTION 16 Other information

Revision Date	01/30/2023
Initial Date	02/27/2021

CONTACT POINT

PLEASE NOTE THAT TITANIUM DIOXIDE IS NOT PRESENT IN CLEAR OR NEUTRAL BASES

SDS Version Summary

Version	Date of Update	Sections Updated
2.2	01/30/2023	Physical Properties

Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios.

Powered by AuthorITe, from Chemwatch.



Tiger Foam™ E84 Fast Rise (TF200FR, TF600FR) B-side Commercial Thermal Solutions, Inc.

Version No: 1.1
Safety Data Sheet according to OSHA HazCom Standard (2012) requirements

Issue Date: **01/30/2023**
Print Date: **01/30/2023**
S.GHS.USA.EN

SECTION 1 Identification

Product Identifier

Product name	Tiger Foam™ E84 Fast Rise (TF200FR, TF600FR) B-side
Synonyms	Not Available
Proper shipping name	Chemical under pressure, n.o.s. (Hydrofluoroolefin, Nitrogen)
Other means of identification	Not Available

Recommended use of the chemical and restrictions on use

Relevant identified uses	Low Pressure Foam Sealant B-side Component
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Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party

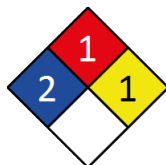
Registered company name	Commercial Thermal Solutions, Inc.
Address	2812 SW 29th Ct. Cape Coral, FL 33914 United States
Telephone	1-800-664-0063
Fax	Not Available
Website	www.tigerfoam.com
Email	customerservice@tigerfoam.com

Emergency phone number

Association / Organisation	CHEMTREC
Emergency telephone numbers	1-800-424-9300
Other emergency telephone numbers	1-703-527-3887

SECTION 2 Hazard(s) identification

Classification of the substance or mixture



Note: The hazard category numbers found in GHS classification in section 2 of this SDSs are NOT to be used to fill in the NFPA 704 diamond. Blue = Health Red = Fire Yellow = Reactivity White = Special (Oxidizer or water reactive substances)

Classification	Serious Eye Damage/Eye Irritation Category 2A, Skin Corrosion/Irritation Category 2, Reproductive Toxicity Category 2, Gases Under Pressure (Compressed Gas)
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Label elements

Hazard pictogram(s)	
Signal word	Warning

Hazard statement(s)

H319	Causes serious eye irritation.
H315	Causes skin irritation.

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H361	Suspected of damaging fertility or the unborn child.
H280	Contains gas under pressure; may explode if heated.

Hazard(s) not otherwise classified

Not Applicable

Precautionary statement(s) Prevention

P201	Obtain special instructions before use.
P280	Wear protective gloves, protective clothing, eye protection and face protection.
P202	Do not handle until all safety precautions have been read and understood.
P271	Use outdoors or in a well ventilated area.
P264	Wash all exposed external body areas thoroughly after handling.

Precautionary statement(s) Response

P308+P313	IF exposed or concerned: Get medical advice/ attention.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313	If eye irritation persists: Get medical advice/attention.
P302+P352	IF ON SKIN: Wash with plenty of water.
P332+P313	If skin irritation occurs: Get medical advice/attention.
P362+P364	Take off contaminated clothing and wash it before reuse.

Precautionary statement(s) Storage

P405	Store locked up.
P410+P403	Protect from sunlight. Store in a well-ventilated place.

Precautionary statement(s) Disposal

P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.
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SECTION 3 Composition / information on ingredients**Substances**

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
7560-83-0	1-5	<u>N-methyldicyclohexylamine</u>
29118-24-9	10-20	<u>1,3,3,3-tetrafluoropropene</u>
111-46-6	5-10	<u>diethylene glycol</u>
13674-84-5*	15-40	<u>tris(2-chloroisopropyl)phosphate</u>
7727-37-9.	<10	<u>nitrogen</u>
9003-11-6	<1	<u>polypropylene/ polyethylene glycol copolymer</u>

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

SECTION 4 First-aid measures**Description of first aid measures**

Eye Contact	<ul style="list-style-type: none"> ▶ If product comes in contact with eyes remove the patient from gas source or contaminated area. ▶ Take the patient to the nearest eye wash, shower or other source of clean water. ▶ Open the eyelid(s) wide to allow the material to evaporate. ▶ Gently rinse the affected eye(s) with clean, cool water for at least 15 minutes. Have the patient lie or sit down and tilt the head back. Hold the eyelid(s) open and pour water slowly over the eyeball(s) at the inner corners, letting the water run out of the outer corners. ▶ The patient may be in great pain and wish to keep the eyes closed. It is important that the material is rinsed from the eyes to prevent further damage. ▶ Ensure that the patient looks up, and side to side as the eye is rinsed in order to better reach all parts of the eye(s) ▶ Transport to hospital or doctor. ▶ Even when no pain persists and vision is good, a doctor should examine the eye as delayed damage may occur. ▶ If the patient cannot tolerate light, protect the eyes with a clean, loosely tied bandage. ▶ Ensure verbal communication and physical contact with the patient. <p>DO NOT allow the patient to rub the eyes DO NOT allow the patient to tightly shut the eyes DO NOT introduce oil or ointment into the eye(s) without medical advice DO NOT use hot or tepid water.</p>
Skin Contact	<p>If skin or hair contact occurs:</p> <ul style="list-style-type: none"> ▶ Immediately flush body and clothes with large amounts of water, using safety shower if available. ▶ Quickly remove all contaminated clothing, including footwear. ▶ Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre. ▶ Transport to hospital, or doctor.

Continued...

Tiger Foam™ E84 Fast Rise (TF200FR, TF600FR) B-side

Inhalation	<ul style="list-style-type: none"> ▶ Following exposure to gas, remove the patient from the gas source or contaminated area. ▶ NOTE: Personal Protective Equipment (PPE), including positive pressure self-contained breathing apparatus may be required to assure the safety of the rescuer. ▶ Prostheses such as false teeth, which may block the airway, should be removed, where possible, prior to initiating first aid procedures. ▶ If the patient is not breathing spontaneously, administer rescue breathing. ▶ If the patient does not have a pulse, administer CPR. ▶ If medical oxygen and appropriately trained personnel are available, administer 100% oxygen. ▶ Summon an emergency ambulance. If an ambulance is not available, contact a physician, hospital, or Poison Control Centre for further instruction. ▶ Keep the patient warm, comfortable and at rest while awaiting medical care. ▶ MONITOR THE BREATHING AND PULSE, CONTINUOUSLY. ▶ Administer rescue breathing (preferably with a demand-valve resuscitator, bag-valve mask-device, or pocket mask as trained) or CPR if necessary.
Ingestion	<p>Not considered a normal route of entry.</p> <ul style="list-style-type: none"> ▶ Avoid giving milk or oils. ▶ Avoid giving alcohol.

Most important symptoms and effects, both acute and delayed

See Section 11

Indication of any immediate medical attention and special treatment needed

for intoxication due to Freons/ Halons;

A: Emergency and Supportive Measures

- ▶ Maintain an open airway and assist ventilation if necessary
- ▶ Treat coma and arrhythmias if they occur. Avoid (adrenaline) epinephrine or other sympathomimetic amines that may precipitate ventricular arrhythmias. Tachyarrhythmias caused by increased myocardial sensitisation may be treated with propranolol, 1-2 mg IV or esmolol 25-100 microgm/kg/min IV.
- ▶ Monitor the ECG for 4-6 hours

B: Specific drugs and antidotes:

- ▶ There is no specific antidote

C: Decontamination

- ▶ Inhalation; remove victim from exposure, and give supplemental oxygen if available.
- ▶ Ingestion; (a) Prehospital: Administer activated charcoal, if available. **DO NOT** induce vomiting because of rapid absorption and the risk of abrupt onset CNS depression. (b) Hospital: Administer activated charcoal, although the efficacy of charcoal is unknown. Perform gastric lavage only if the ingestion was very large and recent (less than 30 minutes)

D: Enhanced elimination:

- ▶ There is no documented efficacy for diuresis, haemodialysis, haemoperfusion, or repeat-dose charcoal.

POISONING and DRUG OVERDOSE, Californian Poison Control System Ed. Kent R Olson; 3rd Edition

- ▶ Do not administer sympathomimetic drugs unless absolutely necessary as material may increase myocardial irritability.
- ▶ No specific antidote.
- ▶ Because rapid absorption may occur through lungs if aspirated and cause systematic effects, the decision of whether to induce vomiting or not should be made by an attending physician.
- ▶ If lavage is performed, suggest endotracheal and/or esophageal control.
- ▶ Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach.
- ▶ Treatment based on judgment of the physician in response to reactions of the patient

To treat poisoning by the higher aliphatic alcohols (up to C7):

- ▶ Gastric lavage with copious amounts of water.
- ▶ It may be beneficial to instill 60 ml of mineral oil into the stomach.
- ▶ Oxygen and artificial respiration as needed.
- ▶ Electrolyte balance: it may be useful to start 500 ml. M/6 sodium bicarbonate intravenously but maintain a cautious and conservative attitude toward electrolyte replacement unless shock or severe acidosis threatens.
- ▶ To protect the liver, maintain carbohydrate intake by intravenous infusions of glucose.
- ▶ Haemodialysis if coma is deep and persistent. [GOSSELIN, SMITH HODGE: Clinical Toxicology of Commercial Products, Ed 5]

BASIC TREATMENT

- ▶ Establish a patent airway with suction where necessary.
- ▶ Watch for signs of respiratory insufficiency and assist ventilation as necessary.
- ▶ Administer oxygen by non-rebreather mask at 10 to 15 l/min.
- ▶ Monitor and treat, where necessary, for shock.
- ▶ Monitor and treat, where necessary, for pulmonary oedema.
- ▶ Anticipate and treat, where necessary, for seizures.
- ▶ **DO NOT use emetics.** Where ingestion is suspected rinse mouth and give up to 200 ml water (5 ml/kg recommended) for dilution where patient is able to swallow, has a strong gag reflex and does not drool.
- ▶ Give activated charcoal.

ADVANCED TREATMENT

- ▶ Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.
- ▶ Positive-pressure ventilation using a bag-valve mask might be of use.
- ▶ Monitor and treat, where necessary, for arrhythmias.
- ▶ Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.
- ▶ If the patient is hypoglycaemic (decreased or loss of consciousness, tachycardia, pallor, dilated pupils, diaphoresis and/or dextrose strip or glucometer readings below 50 mg), give 50% dextrose.
- ▶ Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications.
- ▶ Drug therapy should be considered for pulmonary oedema.
- ▶ Treat seizures with diazepam.
- ▶ Proparacaine hydrochloride should be used to assist eye irrigation.

EMERGENCY DEPARTMENT

- ▶ Laboratory analysis of complete blood count, serum electrolytes, BUN, creatinine, glucose, urinalysis, baseline for serum aminotransferases (ALT and AST), calcium, phosphorus and magnesium, may assist in establishing a treatment regime. Other useful analyses include anion and osmolar gaps, arterial blood gases (ABGs), chest radiographs and electrocardiograph.
- ▶ Positive end-expiratory pressure (PEEP)-assisted ventilation may be required for acute parenchymal injury or adult respiratory distress syndrome.
- ▶ Acidosis may respond to hyperventilation and bicarbonate therapy.
- ▶ Haemodialysis might be considered in patients with severe intoxication.

Continued...

Tiger Foam™ E84 Fast Rise (TF200FR, TF600FR) B-side

‡ Consult a toxicologist as necessary. BRONSTEIN, A.C. and CURRANCE, P.L. EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994

For C8 alcohols and above.

Symptomatic and supportive therapy is advised in managing patients.

For gas exposures:

BASIC TREATMENT

- ‡ Establish a patent airway with suction where necessary.
- ‡ Watch for signs of respiratory insufficiency and assist ventilation as necessary.
- ‡ Administer oxygen by non-rebreather mask at 10 to 15 l/min.
- ‡ Monitor and treat, where necessary, for pulmonary oedema .
- ‡ Monitor and treat, where necessary, for shock.
- ‡ Anticipate seizures.

ADVANCED TREATMENT

- ‡ Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.
- ‡ Positive-pressure ventilation using a bag-valve mask might be of use.
- ‡ Monitor and treat, where necessary, for arrhythmias.
- ‡ Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.
- ‡ Drug therapy should be considered for pulmonary oedema.
- ‡ Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications.
- ‡ Treat seizures with diazepam.
- ‡ Proparacaine hydrochloride should be used to assist eye irrigation.

BRONSTEIN, A.C. and CURRANCE, P.L.

EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994

SECTION 5 Fire-fighting measures

Extinguishing media

- ‡ Alcohol stable foam.
- ‡ Dry chemical powder.
- ‡ BCF (where regulations permit).

Special hazards arising from the substrate or mixture

Fire Incompatibility	‡ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result
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Special protective equipment and precautions for fire-fighters

Fire Fighting	<p>-----</p> <p>GENERAL</p> <p>-----</p> <ul style="list-style-type: none"> ‡ Alert Fire Brigade and tell them location and nature of hazard. ‡ Wear full body protective clothing with breathing apparatus. ‡ Fight fire from a safe distance, with adequate cover.
Fire/Explosion Hazard	<ul style="list-style-type: none"> ‡ Containers may explode when heated - Ruptured cylinders may rocket ‡ May burn but does not ignite easily. ‡ Fire exposed cylinders may vent contents through pressure relief devices thereby increasing vapour concentration.. ‡ Fire may produce irritating, poisonous or corrosive gases. <p>Decomposition may produce toxic fumes of:</p> <p>carbon monoxide (CO)</p> <p>carbon dioxide (CO₂)</p> <p>hydrogen fluoride</p> <p>other pyrolysis products typical of burning organic material.</p>

SECTION 6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	<ul style="list-style-type: none"> ‡ Avoid breathing vapour and any contact with liquid or gas. Protective equipment including respirator should be used. ‡ DO NOT enter confined spaces where gas may have accumulated.
Major Spills	<ul style="list-style-type: none"> ‡ Clear area of all unprotected personnel and move upwind. ‡ Alert Emergency Authority and advise them of the location and nature of hazard. ‡ Wear full body clothing with breathing apparatus. ‡ Remove leaking cylinders to a safe place. ‡ Fit vent pipes. Release pressure under safe, controlled conditions ‡ Burn issuing gas at vent pipes. ‡ DO NOT exert excessive pressure on valve; DO NOT attempt to operate damaged valve.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

Tiger Foam™ E84 Fast Rise (TF200FR, TF600FR) B-side

SECTION 7 Handling and storage

Precautions for safe handling

Safe handling	<ul style="list-style-type: none"> · Consider use in closed pressurised systems, fitted with temperature, pressure and safety relief valves which are vented for safe dispersal. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature · The tubing network design connecting gas cylinders to the delivery system should include appropriate pressure indicators and vacuum or suction lines. · Fully-welded types of pressure gauges, where the bourdon tube sensing element is welded to the gauge body, are recommended. <ul style="list-style-type: none"> ▶ DO NOT transfer gas from one cylinder to another.
Other information	<ul style="list-style-type: none"> ▶ Cylinders should be stored in a purpose-built compound with good ventilation, preferably in the open. ▶ Such compounds should be sited and built in accordance with statutory requirements. ▶ The storage compound should be kept clear and access restricted to authorised personnel only.

Conditions for safe storage, including any incompatibilities

Suitable container	<ul style="list-style-type: none"> ▶ Cylinder: ▶ Ensure the use of equipment rated for cylinder pressure. ▶ Ensure the use of compatible materials of construction. ▶ Valve protection cap to be in place until cylinder is secured, connected.
Storage incompatibility	<ul style="list-style-type: none"> ▶ Glycols and their ethers undergo violent decomposition in contact with 70% perchloric acid. This seems likely to involve formation of the glycol perchlorate esters (after scission of ethers) which are explosive, those of ethylene glycol and 3-chloro-1,2-propanediol being more powerful than glyceryl nitrate, and the former so sensitive that it explodes on addition of water. <p>As a general rule, hydrofluorocarbons tend to be flammable unless they contain more fluorine atoms than hydrogen atoms.</p> <p>Alcohols</p> <ul style="list-style-type: none"> ▶ are incompatible with strong acids, acid chlorides, acid anhydrides, oxidising and reducing agents. ▶ reacts, possibly violently, with alkaline metals and alkaline earth metals to produce hydrogen ▶ react with strong acids, strong caustics, aliphatic amines, isocyanates, acetaldehyde, benzoyl peroxide, chromic acid, chromium oxide, dialkylzincs, dichlorine oxide, ethylene oxide, hypochlorous acid, isopropyl chlorocarbonate, lithium tetrahydroaluminate, nitrogen dioxide, pentafluoroguanidine, phosphorus halides, phosphorus pentasulfide, tangerine oil, triethylaluminium, triisobutylaluminium ▶ should not be heated above 49 deg. C. when in contact with aluminium equipment ▶ Avoid magnesium, aluminium and their alloys, brass and steel. ▶ Compressed gases may contain a large amount of kinetic energy over and above that potentially available from the energy of reaction produced by the gas in chemical reaction with other substances

SECTION 8 Exposure controls / personal protection

Control parameters

Occupational Exposure Limits (OEL)

INGREDIENT DATA

Not Available

Emergency Limits

Ingredient	TEEL-1	TEEL-2	TEEL-3
1,3,3,3-tetrafluoropropene	1,400 ppm	Not Available	Not Available
diethylene glycol	6.9 ppm	140 ppm	860 ppm
nitrogen	7.96E+05 ppm	8.32E+05 ppm	8.69E+05 ppm
polypropylene/ polyethylene glycol copolymer	6.9 mg/m3	76 mg/m3	460 mg/m3

Ingredient	Original IDLH	Revised IDLH
N-methylcyclohexylamine	Not Available	Not Available
1,3,3,3-tetrafluoropropene	Not Available	Not Available
diethylene glycol	Not Available	Not Available
tris(2-chloroisopropyl)phosphate	Not Available	Not Available
nitrogen	Not Available	Not Available
polypropylene/ polyethylene glycol copolymer	Not Available	Not Available

Occupational Exposure Banding

Ingredient	Occupational Exposure Band Rating	Occupational Exposure Band Limit
diethylene glycol	E	≤ 0.1 ppm
tris(2-chloroisopropyl)phosphate	E	≤ 0.1 ppm

Notes:


Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health.

Exposure controls

Appropriate engineering controls	<p>Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.</p> <p>The basic types of engineering controls are:</p> <ul style="list-style-type: none"> Process controls which involve changing the way a job activity or process is done to reduce the risk.
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Continued...

Tiger Foam™ E84 Fast Rise (TF200FR, TF600FR) B-side

Personal protection	
Eye and face protection	<ul style="list-style-type: none"> ▶ Safety glasses with side shields. ▶ Chemical goggles. ▶ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants.
Skin protection	See Hand protection below
Hands/feet protection	<ul style="list-style-type: none"> ▶ When handling sealed and suitably insulated cylinders wear cloth or leather gloves.
Body protection	See Other protection below
Other protection	<ul style="list-style-type: none"> ▶ Protective overalls, closely fitted at neck and wrist. ▶ Eye-wash unit. ▶ Ensure availability of lifeline in confined spaces.

Respiratory protection

Type A-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

- ▶ Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content.
- ▶ The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.
- ▶ Cartridge performance is affected by humidity. Cartridges should be changed after 2 hr of continuous use unless it is determined that the humidity is less than 75%, in which case, cartridges can be used for 4 hr. Used cartridges should be discarded daily, regardless of the length of time used
- ▶ Positive pressure, full face, air-supplied breathing apparatus should be used for work in enclosed spaces if a leak is suspected or the primary containment is to be opened (e.g. for a cylinder change)
- ▶ Air-supplied breathing apparatus is required where release of gas from primary containment is either suspected or demonstrated.

SECTION 9 Physical and chemical properties**Information on basic physical and chemical properties**

Appearance	Not Available		
Physical state	Compressed Gas	Relative density (Water = 1)	1.2
Odour	Not Available	Partition coefficient n-octanol / water	Not Available
Odour threshold	Not Available	Auto-ignition temperature (°C)	Not Available
pH (as supplied)	Not Available	Decomposition temperature (°C)	Not Available
Melting point / freezing point (°C)	Not Available	Viscosity (cSt)	Not Available
Initial boiling point and boiling range (°C)	Not Available	Molecular weight (g/mol)	Not Available
Flash point (°C)	>200	Taste	Not Available
Evaporation rate	Not Available	Explosive properties	Not Available
Flammability	Not Applicable	Oxidising properties	Not Available
Upper Explosive Limit (%)	Not Available	Surface Tension (dyn/cm or mN/m)	Not Available
Lower Explosive Limit (%)	Not Available	Volatile Component (%vol)	Not Available
Vapour pressure (kPa)	Not Available	Gas group	Not Available
Solubility in water	Partly miscible	pH as a solution (1%)	Not Available
Vapour density (Air = 1)	Not Available	VOC g/L	11.4

SECTION 10 Stability and reactivity

Reactivity	See section 7
Chemical stability	<ul style="list-style-type: none"> ▶ Unstable in the presence of incompatible materials. ▶ Product is considered stable. ▶ Hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7

Tiger Foam™ E84 Fast Rise (TF200FR, TF600FR) B-side

Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 Toxicological information

Information on toxicological effects

Inhaled	<p>The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models). Nevertheless inhalation of the material, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress. Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may be damaging to the health of the individual.</p> <p>Exposure to fluorocarbons can produce non-specific flu-like symptoms such as chills, fever, weakness, muscle pain, headache, chest discomfort, sore throat and dry cough with rapid recovery. High concentrations can cause irregular heartbeats and a stepwise reduction in lung capacity. Inhalation of the vapour is hazardous and may even be fatal</p> <p>The use of a quantity of material in an unventilated or confined space may result in increased exposure and an irritating atmosphere developing. Before starting consider control of exposure by mechanical ventilation.</p> <p>Aliphatic alcohols with more than 3-carbons cause headache, dizziness, drowsiness, muscle weakness and delirium, central depression, coma, seizures and behavioural changes. Secondary respiratory depression and failure, as well as low blood pressure and irregular heart rhythms, may follow.</p> <p>Inhalation of toxic gases may cause:</p> <ul style="list-style-type: none"> ▶ Central Nervous System effects including depression, headache, confusion, dizziness, stupor, coma and seizures; ▶ respiratory: acute lung swellings, shortness of breath, wheezing, rapid breathing, other symptoms and respiratory arrest; ▶ heart: collapse, irregular heartbeats and cardiac arrest; ▶ gastrointestinal: irritation, ulcers, nausea and vomiting (may be bloody), and abdominal pain.
Ingestion	<p>Accidental ingestion of the material may be damaging to the health of the individual.</p> <p>Overexposure to non-ring alcohols causes nervous system symptoms. These include headache, muscle weakness and inco-ordination, giddiness, confusion, delirium and coma.</p> <p>Not normally a hazard due to physical form of product.</p> <p>Considered an unlikely route of entry in commercial/industrial environments</p>
Skin Contact	<p>This material can cause inflammation of the skin on contact in some persons.</p> <p>The material may accentuate any pre-existing dermatitis condition</p> <p>Skin contact is not thought to have harmful health effects (as classified under EC Directives); the material may still produce health damage following entry through wounds, lesions or abrasions.</p> <p>Fluorocarbons remove natural oils from the skin, causing irritation, dryness and sensitivity.</p> <p>Most liquid alcohols appear to act as primary skin irritants in humans. Significant percutaneous absorption occurs in rabbits but not apparently in man.</p> <p>Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.</p>
Eye	<p>This material can cause eye irritation and damage in some persons.</p> <p>Not considered to be a risk because of the extreme volatility of the gas.</p>
Chronic	<p>Repeated or long-term occupational exposure is likely to produce cumulative health effects involving organs or biochemical systems. Ample evidence from experiments exists that there is a suspicion this material directly reduces fertility.</p> <p>The reactivity of an epoxide intermediate may be the reason for the cancer-causing properties of halogenated oxiranes. It is reported that 1,1-dichloroethyne, vinyl chloride, trichloroethylene, tetrachloroethylene and chloroprene all cause cancer.</p> <p>Generally speaking, substances with one halogen substitution show higher potential to cause cancer compared to substances with two. Main route of exposure to the gas in the workplace is by inhalation.</p> <p>There has been some concern that this material can cause cancer or mutations but there is not enough data to make an assessment.</p> <p>Fluorocarbons can cause an increased risk of cancer, spontaneous abortion and birth defects.</p>

TigerFoam E84 Fast Rise (TF200FR, TF600FR) B-side	TOXICITY	IRRITATION
	Not Available	Not Available
N-methylcyclohexylamine	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: 323 mg/kg ^[2]	Not Available
	Inhalation(Rat) LC50: >0.54 mg/L4h ^[2]	
	Oral (Rat) LD50: >=267 mg/kg ^[1]	
1,3,3,3-tetrafluoropropene	TOXICITY	IRRITATION
	Inhalation(Rat) LC50: >1157.752 ppm4h ^[2]	Not Available
diethylene glycol	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: 11890 mg/kg ^[2]	Eye (rabbit) 50 mg mild
	Inhalation(Rat) LC50: >4.6 mg/l4h ^[1]	Eye: no adverse effect observed (not irritating) ^[1]
	Oral (Rat) LD50: 12565 mg/kg ^[2]	Skin (human): 112 mg/3d-I mild
		Skin (rabbit): 500 mg mild

Tiger Foam™ E84 Fast Rise (TF200FR, TF600FR) B-side

	Skin: no adverse effect observed (not irritating) ^[1]	
tris(2-chloroisopropyl)phosphate	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: >5000 mg/kg ^[2]	Eye (rabbit): non-irritating*
	Inhalation(Rat) LC50: >4.6 mg/l/4H ^[2]	Skin (rabbit): mild (24 h):
	Intravenous (Mouse) LD50: 56 mg/kg ^[2]	
	Oral (Rat) LD50: 1500 mg/kg ^[2]	
nitrogen	TOXICITY	IRRITATION
	Not Available	Not Available
polypropylene/ polyethylene glycol copolymer	TOXICITY	IRRITATION
	Inhalation(Rat) LC50: 0.32 mg/L4h ^[2]	Eye (rabbit): 500 mg/24h - mild
	Oral (Rat) LD50: 2300 mg/kg ^[2]	Skin (rabbit): 500 mg/24h - mild
Legend:	1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances	

N-METHYLDICYCLOHEXYLAMINE	<p>Overexposure to most of these materials may cause adverse health effects.</p> <p>Many amine-based compounds can cause release of histamines, which, in turn, can trigger allergic and other physiological effects, including constriction of the bronchi or asthma and inflammation of the cavity of the nose. Whole-body symptoms include headache, nausea, faintness, anxiety, a decrease in blood pressure, rapid heartbeat, itching, reddening of the skin, urticaria (hives) and swelling of the face, which are usually transient.</p> <p>There are generally four routes of possible or potential exposure: inhalation, skin contact, eye contact, and swallowing.</p> <p>Inhalation: Inhaling vapours may result in moderate to severe irritation of the tissues of the nose and throat and can irritate the lungs. Higher concentrations of certain amines can produce severe respiratory irritation, characterized by discharge from the nose, coughing, difficulty in breathing and chest pain.</p> <p>Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant.</p> <p>The material may produce respiratory tract irritation, and result in damage to the lung including reduced lung function.</p> <p>Somnolence, convulsions recorded. When applied to the skin of male rabbits, most adverse effects were observed within an hour after treatment and lasted several hours. The onset of paralysis occurred between several hours and two days after treatment. Paralysis affected only the hindlimbs in some rabbits and affected both the forelimbs and hindlimbs in others. Sensitisation: After identification of the slightly irritating and the non-irritating test article concentrations in the primary irritation experiments, a main study was performed with the selected test article concentrations. The experimental animals were intradermally injected with a 5 % concentration and epidermally exposed to the undiluted test substance while the control animals were similarly treated, but with the vehicle only. Immediately after the epidermal exposure, the skin irritation was scored. The epidermal exposure the induction phase resulted in severe skin irritation. The epidermal exposure in the challenge phase resulted in one positive sensitisation reaction in response to the 10 % test article concentration. Under the conditions used in this study, the substance produced sensitisation rate of 5 %. Based on these results and according to the EEC criteria for classification and labelling requirements for dangerous substances and preparations (EEC Directive 91/325/EEC, Amendment to Annex VI of the EEC Directive 67/548/EEC), POLYCAT 12 need not be labelled as a skin sensitiser. Repeat dose toxicity: The test substance caused significant changes of clinical status of animals (mainly convulsions accompanied with marked salivation). These clinical findings were detected in both sexes at the highest dose level. At the middle dose level these symptoms were recorded only sporadically and at the lowest dose level only salivation in males was observed. Genetic toxicity: in vitro The test compound did not demonstrate genetic activity in any of the assays conducted in this evaluation and was considered not mutagenic under these test conditions. Genetic toxicity: in vivo N-methyldicyclohexylamine did not increase the frequency of aberrant cells in rat bone marrow. Toxicity to reproduction: Based on the Reproduction/Developmental toxicity screening test (OECD Guideline 421), NOAEL (offsprings): 40 mg/kg bw/day (male/female), NOAEL (P): 40 mg/kg bw/day (male/female) Developmental; toxicity/ teratogenicity: *REACH Dossier</p>
	1,3,3,3-TETRAFLUOROPROPENE
DIETHYLENE GLYCOL	<p>Diglycolic acid is formed following the oxidation of accidentally ingested diethylene glycol in the body and can lead to severe complications with fatal outcome.</p>
tris(2-chloroisopropyl)phosphate	<p>Non-chlorinated triphosphates have varying chemical, physical, toxicological and environmental properties. Blooming has been identified as a source of potential exposure (human and environmental) to triphosphate plasticisers / flame retardants. Blooming is the movement of an ingredient in rubber or plastic to the outer surface after curing.</p> <p>For tris(2-chloro-1-methylethyl)phosphate (TCPP)</p> <p>The flame retardant product supplied in the EU, marketed as TCPP, is actually a reaction mixture containing four isomers. The individual isomers in this reaction mixture are not separated or marketed. The individual components are never produced as such.</p> <p>Alkyl esters of phosphoric acid exhibit a low to moderate acute toxicity and metabolised. From studies done on mice, they are not likely to cause gene damage or affect reproduction. However, 2-ethylhexanoic acid produced an effect on newborn rats at high doses to the pregnant female.</p>
NITROGEN	<p>No significant acute toxicological data identified in literature search.</p>
POLYPROPYLENE/ POLYETHYLENE GLYCOL COPOLYMER	<p>* Varies - dependent on degree of ethoxylation.</p> <p>Polyethers (such as ethoxylated surfactants and polyethylene glycols) are highly susceptible to being oxidized in the air. They then form complex mixtures of oxidation products.</p> <p>Animal testing reveals that while the pure, non-oxidised surfactant is non-sensitizing, many of the oxidation products are sensitizers. The oxidization products also cause irritation.</p>

Tiger Foam™ E84 Fast Rise (TF200FR, TF600FR) B-side

TigerFoam E84 Fast Rise (TF200FR, TF600FR) B-side & 1,3,3,3-TETRAFLUOROPROPENE	Inhalation of perfluoroalkenes can cause lung injury, kidney damage, brain changes and death. Repeated exposures may alter blood pressure and the production of blood cells. The potential for causing cancer is the subject of speculation. Disinfection byproducts (DBPs) are formed when disinfectants such as chlorine, chloramines and ozone react with organic and inorganic matter in water. Animal studies have shown that some DBPs cause cancer. To date, several hundred DBPs have been identified. Numerous haloalkanes and haloalkenes have been tested for cancer-causing and mutation-causing activities.
N-METHYLDICYCLOHEXYLAMINE & POLYPROPYLENE/ POLYETHYLENE GLYCOL COPOLYMER	The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
N-METHYLDICYCLOHEXYLAMINE & DIETHYLENE GLYCOL & POLYPROPYLENE/ POLYETHYLENE GLYCOL COPOLYMER	The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.

Acute Toxicity	✗	Carcinogenicity	✗
Skin Irritation/Corrosion	✓	Reproductivity	✓
Serious Eye Damage/Irritation	✓	STOT - Single Exposure	✗
Respiratory or Skin sensitisation	✗	STOT - Repeated Exposure	✗
Mutagenicity	✗	Aspiration Hazard	✗

Legend: ✗ – Data either not available or does not fill the criteria for classification
 ✓ – Data available to make classification

SECTION 12 Ecological information

Toxicity

TigerFoam E84 Fast Rise (TF200FR, TF600FR) B-side	Endpoint	Test Duration (hr)	Species	Value	Source
	Not Available	Not Available	Not Available	Not Available	Not Available
N-methylcyclohexylamine	Endpoint	Test Duration (hr)	Species	Value	Source
	EC50(ECx)	72h	Algae or other aquatic plants	0.063mg/l	Not Available
	EC50	72h	Algae or other aquatic plants	0.063mg/l	Not Available
	LC50	96h	Fish	62mg/l	Not Available
	EC50	48h	Crustacea	8mg/l	Not Available
1,3,3,3-tetrafluoropropene	Endpoint	Test Duration (hr)	Species	Value	Source
	LC50	96h	Fish	>117mg/l	2
	EC50	72h	Algae or other aquatic plants	>170mg/l	2
	EC50	48h	Crustacea	>160mg/l	2
	EC50(ECx)	48h	Crustacea	>160mg/l	2
	EC50(ECx)	72h	Algae or other aquatic plants	>10mg/l	2
	EC50	72h	Algae or other aquatic plants	>10mg/l	2
diethylene glycol	Endpoint	Test Duration (hr)	Species	Value	Source
	LC50	96h	Fish	>100mg/l	4
	EC50	48h	Crustacea	84000mg/l	1
	NOEC(ECx)	192h	Algae or other aquatic plants	800mg/l	1
	EC50	96h	Algae or other aquatic plants	6500-13000mg/l	2
tris(2-chloroisopropyl)phosphate	Endpoint	Test Duration (hr)	Species	Value	Source
	EC50	48h	Crustacea	65335mg/l	1
	EC50	96h	Algae or other aquatic plants	4mg/l	1
	EC50(ECx)	96h	Algae or other aquatic plants	4mg/l	1
	ErC50	72h	Algae or other aquatic plants	4mg/l	1
	BCF	1008h	Fish	0.8-2.8	7
	LC50	96h	Fish	56.2mg/l	Not Available
	EC50	72h	Algae or other aquatic plants	82mg/l	Not Available
nitrogen	Endpoint	Test Duration (hr)	Species	Value	Source
	Not Available	Not Available	Not Available	Not Available	Not Available

Tiger Foam™ E84 Fast Rise (TF200FR, TF600FR) B-side

polypropylene/ polyethylene glycol copolymer	Endpoint	Test Duration (hr)	Species	Value	Source
	EC50(ECx)	48h	Crustacea	>100mg/l	Not Available
	EC50	48h	Crustacea	>100mg/l	Not Available
	LC50	96h	Fish	100mg/l	Not Available

Legend: Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data

In addition to carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O), the greenhouse gases mentioned in the Kyoto Protocol include synthetic substances that share the common feature of being highly persistent in the atmosphere and inhibit radiation from escaping out of the atmosphere. These synthetic substances include hydrocarbons that are partially fluorinated (HCFs) or totally fluorinated (PFCs) as well as sulfur hexafluoride (SF₆). The greenhouse potential of these substances, expressed as multiples of that of CO₂, are within the range of 140 to 11,700 for HFCs, from 6500 to 9,200 for PFCs and 23,900 for SF₆.

DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
N-methylcyclohexylamine	HIGH	HIGH
diethylene glycol	LOW	LOW
tris(2-chloroisopropyl)phosphate	HIGH	HIGH

Bioaccumulative potential

Ingredient	Bioaccumulation
N-methylcyclohexylamine	LOW (LogKOW = 3.71)
diethylene glycol	LOW (BCF = 180)
tris(2-chloroisopropyl)phosphate	LOW (BCF = 4.6)

Mobility in soil

Ingredient	Mobility
N-methylcyclohexylamine	LOW (KOC = 325)
diethylene glycol	HIGH (KOC = 1)
tris(2-chloroisopropyl)phosphate	LOW (KOC = 1278)


SECTION 13 Disposal considerations

Waste treatment methods

Product / Packaging disposal	<ul style="list-style-type: none"> Evaporate residue at an approved site. Return empty containers to supplier. If containers are marked non-returnable establish means of disposal with manufacturer prior to purchase.
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SECTION 14 Transport information

Labels Required

	
Marine Pollutant	NO

Land transport (DOT)

UN number	3500
UN proper shipping name	Chemical under pressure, n.o.s. (Hydrofluoroolefin, Nitrogen)
Transport hazard class(es)	Class 2.2
	Subrisk Not Applicable
Packing group	Not Applicable
Environmental hazard	Not Applicable
Special precautions for user	Hazard Label 2.2
	Special provisions 362, T50, TP40

Air transport (ICAO-IATA / DGR)

UN number	3500
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TigerFoam E84 Fast Rise (TF200FR, TF600FR) B-side

UN proper shipping name	Chemical under pressure, n.o.s. * (Hydrofluoroolefin, Nitrogen)	
Transport hazard class(es)	ICAO/IATA Class	2.2
	ICAO / IATA Subrisk	Not Applicable
	ERG Code	2L
Packing group	Not Applicable	
Environmental hazard	Not Applicable	
Special precautions for user	Special provisions	A187
	Cargo Only Packing Instructions	218
	Cargo Only Maximum Qty / Pack	150 kg
	Passenger and Cargo Packing Instructions	218
	Passenger and Cargo Maximum Qty / Pack	75 kg
	Passenger and Cargo Limited Quantity Packing Instructions	Forbidden
	Passenger and Cargo Limited Maximum Qty / Pack	Forbidden

Sea transport (IMDG-Code / GGVSee)

UN number	3500	
UN proper shipping name	CHEMICAL UNDER PRESSURE, N.O.S. (Hydrofluoroolefin, Nitrogen)	
Transport hazard class(es)	IMDG Class	2.2
	IMDG Subrisk	Not Applicable
Packing group	Not Applicable	
Environmental hazard	Not Applicable	
Special precautions for user	EMS Number	F-C, S-V
	Special provisions	274 362
	Limited Quantities	0

Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

Product name	Group
N-methyldicyclohexylamine	Not Available
1,3,3,3-tetrafluoropropene	Not Available
diethylene glycol	Not Available
tris(2-chloroisopropyl)phosphate	Not Available
nitrogen	Not Available
polypropylene/ polyethylene glycol copolymer	Not Available

Transport in bulk in accordance with the ICG Code

Product name	Ship Type
N-methyldicyclohexylamine	Not Available
1,3,3,3-tetrafluoropropene	Not Available
diethylene glycol	Not Available
tris(2-chloroisopropyl)phosphate	Not Available
nitrogen	Not Available
polypropylene/ polyethylene glycol copolymer	Not Available

SECTION 15 Regulatory information

Safety, health and environmental regulations / legislation specific for the substance or mixture

N-methyldicyclohexylamine is found on the following regulatory lists

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

US TSCA Chemical Substance Inventory - Interim List of Active Substances

1,3,3,3-tetrafluoropropene is found on the following regulatory lists

US AIHA Workplace Environmental Exposure Levels (WEELs)

US DOE Temporary Emergency Exposure Limits (TEELs)

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

US Toxicology Excellence for Risk Assessment (TERA) Workplace Environmental Exposure Levels (WEEL)

US TSCA Chemical Substance Inventory - Interim List of Active Substances

diethylene glycol is found on the following regulatory lists

Continued...

Tiger Foam™ E84 Fast Rise (TF200FR, TF600FR) B-side

US AIHA Workplace Environmental Exposure Levels (WEELs)
 US DOE Temporary Emergency Exposure Limits (TEELs)
 US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

US Toxicology Excellence for Risk Assessment (TERA) Workplace Environmental Exposure Levels (WEEL)
 US TSCA Chemical Substance Inventory - Interim List of Active Substances

tris(2-chloroisopropyl)phosphate is found on the following regulatory lists

US - California - Biomonitoring - Priority Chemicals
 US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

US TSCA Chemical Substance Inventory - Interim List of Active Substances

nitrogen is found on the following regulatory lists

US - Massachusetts - Right To Know Listed Chemicals
 US DOE Temporary Emergency Exposure Limits (TEELs)

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
 US TSCA Chemical Substance Inventory - Interim List of Active Substances

polypropylene/ polyethylene glycol copolymer is found on the following regulatory lists

US DOE Temporary Emergency Exposure Limits (TEELs)
 US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

US TSCA Chemical Substance Inventory - Interim List of Active Substances

Federal Regulations

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Section 311/312 hazard categories

Flammable (Gases, Aerosols, Liquids, or Solids)	No
Gas under pressure	Yes
Explosive	No
Self-heating	No
Pyrophoric (Liquid or Solid)	No
Pyrophoric Gas	No
Corrosive to metal	No
Oxidizer (Liquid, Solid or Gas)	No
Organic Peroxide	No
Self-reactive	No
In contact with water emits flammable gas	No
Combustible Dust	No
Carcinogenicity	No
Acute toxicity (any route of exposure)	No
Reproductive toxicity	Yes
Skin Corrosion or Irritation	Yes
Respiratory or Skin Sensitization	No
Serious eye damage or eye irritation	Yes
Specific target organ toxicity (single or repeated exposure)	No
Aspiration Hazard	No
Germ cell mutagenicity	No
Simple Asphyxiant	No
Hazards Not Otherwise Classified	No

US. EPA CERCLA Hazardous Substances and Reportable Quantities (40 CFR 302.4)

None Reported

State Regulations

US. California Proposition 65

WARNING: This product can expose you to chemicals including 1,4 dioxane, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov

National Inventory Status

National Inventory	Status
Australia - AIIIC / Australia Non-Industrial Use	Yes
Canada - DSL	Yes
Canada - NDSL	No
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	Yes
Japan - ENCS	Yes
Korea - KECI	No (N-methyldicyclohexylamine)
New Zealand - NZIoC	No (1,3,3,3-tetrafluoropropene)
Philippines - PICCS	No (1,3,3,3-tetrafluoropropene)
USA - TSCA	Yes
Taiwan - TCSI	Yes

Continued...

Tiger Foam™ E84 Fast Rise (TF200FR, TF600FR) B-side

National Inventory	Status
Mexico - INSQ	Yes
Vietnam - NCI	Yes
Russia - FBEPH	Yes

Legend:*Yes = All CAS declared ingredients are on the inventory**No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.***SECTION 16 Other information**

Revision Date	01/30/2023
Initial Date	01/30/2023

CONTACT POINT**Other information**

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios.

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Tiger Foam™ Slow Rise (TF200SR, TF600SR) A-side

Commercial Thermal Solutions, Inc.

Version No: 3.6
Safety Data Sheet according to OSHA HazCom Standard (2012) requirements

Issue Date: 03/04/2024
Print Date: 03/04/2024
S.GHS.USA.EN

SECTION 1 Identification

Product Identifier

Product name	Tiger Foam™ Slow Rise (TF200SR, TF600SR) A-side
Synonyms	Not Available
Proper shipping name	Chemical under pressure, n.o.s. (Hydrofluoroolefin, Nitrogen)
Other means of identification	Not Available

Recommended use of the chemical and restrictions on use

Relevant identified uses	Low pressure polyurethane foam. Side A Component. For PROFESSIONAL USE ONLY
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Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party

Registered company name	Commercial Thermal Solutions, Inc.
Address	2812 SW 29th Ct. Cape Coral, FL 33914 United States
Telephone	1-800-664-0063
Fax	Not Available
Website	www.tigerfoam.com
Email	customerservice@tigerfoam.com

Emergency phone number

Association / Organisation	CHEMTREC
Emergency telephone numbers	1-800-424-9300
Other emergency telephone numbers	1-703-527-3887

SECTION 2 Hazard(s) identification

Classification of the substance or mixture

NFPA 704 diamond



Note: The hazard category numbers found in GHS classification in section 2 of this SDSs are NOT to be used to fill in the NFPA 704 diamond. Blue = Health Red = Fire Yellow = Reactivity White = Special (Oxidizer or water reactive substances)

Classification	Gases Under Pressure (Compressed Gas), Skin Corrosion/Irritation Category 2, Sensitisation (Skin) Category 1, Serious Eye Damage/Eye Irritation Category 2A, Acute Toxicity (Inhalation) Category 4, Sensitisation (Respiratory) Category 1, Specific Target Organ Toxicity - Single Exposure (Respiratory Tract Irritation) Category 3, Specific Target Organ Toxicity - Repeated Exposure Category 2
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Label elements

Hazard pictogram(s)	
Signal word	Danger

Hazard statement(s)

Tiger Foam™ Slow Rise (TF200SR, TF600SR) A-side

H280	Contains gas under pressure; may explode if heated.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335	May cause respiratory irritation.
H373	May cause damage to organs through prolonged or repeated exposure. (Respiratory system) (Inhalation)

Hazard(s) not otherwise classified

Not Applicable

Precautionary statement(s) Prevention

P260	Do not breathe gas.
P271	Use only outdoors or in a well-ventilated area.
P284	[In case of inadequate ventilation] wear respiratory protection.
P270	Do not eat, drink or smoke when using this product.
P280	Wear protective gloves, protective clothing, eye protection and face protection.
P264	Wash all exposed external body areas thoroughly after handling.
P272	Contaminated work clothing must not be allowed out of the workplace.

Precautionary statement(s) Response

P342+P311	If experiencing respiratory symptoms: Call a POISON CENTER/doctor/physician/first aider.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P314	Get medical advice/attention if you feel unwell.
P333+P313	If skin irritation or rash occurs: Get medical advice/attention.
P337+P313	If eye irritation persists: Get medical advice/attention.
P302+P352	IF ON SKIN: Wash with plenty of water.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P362+P364	Take off contaminated clothing and wash it before reuse.

Precautionary statement(s) Storage

P405	Store locked up.
P410+P403	Protect from sunlight. Store in a well-ventilated place.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.

Precautionary statement(s) Disposal

P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.
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SECTION 3 Composition / information on ingredients**Substances**

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
101-68-8	30-60	<u>4,4'-diphenylmethane diisocyanate (MDI)</u>
9016-87-9	30-60	<u>polymeric diphenylmethane diisocyanate</u>
29118-24-9	5-10	<u>1,3,3,3-tetrafluoropropene</u>
7727-37-9.	<5	<u>nitrogen</u>

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

SECTION 4 First-aid measures**Description of first aid measures**

Eye Contact	<p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none"> ▶ Wash out immediately with fresh running water. ▶ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. ▶ Seek medical attention without delay; if pain persists or recurs seek medical attention. ▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
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Tiger Foam™ Slow Rise (TF200SR, TF600SR) A-side

Skin Contact	<p>If skin or hair contact occurs:</p> <ul style="list-style-type: none"> ▶ Quickly but gently, wipe material off skin with a dry, clean cloth. ▶ Immediately remove all contaminated clothing, including footwear. ▶ Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre. ▶ Transport to hospital, or doctor.
Inhalation	<ul style="list-style-type: none"> ▶ If fumes or combustion products are inhaled remove from contaminated area. ▶ Lay patient down. Keep warm and rested. ▶ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures. ▶ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary. ▶ Transport to hospital, or doctor, without delay. <p>Following uptake by inhalation, move person to an area free from risk of further exposure. Oxygen or artificial respiration should be administered as needed. Asthmatic-type symptoms may develop and may be immediate or delayed up to several hours. Treatment is essentially symptomatic. A physician should be consulted.</p>
Ingestion	<ul style="list-style-type: none"> ▶ IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY. ▶ For advice, contact a Poisons Information Centre or a doctor. ▶ Urgent hospital treatment is likely to be needed. ▶ In the mean time, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition. ▶ If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the SDS should be provided. Further action will be the responsibility of the medical specialist. ▶ If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the SDS. <p>Where medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:</p> <ul style="list-style-type: none"> ▶ INDUCE vomiting with fingers down the back of the throat, ONLY IF CONSCIOUS. Lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. <p>NOTE: Wear a protective glove when inducing vomiting by mechanical means.</p>

Most important symptoms and effects, both acute and delayed

See Section 11

Indication of any immediate medical attention and special treatment needed

For gas exposures:

BASIC TREATMENT

- ▶ Establish a patent airway with suction where necessary.
- ▶ Watch for signs of respiratory insufficiency and assist ventilation as necessary.
- ▶ Administer oxygen by non-rebreather mask at 10 to 15 l/min.
- ▶ Monitor and treat, where necessary, for pulmonary oedema .
- ▶ Monitor and treat, where necessary, for shock.
- ▶ Anticipate seizures.

ADVANCED TREATMENT

- ▶ Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.
- ▶ Positive-pressure ventilation using a bag-valve mask might be of use.
- ▶ Monitor and treat, where necessary, for arrhythmias.
- ▶ Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.
- ▶ Drug therapy should be considered for pulmonary oedema.
- ▶ Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications.
- ▶ Treat seizures with diazepam.
- ▶ Proparacaine hydrochloride should be used to assist eye irrigation.

BRONSTEIN, A.C. and CURRANCE, P.L.

EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994

For sub-chronic and chronic exposures to isocyanates:

- ▶ This material may be a potent pulmonary sensitiser which causes bronchospasm even in patients without prior airway hyperreactivity.
- ▶ Clinical symptoms of exposure involve mucosal irritation of respiratory and gastrointestinal tracts.
- ▶ Conjunctival irritation, skin inflammation (erythema, pain vesiculation) and gastrointestinal disturbances occur soon after exposure.
- ▶ Pulmonary symptoms include cough, burning, substernal pain and dyspnoea.
- ▶ Some cross-sensitivity occurs between different isocyanates.
- ▶ Noncardiogenic pulmonary oedema and bronchospasm are the most serious consequences of exposure. Markedly symptomatic patients should receive oxygen, ventilatory support and an intravenous line.
- ▶ Treatment for asthma includes inhaled sympathomimetics (epinephrine [adrenalin], terbutaline) and steroids.
- ▶ Activated charcoal (1 g/kg) and a cathartic (sorbitol, magnesium citrate) may be useful for ingestion.
- ▶ Mydriatics, systemic analgesics and topical antibiotics (Sulamyd) may be used for corneal abrasions.
- ▶ There is no effective therapy for sensitised workers.

[Ellenhorn and Barceloux; Medical Toxicology]

NOTE: Isocyanates cause airway restriction in naive individuals with the degree of response dependant on the concentration and duration of exposure. They induce smooth muscle contraction which leads to bronchoconstrictive episodes. Acute changes in lung function, such as decreased FEV1, may not represent sensitivity.

[Karol & Jin, Frontiers in Molecular Toxicology, pp 56-61, 1992]

Personnel who work with isocyanates, isocyanate prepolymers or polyisocyanates should have a pre-placement medical examination and periodic examinations thereafter, including a pulmonary function test. Anyone with a medical history of chronic respiratory disease, asthmatic or bronchial attacks, indications of allergic responses, recurrent eczema or sensitisation conditions of the skin should not handle or work with isocyanates. Anyone who develops chronic respiratory distress when working with isocyanates should be removed from exposure and examined by a physician. Further exposure must be avoided if a sensitivity to isocyanates or polyisocyanates has developed.

SECTION 5 Fire-fighting measures**Extinguishing media**

Continued...

Tiger Foam™ Slow Rise (TF200SR, TF600SR) A-side

- ▶ Small quantities of water in contact with hot liquid may react violently with generation of a large volume of rapidly expanding hot sticky semi-solid foam.
- ▶ Presents additional hazard when fire fighting in a confined space.
- ▶ Cooling with flooding quantities of water reduces this risk.
- ▶ Foam.
- ▶ Dry chemical powder.
- ▶ BCF (where regulations permit).

Special hazards arising from the substrate or mixture

Fire Incompatibility	▶ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result
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Special protective equipment and precautions for fire-fighters

Fire Fighting	<ul style="list-style-type: none"> ▶ Alert Fire Brigade and tell them location and nature of hazard. ▶ Wear breathing apparatus plus protective gloves. ▶ Prevent, by any means available, spillage from entering drains or water courses.
Fire/Explosion Hazard	<ul style="list-style-type: none"> - Combustible. - Moderate fire hazard when exposed to heat or flame. - When heated to high temperatures decomposes rapidly generating vapour which pressures and may then rupture containers with release of flammable and highly toxic isocyanate vapour. Combustion products include: carbon monoxide (CO) carbon dioxide (CO ₂) isocyanates hydrogen cyanide and minor amounts of nitrogen oxides (NO _x) other pyrolysis products typical of burning organic material.

SECTION 6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	<ul style="list-style-type: none"> ▶ Clean up all spills immediately. ▶ Avoid breathing vapours/ aerosols/ or dusts and avoid contact with skin and eyes. ▶ Control personal contact with the substance, by using protective equipment.
Major Spills	For isocyanate spills of less than 40 litres (2 m ²): <ul style="list-style-type: none"> ▶ Evacuate area from everybody not dealing with the emergency, keep them upwind and prevent further access, remove ignition sources and, if inside building, ventilate area as well as possible. ▶ Notify supervision and others as necessary. ▶ Put on personal protective equipment (suitable respiratory protection, face and eye protection, protective suit, gloves and impermeable boots). ▶ Avoid contamination with water, alkalies and detergent solutions. ▶ Material reacts with water and generates gas, pressurises containers with even drum rupture resulting. ▶ DO NOT reseal container if contamination is suspected. ▶ DO NOT touch the spill material Clear area of personnel and move upwind. Alert Fire Brigade and tell them location and nature of hazard. Wear breathing apparatus plus protective gloves.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 Handling and storage

Precautions for safe handling

Safe handling	<ul style="list-style-type: none"> ▶ Avoid all personal contact, including inhalation. ▶ Wear protective clothing when risk of exposure occurs. ▶ Use in a well-ventilated area.
Other information	Consider storage under inert gas. <ul style="list-style-type: none"> ▶ Store in original containers. ▶ Keep containers securely sealed. ▶ Store in a cool, dry, well-ventilated area.

Conditions for safe storage, including any incompatibilities

Suitable container	For low viscosity materials <ul style="list-style-type: none"> ▶ Drums and jerricans must be of the non-removable head type. ▶ Where a can is to be used as an inner package, the can must have a screwed enclosure. For materials with a viscosity of at least 2680 cSt.
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Tiger Foam™ Slow Rise (TF200SR, TF600SR) A-side

Storage incompatibility

- Avoid reaction with water, alcohols and detergent solutions. Isocyanates are electrophiles, and as such they are reactive toward a variety of nucleophiles including alcohols, amines, and even water. Upon treatment with an alcohol, an isocyanate forms a urethane linkage.
- A range of exothermic decomposition energies for isocyanates is given as 20-30 kJ/mol.
- The relationship between energy of decomposition and processing hazards has been the subject of discussion; it is suggested that values of energy released per unit of mass, rather than on a molar basis (J/g) be used in the assessment.
- For example, in 'open vessel processes' (with man-hole size openings, in an industrial setting), substances with exothermic decomposition energies below 500 J/g are unlikely to present a danger, whilst those in 'closed vessel processes' (opening is a safety valve or bursting disk) present some danger where the decomposition energy exceeds 150 J/g.

SECTION 8 Exposure controls / personal protection

Control parameters

Occupational Exposure Limits (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
US OSHA Permissible Exposure Limits (PELs) Table Z-1	4,4'-diphenylmethane diisocyanate (MDI)	Methylene bisphenyl isocyanate (MDI)	Not Available	Not Available	0.02 ppm / 0.2 mg/m ³	Not Available
US NIOSH Recommended Exposure Limits (RELs)	4,4'-diphenylmethane diisocyanate (MDI)	Methylene bisphenyl isocyanate	0.005 ppm / 0.05 mg/m ³	Not Available	0.020 (10-minute) ppm / 0.2 (10-minute) mg/m ³	Not Available

Emergency Limits

Ingredient	TEEL-1	TEEL-2	TEEL-3
4,4'-diphenylmethane diisocyanate (MDI)	0.45 mg/m ³	Not Available	Not Available
4,4'-diphenylmethane diisocyanate (MDI)	29 mg/m ³	40 mg/m ³	240 mg/m ³
polymeric diphenylmethane diisocyanate	0.15 mg/m ³	3.6 mg/m ³	22 mg/m ³
1,3,3,3-tetrafluoropropene	1,400 ppm	Not Available	Not Available
nitrogen	7.96E+05 ppm	8.32E+05 ppm	8.69E+05 ppm


Ingredient	Original IDLH	Revised IDLH
4,4'-diphenylmethane diisocyanate (MDI)	75 mg/m ³	Not Available
polymeric diphenylmethane diisocyanate	Not Available	Not Available
1,3,3,3-tetrafluoropropene	Not Available	Not Available
nitrogen	Not Available	Not Available

Occupational Exposure Banding

Ingredient	Occupational Exposure Band Rating	Occupational Exposure Band Limit
polymeric diphenylmethane diisocyanate	E	≤ 0.1 ppm

Notes: Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health.

Exposure controls

Appropriate engineering controls	Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. The basic types of engineering controls are: Process controls which involve changing the way a job activity or process is done to reduce the risk.
Individual protection measures, such as personal protective equipment	
Eye and face protection	<ul style="list-style-type: none"> ▸ Safety glasses with side shields. ▸ Chemical goggles. [AS/NZS 1337.1, EN166 or national equivalent] ▸ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants.
Skin protection	See Hand protection below
Hands/feet protection	<p>NOTE:</p> <ul style="list-style-type: none"> ▸ The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact. ▸ Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed. ▸ Isocyanate resistant materials include Teflon, Viton, nitrile rubber and some PVA gloves. ▸ Protective gloves and overalls should be worn as specified in the appropriate national standard. ▸ Contaminated garments should be removed promptly and should not be re-used until they have been decontaminated.
Body protection	See Other protection below

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Other protection

- ▶ Overalls.
- ▶ Eyewash unit.
- ▶ Barrier cream.

Respiratory protection

- ▶ Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content.
- ▶ The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.
- ▶ Cartridge performance is affected by humidity. Cartridges should be changed after 2 hr of continuous use unless it is determined that the humidity is less than 75%, in which case, cartridges can be used for 4 hr. Used cartridges should be discarded daily, regardless of the length of time used

SECTION 9 Physical and chemical properties

Information on basic physical and chemical properties

Appearance	Moisture sensitive.		
Physical state	Compressed Gas	Relative density (Water = 1)	1.2
Odour	Not Available	Partition coefficient n-octanol / water	Not Available
Odour threshold	Not Available	Auto-ignition temperature (°C)	Not Available
pH (as supplied)	Not Available	Decomposition temperature (°C)	Not Available
Melting point / freezing point (°C)	Not Available	Viscosity (cSt)	Not Available
Initial boiling point and boiling range (°C)	208	Molecular weight (g/mol)	Not Available
Flash point (°C)	>199	Taste	Not Available
Evaporation rate	Not Available	Explosive properties	Not Available
Flammability	Not Applicable	Oxidising properties	Not Available
Upper Explosive Limit (%)	Not Available	Surface Tension (dyn/cm or mN/m)	Not Available
Lower Explosive Limit (%)	Not Available	Volatile Component (%vol)	Not Available
Vapour pressure (kPa)	Not Available	Gas group	Not Available
Solubility in water	Partly miscible	pH as a solution (1%)	Not Available
Vapour density (Air = 1)	Not Available	VOC g/L	<25 when mixed as intended

SECTION 10 Stability and reactivity

Reactivity	See section 7
Chemical stability	<ul style="list-style-type: none"> ▶ Presence of elevated temperatures. ▶ Unstable in the presence of incompatible materials. ▶ Product is considered stable. ▶ Hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 Toxicological information

Information on toxicological effects

Inhaled	<p>The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage. There is strong evidence to suggest that this material can cause, if inhaled once, serious, irreversible damage of organs. The vapour/mist may be highly irritating to the upper respiratory tract and lungs; the response may be severe enough to produce bronchitis and pulmonary oedema. Possible neurological symptoms arising from isocyanate exposure include headache, insomnia, euphoria, ataxia, anxiety neurosis, depression and paranoia. Gastrointestinal disturbances are characterised by nausea and vomiting. Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may be harmful.</p>
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Tiger Foam™ Slow Rise (TF200SR, TF600SR) A-side

	<p>Inhalation of non-toxic gases may cause:</p> <ul style="list-style-type: none"> ▶ CNS effects: headache, confusion, dizziness, stupor, seizures and coma; ▶ respiratory: shortness of breath and rapid breathing; ▶ cardiovascular: collapse and irregular heart beats; ▶ gastrointestinal: mucous membrane irritation, nausea and vomiting. 								
Ingestion	<p>Strong evidence exists that exposure to the material may cause irreversible damage (other than cancer, mutations and birth defects) following a single exposure by swallowing.</p> <p>The material has NOT been classified by EC Directives or other classification systems as 'harmful by ingestion'. This is because of the lack of corroborating animal or human evidence.</p> <p>Not normally a hazard due to physical form of product.</p> <p>Considered an unlikely route of entry in commercial/industrial environments</p> <p>Accidental ingestion of the material may be seriously damaging to the health of the individual; animal experiments indicate that ingestion of less than 40 gram may be fatal.</p>								
Skin Contact	<p>This material can cause inflammation of the skin on contact in some persons.</p> <p>There is strong evidence to suggest that this material, on a single contact with skin, can cause serious, irreversible damage of organs.</p> <p>The material may accentuate any pre-existing dermatitis condition</p> <p>Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.</p> <p>Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.</p>								
Eye	<p>This material may produce eye irritation in some persons and produce eye damage 24 hours or more after instillation. Moderate inflammation may be expected with redness; conjunctivitis may occur with prolonged exposure.</p>								
Chronic	<p>Long-term exposure to respiratory irritants may result in airways disease, involving difficulty breathing and related whole-body problems.</p> <p>Inhaling this product is more likely to cause a sensitisation reaction in some persons compared to the general population.</p> <p>Skin contact with the material is more likely to cause a sensitisation reaction in some persons compared to the general population.</p> <p>Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.</p> <p>This product contains a polymer with a functional group considered to be of high concern. Isothiocyanates may cause hypersensitivity of the skin and airways.</p> <p>The reactivity of an epoxide intermediate may be the reason for the cancer-causing properties of halogenated oxiranes. It is reported that 1,1-dichloroethyne, vinyl chloride, trichloroethylene, tetrachloroethylene and chloroprene all cause cancer.</p> <p>Generally speaking, substances with one halogen substitution show higher potential to cause cancer compared to substances with two.</p> <p>Persons with a history of asthma or other respiratory problems or are known to be sensitised, should not be engaged in any work involving the handling of isocyanates.</p> <p>The chemistry of reaction of isocyanates, as evidenced by MDI, in biological milieu is such that in the event of a true exposure of small MDI doses to the mouth, reactions will commence at once with biological macromolecules in the buccal region and will continue along the digestive tract prior to reaching the stomach. Reaction products will be a variety of polyureas and macromolecular conjugates with for example mucus, proteins and cell components.</p> <p>Animal testing shows that polymeric MDI can damage the nasal cavities and lungs, causing inflammation and increased cell growth.</p> <p>There has been concern that this material can cause cancer or mutations, but there is not enough data to make an assessment.</p> <p>Isocyanate vapours are irritating to the airways and can cause their inflammation, with wheezing, gasping, severe distress, even loss of consciousness and fluid in the lungs. Nervous system symptoms that may occur include headache, sleep disturbance, euphoria, inco-ordination, anxiety, depression and paranoia.</p>								
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Legend:	<p>1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances</p>								
4,4'-DIPHENYLMETHANE	Inhalation (human) TCLo: 0.13 ppm/30 mins Eye (rabbit): 0.10 mg moderate								

Tiger Foam™ Slow Rise (TF200SR, TF600SR) A-side

DIISOCYANATE (MDI)	
POLYMERIC DIPHENYLMETHANE DIISOCYANATE	product Isocyanate vapours are irritating to the airways and can cause their inflammation, with wheezing, gasping, severe distress, even loss of consciousness and fluid in the lungs. Nervous system symptoms that may occur include headache, sleep disturbance, euphoria, inco-ordination, anxiety, depression and paranoia.
1,3,3,3-TETRAFLUOROPROPENE	Inhalation (rat) NOEL (28 days): >1.5 mg/l * * Vendor HFO-1234ze is not likely to accumulate in the bodies of humans or animals HFO-1234ze is practically non-toxic. Short-term exposures at levels higher than 10% have not induced cardiac sensitization to adrenalin nor induced serious toxic effects. Rats and rabbits did not exhibit any serious toxic, developmental or reproductive effects even with exposures to high levels of HFO-1234ze. Based on a series of mutagenicity and genomics studies, the cancer risk for HFO-1234ze is low, no cardiac sensitisation was observed in dogs with exposures up to 120,000 ppm; repeated dose toxicity in rats (13-wk) found mild effects on the heart (NOEL 5,000ppm); in vitro genotoxicity findings include negative Ames Test and negative human lymphocyte chromosome aberration test; in vivo genotoxicity findings in the mouse micronucleus test were negative (inhalation, mammalian bone-marrow cytogenic test with chromosomal analysis). Inhalation of perfluoroalkenes can cause lung injury, kidney damage, brain changes and death. Repeated exposures may alter blood pressure and the production of blood cells. The potential for causing cancer is the subject of speculation.
NITROGEN	No significant acute toxicological data identified in literature search.
TigerFoam Slow Rise (TF200SR, TF600SR) A-side & 4,4'-DIPHENYLMETHANE DIISOCYANATE (MDI) & POLYMERIC DIPHENYLMETHANE DIISOCYANATE	Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Allergic reactions involving the respiratory tract are usually due to interactions between IgE antibodies and allergens and occur rapidly. Allergic potential of the allergen and period of exposure often determine the severity of symptoms. Some people may be genetically more prone than others, and exposure to other irritants may aggravate symptoms. Attention should be paid to atopic diathesis, characterised by increased susceptibility to nasal inflammation, asthma and eczema. Exogenous allergic alveolitis is induced essentially by allergen specific immune-complexes of the IgG type; cell-mediated reactions (T lymphocytes) may be involved. Such allergy is of the delayed type with onset up to four hours following exposure. The following information refers to contact allergens as a group and may not be specific to this product. Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type.
TigerFoam Slow Rise (TF200SR, TF600SR) A-side & 1,3,3,3-TETRAFLUOROPROPENE	Disinfection byproducts (DBPs) are formed when disinfectants such as chlorine, chloramines and ozone react with organic and inorganic matter in water. Animal studies have shown that some DBPs cause cancer. To date, several hundred DBPs have been identified. Numerous haloalkanes and haloalkenes have been tested for cancer-causing and mutation-causing activities.
4,4'-DIPHENYLMETHANE DIISOCYANATE (MDI) & POLYMERIC DIPHENYLMETHANE DIISOCYANATE	The substance is classified by IARC as Group 3: NOT classifiable as to its carcinogenicity to humans. Evidence of carcinogenicity may be inadequate or limited in animal testing. The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. Aromatic and aliphatic diisocyanates may cause airway toxicity and skin sensitization. Monomers and prepolymers exhibit similar respiratory effect. Of the several members of diisocyanates tested on experimental animals by inhalation and oral exposure, some caused cancer while others produced a harmless outcome.

Acute Toxicity	✓	Carcinogenicity	✗
Skin Irritation/Corrosion	✓	Reproductivity	✗
Serious Eye Damage/Irritation	✓	STOT - Single Exposure	✓
Respiratory or Skin sensitisation	✓	STOT - Repeated Exposure	✓
Mutagenicity	✗	Aspiration Hazard	✗

Legend: ✗ – Data either not available or does not fill the criteria for classification
 ✓ – Data available to make classification

SECTION 12 Ecological information

Toxicity

TigerFoam Slow Rise (TF200SR, TF600SR) A-side	Endpoint	Test Duration (hr)	Species	Value	Source
	Not Available	Not Available	Not Available	Not Available	Not Available
4,4'-diphenylmethane diisocyanate (MDI)	Endpoint	Test Duration (hr)	Species	Value	Source
	EC50	48h	Crustacea	>100mg/l	2
	BCF	672h	Fish	61-150	7
	NOEC(ECx)	504h	Crustacea	>=10mg/l	2
	LC50	96h	Fish	95.24-134.37mg/l	Not Available
polymeric diphenylmethane diisocyanate	Endpoint	Test Duration (hr)	Species	Value	Source
	Not Available	Not Available	Not Available	Not Available	Not Available
1,3,3,3-tetrafluoropropene	Endpoint	Test Duration (hr)	Species	Value	Source
	ERC50	72h	Algae or other aquatic plants	>170mg/l	2
	EC50	48h	Crustacea	>160mg/l	2
	EC50	72h	Algae or other aquatic plants	>170mg/l	2
	EC50(ECx)	48h	Crustacea	>160mg/l	2

Continued...

Tiger Foam™ Slow Rise (TF200SR, TF600SR) A-side

	LC50	96h	Fish	>117mg/l	2
	EC50	72h	Algae or other aquatic plants	>10mg/l	2
	EC50(ECx)	72h	Algae or other aquatic plants	>10mg/l	2
nitrogen	Endpoint	Test Duration (hr)	Species	Value	Source
	Not Available	Not Available	Not Available	Not Available	Not Available
Legend:	Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data				

for polyisocyanates:

Polyisocyanates are not readily biodegradable. However, due to other elimination mechanisms (hydrolysis, adsorption), long retention times in water are not to be expected. The resulting polyurea is more or less inert and, due to its molecular size, not bioavailable.

For Isocyanate Monomers:

Environmental Fate: Isocyanates, (di- and polyfunctional isocyanates), are commonly used to make various polymers, such as polyurethanes. Polyurethanes find significant application in the manufacture of rigid and flexible foams. They are also used in the production of adhesives, elastomers, and coatings.

DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
4,4'-diphenylmethane diisocyanate (MDI)	LOW (Half-life = 1 days)	LOW (Half-life = 0.24 days)

Bioaccumulative potential

Ingredient	Bioaccumulation
4,4'-diphenylmethane diisocyanate (MDI)	LOW (BCF = 15)

Mobility in soil

Ingredient	Mobility
4,4'-diphenylmethane diisocyanate (MDI)	LOW (KOC = 376200)


SECTION 13 Disposal considerations

Waste treatment methods

Product / Packaging disposal	<ul style="list-style-type: none"> ▶ DO NOT allow wash water from cleaning or process equipment to enter drains. ▶ It may be necessary to collect all wash water for treatment before disposal. ▶ In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first. ▶ DO NOT recycle spilled material. ▶ Consult State Land Waste Management Authority for disposal. ▶ Neutralise spill material carefully and decontaminate empty containers and spill residues with 10% ammonia solution plus detergent or a proprietary decontaminant prior to disposal.
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SECTION 14 Transport information

Labels Required

	
Marine Pollutant	NO

Shipping container, transport vehicle placarding, and labeling may vary from the below information. This depends on the quantity shipped, the applicability of excepted quantity requirements, limited quantity requirements, and/or special provisions according to US DOT, IATA and IMDG regulations. In case of reshipment, it is the responsibility of the shipper to determine the appropriate labels and markings in accordance with applicable transport regulations.

Land transport (DOT)

14.1. UN number or ID number	3500				
14.2. UN proper shipping name	Chemical under pressure, n.o.s. (Hydrofluoroolefin, Nitrogen)				
14.3. Transport hazard class(es)	<table border="1"> <tbody> <tr> <td>Class</td> <td>2.2</td> </tr> <tr> <td>Subsidiary Hazard</td> <td>Not Applicable</td> </tr> </tbody> </table>	Class	2.2	Subsidiary Hazard	Not Applicable
Class	2.2				
Subsidiary Hazard	Not Applicable				
14.4. Packing group	Not Applicable				
14.5. Environmental hazard	Not Applicable				

Tiger Foam™ Slow Rise (TF200SR, TF600SR) A-side

14.6. Special precautions for user	Hazard Label	2.2
	Special provisions	362, T50, TP40

Air transport (ICAO-IATA / DGR)

14.1. UN number	3500	
14.2. UN proper shipping name	Chemical under pressure, n.o.s. * (Hydrofluoroolefin, Nitrogen)	
14.3. Transport hazard class(es)	ICAO/IATA Class	2.2
	ICAO / IATA Subsidiary Hazard	Not Applicable
	ERG Code	2L
14.4. Packing group	Not Applicable	
14.5. Environmental hazard	Not Applicable	
14.6. Special precautions for user	Special provisions	A187
	Cargo Only Packing Instructions	218
	Cargo Only Maximum Qty / Pack	150 kg
	Passenger and Cargo Packing Instructions	218
	Passenger and Cargo Maximum Qty / Pack	75 kg
	Passenger and Cargo Limited Quantity Packing Instructions	Forbidden
	Passenger and Cargo Limited Maximum Qty / Pack	Forbidden

Sea transport (IMDG-Code / GGVSee)

14.1. UN number	3500	
14.2. UN proper shipping name	CHEMICAL UNDER PRESSURE, N.O.S. (Hydrofluoroolefin, Nitrogen)	
14.3. Transport hazard class(es)	IMDG Class	2.2
	IMDG Subsidiary Hazard	Not Applicable
14.4. Packing group	Not Applicable	
14.5. Environmental hazard	Not Applicable	
14.6. Special precautions for user	EMS Number	F-C , S-V
	Special provisions	274 362
	Limited Quantities	0

14.7.1. Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

14.7.2. Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

Product name	Group
4,4'-diphenylmethane diisocyanate (MDI)	Not Available
polymeric diphenylmethane diisocyanate	Not Available
1,3,3,3-tetrafluoropropene	Not Available
nitrogen	Not Available

14.7.3. Transport in bulk in accordance with the IGC Code

Product name	Ship Type
4,4'-diphenylmethane diisocyanate (MDI)	Not Available
polymeric diphenylmethane diisocyanate	Not Available
1,3,3,3-tetrafluoropropene	Not Available
nitrogen	Not Available

SECTION 15 Regulatory information

Safety, health and environmental regulations / legislation specific for the substance or mixture

4,4'-diphenylmethane diisocyanate (MDI) is found on the following regulatory lists

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Not Classified as Carcinogenic

US - California Hazardous Air Pollutants Identified as Toxic Air Contaminants

US - Massachusetts - Right To Know Listed Chemicals

Continued...

Tiger Foam™ Slow Rise (TF200SR, TF600SR) A-side

US Clean Air Act - Hazardous Air Pollutants
 US DOE Temporary Emergency Exposure Limits (TEELs)
 US EPA Integrated Risk Information System (IRIS)
 US EPCRA Section 313 Chemical List
 US NIOSH Recommended Exposure Limits (RELs)
 US OSHA Permissible Exposure Limits (PELs) Table Z-1
 US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
 US TSCA New Chemical Exposure Limits (NCEL)

polymeric diphenylmethane diisocyanate is found on the following regulatory lists

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Not Classified as Carcinogenic
 US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)
 US DOE Temporary Emergency Exposure Limits (TEELs)
 US EPCRA Section 313 Chemical List
 US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

1,3,3,3-tetrafluoropropene is found on the following regulatory lists

US AIHA Workplace Environmental Exposure Levels (WEELs)
 US DOE Temporary Emergency Exposure Limits (TEELs)
 US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
 US Toxicology Excellence for Risk Assessment (TERA) Workplace Environmental Exposure Levels (WEEL)

nitrogen is found on the following regulatory lists

US - Massachusetts - Right To Know Listed Chemicals
 US DOE Temporary Emergency Exposure Limits (TEELs)
 US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

Additional Regulatory Information

Not Applicable

Federal Regulations

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Section 311/312 hazard categories

Flammable (Gases, Aerosols, Liquids, or Solids)	No
Gas under pressure	Yes
Explosive	No
Self-heating	No
Pyrophoric (Liquid or Solid)	No
Pyrophoric Gas	No
Corrosive to metal	No
Oxidizer (Liquid, Solid or Gas)	No
Organic Peroxide	No
Self-reactive	No
In contact with water emits flammable gas	No
Combustible Dust	No
Carcinogenicity	No
Acute toxicity (any route of exposure)	Yes
Reproductive toxicity	No
Skin Corrosion or Irritation	Yes
Respiratory or Skin Sensitization	Yes
Serious eye damage or eye irritation	Yes
Specific target organ toxicity (single or repeated exposure)	Yes
Aspiration Hazard	No
Germ cell mutagenicity	No
Simple Asphyxiant	No
Hazards Not Otherwise Classified	No

US. EPA CERCLA Hazardous Substances and Reportable Quantities (40 CFR 302.4)

Name	Reportable Quantity in Pounds (lb)	Reportable Quantity in kg
4,4'-diphenylmethane diisocyanate (MDI)	5000	2270

US. EPCRA Section 313 Toxic Release Inventory (TRI) (40 CFR 372)

This product contains the following EPCRA section 313 chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know-Act of 1986 (40 CFR 372):

CAS No	%[weight]	Name
101-68-8	30-60	4,4'-diphenylmethane diisocyanate (MDI)

This information must be included in all SDSs that are copied and distributed for this material.

Continued...

Tiger Foam™ Slow Rise (TF200SR, TF600SR) A-side

CAS No	%[weight]	Name
9016-87-9	30-60	polymeric diphenylmethane diisocyanate

This information must be included in all SDSs that are copied and distributed for this material.

Additional Federal Regulatory Information

Not Applicable

State Regulations**US. California Proposition 65**

None Reported

Additional State Regulatory Information

Not Applicable

National Inventory Status

National Inventory	Status
Australia - AIIC / Australia Non-Industrial Use	Yes
Canada - DSL	Yes
Canada - NDSL	No
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	Yes
Japan - ENCS	No (nitrogen)
Korea - KECI	Yes
New Zealand - NZIoC	No (1,3,3,3-tetrafluoropropene)
Philippines - PICCS	No (1,3,3,3-tetrafluoropropene)
USA - TSCA	Yes
Taiwan - TCSI	Yes
Mexico - INSQ	Yes
Vietnam - NCI	Yes
Russia - FBEPH	Yes
Legend:	Yes = All CAS declared ingredients are on the inventory No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.

SECTION 16 Other information

Revision Date	03/04/2024
Initial Date	02/27/2021

CONTACT POINT**SDS Version Summary**

Version	Date of Update	Sections Updated
2.6	03/04/2024	Hazards identification - Classification

Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios.

Powered by AuthorITe, from Chemwatch.



Tiger Foam™ Slow Rise (TF200SR, TF600SR) B-side Commercial Thermal Solutions, Inc.

Version No: 1.2
Safety Data Sheet according to OSHA HazCom Standard (2012) requirements

Issue Date: **03/04/2024**
Print Date: **03/04/2024**
S.GHS.USA.EN

SECTION 1 Identification

Product Identifier

Product name	Tiger Foam™ Slow Rise (TF200SR, TF600SR) B-side
Synonyms	Not Available
Proper shipping name	Chemical under pressure, n.o.s. (Hydrofluoroolefin, Nitrogen)
Other means of identification	Not Available

Recommended use of the chemical and restrictions on use

Relevant identified uses	Low Pressure Polyurethane Foam
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Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party

Registered company name	Commercial Thermal Solutions, Inc.
Address	2812 SW 29th Ct. Cape Coral, FL 33914 United States
Telephone	1-800-664-0063
Fax	Not Available
Website	www.tigerfoam.com
Email	customerservice@tigerfoam.com

Emergency phone number

Association / Organisation	CHEMTREC
Emergency telephone numbers	1-800-424-9300
Other emergency telephone numbers	1-703-527-3887

SECTION 2 Hazard(s) identification

Classification of the substance or mixture

NFPA 704 diamond



Note: The hazard category numbers found in GHS classification in section 2 of this SDSs are NOT to be used to fill in the NFPA 704 diamond. Blue = Health Red = Fire Yellow = Reactivity White = Special (Oxidizer or water reactive substances)

Classification	Gases Under Pressure (Compressed Gas), Skin Corrosion/Irritation Category 2, Serious Eye Damage/Eye Irritation Category 2A, Reproductive Toxicity Category 2, Specific Target Organ Toxicity - Repeated Exposure Category 2, Simple Asphyxiant
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Label elements

Hazard pictogram(s)	
Signal word	Warning

Hazard statement(s)

Tiger Foam™ Slow Rise (TF200SR, TF600SR) B-side

H280	Contains gas under pressure; may explode if heated.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H361	Suspected of damaging fertility or the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.

Hazard(s) not otherwise classified

Not Applicable

Precautionary statement(s) Prevention

P201	Obtain special instructions before use.
P260	Do not breathe gas.
P280	Wear protective gloves, protective clothing, eye protection and face protection.
P202	Do not handle until all safety precautions have been read and understood.
P264	Wash all exposed external body areas thoroughly after handling.

Precautionary statement(s) Response

P308+P313	IF exposed or concerned: Get medical advice/ attention.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P314	Get medical advice/attention if you feel unwell.
P337+P313	If eye irritation persists: Get medical advice/attention.
P302+P352	IF ON SKIN: Wash with plenty of water.
P332+P313	If skin irritation occurs: Get medical advice/attention.
P362+P364	Take off contaminated clothing and wash it before reuse.

Precautionary statement(s) Storage

P405	Store locked up.
P410+P403	Protect from sunlight. Store in a well-ventilated place.

Precautionary statement(s) Disposal

P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.
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SECTION 3 Composition / information on ingredients

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
111-46-6	3-7	<u>diethylene glycol</u>
13674-84-5*	20-30	<u>tris(2-chloroisopropyl)phosphate</u>
107-21-1	<1	<u>ethylene glycol</u>
7560-83-0	0.5-1.5	<u>N-methyldicyclohexylamine</u>
29118-24-9	10-20	<u>1,3,3,3-tetrafluoropropene</u>
7727-37-9.	<5	<u>nitrogen</u>

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

SECTION 4 First-aid measures

Description of first aid measures

Eye Contact	<ul style="list-style-type: none"> ▶ If product comes in contact with eyes remove the patient from gas source or contaminated area. ▶ Take the patient to the nearest eye wash, shower or other source of clean water. ▶ Open the eyelid(s) wide to allow the material to evaporate. ▶ Gently rinse the affected eye(s) with clean, cool water for at least 15 minutes. Have the patient lie or sit down and tilt the head back. Hold the eyelid(s) open and pour water slowly over the eyeball(s) at the inner corners, letting the water run out of the outer corners. ▶ The patient may be in great pain and wish to keep the eyes closed. It is important that the material is rinsed from the eyes to prevent further damage. ▶ Ensure that the patient looks up, and side to side as the eye is rinsed in order to better reach all parts of the eye(s) ▶ Transport to hospital or doctor. ▶ Even when no pain persists and vision is good, a doctor should examine the eye as delayed damage may occur. ▶ If the patient cannot tolerate light, protect the eyes with a clean, loosely tied bandage. ▶ Ensure verbal communication and physical contact with the patient. <p>DO NOT allow the patient to rub the eyes DO NOT allow the patient to tightly shut the eyes DO NOT introduce oil or ointment into the eye(s) without medical advice DO NOT use hot or tepid water.</p>
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Continued...

Tiger Foam™ Slow Rise (TF200SR, TF600SR) B-side

Skin Contact	<p>If skin or hair contact occurs:</p> <ul style="list-style-type: none"> ▶ Immediately flush body and clothes with large amounts of water, using safety shower if available. ▶ Quickly remove all contaminated clothing, including footwear. ▶ Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre. ▶ Transport to hospital, or doctor.
Inhalation	<ul style="list-style-type: none"> ▶ Following exposure to gas, remove the patient from the gas source or contaminated area. ▶ NOTE: Personal Protective Equipment (PPE), including positive pressure self-contained breathing apparatus may be required to assure the safety of the rescuer. ▶ Prostheses such as false teeth, which may block the airway, should be removed, where possible, prior to initiating first aid procedures. ▶ If the patient is not breathing spontaneously, administer rescue breathing. ▶ If the patient does not have a pulse, administer CPR. ▶ If medical oxygen and appropriately trained personnel are available, administer 100% oxygen. ▶ Summon an emergency ambulance. If an ambulance is not available, contact a physician, hospital, or Poison Control Centre for further instruction. ▶ Keep the patient warm, comfortable and at rest while awaiting medical care. ▶ MONITOR THE BREATHING AND PULSE, CONTINUOUSLY. ▶ Administer rescue breathing (preferably with a demand-valve resuscitator, bag-valve mask-device, or pocket mask as trained) or CPR if necessary.
Ingestion	<p>Not considered a normal route of entry.</p> <ul style="list-style-type: none"> ▶ Avoid giving milk or oils. ▶ Avoid giving alcohol.

Most important symptoms and effects, both acute and delayed

See Section 11

Indication of any immediate medical attention and special treatment needed

for intoxication due to Freons/ Halons;

A: Emergency and Supportive Measures

- ▶ Maintain an open airway and assist ventilation if necessary
- ▶ Treat coma and arrhythmias if they occur. Avoid (adrenaline) epinephrine or other sympathomimetic amines that may precipitate ventricular arrhythmias. Tachyarrhythmias caused by increased myocardial sensitisation may be treated with propranolol, 1-2 mg IV or esmolol 25-100 microgm/kg/min IV.
- ▶ Monitor the ECG for 4-6 hours

B: Specific drugs and antidotes:

- ▶ There is no specific antidote

C: Decontamination

- ▶ Inhalation; remove victim from exposure, and give supplemental oxygen if available.
- ▶ Ingestion; (a) Prehospital: Administer activated charcoal, if available. **DO NOT** induce vomiting because of rapid absorption and the risk of abrupt onset CNS depression. (b) Hospital: Administer activated charcoal, although the efficacy of charcoal is unknown. Perform gastric lavage only if the ingestion was very large and recent (less than 30 minutes)

D: Enhanced elimination:

- ▶ There is no documented efficacy for diuresis, haemodialysis, haemoperfusion, or repeat-dose charcoal.

POISONING and DRUG OVERDOSE, Californian Poison Control System Ed. Kent R Olson; 3rd Edition

- ▶ Do not administer sympathomimetic drugs unless absolutely necessary as material may increase myocardial irritability.
- ▶ No specific antidote.
- ▶ Because rapid absorption may occur through lungs if aspirated and cause systematic effects, the decision of whether to induce vomiting or not should be made by an attending physician.
- ▶ If lavage is performed, suggest endotracheal and/or esophageal control.
- ▶ Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach.
- ▶ Treatment based on judgment of the physician in response to reactions of the patient

To treat poisoning by the higher aliphatic alcohols (up to C7):

- ▶ Gastric lavage with copious amounts of water.
- ▶ It may be beneficial to instill 60 ml of mineral oil into the stomach.
- ▶ Oxygen and artificial respiration as needed.
- ▶ Electrolyte balance: it may be useful to start 500 ml. M/6 sodium bicarbonate intravenously but maintain a cautious and conservative attitude toward electrolyte replacement unless shock or severe acidosis threatens.
- ▶ To protect the liver, maintain carbohydrate intake by intravenous infusions of glucose.
- ▶ Haemodialysis if coma is deep and persistent. [GOSSELIN, SMITH HODGE: Clinical Toxicology of Commercial Products, Ed 5]

BASIC TREATMENT

- ▶ Establish a patent airway with suction where necessary.
- ▶ Watch for signs of respiratory insufficiency and assist ventilation as necessary.
- ▶ Administer oxygen by non-rebreather mask at 10 to 15 l/min.
- ▶ Monitor and treat, where necessary, for shock.
- ▶ Monitor and treat, where necessary, for pulmonary oedema.
- ▶ Anticipate and treat, where necessary, for seizures.
- ▶ **DO NOT use emetics.** Where ingestion is suspected rinse mouth and give up to 200 ml water (5 ml/kg recommended) for dilution where patient is able to swallow, has a strong gag reflex and does not drool.
- ▶ Give activated charcoal.

ADVANCED TREATMENT

- ▶ Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.
- ▶ Positive-pressure ventilation using a bag-valve mask might be of use.
- ▶ Monitor and treat, where necessary, for arrhythmias.
- ▶ Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.
- ▶ If the patient is hypoglycaemic (decreased or loss of consciousness, tachycardia, pallor, dilated pupils, diaphoresis and/or dextrose strip or glucometer readings below 50 mg), give 50% dextrose.
- ▶ Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications.
- ▶ Drug therapy should be considered for pulmonary oedema.
- ▶ Treat seizures with diazepam.
- ▶ Proparacaine hydrochloride should be used to assist eye irrigation.

EMERGENCY DEPARTMENT

Tiger Foam™ Slow Rise (TF200SR, TF600SR) B-side

- ▶ Laboratory analysis of complete blood count, serum electrolytes, BUN, creatinine, glucose, urinalysis, baseline for serum aminotransferases (ALT and AST), calcium, phosphorus and magnesium, may assist in establishing a treatment regime. Other useful analyses include anion and osmolar gaps, arterial blood gases (ABGs), chest radiographs and electrocardiograph.
- ▶ Positive end-expiratory pressure (PEEP)-assisted ventilation may be required for acute parenchymal injury or adult respiratory distress syndrome.
- ▶ Acidosis may respond to hyperventilation and bicarbonate therapy.
- ▶ Haemodialysis might be considered in patients with severe intoxication.
- ▶ Consult a toxicologist as necessary. BRONSTEIN, A.C. and CURRANCE, P.L. EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994

For C8 alcohols and above.

Symptomatic and supportive therapy is advised in managing patients.

For gas exposures:

BASIC TREATMENT

- ▶ Establish a patent airway with suction where necessary.
- ▶ Watch for signs of respiratory insufficiency and assist ventilation as necessary.
- ▶ Administer oxygen by non-rebreather mask at 10 to 15 l/min.
- ▶ Monitor and treat, where necessary, for pulmonary oedema .
- ▶ Monitor and treat, where necessary, for shock.
- ▶ Anticipate seizures.

ADVANCED TREATMENT

- ▶ Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.
- ▶ Positive-pressure ventilation using a bag-valve mask might be of use.
- ▶ Monitor and treat, where necessary, for arrhythmias.
- ▶ Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.
- ▶ Drug therapy should be considered for pulmonary oedema.
- ▶ Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications.
- ▶ Treat seizures with diazepam.
- ▶ Proparacaine hydrochloride should be used to assist eye irrigation.

BRONSTEIN, A.C. and CURRANCE, P.L.

EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994

SECTION 5 Fire-fighting measures

Extinguishing media

- ▶ Alcohol stable foam.
- ▶ Dry chemical powder.
- ▶ BCF (where regulations permit).

Special hazards arising from the substrate or mixture

Fire Incompatibility	▶ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result
-----------------------------	--

Special protective equipment and precautions for fire-fighters

Fire Fighting	<p>GENERAL</p> <ul style="list-style-type: none"> ▶ Alert Fire Brigade and tell them location and nature of hazard. ▶ Wear full body protective clothing with breathing apparatus. ▶ Fight fire from a safe distance, with adequate cover.
Fire/Explosion Hazard	<ul style="list-style-type: none"> ▶ Containers may explode when heated - Ruptured cylinders may rocket ▶ May burn but does not ignite easily. ▶ Fire exposed cylinders may vent contents through pressure relief devices thereby increasing vapour concentration.. ▶ Fire may produce irritating, poisonous or corrosive gases. <p>Decomposition may produce toxic fumes of: carbon monoxide (CO) carbon dioxide (CO2) hydrogen fluoride other pyrolysis products typical of burning organic material.</p> <p>Contains low boiling substance: Closed containers may rupture due to pressure buildup under fire conditions.</p>

SECTION 6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	<ul style="list-style-type: none"> ▶ Avoid breathing vapour and any contact with liquid or gas. Protective equipment including respirator should be used. ▶ DO NOT enter confined spaces where gas may have accumulated.
Major Spills	<ul style="list-style-type: none"> ▶ Clear area of all unprotected personnel and move upwind. ▶ Alert Emergency Authority and advise them of the location and nature of hazard. ▶ Wear full body clothing with breathing apparatus.

Continued...

Tiger Foam™ Slow Rise (TF200SR, TF600SR) B-side

- ▶ Remove leaking cylinders to a safe place.
- ▶ Fit vent pipes. Release pressure under safe, controlled conditions
- ▶ Burn issuing gas at vent pipes.
- ▶ DO NOT exert excessive pressure on valve; DO NOT attempt to operate damaged valve.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 Handling and storage

Precautions for safe handling

Safe handling	<ul style="list-style-type: none"> · Consider use in closed pressurised systems, fitted with temperature, pressure and safety relief valves which are vented for safe dispersal. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature · The tubing network design connecting gas cylinders to the delivery system should include appropriate pressure indicators and vacuum or suction lines. · Fully-welded types of pressure gauges, where the bourdon tube sensing element is welded to the gauge body, are recommended. <ul style="list-style-type: none"> ▶ DO NOT transfer gas from one cylinder to another.
Other information	<ul style="list-style-type: none"> ▶ Cylinders should be stored in a purpose-built compound with good ventilation, preferably in the open. ▶ Such compounds should be sited and built in accordance with statutory requirements. ▶ The storage compound should be kept clear and access restricted to authorised personnel only.

Conditions for safe storage, including any incompatibilities

Suitable container	<ul style="list-style-type: none"> ▶ Cylinder: ▶ Ensure the use of equipment rated for cylinder pressure. ▶ Ensure the use of compatible materials of construction. ▶ Valve protection cap to be in place until cylinder is secured, connected.
Storage incompatibility	<ul style="list-style-type: none"> ▶ Glycols and their ethers undergo violent decomposition in contact with 70% perchloric acid. This seems likely to involve formation of the glycol perchlorate esters (after scission of ethers) which are explosive, those of ethylene glycol and 3-chloro-1,2-propanediol being more powerful than glyceryl nitrate, and the former so sensitive that it explodes on addition of water. As a general rule, hydrofluorocarbons tend to be flammable unless they contain more fluorine atoms than hydrogen atoms. Alcohols <ul style="list-style-type: none"> ▶ are incompatible with strong acids, acid chlorides, acid anhydrides, oxidising and reducing agents. ▶ reacts, possibly violently, with alkaline metals and alkaline earth metals to produce hydrogen ▶ react with strong acids, strong caustics, aliphatic amines, isocyanates, acetaldehyde, benzoyl peroxide, chromic acid, chromium oxide, dialkylzincs, dichlorine oxide, ethylene oxide, hypochlorous acid, isopropyl chlorocarbonate, lithium tetrahydroaluminate, nitrogen dioxide, pentafluoroguanidine, phosphorus halides, phosphorus pentasulfide, tangerine oil, triethylaluminium, triisobutylaluminium ▶ should not be heated above 49 deg. C. when in contact with aluminium equipment ▶ Haloalkenes are highly reactive. ▶ Some of the more lightly substituted lower members are highly flammable; many members of the group are peroxidisable and polymerisable. ▶ Avoid reaction or contact with potassium or its alloys - although apparently stable on contact with a wide range of halocarbons, reaction products may be shock-sensitive and may explode with great violence on light impact. ▶ Compressed gases may contain a large amount of kinetic energy over and above that potentially available from the energy of reaction produced by the gas in chemical reaction with other substances

SECTION 8 Exposure controls / personal protection

Control parameters

Occupational Exposure Limits (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
US NIOSH Recommended Exposure Limits (RELs)	ethylene glycol	Ethylene glycol	Not Available	Not Available	Not Available	See Appendix D

Emergency Limits

Ingredient	TEEL-1	TEEL-2	TEEL-3
diethylene glycol	6.9 ppm	140 ppm	860 ppm
ethylene glycol	30 ppm	150 ppm	900 ppm
1,3,3,3-tetrafluoropropene	1,400 ppm	Not Available	Not Available
nitrogen	7.96E+05 ppm	8.32E+05 ppm	8.69E+05 ppm

Ingredient	Original IDLH	Revised IDLH
diethylene glycol	Not Available	Not Available
tris(2-chloroisopropyl)phosphate	Not Available	Not Available
ethylene glycol	Not Available	Not Available
N-methylcyclohexylamine	Not Available	Not Available
1,3,3,3-tetrafluoropropene	Not Available	Not Available
nitrogen	Not Available	Not Available


Occupational Exposure Banding

Ingredient	Occupational Exposure Band Rating	Occupational Exposure Band Limit
diethylene glycol	E	≤ 0.1 ppm

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Ingredient	Occupational Exposure Band Rating	Occupational Exposure Band Limit
tris(2-chloroisopropyl)phosphate	E	≤ 0.1 ppm
Notes:	Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health.	

Exposure controls

Appropriate engineering controls	Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. The basic types of engineering controls are: Process controls which involve changing the way a job activity or process is done to reduce the risk.
Individual protection measures, such as personal protective equipment	
Eye and face protection	<ul style="list-style-type: none"> ▶ Safety glasses with side shields. ▶ Chemical goggles. [AS/NZS 1337.1, EN166 or national equivalent] ▶ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants.
Skin protection	See Hand protection below
Hands/feet protection	<ul style="list-style-type: none"> ▶ When handling sealed and suitably insulated cylinders wear cloth or leather gloves.
Body protection	See Other protection below
Other protection	<ul style="list-style-type: none"> ▶ Protective overalls, closely fitted at neck and wrist. ▶ Eye-wash unit. ▶ Ensure availability of lifeline in confined spaces.

Respiratory protection

Type KAX-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

- ▶ Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content.
- ▶ The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.
- ▶ Cartridge performance is affected by humidity. Cartridges should be changed after 2 hr of continuous use unless it is determined that the humidity is less than 75%, in which case, cartridges can be used for 4 hr. Used cartridges should be discarded daily, regardless of the length of time used
- ▶ Positive pressure, full face, air-supplied breathing apparatus should be used for work in enclosed spaces if a leak is suspected or the primary containment is to be opened (e.g. for a cylinder change)
- ▶ Air-supplied breathing apparatus is required where release of gas from primary containment is either suspected or demonstrated.

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Required minimum protection factor	Maximum gas/vapour concentration present in air p.p.m. (by volume)	Half-face Respirator	Full-Face Respirator
up to 10	1000	AX-AUS / Class 1	-
up to 50	1000	-	AX-AUS / Class 1
up to 50	5000	Airline *	-
up to 100	5000	-	AX-2
up to 100	10000	-	AX-3
100+		-	Airline**

** - Continuous-flow or positive pressure demand.

A(All classes) = Organic vapours, B AUS or B1 = Acid gases, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 deg C)

SECTION 9 Physical and chemical properties

Information on basic physical and chemical properties

Appearance	Creme		
Physical state	Compressed Gas	Relative density (Water = 1)	Not Available
Odour	Not Available	Partition coefficient n-octanol / water	Not Available
Odour threshold	Not Available	Auto-ignition temperature (°C)	Not Available
pH (as supplied)	Not Available	Decomposition temperature (°C)	Not Available
Melting point / freezing point (°C)	Not Available	Viscosity (cSt)	Not Available
Initial boiling point and boiling range (°C)	-19	Molecular weight (g/mol)	Not Available

Continued...

Tiger Foam™ Slow Rise (TF200SR, TF600SR) B-side

Flash point (°C)	Not Available	Taste	Not Available
Evaporation rate	Not Available	Explosive properties	Not Available
Flammability	Not Available	Oxidising properties	Not Available
Upper Explosive Limit (%)	Not Available	Surface Tension (dyn/cm or mN/m)	Not Available
Lower Explosive Limit (%)	Not Available	Volatile Component (%vol)	Not Available
Vapour pressure (kPa)	Not Available	Gas group	Not Available
Solubility in water	Partly miscible	pH as a solution (1%)	Not Available
Vapour density (Air = 1)	Not Available	VOC g/L	<25 when mixed as intended

SECTION 10 Stability and reactivity

Reactivity	See section 7
Chemical stability	<ul style="list-style-type: none"> ▶ Unstable in the presence of incompatible materials. ▶ Product is considered stable. ▶ Hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 Toxicological information

Information on toxicological effects

Inhaled	<p>The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models). Nevertheless inhalation of the material, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.</p> <p>Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may be damaging to the health of the individual.</p> <p>Exposure to fluorocarbons can produce non-specific flu-like symptoms such as chills, fever, weakness, muscle pain, headache, chest discomfort, sore throat and dry cough with rapid recovery. High concentrations can cause irregular heartbeats and a stepwise reduction in lung capacity. Inhalation of the vapour is hazardous and may even be fatal</p> <p>The use of a quantity of material in an unventilated or confined space may result in increased exposure and an irritating atmosphere developing. Before starting consider control of exposure by mechanical ventilation.</p> <p>Aliphatic alcohols with more than 3-carbons cause headache, dizziness, drowsiness, muscle weakness and delirium, central depression, coma, seizures and behavioural changes. Secondary respiratory depression and failure, as well as low blood pressure and irregular heart rhythms, may follow.</p> <p>Inhalation of toxic gases may cause:</p> <ul style="list-style-type: none"> ▶ Central Nervous System effects including depression, headache, confusion, dizziness, stupor, coma and seizures; ▶ respiratory: acute lung swellings, shortness of breath, wheezing, rapid breathing, other symptoms and respiratory arrest; ▶ heart: collapse, irregular heartbeats and cardiac arrest; ▶ gastrointestinal: irritation, ulcers, nausea and vomiting (may be bloody), and abdominal pain. <p>Material is highly volatile and may quickly form a concentrated atmosphere in confined or unventilated areas. The vapour may displace and replace air in breathing zone, acting as a simple asphyxiant. This may happen with little warning of overexposure.</p>
Ingestion	<p>Accidental ingestion of the material may be damaging to the health of the individual.</p> <p>Overexposure to non-ring alcohols causes nervous system symptoms. These include headache, muscle weakness and inco-ordination, giddiness, confusion, delirium and coma.</p> <p>Not normally a hazard due to physical form of product.</p> <p>Considered an unlikely route of entry in commercial/industrial environments</p>
Skin Contact	<p>This material can cause inflammation of the skin on contact in some persons.</p> <p>The material may accentuate any pre-existing dermatitis condition</p> <p>Skin contact is not thought to have harmful health effects (as classified under EC Directives); the material may still produce health damage following entry through wounds, lesions or abrasions.</p> <p>Fluorocarbons remove natural oils from the skin, causing irritation, dryness and sensitivity.</p> <p>Most liquid alcohols appear to act as primary skin irritants in humans. Significant percutaneous absorption occurs in rabbits but not apparently in man.</p> <p>Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.</p>
Eye	<p>This material can cause eye irritation and damage in some persons.</p> <p>Not considered to be a risk because of the extreme volatility of the gas.</p>
Chronic	<p>Repeated or long-term occupational exposure is likely to produce cumulative health effects involving organs or biochemical systems.</p> <p>Ample evidence from experiments exists that there is a suspicion this material directly reduces fertility.</p>

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	The reactivity of an epoxide intermediate may be the reason for the cancer-causing properties of halogenated oxiranes. It is reported that 1,1-dichloroethyne, vinyl chloride, trichloroethylene, tetrachloroethylene and chloroprene all cause cancer. Generally speaking, substances with one halogen substitution show higher potential to cause cancer compared to substances with two. Main route of exposure to the gas in the workplace is by inhalation. There has been some concern that this material can cause cancer or mutations but there is not enough data to make an assessment. Fluorocarbons can cause an increased risk of cancer, spontaneous abortion and birth defects.	
TigerFoam Slow Rise (TF200SR, TF600SR) B-side	TOXICITY	IRRITATION
	Not Available	Not Available
diethylene glycol	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: 11890 mg/kg ^[2]	Eye (rabbit) 50 mg mild
	Inhalation(Rat) LC50: >4.6 mg/l4h ^[1]	Eye: no adverse effect observed (not irritating) ^[1]
	Oral (Rat) LD50: 12565 mg/kg ^[2]	Skin (human): 112 mg/3d-l mild
		Skin (rabbit): 500 mg mild
	Skin: no adverse effect observed (not irritating) ^[1]	
tris(2-chloroisopropyl)phosphate	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: >5000 mg/kg ^[2]	Eye (rabbit): non-irritating*
	Inhalation(Rat) LC50: >4.6 mg/l/4H ^[2]	Skin (rabbit): mild (24 h):
	Intravenous (Mouse) LD50: 56 mg/kg ^[2]	
Oral (Rat) LD50: 1500 mg/kg ^[2]		
ethylene glycol	TOXICITY	IRRITATION
	dermal (mouse) LD50: >3500 mg/kg ^[1]	Eye (rabbit): 100 mg/1h - mild
	Oral (Rat) LD50: >2000 mg/kg ^[2]	Eye (rabbit): 12 mg/m3/3D
		Eye (rabbit): 1440mg/6h-moderate
		Eye (rabbit): 500 mg/24h - mild
		Eye: no adverse effect observed (not irritating) ^[1]
		Skin (rabbit): 555 mg(open)-mild
	Skin: no adverse effect observed (not irritating) ^[1]	
N-methyldicyclohexylamine	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: 323 mg/kg ^[2]	Not Available
	Inhalation(Rat) LC50: >0.54 mg/L4h ^[2]	
Oral (Rat) LD50: >=267 mg/kg ^[1]		
1,3,3,3-tetrafluoropropene	TOXICITY	IRRITATION
	Inhalation(Rat) LC50: >1157.752 ppm4h ^[2]	Not Available
nitrogen	TOXICITY	IRRITATION
	Not Available	Not Available
Legend:	1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances	

DIETHYLENE GLYCOL	Diglycolic acid is formed following the oxidation of accidentally ingested diethylene glycol in the body and can lead to severe complications with fatal outcome.
tris(2-chloroisopropyl)phosphate	Non-chlorinated triphosphates have varying chemical, physical, toxicological and environmental properties. Blooming has been identified as a source of potential exposure (human and environmental) to triphosphate plasticisers / flame retardants. Blooming is the movement of an ingredient in rubber or plastic to the outer surface after curing. For tris(2-chloro-1-methylethyl)phosphate (TCPP) The flame retardant product supplied in the EU, marketed as TCPP, is actually a reaction mixture containing four isomers. The individual isomers in this reaction mixture are not separated or marketed. The individual components are never produced as such. Alkyl esters of phosphoric acid exhibit a low to moderate acute toxicity and metabolised. From studies done on mice, they are not likely to cause gene damage or affect reproduction. However, 2-ethylhexanoic acid produced an effect on newborn rats at high doses to the pregnant female.
ETHYLENE GLYCOL	[Estimated Lethal Dose (human) 100 ml; RTECS quoted by Orica] Substance is reproductive effector in rats (birth defects). Mutagenic to rat cells. For ethylene glycol: Ethylene glycol is quickly and extensively absorbed throughout the gastrointestinal tract. Limited information suggests that it is also absorbed

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	through the airways; absorption through skin is apparently slow. Following absorption, it is distributed throughout the body.
N-METHYLDICYCLOHEXYLAMINE	<p>Somnolence, convulsions recorded. When applied to the skin of male rabbits, most adverse effects were observed within an hour after treatment and lasted several hours. The onset of paralysis occurred between several hours and two days after treatment. Paralysis affected only the hindlimbs in some rabbits and affected both the forelimbs and hindlimbs in others. Sensitisation: After identification of the slightly irritating and the non-irritating test article concentrations in the primary irritation experiments, a main study was performed with the selected test article concentrations. The experimental animals were intradermally injected with a 5 % concentration and epidermally exposed to the undiluted test substance while the control animals were similarly treated, but with the vehicle only. Immediately after the epidermal exposure, the skin irritation was scored. The epidermal exposure the induction phase resulted in severe skin irritation. The epidermal exposure in the challenge phase resulted in one positive sensitisation reaction in response to the 10 % test article concentration. Under the conditions used in this study, the substance produced sensitisation rate of 5 %. Based on these results and according to the EEC criteria for classification and labelling requirements for dangerous substances and preparations (EEC Directive 91/325/EEC, Amendment to Annex VI of the EEC Directive 67/548/EEC), POLYCAT 12 need not be labelled as a skin sensitiser. Repeat dose toxicity: The test substance caused significant changes of clinical status of animals (mainly convulsions accompanied with marked salivation). These clinical findings were detected in both sexes at the highest dose level. At the middle dose level these symptoms were recorded only sporadically and at the lowest dose level only salivation in males was observed. Genetic toxicity: in vitro The test compound did not demonstrate genetic activity in any of the assays conducted in this evaluation and was considered not mutagenic under these test conditions. Genetic toxicity: in vivo N-methylcyclohexylamine did not increase the frequency of aberrant cells in rat bone marrow. Toxicity to reproduction: Based on the Reproduction/Developmental toxicity screening test (OECD Guideline 421), NOAEL (offsprings): 40 mg/kg bw/day (male/female), NOAEL (P): 40 mg/kg bw/day (male/female) Developmental; toxicity/ teratogenicity: *REACH Dossier</p> <p>Overexposure to most of these materials may cause adverse health effects.</p> <p>Many amine-based compounds can cause release of histamines, which, in turn, can trigger allergic and other physiological effects, including constriction of the bronchi or asthma and inflammation of the cavity of the nose. Whole-body symptoms include headache, nausea, faintness, anxiety, a decrease in blood pressure, rapid heartbeat, itching, reddening of the skin, urticaria (hives) and swelling of the face, which are usually transient.</p> <p>There are generally four routes of possible or potential exposure: inhalation, skin contact, eye contact, and swallowing.</p> <p>Inhalation: Inhaling vapours may result in moderate to severe irritation of the tissues of the nose and throat and can irritate the lungs. Higher concentrations of certain amines can produce severe respiratory irritation, characterized by discharge from the nose, coughing, difficulty in breathing and chest pain.</p> <p>The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.</p> <p>Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant.</p> <p>The material may produce respiratory tract irritation, and result in damage to the lung including reduced lung function.</p>
1,3,3,3-TETRAFLUOROPROPENE	<p>Inhalation (rat) NOEL (28 days): >1.5 mg/l * * Vendor HFO-1234ze is not likely to accumulate in the bodies of humans or animals HFO-1234ze is practically non-toxic. Short-term exposures at levels higher than 10% have not induced cardiac sensitization to adrenalin nor induced serious toxic effects. Rats and rabbits did not exhibit any serious toxic, developmental or reproductive effects even with exposures to high levels of HFO-1234ze. Based on a series of mutagenicity and genomics studies, the cancer risk for HFO-1234ze is low, no cardiac sensitisation was observed in dogs with exposures up to 120,000 ppm; repeated dose toxicity in rats (13-wk) found mild effects on the heart (NOEL 5,000ppm); in vitro genotoxicity findings include negative Ames Test and negative human lymphocyte chromosome aberration test; in vivo genotoxicity findings in the mouse micronucleus test were negative (inhalation, mammalian bone-marrow cytogenic test with chromosomal analysis).</p>
NITROGEN	No significant acute toxicological data identified in literature search.
TigerFoam Slow Rise (TF200SR, TF600SR) B-side & 1,3,3,3-TETRAFLUOROPROPENE	<p>Inhalation of perfluoroalkenes can cause lung injury, kidney damage, brain changes and death. Repeated exposures may alter blood pressure and the production of blood cells. The potential for causing cancer is the subject of speculation.</p> <p>Disinfection byproducts (DBPs) are formed when disinfectants such as chlorine, chloramines and ozone react with organic and inorganic matter in water. Animal studies have shown that some DBPs cause cancer. To date, several hundred DBPs have been identified. Numerous haloalkanes and haloalkenes have been tested for cancer-causing and mutation-causing activities.</p>
DIETHYLENE GLYCOL & N-METHYLDICYCLOHEXYLAMINE	The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.

Acute Toxicity	✗	Carcinogenicity	✗
Skin Irritation/Corrosion	✓	Reproductivity	✓
Serious Eye Damage/Irritation	✓	STOT - Single Exposure	✗
Respiratory or Skin sensitisation	✗	STOT - Repeated Exposure	✓
Mutagenicity	✗	Aspiration Hazard	✗

Legend: ✗ – Data either not available or does not fill the criteria for classification
 ✓ – Data available to make classification

SECTION 12 Ecological information

Toxicity

TigerFoam Slow Rise (TF200SR, TF600SR) B-side	Endpoint	Test Duration (hr)	Species	Value	Source
		Not Available	Not Available	Not Available	Not Available

diethylene glycol	Endpoint	Test Duration (hr)	Species	Value	Source
	EC50	96h	Algae or other aquatic plants	4566mg/l	2
	EC50	48h	Crustacea	>100mg/l	2
	EC50	72h	Algae or other aquatic plants	>6500<13000mg/l	2
	NOEC(ECx)	192h	Algae or other aquatic plants	800mg/l	1
	LC50	96h	Fish	>100mg/l	4

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tris(2-chloroisopropyl)phosphate	Endpoint	Test Duration (hr)	Species	Value	Source
	EC50	96h	Algae or other aquatic plants	4mg/l	1
	BCF	1008h	Fish	0.8-2.8	7
	ErC50	72h	Algae or other aquatic plants	4mg/l	1
	EC50	48h	Crustacea	65335mg/l	1
	EC50	72h	Algae or other aquatic plants	82mg/l	Not Available
	EC50(ECx)	96h	Algae or other aquatic plants	4mg/l	1
	LC50	96h	Fish	56.2mg/l	Not Available

ethylene glycol	Endpoint	Test Duration (hr)	Species	Value	Source
	EC50	96h	Algae or other aquatic plants	6500-13000mg/l	1
	EC50	48h	Crustacea	>100mg/l	2
	EC50(ECx)	Not Available	Algae or other aquatic plants	6500-7500mg/l	1
LC50	96h	Fish	8050mg/l	4	

N-methyldicyclohexylamine	Endpoint	Test Duration (hr)	Species	Value	Source
	EC50	48h	Crustacea	8mg/l	Not Available
	EC50	72h	Algae or other aquatic plants	0.063mg/l	Not Available
	EC50(ECx)	72h	Algae or other aquatic plants	0.063mg/l	Not Available
LC50	96h	Fish	62mg/l	Not Available	

1,3,3,3-tetrafluoropropene	Endpoint	Test Duration (hr)	Species	Value	Source
	ErC50	72h	Algae or other aquatic plants	>170mg/l	2
	EC50	48h	Crustacea	>160mg/l	2
	EC50	72h	Algae or other aquatic plants	>170mg/l	2
	EC50(ECx)	48h	Crustacea	>160mg/l	2
	LC50	96h	Fish	>117mg/l	2
	EC50	72h	Algae or other aquatic plants	>10mg/l	2
EC50(ECx)	72h	Algae or other aquatic plants	>10mg/l	2	

nitrogen	Endpoint	Test Duration (hr)	Species	Value	Source
	Not Available	Not Available	Not Available	Not Available	Not Available

Legend: *Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data*

Substances containing unsaturated carbons are ubiquitous in indoor environments. They result from many sources (see below). Most are reactive with environmental ozone and many produce stable products which are thought to adversely affect human health. The potential for surfaces in an enclosed space to facilitate reactions should be considered.

In addition to carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O), the greenhouse gases mentioned in the Kyoto Protocol include synthetic substances that share the common feature of being highly persistent in the atmosphere and inhibit radiation from escaping out of the atmosphere. These synthetic substances include hydrocarbons that are partially fluorinated (HCFs) or totally fluorinated (PFCs) as well as sulfur hexafluoride (SF₆). The greenhouse potential of these substances, expressed as multiples of that of CO₂, are within the range of 140 to 11,700 for HFCs, from 6500 to 9,200 for PFCs and 23,900 for SF₆.

DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
diethylene glycol	LOW	LOW
tris(2-chloroisopropyl)phosphate	HIGH	HIGH
ethylene glycol	LOW (Half-life = 24 days)	LOW (Half-life = 3.46 days)
N-methyldicyclohexylamine	HIGH	HIGH

Bioaccumulative potential

Ingredient	Bioaccumulation
diethylene glycol	LOW (BCF = 180)
tris(2-chloroisopropyl)phosphate	LOW (BCF = 4.6)
ethylene glycol	LOW (BCF = 200)
N-methyldicyclohexylamine	LOW (LogKOW = 3.71)

Mobility in soil

Ingredient	Mobility
diethylene glycol	HIGH (KOC = 1)

Continued...

Tiger Foam™ Slow Rise (TF200SR, TF600SR) B-side

Ingredient	Mobility
tris(2-chloroisopropyl)phosphate	LOW (KOC = 1278)
ethylene glycol	HIGH (KOC = 1)
N-methyldicyclohexylamine	LOW (KOC = 325)


SECTION 13 Disposal considerations

Waste treatment methods

Product / Packaging disposal	<ul style="list-style-type: none"> ▶ Evaporate residue at an approved site. ▶ Return empty containers to supplier. If containers are marked non-returnable establish means of disposal with manufacturer prior to purchase.
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SECTION 14 Transport information

Labels Required

	
Marine Pollutant	NO

Shipping container, transport vehicle placarding, and labeling may vary from the below information. This depends on the quantity shipped, the applicability of excepted quantity requirements, limited quantity requirements, and/or special provisions according to US DOT, IATA and IMDG regulations. In case of reshipment, it is the responsibility of the shipper to determine the appropriate labels and markings in accordance with applicable transport regulations.

Land transport (DOT)

14.1. UN number or ID number	3500	
14.2. UN proper shipping name	Chemical under pressure, n.o.s. (Hydrofluoroolefin, Nitrogen)	
14.3. Transport hazard class(es)	Class	2.2
	Subsidiary Hazard	Not Applicable
14.4. Packing group	Not Applicable	
14.5. Environmental hazard	Not Applicable	
14.6. Special precautions for user	Hazard Label	2.2
	Special provisions	362, T50, TP40

Air transport (ICAO-IATA / DGR)

14.1. UN number	3500	
14.2. UN proper shipping name	Chemical under pressure, n.o.s. * (Hydrofluoroolefin, Nitrogen)	
14.3. Transport hazard class(es)	ICAO/IATA Class	2.2
	ICAO / IATA Subsidiary Hazard	Not Applicable
	ERG Code	2L
14.4. Packing group	Not Applicable	
14.5. Environmental hazard	Not Applicable	
14.6. Special precautions for user	Special provisions	A187
	Cargo Only Packing Instructions	218
	Cargo Only Maximum Qty / Pack	150 kg
	Passenger and Cargo Packing Instructions	218
	Passenger and Cargo Maximum Qty / Pack	75 kg
	Passenger and Cargo Limited Quantity Packing Instructions	Forbidden
	Passenger and Cargo Limited Maximum Qty / Pack	Forbidden

Sea transport (IMDG-Code / GGVSee)

14.1. UN number	3500
14.2. UN proper shipping name	CHEMICAL UNDER PRESSURE, N.O.S. (Hydrofluoroolefin, Nitrogen)

Tiger Foam™ Slow Rise (TF200SR, TF600SR) B-side

14.3. Transport hazard class(es)	IMDG Class	2.2
	IMDG Subsidiary Hazard	Not Applicable
14.4. Packing group	Not Applicable	
14.5. Environmental hazard	Not Applicable	
14.6. Special precautions for user	EMS Number	F-C , S-V
	Special provisions	274 362
	Limited Quantities	0

14.7.1. Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

14.7.2. Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

Product name	Group
diethylene glycol	Not Available
tris(2-chloroisopropyl)phosphate	Not Available
ethylene glycol	Not Available
N-methyldicyclohexylamine	Not Available
1,3,3,3-tetrafluoropropene	Not Available
nitrogen	Not Available

14.7.3. Transport in bulk in accordance with the IGC Code

Product name	Ship Type
diethylene glycol	Not Available
tris(2-chloroisopropyl)phosphate	Not Available
ethylene glycol	Not Available
N-methyldicyclohexylamine	Not Available
1,3,3,3-tetrafluoropropene	Not Available
nitrogen	Not Available

SECTION 15 Regulatory information

Safety, health and environmental regulations / legislation specific for the substance or mixture

diethylene glycol is found on the following regulatory lists

US AIHA Workplace Environmental Exposure Levels (WEELs)
 US DOE Temporary Emergency Exposure Limits (TEELs)
 US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
 US Toxicology Excellence for Risk Assessment (TERA) Workplace Environmental Exposure Levels (WEEL)

tris(2-chloroisopropyl)phosphate is found on the following regulatory lists

US - California - Biomonitoring - Priority Chemicals
 US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

ethylene glycol is found on the following regulatory lists

Chemical Footprint Project - Chemicals of High Concern List
 US - California Hazardous Air Pollutants Identified as Toxic Air Contaminants
 US - California Proposition 65 - Maximum Allowable Dose Levels (MADLs) for Chemicals Causing Reproductive Toxicity
 US - California Proposition 65 - Reproductive Toxicity
 US - California Safe Drinking Water and Toxic Enforcement Act of 1986 - Proposition 65 List
 US - Massachusetts - Right To Know Listed Chemicals
 US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)
 US Clean Air Act - Hazardous Air Pollutants
 US DOE Temporary Emergency Exposure Limits (TEELs)
 US EPA Integrated Risk Information System (IRIS)
 US EPCRA Section 313 Chemical List
 US NIOSH Recommended Exposure Limits (RELs)
 US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

N-methyldicyclohexylamine is found on the following regulatory lists

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

1,3,3,3-tetrafluoropropene is found on the following regulatory lists

US AIHA Workplace Environmental Exposure Levels (WEELs)
 US DOE Temporary Emergency Exposure Limits (TEELs)
 US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
 US Toxicology Excellence for Risk Assessment (TERA) Workplace Environmental Exposure Levels (WEEL)

nitrogen is found on the following regulatory lists

US - Massachusetts - Right To Know Listed Chemicals

Tiger Foam™ Slow Rise (TF200SR, TF600SR) B-side

US DOE Temporary Emergency Exposure Limits (TEELs)

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

Additional Regulatory Information

Not Applicable

Federal Regulations**Superfund Amendments and Reauthorization Act of 1986 (SARA)****Section 311/312 hazard categories**

Flammable (Gases, Aerosols, Liquids, or Solids)	No
Gas under pressure	Yes
Explosive	No
Self-heating	No
Pyrophoric (Liquid or Solid)	No
Pyrophoric Gas	No
Corrosive to metal	No
Oxidizer (Liquid, Solid or Gas)	No
Organic Peroxide	No
Self-reactive	No
In contact with water emits flammable gas	No
Combustible Dust	No
Carcinogenicity	No
Acute toxicity (any route of exposure)	No
Reproductive toxicity	Yes
Skin Corrosion or Irritation	Yes
Respiratory or Skin Sensitization	No
Serious eye damage or eye irritation	Yes
Specific target organ toxicity (single or repeated exposure)	Yes
Aspiration Hazard	No
Germ cell mutagenicity	No
Simple Asphyxiant	Yes
Hazards Not Otherwise Classified	No

US. EPA CERCLA Hazardous Substances and Reportable Quantities (40 CFR 302.4)

Name	Reportable Quantity in Pounds (lb)	Reportable Quantity in kg
ethylene glycol	5000	2270

US. EPCRA Section 313 Toxic Release Inventory (TRI) (40 CFR 372)

This product contains the following EPCRA section 313 chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know-Act of 1986 (40 CFR 372):

CAS No	%[weight]	Name
107-21-1	<1	ethylene glycol

This information must be included in all SDSs that are copied and distributed for this material.

Additional Federal Regulatory Information

Not Applicable

State Regulations**US. California Proposition 65**

WARNING: This product can expose you to chemicals including **ethylene glycol**, which is known to the State of California to cause birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov

Additional State Regulatory Information

Not Applicable

National Inventory Status

National Inventory	Status
Australia - AIIC / Australia Non-Industrial Use	Yes
Canada - DSL	Yes
Canada - NDSL	No
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	No (1,3,3,3-tetrafluoropropene)
Japan - ENCS	No (nitrogen)

Continued...

Tiger Foam™ Slow Rise (TF200SR, TF600SR) B-side

National Inventory	Status
Korea - KECI	No (N-methyldicyclohexylamine)
New Zealand - NZIoC	No (1,3,3,3-tetrafluoropropene)
Philippines - PICCS	No (1,3,3,3-tetrafluoropropene)
USA - TSCA	Yes
Taiwan - TCSI	Yes
Mexico - INSQ	Yes
Vietnam - NCI	Yes
Russia - FBEPH	Yes

Legend:
Yes = All CAS declared ingredients are on the inventory
No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.

SECTION 16 Other information

Revision Date	03/04/2024
Initial Date	08/16/2019

CONTACT POINT

SDS Version Summary

Version	Date of Update	Sections Updated
0.2	03/04/2024	Toxicological information - Acute Health (inhaled), Toxicological information - Acute Health (skin), Toxicological information - Acute Health (swallowed), First Aid measures - Advice to Doctor, Toxicological information - Chronic Health, Hazards identification - Classification, Exposure controls / personal protection - Engineering Control, Ecological Information - Environmental, Firefighting measures - Fire Fighter (extinguishing media), Firefighting measures - Fire Fighter (fire/explosion hazard), Firefighting measures - Fire Fighter (fire fighting), First Aid measures - First Aid (skin), First Aid measures - First Aid (swallowed), Composition / information on ingredients - Ingredients, Accidental release measures - Spills (major), Handling and storage - Storage (storage incompatibility), Transport information - Transport

Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios.

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SAFETY DATA SHEET

LOW PRESSURE POLYURETHANE FOAM TF B-SIDE COMPONENT HFC FORMULAS



Revised May 2024

SECTION 1- IDENTIFICATION

1.1 Product Identifier

Product Name: Tiger Foam™ X Series 200, 600 and 1350 HFC Based Kits
Tiger Foam™ TF200FR-X E84 Fast Rise, TF600FR-X E84 Fast Rise, Rise, TF205-X Quick Cure, TF605-X Quick Cure

1.2 Relevant identified uses of the substance or mixture and uses advised against:

General Use Low pressure polyurethane foam, Side-B Component, for PROFESSIONAL USE ONLY
Uses advised against No further information available

1.3 Details of the supplier and of the safety data sheet:

Manufacturer COMMERCIAL THERMAL SOLUTIONS, INC.
2812 SW 29th Ct
Cape Coral FL 33914-3852
In US & Canada 1-800-664-0063

1.4 Emergency telephone numbers:

In the U.S.A CHEMTREC (24 hours) 1-800-424-9300
International CHEMTREC (24 hours) (703)-527-3887
Reference: CHEMTREC ACCOUNT # 201586

SECTION 2- HAZARDS IDENTIFICATION

2.1 Classification of substance or mixture

Product definition: Mixture
Classification: Gases Under Pressure- Compressed Gas
Skin Irritation- Category 2
Eye Irritation- Category 2A

2.2 Label elements

Hazard Symbols:



Signal Word: WARNING

Hazard Statements:

H280 Contains gas under pressure; may explode if heated
H315 Causes skin irritation
H319 Causes serious eye irritation

Prevention:

P202 Do not handle until all safety precautions have been read and understood
P251 Pressurized container: Do not pierce or burn, even after use.
P264 Wash hands and other skin areas exposed to material thoroughly after handling
P271 Use outdoors or in a well-ventilated area
P280 Wear protective gloves, protective clothing and eye protection
P285 In case of inadequate ventilation: wear respiratory protection

Response:

P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P321 Specific treatment: Seek immediate medical advice. Refer to product label and Section 4 of this SDS
P333+P313 If skin irritation or rash occurs: Get medical attention

P337+P313 If eye irritation persists: Get medical attention
 P362 Take off contaminated clothing and wash before reuse.

Storage:

P405 Store locked up
 P410+P403 Protect from sunlight. Store in a well-ventilated place.

Disposal:

P501 Dispose of contents/container in accordance with applicable local/regional/national/international regulations.

Other hazards:

There are no other hazards otherwise classified that have been identified

SECTION 3-COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances

Not applicable

3.2 Mixtures

Chemical characterization (preparation):

% by Weight	Ingredient	CAS No.	EC Number
15-45	Tris (1-chloro-2-propyl) Phosphate	13674-84-5	237-158-7
10-30	1,1,1,2- Tetrafluoroethane	811-97-2	212-377-0
<10	Nitrogen	7727-37-9	231-783-9
1-5	Pentamethyldiethylenetriamine	3030-47-5	221-201-1
0.5 – 1.5	Diethylene Glycol	111-46-6	203-872-2

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to the health or the environment and hence require reporting in this section.

SECTION 4- FIRST AID MEASURES

4.1 Description of first aid measures

Inhalation: If product vapors causes respiratory irritation or distress, move the exposed person to fresh air immediately. If breathing is difficult or irregular, administer oxygen. If respiratory arrest occurs, start artificial respiration by a trained individual. Loosen tight fitting clothing such as a jacket or tie. Seek medical attention immediately.

Eye: Immediately flush eyes with large amounts of water for at least 15 minutes, holding the eyes open with fingers and occasionally lifting the upper and lower lids. Use lukewarm water if possible. If present and easy to do, remove contact lenses. If irritation persists, get medical attention.

Skin: Flush skin with large amounts of water while removing contaminated clothing. Gently wipe product from skin with a damp cloth and continue rinsing for 15 minutes. Wash clothing before reuse. Call a physician if irritation persists.

Ingestion: If swallowed, do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical advice/attention.

4.2 Most important symptoms and effects, both acute and delayed

See Section 11.1. Information on toxicological effects.

4.3 Notes to the physician

If case of an accident or if you feel unwell, seek medical advice immediately (show label or SDS if possible). Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to high propellant concentrations (enclosed spaces or with deliberate abuse). The use of other drugs with less arrhythmogenic potential should be considered. If sympathomimetic drugs are administered, observe victim for the development of cardiac arrhythmias.

SECTION 5- FIRE FIGHTING MEASURES

5.1 Extinguishable media

Suitable methods of extinction: Use dry chemical, carbon dioxide, alcohol resistant foams and water spray

Unsuitable methods of extinction: None

5.2 Special hazards arising from the substance or mixture

Cans, cylinders, or refillable cylinders may explode due to the buildup of pressure when exposed to extreme heat. Highly toxic gases may be generated by thermal decomposition or combustion. Overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent or may be delayed. Hazardous decomposition products may include and are not limited to: Carbon monoxide, Carbon dioxide, Aldehydes, Oxides of Nitrogen.

5.3 Advice for firefighters

Keep upwind of fire. Wear full fire-fighting turn-out gear (full Bunker gear) and respiratory protection (SCBA). Use water spray to keep fire-exposed containers cool.

SECTION 6- ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear personal protective equipment recommended in Section 8. Isolate the hazard area and deny entry to unnecessary and unprotected personnel. Eliminate sources of ignition. Ventilate the area.

6.2 Environmental precautions

Avoid dispersal of spilled material or run-off and prevent contact with soil and entry into drains, sewers or waterways.

6.3 Methods and materials for containment and cleaning up

Cover drains and contain spill. Cover spilled material with a large quantity of inert absorbent. Collect material and place into an approved, open-head metal container. Clean contaminated area with soap and water.

6.4 Reference to other sections

For indications about waste treatment and disposal, see Section 13

See Section 7 for information about safe handling

SECTION 7- HANDLING AND STORAGE

7.1 Precautions for safe handling

For Industrial or professional use only. Observe label precautions, do not use until all safety precautions have been read and understood. Wear all appropriate protective equipment specified in Section 8. Keep cylinders/valves closed when not in use. Recommend using in a well-ventilated area with respiratory protection. Avoid contact with eyes and skin. Keep out of reach of children.

Advice on protection against fire and explosion

Contents under pressure. Exposure to high temperatures can cause cylinders to rupture or explode.

7.2 Conditions for safe storage, including any incompatibilities

Store in a dry, well-ventilated area and away from incompatible materials (see Section 10.5). Storage temperature is 60-90°F (16-32°C). Products stored below 60°F (16°C) or above 90°F (32°C) must be given adequate time to warm up/cool down. Do not expose the cylinders/kits to open flame or temperatures above 122°F (50°C); storage at elevated temperatures can cause the cylinder to rupture. Excessive heat can cause premature aging of components resulting in a shorter shelf life. Protect unused product from freezing. Storage below 60°F (16°C) may affect foam quality if chemicals are not warmed to room temperature before using. Protect cylinders from physical abuse. Always store the containers in the upright position. **KEEP OUT OF REACH OF CHILDREN.**

SECTION 8- EXPOSURE CONTROLS/ PERSONAL PROTECTION

8.1 Control Parameters

Ingredient	CAS Number	OSHA-PEL	ACGIH-TLV	Other
Diethylene Glycol	111-46-6			WEEL 10 mg/kg
1,1,1,2 Tetrafluoroethane	811-97-2			WEEL 1,000 ppm

8.2 Exposure controls:

Engineering Controls: Use local and general exhaust ventilation to control levels of exposure.

Eye/face Protection: Wear protective goggles or safety glasses with side shields.

Hand Protection: Use chemically resistant gloves (i.e. Nitrile gloves). Nitrile/butadiene rubber, butyl rubber, polyethylene, PVC (vinyl), or neoprene gloves are also effective. Glove selection should take into account potential body reactions to certain materials and manufacturer's instructions for use. Break through time of selected gloves must be greater than the intended use period.

Other Protective Equipment: Use clothing that protects against dermal exposure. Appropriate protective clothing varies depending on the potential for exposure. To ensure proper skin protection, wear PPE in such a manner that no skin is exposed.

Respiratory Protection: Atmospheric levels should be maintained below the exposure guidelines. Use products only in a well-ventilated area. Engineering and administrative (work practices) controls should be implemented to protect the workers. If atmospheric levels are expected to exceed the exposure levels, use a NIOSH approved air purifying respirator equipped with an organic vapor cartridge and a particulate filter. If atmospheric levels exceed 10 times the TLV or PEL level for which an air-purifying respirator is effective, use a powered air purifying respirator (PAPR). The type of respiratory protection selected must comply with the requirements set forth in OSHA's Respiratory Protection Standard (29 CFR 1910.134). The odor and irritancy of this material is inadequate to warn of excessive exposure.

Hygiene Measures: An eye wash station or portable eye wash station should be in the area. Wash hands thoroughly after use, before eating, drinking or using the lavatory. Employees/Users should be educated and trained in the safe use and handling of this product.

SECTION 9- PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties	
General Physical Form	Amber to dark brown liquid. Forms an off-white to yellowish froth when released from the container
Odor	Slight fluorocarbon and amine odor
Odor Threshold	No data available
pH	No data available
Melting Point/Freezing Point	No data available
Initial Boiling Point and Boiling Range	Propellant -26°C (-15°F); >93°C (200°F), liquid phase
Flash Point	Estimated >392°F (>200°C).
Evaporation Rate	No data available
Flammability	No applicable
Lower Flammability/Explosive Limit	Not available
Upper Flammability/Explosive Limit	Not available
Vapor Pressure in Container	Contents under pressure have a vapor pressure >50 psi (>345kPa)
Vapor Pressure of Liquid	Liquid phase vapor pressure: <1 mm Hg @ 40°C
Vapor Density	No data available
Relative Density/Specific Gravity	~ 1.2 @ 25°C (Water = 1)
Solubility	Water: partly soluble, does not react
Partition coefficient: n-octanol/water	No data available
Auto-ignition Temperature	No data available
Decomposition Temperature	No data available
Viscosity	No data available
Oxidizing Properties	Not available
VOC Content (calculated minus exempt compounds)	Calculated 11.4 g/L

SECTION 10- STABILITY AND REACTIVITY

10.1 Reactivity

No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

Stable under normal conditions of use and recommended storage conditions. See Section 7 for storage recommendations.

10.3 Possibility of hazardous reactions

Exposure to elevated temperatures can cause containers to rupture or explode. Contents are under pressure.

10.4 Conditions to avoid

Temperatures below 60°F (16°C) or temperatures above 90°F (32°C). Avoid heat and flames.

10.5 Incompatible materials

Alcohols, strong bases, amines, metal compounds, ammonia, and strong oxidizers.

10.6 Hazardous decomposition products

See Section 5.2 for hazardous decomposition products due to combustion.

SECTION 11- TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Signs and Symptoms of Exposure based on test data and/or information on the components, this material may produce the following health effects:

Inhalation:

Mist or vapor may cause irritation of the nose, throat and respiratory tract. Symptoms may include sore throat, coughing, headache, nausea and shortness of breath. Inhalation of propellant may cause lightheadedness, headache and lethargy.

Skin Contact:

May cause mild skin irritation. Symptoms may include localized redness and discomfort.

Eye Contact:

May cause serious eye irritation. Symptoms may include redness, swelling, stinging, and tearing. May cause temporary corneal injury. Product vapor may cause eye irritation with symptoms of burning and tearing.

Ingestion:

May cause gastrointestinal irritation: stomach distress, nausea, or vomiting. Repeated ingestion may be harmful.

Acute toxicity:**LD/LC50 Values that are relevant for classification: None**

Primary irritant effect:

On the skin: Irritant to skin and mucous membranes.**On the eye:** Irritating effect**Sensitization:** Based on available data, the classification criteria are not met**IARC (International Agency for Research on Cancer):** None of the ingredients are listed.**NTP (National Toxicology Program):** None of the ingredients are listed**OSHA-Ca (Occupational Safety & Health Administration):** None of the ingredients are listed

Probable routes of exposure: Inhalation, eye contact and skin contact.

Acute effects (acute toxicity, irritation and corrosivity): Irritating to eyes and skin.

CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)

Germ cell mutagenicity: Based on available data, the classification criteria are not met

Specific organ toxicity- single exposure

No data available

Specific organ toxicity- repeated exposure

No data available

Aspiration hazard

No data available

Other: This product has not been tested. The above information has been derived from the properties of the individual components.**SECTION 12- ECOLOGICAL INFORMATION****12.1 Ecotoxicity**

The ecotoxicity of this product has not been experimentally determined. However, it is expected to have low acute aquatic toxicity based on the acute aquatic toxicity of the individual components and their concentrations in this composition.

12.2 Persistence and degradability

Product is readily biodegradable.

12.3 Bioaccumulation potential

Product is not expected to bioaccumulate

12.4 Mobility

No data available

12.5 Results of PBT and vPvB assessment

No data available

12.6 Other adverse effects

Additional ecological information: Do not allow material to run into surface waters, wastewater, or soil. An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

SECTION 13- DISPOSAL CONSIDERATIONS**13.1 Waste Treatment Methods**

Always wear proper protective equipment as you would while spraying the two-component foam in a well-ventilated area.

Procedure for handling empty or partially used disposable cylinders (not returnable):

1. DO NOT INCINERATE CYLINDERS.
2. Empty cylinders by dispensing the foam into a waste container like a cardboard box or plastic bag. Depressurize the used cylinders using the dispensing unit with a new nozzle attached. Spray the foam until one of the components/cylinders no longer sprays chemical.
3. Remove the nozzle and then continue to depressurize by dispensing the remaining chemical(s) into a waste container (a box lined with a plastic bag) that has adequate industrial liquid absorbing medium in the bottom. Dispense the residual chemicals until the pressure is down to a minimum or there are just large bubbles in the hose.
4. Close the cylinder valves completely, and then operate the dispensing unit again to empty and depressurize the hoses. Use a 9/16" wrench and remove the hoses from the cylinders. Use caution in case there is some residual chemical and/or pressure in the hoses.
5. Invert the cylinder and point away from face. Slowly open the cylinder over the waste container to catch any residual spray.
6. Return the cylinder to an upright position. Shake the container; there should not be any sloshing of liquid. Make sure to leave valves OPEN-do not close. **DO NOT PUNCTURE.**
7. The user of this material has the responsibility to dispose of empty cylinders, unused material and residues in compliance to all applicable federal, state, international and local regulations regarding the treatment, storage, and disposal for hazardous and nonhazardous wastes. Check with your local waste disposal service for guidance.

NOTE: After dispensing if one cylinder has chemical left in it, treat as hazardous material.

Procedure for handling empty refillable cylinders:

THESE CYLINDERS ARE RETURNABLE. These cylinders (refillable cylinders) are shipped back to Commercial Thermal Solutions, Inc. to be cleaned, refilled, and redistributed. Return instructions are included in or on the A-cylinder collar.

SECTION 14- TRANSPORTATION

Note: Transportation information is for reference only. Customer is urged to consult 49 CFR 100-177, IMDG, IATA, EC, United Nations TDG and WHMIS (Canada) TDG information manuals for detailed regulations and exceptions covering specific container sizes, packaging materials and methods of shipping.

	Containers Less Than 1000 cu. cm. (1 liter)	Containers Greater Than 1000 cu. cm. (1 liter)
Ground	Consumer Commodity ORM-D	UN3500 Chemical Under Pressure n.o.s. (Fluorinated hydrocarbon, nitrogen) 2.2 (Non-Flammable Gas Label)
Air	UN1950 Aerosols, Non-Flammable 2.2 (Non-flammable Gas Label) LIMITED QUANTITY Packing Instructions (Cargo & Passenger) 203	UN3500 Chemical Under Pressure n.o.s. (Fluorinated hydrocarbon, nitrogen) 2.2 (Non-Flammable Gas Label) Packing Instructions (Cargo & Passenger) 218
Water	UN1950 Aerosols, Non-Flammable 2.2 (Non-flammable Gas Label) LIMITED QUANTITY	UN3500 Chemical Under Pressure n.o.s. (Fluorinated hydrocarbon, nitrogen) 2.2 (Non-Flammable Gas Label)

SECTION 15- REGULATORY**15.1 Safety, health, and environmental regulations/legislations specific for the substance or mixture****U.S. Federal Regulations:**

OSHA Hazard Communication Standard: This material is classified as hazardous in accordance with OSHA 29 CFR 1910-1200

TSCA Status: All components of this product are listed on the Toxic Substance Control Act (TSCA) Inventory. This product is not subject to TSCA 12(b) Export Notification.

Superfund Amendments and Reauthorization Act (SARA)

SARA Section 311/312 Hazard Categories: Acute Health Hazard, Sudden Release of Pressure Hazard

SARA 313 Information: No components of the product are subject to reporting levels established by Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986.

SARA 302/304 Extremely Hazardous Substance: No components of the product exceed the threshold (de minimis) reporting levels established by these sections of the Title III of SARA.

SARA 302/304 Emergency Planning & Notification: No components of the product exceed the threshold (de minimis) report levels established by these sections of the Title III of SARA.

Comprehensive Response Compensation and Liability Act (CERCLA): None of the substances in this product are contained in levels that exceed the threshold (de minimis) reporting levels established by CERCLA

Clean Air Act (CAA) – This product does not have any components listed as a Hazardous Air Pollutant (HAP) designated in CAA Section 112 (b). This product does not contain any Class 1 or Class 2 Ozone depleters.

Clean Water Act (CWA) – This products does not have any components listed as a Hazardous Substance under the CWA. None of the chemicals in these products are listed as Priority Pollutants under the CWA. None of the chemicals listed in these products are listed as Toxic Pollutants under the CWA.

U.S. State Regulations:

California Prop 65, Safe Drinking Water and Toxic Enforcement Act of 1986:  **WARNING:** Cancer- www.P65Warnings.ca.gov

Other U.S. State Inventories:

Diethylene glycol (CAS#111-46-6) is listed on the following State Hazardous Substance Inventories, Right-to-Know lists and/or Air Quality/air Pollutants lists: MN, PA

1,1,1,2- Tetrafluoroethane (CAS #811-97-2) is listed on the following State Hazardous Substance Inventories, Right-to-Know lists and/or Air Quality/Air Pollutants lists: ME, WI

Canada Controlled Product Regulations (CPR): This product has been classified in accordance with the hazard criteria of the Controlled Products Regulation, and the SDS contains all the information required by the Controlled Products Regulations.

Canadian Ingredient Disclosure List (IDL): None of the substances in this product are listed on the IDL.

Canadian National Pollutant Release Inventory (NPRI): None of the components of this product are listed on the NPRI

WGK, Germany (Water danger/protection): 1

Global Chemical Inventory Lists:

United States: Toxic Substance Control Act (TSCA)- Yes

Canada: Domestic Substances List (DSL)- Yes

Canada: Non-Domestic Substances List (NDSL)- No

Europe: Inventory of New and Existing Chemicals- (EINECS)- Yes

Australia: Australian Inventory of Chemical Substances (AICS)- Yes

New Zealand: New Zealand Inventory of Chemicals (NZLoC)- Yes

China: Inventory of Existing Chemical Substances in China (IECSC)- Yes

Japan: Inventory of Existing and New Chemical Substances (ENCS)- Yes

Korea: Existing Chemicals List (ECL)- Yes

Philippines: Philippines Inventory of Chemicals and Chemical Substances (PICCS)- Yes

15.2 Chemical safety assessment: For this product a chemical safety assessment was not carried out

SECTION 16- OTHER



NFPA: Health Hazard 2; Flammability 1; Reactivity 1

HMIS: Health Hazard 2; Flammability 1; Physical Hazard 1

Hazard Rating: 0=minimal, 1= slight, 2=moderate, 3=severe, 4= extreme

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

CAS: Chemical Abstracts Service (division of the American Chemical Society)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

NIOSH: National Institute for Occupational Safety

OSHA: Occupational Safety & Health

The information and recommendations set forth herein are presented in good faith and believed to be correct as of the date hereof. The manufacturer makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving it will make their own determination as to its suitability for their purposes prior to use. In no event will the manufacturer be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information. No representations or warranties, either expressed or implied, of merchantability or fitness for a particular use are made hereunder with respect to this information or the product to which information refers.

Information contained herein is deemed to be reliable, conservative and accurate. Commercial Thermal Solutions, Inc. reserves the right to change the design, specifications or any other features at any time and without notice, while otherwise maintaining regulatory compliance.

Revision-May 23, 2024 (Date of Preparation) Version 3.5

Replaces Version 3.4 November, 2021

SAFETY DATA SHEET

OPEN CELL POLYURETHANE FOAM

TF B-SIDE COMPONENT HFC FORMULA



Revised May 2024

SECTION 1- IDENTIFICATION

1.1 Product Identifier

Product Name: Tiger Foam™ Open Cell TF1350-X, TF450-X

1.2 Relevant identified uses of the substance or mixture and uses advised against:

General Use Low pressure polyurethane foam, Side-B Component, for PROFESSIONAL USE ONLY
Uses advised against No further information available

1.3 Details of the supplier and of the safety data sheet:

Manufacturer COMMERCIAL THERMAL SOLUTIONS, INC.
2812 SW 29th Ct
Cape Coral FL 33914-3852
In US & Canada 1-800-664-0063

1.4 Emergency telephone numbers:

In the U.S.A CHEMTREC (24 hours) 1-800-424-9300
International CHEMTREC (24 hours) (703)-527-3887
Reference: CHEMTREC ACCOUNT # 201586

SECTION 2- HAZARDS IDENTIFICATION

2.1 Classification of substance or mixture

Product definition: Mixture
Classification: Gases Under Pressure- Compressed Gas
Skin Irritation- Category 2
Eye Irritation- Category 2B

2.2 Label elements

Labeling

Hazard Symbols:



Signal Word: WARNING

Hazard Statements:

H280 Contains gas under pressure; may explode if heated
H315 Causes skin irritation
H319 Causes serious eye irritation

Prevention:

P202 Do not handle until all safety precautions have been read and understood
P251 Pressurized container: Do not pierce or burn, even after use.
P264 Wash hands and other skin areas exposed to material thoroughly after handling
P271 Use outdoors or in a well-ventilated area
P280 Wear protective gloves, protective clothing and eye protection
P285 In case of inadequate ventilation: wear respiratory protection

Response:

P302 +P352 IF ON SKIN: Wash with plenty of soap and water.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P321 Specific treatment: Seek immediate medical advice. Refer to product label and Section 4 of this SDS
P333 + P313 If skin irritation or rash occurs: Get medical attention
P337+P313 If eye irritation persists: Get medical attention
P362 Take off contaminated clothing and wash before reuse.

Storage:

P405 Store locked up
 P410+P403 Protect from sunlight. Store in a well-ventilated place.

Disposal:

P501 Dispose of contents/container in accordance with applicable local/regional/national/international regulations.

Other Hazards:

There are no other hazards otherwise classified that have been identified.

SECTION 3-COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances

Not applicable

3.2 Mixtures

Chemical characterization (preparation):

% by Weight	Ingredient	CAS No.
10-30	Tris (1-chloro-2-propyl) phosphate	13674-84-5
10-30	1,1,1,2- Tetrafluoroethane	811-97-2
<10	Nitrogen	7727-37-9
0.5–1.5	Pentamethyldiethylenetriamine	3030-47-5
0.5–1.5	Nonylphenol, ethoxylated	2212-32-0

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to the health or the environment and hence require reporting in this section.

SECTION 4- FIRST AID MEASURES

4.1 Description of first aid measures

Inhalation: If product vapors causes respiratory irritation or distress, move the exposed person to fresh air immediately. If breathing is difficult or irregular, administer oxygen. If respiratory arrest occurs, start artificial respiration by a trained individual. Loosen tight fitting clothing such as a jacket or tie. Seek medical attention immediately.

Eye: Immediately flush eyes with large amounts of water for at least 15 minutes, holding the eyes open with fingers and occasionally lifting the upper and lower lids. Use lukewarm water if possible. If present and easy to do, remove contact lenses. If irritation persists, get medical attention.

Skin: Flush skin with large amounts of water while removing contaminated clothing. Gently wipe product from skin with a damp cloth and continue rinsing for 15 minutes. Wash clothing before reuse. Call a physician if irritation persists.

Ingestion: If swallowed, do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical advice/attention.

4.2 Most important symptoms and effects, both acute and delayed

See Section 11.1. Information on toxicological effects.

4.3 Notes to the physician

If case of an accident or if you feel unwell, seek medical advice immediately (show label or SDS if possible). Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to high propellant concentrations (enclosed spaces or with deliberate abuse). The use of other drugs with less arrhythmogenic potential should be considered. If sympathomimetic drugs are administered, observe victim for the development of cardiac arrhythmias.

SECTION 5- FIRE FIGHTING MEASURES

5.1 Extinguishable media

Suitable methods of extinction: Use dry chemical, carbon dioxide, alcohol resistant foams and water spray

Unsuitable methods of extinction: Do not use high pressure water spray or water jets as these may spread the fire.

5.2 Special hazards arising from the substance or mixture

Cans, cylinders, or refillable cylinders may explode due to the buildup of pressure when exposed to extreme heat. Highly toxic gases may be generated by thermal decomposition or combustion. Overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent or may be delayed. Hazardous decomposition products may include and are not limited to: Carbon monoxide, Carbon dioxide, Aldehydes, Oxides of Nitrogen.

5.3 Advice for firefighters

Keep upwind of fire. Wear full fire-fighting turn-out gear (full Bunker gear) and respiratory protection (SCBA). Use water spray to keep fire-exposed containers cool.

SECTION 6- ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear personal protective equipment recommended in Section 8. Isolate the hazard area and deny entry to unnecessary and unprotected personnel. Eliminate sources of ignition. Ventilate the area.

6.2 Environmental precautions

Avoid dispersal of spilled material or run-off and prevent contact with soil and entry into drains, sewers or waterways.

6.3 Methods and materials for containment and cleaning up

Cover drains and contain spill. Cover spilled material with a large quantity of inert absorbent. Collect material and place into an approved, open-head metal container. Clean contaminated area with soap and water.

6.4 Reference to other sections

For indications about waste treatment, see Section 13

See Section 7 for information about safe handling

SECTION 7- HANDLING AND STORAGE

7.1 Precautions for safe handling

For Industrial or professional use only. Observe label precautions, do not use until all safety precautions have been read and understood. Wear all appropriate protective equipment specified in Section 8. Keep cylinders/valves closed when not in use. Recommend using in a well-ventilated area with respiratory protection. Avoid contact with eyes and skin. Keep out of reach of children.

Advice on protection against fire and explosion

Contents under pressure. Exposure to high temperatures can cause cylinders to rupture or explode.

7.2 Conditions for safe storage, including any incompatibilities

Store in a dry, well-ventilated area and away from incompatible materials (see Section 10.5). Storage temperature is 60-90°F (16-32°C). Products stored below 60°F (16°C) or above 90°F (32°C) must be given adequate time to warm up/cool down. Do not expose the cylinders/kits to open flame or temperatures above 122°F (50°C); storage at elevated temperatures can cause the cylinder to rupture. Excessive heat can cause premature aging of components resulting in a shorter shelf life. Protect unused product from freezing. Storage below 60°F (16°C) may affect foam quality if chemicals are not warmed to room temperature before using. Protect cylinders from physical abuse. Always store the containers in the upright position. **KEEP OUT OF REACH OF CHILDREN.**

SECTION 8- EXPOSURE CONTROLS/ PERSONAL PROTECTION

8.1 Control Parameters

Ingredient	CAS Number	OSHA-PEL	ACGIH-TLV	Other
1,1,1,2 Tetrafluoroethane	811-97-2			WEEL 1,000 ppm

8.2 Exposure controls:

Engineering Controls: Use local and general exhaust ventilation to control levels of exposure.

Eye/face Protection: Wear protective goggles or safety glasses with side shields.

Hand Protection: Use chemically resistant gloves (i.e. Nitrile gloves). Nitrile/butadiene rubber, butyl rubber, polyethylene, PVC (vinyl), or neoprene gloves are also effective. Glove selection should take into account potential body reactions to certain materials and manufacturer's instructions for use. Break through time of selected gloves must be greater than the intended use period.

Other Protective Equipment: Use clothing that protects against dermal exposure. Appropriate protective clothing varies depending on the potential for exposure. To ensure proper skin protection, wear PPE in such a manner that no skin is exposed.

Respiratory Protection: Atmospheric levels should be maintained below the exposure guidelines. Use products only in a well-ventilated area. Engineering and administrative (work practices) controls should be implemented to protect the workers. If atmospheric levels are expected to exceed the exposure levels, use a NIOSH approved air purifying respirator equipped with an organic vapor cartridge and a particulate filter. If atmospheric levels exceed 10 times the TLV or PEL level for which an air-purifying respirator is effective, use a powered air purifying respirator (PAPR). The type of respiratory protection selected must comply with the requirements set forth in OSHA's Respiratory Protection Standard (29 CFR 1910.134). The odor and irritancy of this material is inadequate to warn of excessive exposure.

Hygiene Measures: An eye wash station or portable eye wash station should be in the area. Wash hands thoroughly after use, before eating, drinking or using the lavatory. Employees/Users should be educated and trained in the safe use and handling of this product.

SECTION 9- PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties	
General Physical Form	Amber to dark brown liquid. Forms an off-white to yellowish froth when released from the container
Odor	Slight fluorocarbon and amine odor
Odor Threshold	No data available
pH	No data available
Melting Point/Freezing Point	No data available
Initial Boiling Point and Boiling Range	Propellant -26°C (-15°F); >93°C (200°F), liquid phase
Flash Point	Estimated >392°F (>200°C).
Evaporation Rate	No data available
Flammability	No applicable
Lower Flammability/Explosive Limit	Not available
Upper Flammability/Explosive Limit	Not available
Vapor Pressure in Container	Contents under pressure have a vapor pressure >50 psi (>345kPa)
Vapor Pressure of Liquid	Liquid phase vapor pressure: <1 mm Hg @ 40°C
Vapor Density	No data available
Relative Density/Specific Gravity	~ 1.2 @ 25°C (Water = 1)
Solubility	Water: partly soluble, does not react
Partition coefficient: n-octanol/water	No data available
Auto-ignition Temperature	No data available
Decomposition Temperature	No data available
Viscosity	No data available
Oxidizing Properties	Not available
VOC Content (calculated minus exempt compounds)	Calculated at around 25 g/L

SECTION 10- STABILITY AND REACTIVITY

10.1 Reactivity

No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

Stable under normal conditions of use and recommended storage conditions. See Section 7 for storage recommendations.

10.3 Possibility of hazardous reactions

Exposure to elevated temperatures can cause containers to rupture or explode. Contents are under pressure.

10.4 Conditions to avoid

Temperatures below 60°F (16°C) or temperatures above 90°F (32°C). Avoid heat and flames.

10.5 Incompatible materials

Alcohols, strong bases, amines, metal compounds, ammonia, and strong oxidizers.

10.6 Hazardous decomposition products

See Section 5.2 for hazardous decomposition products due to combustion.

SECTION 11- TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Signs and Symptoms of Exposure based on test data and/or information on the components, this material may produce the following health effects:

Inhalation:

Mist or vapor may cause irritation of the nose, throat and respiratory tract. Symptoms may include sore throat, coughing, headache, nausea and shortness of breath. Inhalation of propellant may cause lightheadedness, headache and lethargy.

Eye:

May cause eye irritation. Symptoms may include redness, swelling, stinging, and tearing. May cause temporary corneal injury. Product vapor may cause eye irritation with symptoms of burning and tearing.

Skin:

May cause mild skin irritation. Symptoms may include localized redness and discomfort.

Ingestion:

May cause gastrointestinal irritation: stomach distress, nausea, or vomiting. Repeated ingestion may be harmful.

Chronic: Pre-existing disorders of the skin and respiratory system may be aggravated by exposure to this product. Diethylene glycol has caused reproductive and developmental effects in some laboratory animal's tests.

Acute oral toxicity

Expected to have low acute oral toxicity

Acute inhalation toxicity

Expected to have low acute inhalation toxicity

Acute dermal toxicity

Expected to have a low acute dermal toxicity

Skin irritation

May cause mild skin irritation

Eye irritation

Causes eye irritation

Sensitization

No data available

Genotoxicity

No data available

Mutagenicity

No data available

Specific organ toxicity- single exposure

No data available

Specific organ toxicity- repeated exposure

No data available

Aspiration hazard

No data available

11.2 Further information

None of the components of this product are listed as carcinogens by IARC, ACGIH, NTP or OSHA. No data is available regarding the mutagenicity or teratogenicity of this product, nor is there any available data that indicates that it causes adverse or fertility effects.

Tris (1-chloro-2-propyl) phosphate is reported to be a weak organophosphate-type cholinesterase inhibitor. Excessive exposure may product organophosphate cholinesterase inhibition. Symptoms may include sweating, headache, nausea, muscle twitching, incoordination, diarrhea, blurred vision, abdominal cramps, tearing, tremors and chest discomfort.

Other: This product has not been tested. The above information has been derived from the properties of the individual components

SECTION 12- ECOLOGICAL INFORMATION**12.1 Ecotoxicity**

The ecotoxicity of this product has not been experimentally determined. Ecological toxicity data is not available for all components. Nonylphenol is a toxic breakdown product of Nonylphenol ethoxylates, a compound in this product.

12.2 Persistence and degradability

Product is readily biodegradable.

12.3 Bioaccumulation potential

Product is not expected to bioaccumulate. Contains Nonylphenol, Ethoxylate which has the potential to bioaccumulate (log Pow ~4.48)

12.4 Mobility

No data available

12.5 Results of PBT and vPvB assessment

No data available

12.6 Other adverse effects

Additional ecological information: Do not allow material to run into surface waters, wastewater, or soil. An environmental hazard cannot be excluded in the event of unprofessional handling or disposal

SECTION 13- DISPOSAL CONSIDERATIONS**13.1 Waste Treatment Methods**

Always wear proper protective equipment as you would while spraying the two-component foam in a well-ventilated area.

Procedure for handling empty or partially used disposable cylinders (not returnable):

1. DO NOT INCINERATE CYLINDERS.
2. Empty cylinders by dispensing the foam into a waste container like a cardboard box or plastic bag. Depressurize the used cylinders using the dispensing unit with a new nozzle attached. Spray the foam until one of the components/cylinders no longer sprays chemical.

3. Remove the nozzle and then continue to depressurize by dispensing the remaining chemical(s) into a waste container (a box lined with a plastic bag) that has adequate industrial liquid absorbing medium in the bottom. Dispense the residual chemicals until the pressure is down to a minimum or there are just large bubbles in the hose.
4. Close the cylinder valves completely, and then operate the dispensing unit again to empty and depressurize the hoses. Use a 9/16" wrench and remove the hoses from the cylinders. Use caution in case there is some residual chemical and/or pressure in the hoses.
5. Invert the cylinder and point away from face. Slowly open the cylinder over the waste container to catch any residual spray.
6. Return the cylinder to an upright position. Shake the container; there should not be any sloshing of liquid. Make sure to leave valves OPEN-do not close. **DO NOT PUNCTURE.**
7. The user of this material has the responsibility to dispose of empty cylinders, unused material and residues in compliance to all applicable federal, state, international and local regulations regarding the treatment, storage, and disposal for hazardous and nonhazardous wastes. Check with your local waste disposal service for guidance.

NOTE: After dispensing if one cylinder has chemical left in it, treat as hazardous material.

Procedure for handling empty refillable cylinders:

THESE CYLINDERS ARE RETURNABLE. These cylinders (refillable cylinders) are shipped back to Commercial Thermal Solutions, Inc. to be cleaned, refilled, and redistributed. Return instructions are included in or on the A-cylinder collar.

SECTION 14- TRANSPORTATION

Note: Transportation information is for reference only. Customer is urged to consult 49 CFR 100-177, IMDG, IATA, EC, United Nations TDG and WHMIS (Canada) TDG information manuals for detailed regulations and exceptions covering specific container sizes, packaging materials and methods of shipping.

	Containers Greater Than 1000 cu. cm. (1 liter)
Ground	UN3500 Chemical Under Pressure n.o.s. (Fluorinated hydrocarbon, nitrogen) 2.2 (Non-Flammable Gas Label)
Air	UN3500 Chemical Under Pressure n.o.s. (Fluorinated hydrocarbon, nitrogen) 2.2 (Non-Flammable Gas Label) Packing Instruction (Cargo & Passenger) 200
Water	UN3500 Chemical Under Pressure n.o.s. (Fluorinated hydrocarbon, nitrogen) 2.2 (Non-Flammable Gas Label) Product contains <1% Nonylphenol, ethoxylate, which is a known marine pollutant

SECTION 15- REGULATORY

15.1 Safety, health, and environmental regulations/legislations specific for the substance or mixture

U.S. Federal Regulations:

OSHA Hazard Communication Standard: This material is classified as hazardous in accordance with OSHA 29 CFR 1910-1200

TSCA Status: All components of this product are listed on the Toxic Substance Control Act (TSCA) Inventory. This product is not subject to TSCA 12(b) Export Notification.

Superfund Amendments and Reauthorization Act (SARA)

SARA Section 311/312 Hazard Categories: Acute Health Hazard, Chronic Health Hazard, Sudden Release of Pressure Hazard

SARA 313 Information: No components of the product are subject to reporting levels established by Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986.

SARA 302/304 Extremely Hazardous Substance: No components of the product exceed the threshold (de minimis) reporting levels established by these sections of the Title III of SARA.

SARA 302/304 Emergency Planning & Notification: No components of the product exceed the threshold (de minimis) report levels established by these sections of the Title III of SARA.

Comprehensive Response Compensation and Liability Act (CERCLA): None of the substances in this product are contained in levels that exceed the threshold (de minimis) reporting levels established by CERCLA

Clean Air Act (CAA) – This product does not have any components listed as a Hazardous Air Pollutant (HAP) designated in CAA Section 112 (b). This product does not contain any Class 1 or Class 2 Ozone depletors.

Clean Water Act (CWA) – This products does not have any components listed as a Hazardous Substance under the CWA. None of the chemicals in these products are listed as Priority Pollutants under the CWA. None of the chemicals listed in these products are listed as Toxic Pollutants under the CWA.

U.S. State Regulations:

California Prop 65, Safe Drinking Water and Toxic Enforcement Act of 1986: None of the chemicals are listed.

Other U.S. State Inventories:

1,1,1,2- Tetrafluoroethane (CAS #811-97-2) is listed on the following State Hazardous Substance Inventories, Right-to-Know lists and/or Air Quality/Air Pollutants lists: ME, WI

Canada Controlled Product Regulations (CPR): This product has been classified in accordance with the hazard criteria of the Controlled Products Regulation, and the SDS contains all the information required by the Controlled Products Regulations.

Canadian Ingredient Disclosure List (IDL): None of the substances in this product are listed on the IDL.

Canadian National Pollutant Release Inventory (NPRI): Nonylphenol, ethoxylate (CAS #2212-32-0) is listed on the NPRI

Global Chemical Inventory Lists:

United States: Toxic Substance Control Act (TSCA)- Yes

Canada: Domestic Substances List (DSL)- Yes

Canada: Non-Domestic Substances List (NDSL)- No

SECTION 16- OTHER



NFPA: Health Hazard 2; Flammability 1; Reactivity 1

HMIS: Health Hazard 2; Flammability 1; Physical Hazard 1

Hazard Rating: 0=minimal, 1= slight, 2=moderate, 3=severe, 4= extreme

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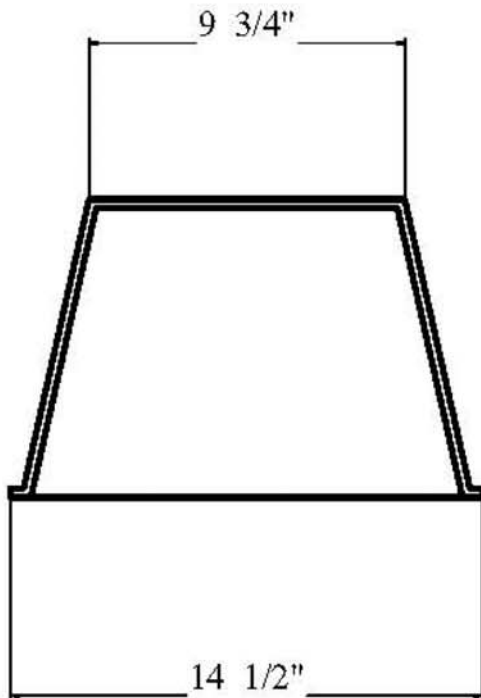
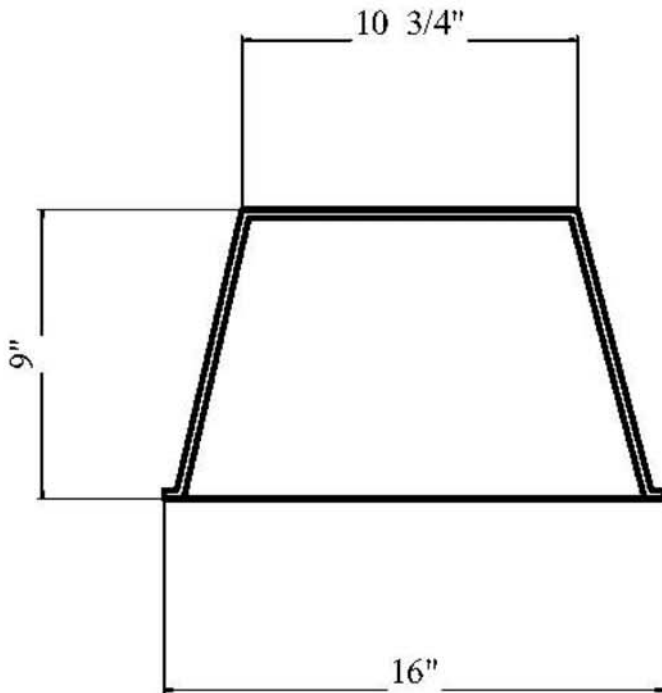
Revision- May 23, 2024 (Date of Preparation) Version 3.5

Replaces Version 3.4 November,



Technical Product Specifications

MODEL TC-130 Recessed Light Cover



* All drawing sizes nominal

Model Number	Outside Height	Outside Length	Outside Width
TC130	9"	16"	14 1/2"

Performance Data

For Use:

- Prevents insulation from coming in contact with recessed light fixtures.
- Can be used in conjunction with wide range of recessed lights.
- Compatible with sprayed foam insulation, low density foam, blown-in insulation and lay-in insulation.
- Suitable for attic spaces, ceiling spaces, insulated ceilings, and drop ceilings.

General Information

Benefits:

- Fire Resistant.
- Energy Saving.
- Reduces draft problems.
- Prevents heat loss through the fixture.
- Reduces airflow from the outside.
- Added Flange for improved draftstopping capabilities.
- Enhances the acoustic protection of the ceiling.
- Prevents insects and other small animals from entering through the light.
- Lightweight (approx. 1 lbs.).
- Easy to fit without special tools.
- Maintenance free.

Manufactured By

Commercial Thermal Solutions, Inc.

524 Brighton Ave, Suite 9
Spring Lake, NJ 07762

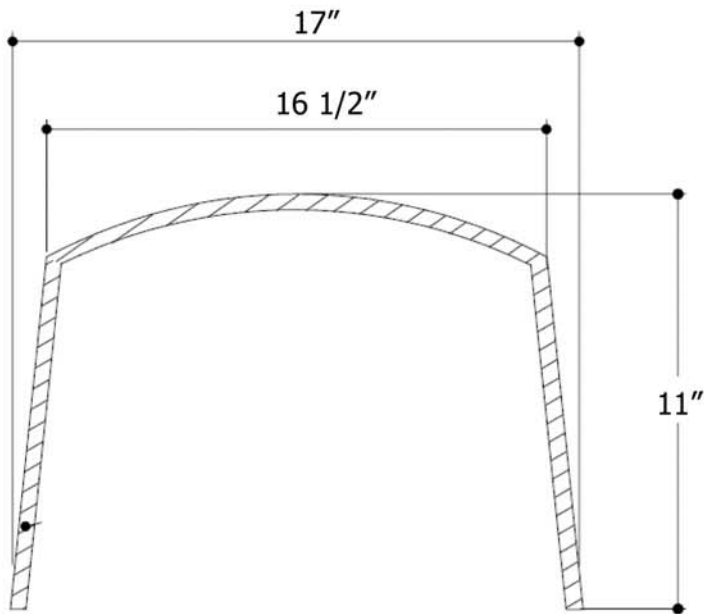
Sales and Technical Support:

Toll Free: 800.664.0063 • Fax: 877.415.1185

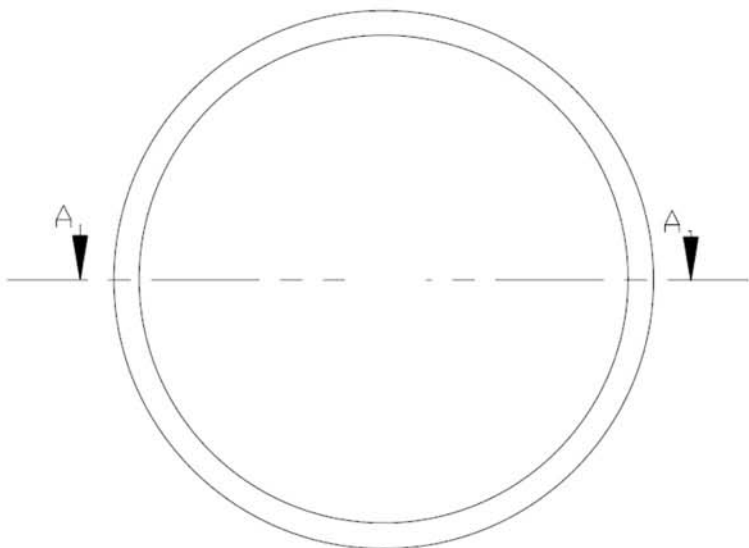
• International Phone: (001) 1+732.927.2090

• International Fax: (001) 1+732.927.2091

MODELTC-135 Draft Stop Cover



FLEXIBLE TO FIT 16" ON CENTER JOISTS



* All drawing sizes nominal

Model Number	Inside Height	Inside Diameter
TC135	10 3/4"	16 1/2"

Performance Data

For Use:

- Prevents insulation from coming in contact with recessed light fixtures.
- Can be used in conjunction with wide range of recessed lights.
- Compatible with sprayed foam insulation, low density foam, blown-in insulation and lay-in insulation.
- Suitable for attic spaces, ceiling spaces, insulated ceilings, and drop ceilings.

General Information

Benefits:

- Energy Saving.
- Reduces draft problems.
- Limits heat loss through the fixture.
- Reduces airflow from the outside.
- Easy to fit without special tools.
- Lightweight (approx. 2 lbs.).
- Enhances the acoustic protection of the ceiling.
- Prevents insects and other small animals from entering through the light.
- Flexible to fit 16" on center joists
- Maintenance free.

Manufactured By

Commercial Thermal Solutions, Inc.

524 Brighton Ave, Suite 9
Spring Lake, NJ 07762

Sales and Technical Support:

Toll Free: 800.664.0063 • Fax: 877.415.1185

- International Phone: (001) 1 + 732.927.2090
- International Fax: (001) 1 + 732.927.2091

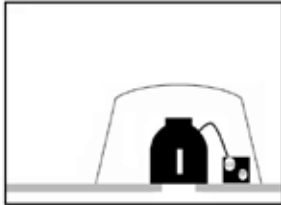


Installation and Safety Instructions

MODEL TC130 RECESSED LIGHT COVER

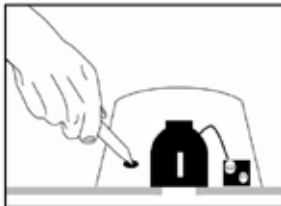
Step 1

Place Tiger Foam TC-130 cover over the fixture. For optimal performance make sure that the flange of the cover is in contact with the drywall.



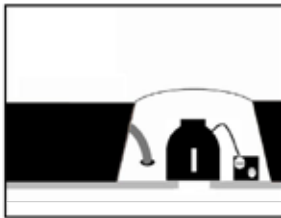
Step 2

If necessary, slit the cover to fit over the hanger bars and the wiring of the fixture.



Step 3

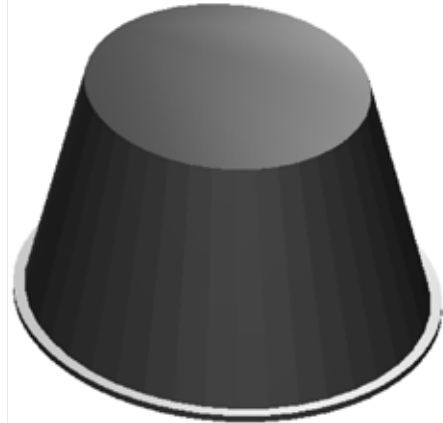
The Tiger Foam TC-130 Recessed Light Cover is compatible with all kind of insulation, including sprayed foam, mineral wool, fiber glass and blown-in cellulose.



WARNING: BE SURE THE ELECTRICITY TO THE SYSTEM YOU ARE WORKING ON IS TURNED OFF; EITHER THE FUSE REMOVED OR THE CIRCUIT BREAKER SET AT OFF.

Model Number	Outside Height	Outside Length	Outside Width
TC 130	9"	16"	14 1/2"

TF 130 RECESSED LIGHT COVER



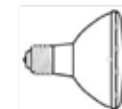
MAXIMUM LAMP WATTAGE AND TYPE

USE WITH LAMP TYPES AND WATTAGE AS RECOMMENDED BY THE LIGHT MANUFACTURER OR TIGER FOAM, WHICHEVER IS LOWER, IN ORDER TO AVOID THERMAL OVERLOAD.



Compact Fluorescent Lamps 120V

13W
18W
26W
32W
42W



Directional Lamps
65W, BR 30
90W PAR38



Do not use with energy inefficient incandescent light bulbs!



WARNING - USE WITH LAMP TYPES & WATTAGES AS INDICATED ABOVE.

FOLLOW THE LIGHT MANUFACTURER'S RECOMMENDATIONS FOR INSTALLATION WITHIN ENCLOSED SPACES.

NOTICE - FOR USE WITH THERMALLY PROTECTED FIXTURE ONLY. BLINKING LIGHT MAY INDICATE IMPROPER LAMP SIZE.

Manufactured By

Commercial Thermal Solutions, Inc.

524 Brighton Ave, Suite 9
Spring Lake, NJ 07762

Sales and Technical Support:

Toll Free: 800.664.0063 • Fax: 877.415.1185

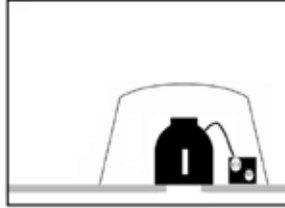
• International Phone: (001) 1+732.927.2090

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MODEL TC-135 RECESSED LIGHT COVER

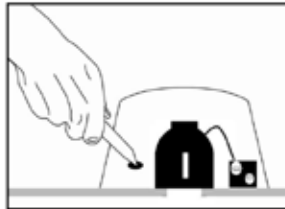
Step 1

Place Tiger Foam TC-135 cover over the fixture. For optimal performance make sure that the flange of the cover is in contact with the drywall.



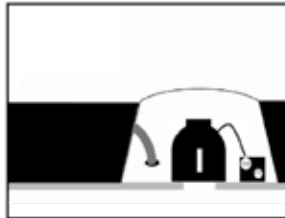
Step 2

If necessary, slit the cover to fit over the hanger bars and the wiring of the fixture.



Step 3

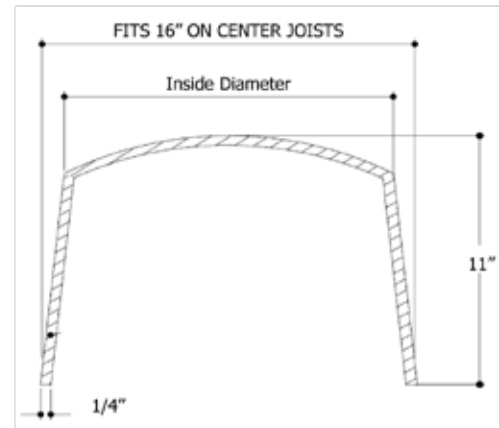
The Tiger Foam TC-135 Recessed Light Cover is compatible with all kind of insulation, including sprayed foam, mineral wool, fiber glass and blown-in cellulose.



WARNING: BE SURE THE ELECTRICITY TO THE SYSTEM YOU ARE WORKING ON IS TURNED OFF; EITHER THE FUSE REMOVED OR THE CIRCUIT BREAKER SET AT OFF.

Model Number	Inside Height	Inside Diameter
TC135	10 3/4"	16 1/2"

TF 135 RECESSED LIGHT COVER



MAXIMUM LAMP WATTAGE AND TYPE

USE WITH LAMP TYPES AND WATTAGE AS RECOMMENDED BY THE LIGHT MANUFACTURER OR TIGER FOAM, WHICHEVER IS LOWER, IN ORDER TO AVOID THERMAL OVERLOAD.



Compact Fluorescent Lamps 120V

13W

18W

26W

32W

42W



Directional Lamps

65W, BR 30

90W PAR38

Do not use with energy inefficient incandescent light bulbs!



WARNING - USE WITH LAMP TYPES & WATTAGES AS INDICATED ABOVE.

FOLLOW THE LIGHT MANUFACTURER'S RECOMMENDATIONS FOR INSTALLATION WITHIN ENCLOSED SPACES.

NOTICE - FOR USE WITH THERMALLY PROTECTED FIXTURE ONLY. BLINKING LIGHT MAY INDICATE IMPROPER LAMP SIZE.

Manufactured By

Commercial Thermal Solutions, Inc.

524 Brighton Ave, Suite 9
Spring Lake, NJ 07762

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The Manufacturer warrants only that the product shall meet its specifications: this warranty is in lieu of all other written or unwritten, expressed or implied warranties and The Manufacturer expressly disclaims any warranty of merchantability, or fitness for a particular purpose. The buyer assumes all risks whatsoever as to the use of the material. Buyer's exclusive remedy as to any breach of warranty, negligence or other claim shall be limited to the replacement of the material. Failure to strictly adhere to any recommended procedures shall release the Manufacturer of all liability with respect to the materials of the use thereof. User of this product must determine suitability for any particular purpose, including, but not limited to, structural requirements, performance specifications and application requirements prior to installation and after product has been properly applied.

Two – Component Dispensing Unit

U.S. Patent #6,345,776

Other Patents Pending

www.tigerfoam.com

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Fax Number: (877) 415-1185

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