

Commercial Thermal Solutions, Inc.

TIGER FOAMTM
INSULATION

THE PREMIER PROVIDER OF
SPRAY POLYURETHANE FOAM INSULATION

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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



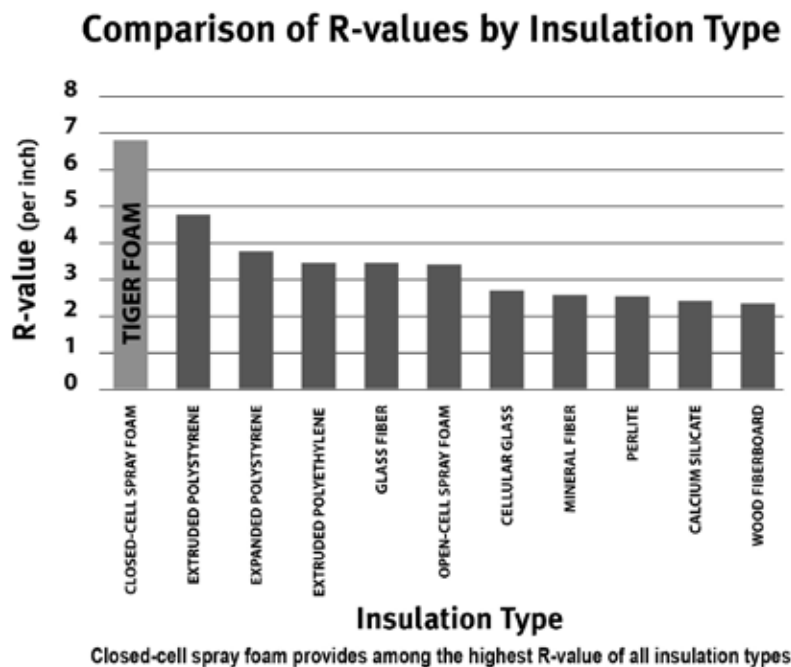


Tiger Foam Polyurethane Spray Foam Insulation can contribute credits to the Leadership in Environmental Energy and Design (LEED) green building rating system. Although individual products cannot be “LEED certified”, they may contribute to points under the rating system, which is administered by the U.S.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

- $30L + 20W \times 2 = 100 \times 10'$ 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)

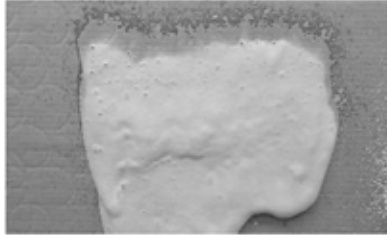
Routes of Exposure	Recommended PPE
EYES	Safety Glasses or Goggles  
SKIN	Covers Skin 
HANDS	Nitrile Gloves 
LUNGS	Respirator and/or Vapor Respirator OV/Pre-filter Provide Good Ventilation  

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.

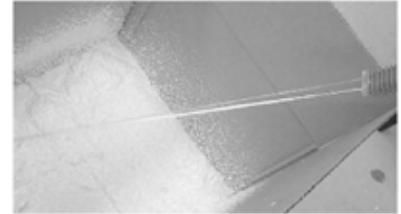
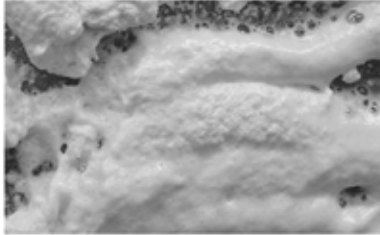
"A-Rich" Foam:

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

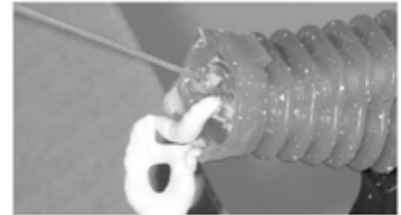


"B-Rich" Foam:

Softer, white colored foam, with shrinkage.



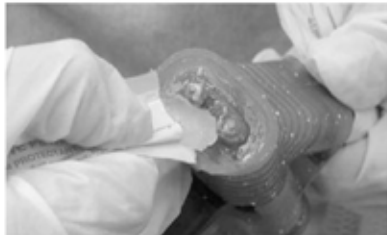
With the nozzle removed, check that both chemicals flow with equivalent force.



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

Nozzle Care and Usage

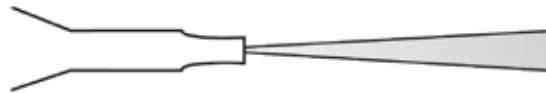
Apply a small amount of petroleum jelly, which is provided with each kit, to help keep the gun face clean from cured foam or contamination that could block one of the chemical ports.



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



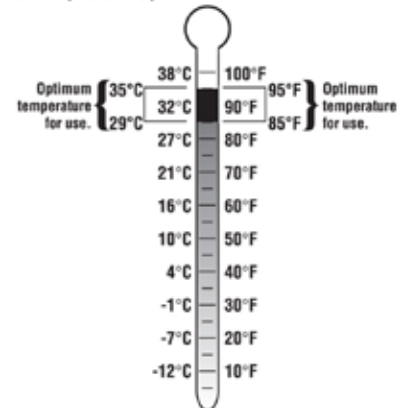
Use Solvents!



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.

E-84 Fire-Rated SPF CLASS 1 SPRAY FOAM SYSTEM (Fast Rise Polyurethane Foam)

Applies to Product ID# TF600FR and TF200FR Portable Spray Foam Insulation Systems By Commercial Thermal Solutions, Inc.

Approvals and Standards

ASTM E-84 Class 1 Approval

CCMC #13484-L

ICC Report #ESR-3183

ODP (Ozone-Depletion Potential): Contains non-ozone-depleting, non-flammable HFC Propellant.

Tiger Foam conforms to international guidelines for protection of the ozone layer and with respect to the Montreal Protocol of 1987 and other environmental guidelines.

VOC Content: Contains no VOC's, according to currently accepted definitions.

Applications

Spray foam onto any dry, clean surface in any direction; even to the underside of a floor or roof deck. This product will adhere to practically any substrate except Teflon™, oily surfaces, greases, polypropylene, polyethylene, silicone, seals, mold release agents & similar materials. It is especially critical where flame-retardant specifications require E-84 Class 1 foam. Protect surfaces not to be foamed. Always read all safety data sheets and operating instructions including use of proper personal protective equipment prior to use. Based on the manufacturer's Human Health Risk Assessment, we recommend a minimum of one hour for safe re-occupancy time for homeowner's. Please consult Commercial Thermal Solutions Product Management Department for details (800-664-0063).

Product Description

Tiger Foam E-84 Class 1 Fire-Rated foam insulation is a multipurpose, two-part, closed-cell polyurethane formula specifically manufactured for fire retardancy. The packaging, delivery system, and components were designed to be user- and environmentally friendly. These systems are both portable and disposable. They are completely self-contained to provide flexibility in end use performance. Tiger Foam E84 Fire-Rated SPF Class 1 Spray Foam can assist in attaining LEED and/ or ENERGY STAR™ Certification. Details at our website: www.tigerfoam.com

Properties

Two-part foam systems will begin to expand immediately upon chemical reaction of the "A" component (a polymeric isocyanate) and "B" component (a polyol blended with proprietary additive ratios) chemicals to a volume that is 3-5 times the dispensed volume, depending on ambient conditions. The foam will cure to semi-rigid, closed-cell foam. Optimum application temperature of the chemicals in the tanks is 75° F (24° C) to 85° F (34° C) and may be sprayed onto colder or warmer substrates, with slight effects on the foam's characteristics. Cured foam is resistant to heat and cold -200° F to +240° F (-129° C to +116° C). It is also resistant to negative effects of aging. It is not resistant to UV light and must be painted, coated, or covered if exposed to direct sunlight after application.

Cured 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 plastic. It is approved for use around wires, plumbing penetrations, etc., and contains no formaldehyde. Tiger Foam creates a tight seal that insulates and protects against dust, air infiltration, pests, and sound.

Special Features

Cleanable tips (use Acetone)

Metered spray gun

Tiger Foam systems do not require outside electrical or mechanical power source.

Technical Data (Metric data shown in parentheses)

FIRE RATING: ASTM E-84 (Tested according to ASTM E-84 at a maximum thickness of 2 inches and not to exceed this thickness as recognized by ICC-ES Evaluation Report #ESR-3183)

Tested @ 2"

Flame Spread = 20

Smoke Developed = 400

FIRE RATING

CAN/ULC S102

Flame Spread = 9

Tested at 2" beads

Smoke Developed = 43

Caulking & Sealant

R-Value (Metric RSI in parentheses):

R Value - 7

Aged R Value- 6 per inch (RSI=1.05/inch)

Density:

ASTM D-1622 (In place Density)

2.12 lb/ft³ (34 kg/m³)

ASTM D-1622 (Free Rise)

1.75 lbs/ft³ (28 kg/m³)

K-Factor (per inch): ASTM C-518 - aged 90 days @ 140° F

0.166 BTU·inch / ft²·h·°F (0.023 W/m·K)

Air Barrier Properties: ASTM E-283

@ 1.57 psf (75 Pa)

<0.0025 cfm/ft² (<0.0125 L/s/m²)

@ 6.24 psf (300 Pa)

<0.01 cfm/ ft² (<0.05 L/s/m²)

Perm Rating: ASTM E-96 method A

@ 1" (2.54 cm) =

1.67 (100 ng/(m²·Pa·s))

@ 2" (5.04 cm) =

1.44 (82 ng/(m²·Pa·s))

@ 3" (7.62 cm) =

1.00 (57 ng/(m²·Pa·s))

Tensile Strength: ASTM D1623

29 psi (200 kPa)

Compressive Strength: ASTM D-1621

Parallel @ 10% -

23psi (158 kPa)

Perpendicular @ 10% -

16 psi (110 kPa)

Closed Cell Content - ASTM D-2856

Greater than 90%

Tack Free/Expansion Time: 30-60 seconds

Cutable: 2-5 minutes

Sandable: 1 hour

Paintable: 5 minutes

Fully Cured: 1 hour

Theoretical Yield:

TF600FR = 600 board feet expanded 1" = 50 cu. ft. (1.42 m³)

TF200FR = 200 board feet expanded 1" = 16 cu. ft. (.45 m³)

*Yields are based on theoretical calculations, for comparative purposes, and will vary depending on ambient conditions and particular application. For calculating actual yield, it is recommended to reduce this theoretical yield by 10-12% to allow for these variations.

Tank Specifications:

DOT—39 Approved Cylinder

TF600FR: 58 lbs per tank, 116 lbs per kit

Box Dimensions:

H: 18" (45.7 cm)

W: 13" (33 cm)

L: 13" (33 cm)

TF200FR: 21 lbs per tank, 42 lbs per kit

Box Dimensions:

H: 16" (40.6 cm)

W: 9" (22.9 cm)

L: 16" (40.6 cm)

*Filled tank weights are approximate for estimation purposes only. Actual gross weight is formulation specific and may be slightly higher or lower.

Product Storage: Store in dry area below 120° F (49°). Optimal storage temperature is 60° F - 80° F (15° C to 26° C). Do not expose to open flame or temperatures above 120° F (49° C). Excessive heat or cold can cause premature aging of components resulting in a shorter shelf life. Tiger Foam is reusable as long as it is stored in a warm place, nozzle tip is changed, and product is shaken before using.

Cold Weather: For best results, the foam chemical temperature must be between 75°F-85°F (24°-29°C). Warm kits for a minimum of 1 day at room temperature. In extreme cold conditions during shipment or storage are encountered, warm tanks for several days at room temperature and shake well, prior to warming chemical for spray application.

Warning: Use only in well-ventilated area with certified respiratory protection. Wear gloves, eye protection, and protective clothing during application. Read all instructions and safety information (MSDS) prior to use. The product contains NO FORMALDEHYDE. Cured foam is non-toxic.

KEEP OUT OF REACH OF CHILDREN

Always read all operating, application, and safety instructions before using any products from Tiger Foam. 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 Tiger Foam from all liability with respect to the materials or use thereof.

Note: Physical properties shown are typical and 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. Yields shown are based on theoretical calculations and will vary depending on ambient conditions and particular application. Read all product directions and safety information before use. Consult local building codes for specific requirements regarding the use of cellular plastics or urethane products in construction.

1. SLOW-RISE POLYURETHANE FOAM FORMULA

Applies to Product ID# TF600SR and TF200SR Portable Spray Foam Insulation Systems by Commercial Thermal Solutions, Inc.

Approvals and Standards

Meets or exceeds the Coast Guard specification requirements for flotation in Title 33 code of the Federal Regulations, paragraph 183.114 and meets the requirements of DIN 4102-1 for a B2 building material and is designed within the international guidelines for protection of the ozone layer, and with respect to the Montreal Protocol, 1987, and other environmental guidelines.

ODP (Ozone Depletion Potential): Contains non-ozone-depleting, non-flammable HFC Propellant.

VOC Content: Contains no VOC's, according to currently accepted definitions.

2. APPLICATIONS

Tiger Foam Slow Rise can be dispensed into a dry cavity to insulate, fill, and seal various size voids, provide buoyancy, dampen sound, or reduce vibration. It is specifically designed to spray into molds or cavities and formulated not to damage drywall if standard building practices are followed for attachment to studs, drywall is 3/8" or thicker, and the manufacturer's directions are followed. Tiger Foam Slow-Rise Formula adheres to almost all building materials with the exception of surfaces such as polyethylene, Teflon™, silicone, oils, greases, mold release agents, or similar materials. Substrate must be clean, dry, firm, and free of loose particles. Protect surfaces not to be foamed. Foam is safe for internal wiring and around electrical boxes.

3. PRODUCT DESCRIPTION

Tiger Foam Slow-Rise Cavity Fill Formula is a multi-purpose, two-part closed-cell polyurethane formula specifically designed for low pressure and delayed foaming action. The packaging, delivery system, and components were designed to be user- and environmentally friendly. These systems are both portable and disposable. They are completely self-contained to provide flexibility in end-use performance. Details at our website: www.tigerfoam.com

4. PROPERTIES

Two-part foam systems will begin to expand immediately upon chemical reaction of the "A" component (a polymeric isocyanate) and "B" component (a polyol blended with proprietary additive ratios) chemicals to a volume that is 3-5 times the dispensed volume, depending on ambient conditions and cavity size. The foam will cure to semi-rigid, closed-cell foam. Optimum application temperature of the chemicals in the tanks is 75° F (24° C) to 85° F (34° C). Cured foam is resistant to heat and cold -200° F to +200° F (-129° C to +93° C). It is also resistant to negative effects of aging. It is not resistant to UV light and must be painted, coated, or covered if exposed to direct sunlight after application.

Cured 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 plastic. It is approved for use around wires, plumbing penetrations, etc., and contains no formaldehyde. Tiger Foam creates a tight seal that insulates and protects against dust, air infiltration, pests, and sound.

5. PREPARATION FOR USE

Protect surfaces not to be foamed. For mold filling applications, clamping or bracing of the mold is generally required to provide uniform support against foaming pressure. Extent of this clamping should be determined based on application and desired results. For best results, heat the mold substrate to 80 - 100°F (27 - 37°C), as this will improve the adhesion and “flowability” (filling characteristics) of the dispensed foam. Optimum chemical temperature is 75 - 85 °F (24 - 29°C). See the “Product Storage” section for important temperature information.

6. SPECIAL FEATURES

- Cleanable tips (use Acetone)
- Metered spray gun
- Tiger Foam systems do not require outside electrical or mechanical power source.

7. TECHNICAL DATA (METRIC DATA SHOWN IN PARENTHESES)

Density: ASTM D-1622

2.0 lbs/ft³ (32 kg/m³) – based on average, in-place density

K-Factor (per inch): ASTM C-518 - aged 28 day value

0.168 BTU·inch / (ft²)(hr)(°F) (.024 W/m·K)

R-Value (aged): 5.9 per inch (RSI = 1.04/in, 0.41/cm)

Tensile Strength: ASTM D-1623

Parallel = 42psi (290 kPa)

Perpendicular = 28psi (193 kPa)

Compressive Strength: ASTM D-1621

Parallel @ 10%= 14psi (97kPa)

Perpendicular @ 10% = 15psi (103 kPa)

Closed Cell Content ASTM D-2856= Approximately 90%

Dimensional Stability: ASTM D-2126

Heat Age: (+ 158° F / 70°C; 28 days) -4.5%

Humid Age: (+ 158° F / 70° C, 100% RH) -1.0%

Cold Age: (-4° F / -20° C) -0.3%

Tack Free/Expansion Time: 60-90 seconds

Cutttable: 5-10 minutes

Fully cured within several hours

Fire Rating: DIN 4102-1 B2

Theoretical Yield at 1”:

TF600SR = 516 board feet or 43 cu. ft. (1.24 m³)

TF200SR = 162.5 board feet or 13 cu. ft. (.37 m³)

*Yields are based on theoretical calculations, (or comparative purposes, and will vary depending on ambient conditions and particular application. For calculating actual yield, it is recommended to reduce this theoretical yield by 10-12% to allow for these variations.

Tank Specifications:

DOT—39 Approved Cylinder

Tank Specifications:

DOT—39 Approved Cylinder

TF600SR: 58 lbs per tank, 116 lbs per kit

Box Dimensions:

H: 18" (45.7 cm)

W: 13" (33 cm)

L: 13" (33 cm)

TF200SR: 21 lbs per tank, 42 lbs per kit

Box Dimensions:

H: 16" (40.6 cm)

W: 9" (22.9 cm)

L: 16" (40.6 cm)

*Filled tank weights are approximate for estimation purposes only. Actual gross weight is formulation specific and may be slightly higher or lower.

Product Storage: Store in dry area below 120° F (49°). Optimal storage temperature is 60° F - 80° F (15° C to 26° C). Do not expose to open flame or temperatures above 120° F (49° C). Excessive heat or cold can cause premature aging of components resulting in a shorter shelf life. Tiger Foam is reusable as long as it is stored in a warm place, nozzle tip is changed, and product is shaken before using.

Cold Weather: For best results, the foam chemical temperature must be between 75°F-85°F (24°-29°C). Warm kits for a minimum of 1 day at room temperature. In extreme cold conditions during shipment or storage are encountered, warm tanks for several days at room temperature and shake well, prior to warming chemical for spray application.

Warning: Use only in well-ventilated area with certified respiratory protection. Wear gloves, eye protection, and protective clothing during application. Read all instructions and safety information (MSDS) prior to use. The product contains NO FORMALDEHYDE. Cured foam is non-toxic.

KEEP OUT OF REACH OF CHILDREN

Always read all operating, application, and safety instructions before using any products from Tiger Foam. 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 Tiger Foam from all liability with respect to the materials or use thereof.

Note: Physical properties shown are typical and 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. Yields shown are based on theoretical calculations and will vary depending on ambient conditions and particular application. Read all product directions and safety information before use. Consult local building codes for specific requirements regarding the use of cellular plastics or urethane products in construction.

1. QUICK CURE TWO-COMPONENT POLYURETHANE FOAM

Applies to Product ID# TF605 and TF205 Portable Spray Foam Insulation Systems By Commercial Thermal Solutions, Inc.

Approvals and Standards

ODP (Ozone-Depletion Potential): Contains non-ozone-depleting, non-flammable HFC Propellant.

VOC Content: Contains no VOC's, according to currently accepted definitions.

"Class 2" – material which will achieve a Flame Spread of 75 or less and a Smoke Developed rating of 450 or less when tested according to ASTM E-84. DIN 4102-1 is a common European fire standard for building materials.

Tiger Foam package is patented under U.S. patent.

Tiger Foam conforms to international guidelines for protection of the ozone layer and with respect to the Montreal Protocol of 1987 and other environmental guidelines.

2. APPLICATIONS

Spray foam onto any dry, clean surface in any direction to seal, insulate, or fill voids, reduce vibration or deaden sound. This product will adhere to practically any substrate except Teflon™, oily surfaces, greases, polypropylene, polyethylene, silicone, seals, mold release agents & similar materials. Protect surfaces not to be foamed. Always read all safety data sheets and operating instructions including use of proper personal protective equipment prior to use.

3. PRODUCT DESCRIPTION

Tiger Foam Quick Cure foam insulation is a multipurpose, two-part, closed-cell polyurethane formula. The packaging, delivery system, and components were designed to be user- and environmentally friendly. These systems are both portable and disposable. They are completely self-contained to provide flexibility in end use performance.

Details at our website: www.tigerfoam.com

4. PROPERTIES

Two-part foam systems will begin to expand immediately upon chemical reaction of the "A" component (a polymeric isocyanate) and "B" component (a polyol blended with proprietary additive ratios) chemicals to a volume that is 3-5 times the dispensed volume, depending on ambient conditions. The foam will cure to semi-rigid, closed-cell foam. Optimum application temperature of the chemicals in the tanks is 75° F (24° C) to 85° F (34° C) and may be sprayed onto colder or warmer substrates, with slight effects on the foam's characteristics. Cured foam is resistant to heat and cold -200° F to +240° F (-129° C to +116° C). It is also resistant to negative effects of aging. It is not resistant to UV light and must be painted, coated, or covered if exposed to direct sunlight after application.

Cured 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 plastic. It is approved for use around wires, plumbing penetrations, etc., and contains no formaldehyde. Tiger Foam creates a tight seal that insulates and protects against dust, air infiltration, pests, and sound.

5. SPECIAL FEATURES

Cleanable tips (use Acetone)

Metered spray gun

Tiger Foam systems do not require outside electrical or mechanical power source.

6. TECHNICAL DATA (METRIC DATA SHOWN IN PARENTHESES)

R-Value (Metric RSI in parentheses): Aged - 6 per inch (RSI=1.05/inch)

Density: ASTM D-1622

1.75 lbs/ft³ (28 kg/m³)

K-Factor (per inch): ASTM C-518 - aged 28 days

0.16 BTU·inch / ft²·h·°F (0.02 W/m·K)

Air Barrier Properties: ASTM E-283

@ 1.57 psf (75 Pa) <0.0025 cfm/ft² (<0.0125 L/s/m²)

@ 6.24 psf (300 Pa) <0.01 cfm/ ft² (<0.05 L/s/m²)

Perm Rating: ASTM E-96 method A

@ 1" (2.54 cm) = 1.99

@ 2.5" (6.35 cm) = 1.18

Tensile Strength: ASTM D1623

Parallel 46 psi (317 kPa)

Compressive Strength: ASTM D-1621

Parallel @ 10% 27psi (186 kPa)

Perpendicular @ 10% 18 psi (124 kPa)

Dimensional Stability: ASTM D-2126

Heat Age +158° F (70° C) -0.6%

Humid Age +158° F (70° C), 100% RH +2.9%

Cold Age -4° F (-20° C) -0.3%

Closed Cell Content - ASTM D-2856

Greater than 90%

Tack Free/Expansion Time: 30-60 seconds

Cutttable: 2-5 minutes

Sandable: 1 hour

Paintable: 5 minutes

Fully Cured: 1 hour

Theoretical Yield:

TF605 = 600 board feet expanded 1" = 50 cu. ft. (1.42 m³)

TF205 = 200 board feet expanded 1" = 16 cu. ft. (.45 m³)

*Yields are based on theoretical calculations, for comparative purposes, and will vary depending on ambient conditions and particular application. For calculating actual yield, it is recommended to reduce this theoretical yield by 10-12% to allow for these variations.

Tank Specifications:

DOT—39 Approved Cylinder

TF605: 58 lbs per tank, 116 lbs per kit

Box Dimensions:

H: 18" (45.7 cm)

W: 13" (33 cm)

L: 13" (33 cm)

TF205: 21 lbs per tank, 42 lbs per kit

Box Dimensions:

H: 16" (40.6 cm)

W: 9" (22.9 cm)

L: 16" (40.6 cm)

*Filled tank weights are approximate for estimation purposes only. Actual gross weight is formulation specific and may be slightly higher or lower.

Product Storage: Store in dry area below 120° F (49°). Optimal storage temperature is 60° F - 80° F (15° C to 26° C). Do not expose to open flame or temperatures above 120° F (49° C). Excessive heat or cold can cause premature aging of components resulting in a shorter shelf life. Tiger Foam is reusable as long as it is stored in a warm place, nozzle tip is changed, and product is shaken before using.

Cold Weather: For best results, the foam chemical temperature must be between 75°F-85°F (24°-29°C). Warm kits for a minimum of 1 day at room temperature. In extreme cold conditions during shipment or storage are encountered, warm tanks for several days at room temperature and shake well, prior to warming chemical for spray application.

Warning: Use only in well-ventilated area with certified respiratory protection. Wear gloves, eye protection, and protective clothing during application. Read all instructions and safety information (MSDS) prior to use. The product contains NO FORMALDEHYDE. Cured foam is non-toxic.

KEEP OUT OF REACH OF CHILDREN

Always read all operating, application, and safety instructions before using any products from Tiger Foam. 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 Tiger Foam from all liability with respect to the materials or use thereof.

Note: Physical properties shown are typical and 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. Yields shown are based on theoretical calculations and will vary depending on ambient conditions and particular application. Read all product directions and safety information before use. Consult local building codes for specific requirements regarding the use of cellular plastics or urethane products in construction.

Limited Warranty: The Manufacturer warrants only that the product shall meet its specifications: this warranty is in lieu of all 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 from all liability with respect to the materials or 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.

Applies to Product ID# TF450 and TF1350. Portable Spray Foam Insulation Systems by Commercial Thermal Solutions, Inc.

Product Description

Tiger Foam™ Sound Predator Spray Foam is a multiple purpose open cell, low density polyurethane spray foam that utilizes a non-flammable blowing agent. Tiger Foam™ Sound Predator Spray Foam is excellent for sound deadening and reducing noise levels.

Approvals and Standards

Tiger Foam™ Open Cell Spray Foam conforms to the requirements of ASTM E84 as a “Class 2” material, tested at 4” thickness.

Flame Spread: 50

Smoke Developed: 450

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™ Open Cell Spray Foam**.

The **NRC** is a single number index for rating how absorptive a material is. **Tiger Foam™ Open Cell 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.

Applications

Spray foam onto any dry, clean surface in any direction; even to the underside of a floor or roof deck, to insulate, fill and seal various size voids, deaden sound or reduce vibration. This product will adhere to practically any substrate except Teflon™, oily surfaces, greases, polypropylene, polyethylene, silicone, seals, mold release agents & similar materials. Protect surfaces not to be foamed. Always read all safety data sheets and operating instructions including use of proper personal protective equipment prior to use. **Tiger Foam™ Open Cell Spray Foam** has a free-rise density of 0.75 lbs/ft³. (See page 2 of this document for complete technical data). This product is not recommended for “flash and batt” applications (ex: “Hybrid”).

Properties

Two-part, low density, open cell foam systems will begin to expand immediately upon chemical reaction of the “A” component (a polymeric isocyanate) and “B” component (a polyol blend with proprietary additive ratios) chemicals. The foam will cure to a semi-rigid open cell foam. Optimum application temperature is 90°F (32.2°C) but may be sprayed onto colder or warmer substrates, with slight effects on the foam characteristics. Cured foam is resistant to heat and cold, -200 to +240°F (-129 to +115°C), and to aging, but not UV rays (i.e. sunlight) unless painted, covered or coated. Cured PU foam is chemically inert and non-reactive in approved applications, and will not harm electrical wire insulations, Romex™, rubber, PVC, polyethylene (i.e. PEX), CPVC or other plastic. It is approved for use around wires, plumbing penetrations, etc., and contains no added formaldehyde.

Tiger Foam™ Open Cell Spray Foam fully expands and dries tack-free within 30-45 seconds, and fully cures within 1 hour.

Tiger Foam™ Open Cell Spray Foam systems are available in three non-refillable sizes to meet specific job applications requirements. When sprayed, the foam will create a seamless, continuous seal to insulate and protect against dust, air infiltration and pests.

Preparation for Use

Substrate must be clean, dry, firm and free of loose particles and free of dust, grease and mold release agents. Protect surfaces not to be foamed.

Shake kits well before using.

Read the enclosed operating instructions available in every kit or they can be found on our website www.tigerfoam.com. Carefully read all cautions and warnings before use. Always refer to the local building codes before application of product.

Use

Warm tanks to 85°F-95°F (29°C-35°C). After following instructions for setup, attach appropriate hose to tanks A and B if needed (II-1350 size). Shake kits well before using. Open tank valves as directed. Materials are dispensed through the hoses. Attach the static cone nozzle to the end of the dispensing unit. The A-component and the B-component meet and mix in the disposable nozzle. With a nozzle attached to the two-component froth dispensing unit, dispense foam by squeezing the trigger of the unit. To interrupt or stop foaming process, release the trigger. Once foaming process has stopped, the dispensing unit must be reactivated within 30 seconds or a new nozzle **must** be installed. Fresh foam may be applied in several stages to reduce overfilling of void or damage to non-rigid, confined cavities. Cured foam can only be removed manually.

* For best results, warm kit for a minimum of 1 day at 85-95°F (29-35°C)

Technical Data (Metric data shown in parentheses)

FIRE RATING: ASTM E-84 (Tested according to ASTM E-84 at a maximum thickness of 4 inches)

Tested @ 4"	Flame Spread = 50
	Smoke Developed = 450

R-Value (Metric RSI in parentheses):	3.7 per inch (RSI=1.05/inch)
Aged 28 days @ 70°F	

Density:	
ASTM D-1622 (Free Rise)	0.75 lbs/ft ³ (12 kg/m ³)

K-Factor (per inch):	0.270 BTU·inch / ft ² ·h·°F (0.0 W/m·K)
ASTM C-518 - aged 90 days @ 140° F	

Air Barrier Properties: ASTM E-283

@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)

Perm Rating: ASTM E-96 method A

1" (2.54 cm)	31 perms
3" (7.62 cm)	16 perms

Dimensional Stability: ASTM D2126

Heat Age: +158°F (70°C)
Humid Age: +158°F (70°C), 100% RH <5% change for all conditions
Cold Age: -4°F (-20°C)

Sound Transmission Class	STC 35
Noise Reduction Coefficient	NRC .70

Tack Free/Expansion Time:	30-45 seconds
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Cutable: 3-5 minutes

Fully Cured: 1 hour

Theoretical Yield:

TF450 = 450 board feet = 37.5 cu. ft. (1.06 m³)

TF1350 = 1350 board feet = 112.5 cu. ft. (3.18 m³)

*Yields are based on theoretical calculations, for comparative purposes, and will vary depending on ambient conditions and particular application. For calculating actual yield, it is recommended to reduce this theoretical yield by 10-12% to allow for these variations.

Tank Specifications: DOT—39 Approved Cylinder

TF1350: 58 lbs per tank, 116 lbs per kit

TF450: 21 lbs

per tank, 42 lbs per kit

Box Dimensions:

Box Dimensions:

H: 18" (45.7 cm)
cm)

H: 16" (40.6

W: 13" (33 cm)
cm)

W: 9" (22.9

L: 13" (33 cm)

L: 16" (40.6 cm)

*Filled tank weights are approximate for estimation purposes only. Actual gross weight is formulation specific and may be slightly higher or lower.

Product Storage: Store in dry area below 120° F (49°). Do not expose to open flame or temperatures above 120° F (49° C). Excessive heat or cold can cause premature aging of components resulting in a shorter shelf life. Tiger Foam™ is reusable as long as it is stored in a warm place, nozzle tip is changed, and product is shaken before using.

Cold Weather: For best results, the foam chemical temperature must be between 85°F-95°F (29°-35°C). Warm kits for a minimum of 1 day at room temperature. In extreme cold conditions during shipment or storage are encountered, warm tanks for several days at room temperature and shake well, prior to warming chemical for spray application.

Disposal Procedures

1. DO NOT INCINERATE TANKS.

2. After tanks are empty, the hose must be removed and the tanks must be vented. **CAUTION:** Tanks will still be under pressure. Turn valves to the off position before removing hoses. Protective 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. (Consult MSDS).

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

Important Note

Warning: Use only in well-ventilated area with certified respiratory protection. Wear protective glasses with side shields or goggles, nitrile gloves, and clothing that protects against dermal exposure. Read all instructions and safety information (MSDS) prior to use, which can be found on www.tigerfoam.com or inside the box. 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). The product contains NO FORMALDEHYDE. Cured foam is non-toxic.

KEEP OUT OF REACH OF CHILDREN

Always read all operating, application, and safety instructions before using any products from Tiger Foam. 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 Tiger Foam from all liability with respect to the materials or use thereof. For additional information, please call Commercial Thermal Solutions, Inc. 1-800-664-0063.

Note: Physical properties shown are typical and 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. Yields shown are based on theoretical calculations and will vary depending on ambient conditions and particular application. Read all product directions and safety information before use. Consult local building codes for specific requirements regarding the use of cellular plastics or urethane products in construction.

WARNINGS: Follow safety precautions and wear protective equipment as recommended. Consult Material Safety Data Sheet (MSDS) at www.tigerfoam.com for specific information. 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. Use only 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 (see MSDS). Contents may be very sticky and irritating to skin and eyes, therefore wear safety glasses 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: The Manufacturer warrants only that the product shall meet its specifications: this warranty is in lieu of all 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 from all liability with respect to the materials or 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.

Tiger Foam™ Ignition Barrier is an intumescent, latex based coating used in combination with Tiger Foam™ E84 Class 1 Spray Foam System (SPF) in applications that require an ignition barrier. Tiger Foam™ Ignition Barrier acts as a shield protecting the substrate from exposure or propagation of flame by surrounding the spray foam with a protective char-barrier.

Tiger Foam™ Ignition Barrier is supplied in 5-gallon (19 L) pails.

Use

Applied to open or closed cell spray polyurethane foam.

Application

Prior to the application of Tiger Foam™ Ignition Barrier, the surface must be free from all deposits, including dust, dirt, oil, paint flakes scales, wax, etc. for the product to adhere properly to the substrate. Tiger Foam™ Ignition Barrier should be at or above 40° F (5°C), prior to and during application. The cured foam surface to be treated should be at or above 40° F (5°C), prior to and during application. Moisture content of the substrate must not exceed 19 percent during the application of Tiger Foam™ Ignition Barrier.

Apply the Tiger Foam™ Ignition Barrier using an airless sprayer, roller, or brush, evenly coating the substrate. The entire surface is to be covered with 10 wet mils of coating. When using an airless sprayer, it is commonly recommended that the spray equipment be capable of producing a minimum of 3300 psi of pressure and that it can accommodate the recommended tip orifice sizes of .025-.031. It is further recommended that the filters be removed from both the spray gun and the pump to allow for the passage of solid content. The most common tip for applying Tiger Foam™ Ignition Barrier over spray polyurethane foam (SPF) or similar applications is 527, but variations in spray pattern width and tip size may be required depending on the surface area and the substrate to which the product is being applied.

Coverage rate of 90-300 square feet per gallon. Drying time is typically between 60-90 minutes. Allow Tiger Foam™ Ignition Barrier to dry completely between coats, if more than one coat is required.

Application Areas

The building codes require that Spray Polyurethane Foam (SPF) used in attics and crawlspaces (unoccupied and not used for storage) must meet ignition barrier requirements prescribed by the code. Specific ignition barriers are listed in the code, but under qualifying conditions (AC377 appendix X) a non-prescriptive ignition barrier can be used. Tiger Foam™ Ignition Barrier and Tiger Foam™ E84 Class 1 Spray Foam System (SPF) have been tested according to AC377 appendix X.

Qualifying Conditions

Tiger Foam™ E84 Class 1 Spray Foam System (SPF) and Tiger Foam™ Ignition Barrier can only be used in areas that meet the following qualifying conditions:

- Attic & Crawlspace entry is made only for the service of utilities
- There are no interconnected attic or basement areas
- Air is not circulated to other parts of the building
- Combustion air is provided in accordance with IMC section 701
- Ventilation is provided when required by IBS Section 1203.2 or IRC section R806, or as required, except when air impermeable insulation is permitted in unvented attics in accordance with IRC Section R806.4

Physical Properties

See technical data table on the second page.

Preparation For Use

After application of Tiger Foam™ E84 Class 1 Spray Foam System (SPF) wait for one hour before applying Tiger Foam™ Ignition Barrier to all exposed cured foam surfaces. Use Tiger Foam™ Ignition Barrier as is; DO NOT DILUTE. Prior to the application the cured foam surface should be free from moisture and all deposits, including dust, dirt, oil, paint flakes, scales, wax, etc. for the product to adhere properly.

Mixing

Tiger Foam™ Ignition Barrier has a high solids content that must be suspended evenly throughout the mixing process, and it **must be thoroughly mixed before use**. Mix with a rotary mixer or drill, utilizing a power mixer wand, at or between 300-500 rpm, for a mixing time of 20 minutes per 5-gallon pail or use a Squirrel™ 5 gallon power mixing wand or equivalent at or between 500-1500 RPM for a mixing time of 5 minutes per pail.

Shaking Tiger Foam™ Ignition Barrier with a paint shaker or paint mixer is NOT sufficient.

If Tiger Foam™ Ignition Barrier is mixed more than 24 hours prior to use, mix it again before using.

Training

Commercial Thermal Solutions, Inc. highly recommends completing No-Burn™'s comprehensive online training program prior to using Tiger Foam™ Ignition Barrier. The training program can be accessed at <http://noburn.com/tigerfoam>.

Important Note: Use only in well-ventilated areas. If spraying, wear certified respiratory protection or a powered air purifying respirator (PAPR). Wear safety glasses or goggles, gloves, and clothing that protects against exposure. Read all instructions and safety information (MSDS) prior to use of any product. The MSDS can be found at www.tigerfoam.com.

KEEP OUT OF REACH OF CHILDREN

Product Application, Storage and Transportation Temperature

Store, use or transport at a minimum of 40°F (5°C) or a maximum of 90°F (32°C) and keep out of direct sunlight. **Do NOT allow product to freeze. Do not store, ship, or apply Tiger Foam™ Ignition Barrier below 40°F (5°C).**

Disposal Procedures

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

Pails and lids are recyclable HDPE 2 plastic. Check with your local waste disposal for recycling guidance.

Note:

The manufacturer warrants only that the product shall meet its specifications when stored, mixed and applied in accordance with published directions.

TECHNICAL DATA

Color	Opaque/White
Volatile Organic Content (VOC)	18 grams per liter (g/L)
Cure Time	24 hours
Fire Rating NFPA 286 Tested with Tiger Foam™ E84 Class 1 (SPF)	Pass
Drying Time	60-90 minutes
Shelf Life	36 months

THEORETICAL YIELD*

Non-Refillable	Coverage	Weight
5 Gallons TF10000CT	450 – 1500 sq ft	55 lbs
10 wet mil coating	800 sq ft	55 lbs
12 wet mil coating	670 sq ft	55 lbs

*Yields are based on theoretical calculations, for comparative purposes, and will vary depending on ambient conditions and particular application.

PROCESSING PARAMETERS*

Product Storage	40°F - 90°F (5°-32°C)	Store in a dry area
Application Temperature	40°F - 90°F (5°-32°C)	For best results
Transportation Temperature	Minimum of 40°F (5°C)	

*Do not use if stored or transported below 40°F (5°C).

Equipment: Airless Sprayers				
Model	Graco	Max PSI	Max Output	Max Tip Sizes
	Ultra Max II 795*	3300	.95gpm	1 gun - .031 in. tip
	Ultra Max II 1095	3300	1.1gpm	1 gun - .033 in. tip
	Ultra Max II 1595	3300	1.25gpm	1 gun - .037 in. tip

Equipment: Airless Sprayers				
Model	Titan	Max PSI	Max Output	Max Tip Sizes
	840 Impact*	3300	1gpm	1 gun - .032 in. tip
	1140 Impact	3300	1.2gpm	1 gun - .034 in. tip
	1640 Impact	3300	1.3gpm	1 gun - .039 in. tip

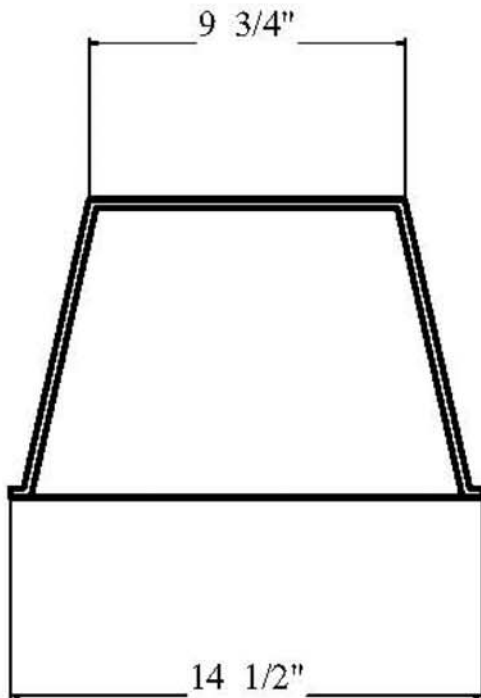
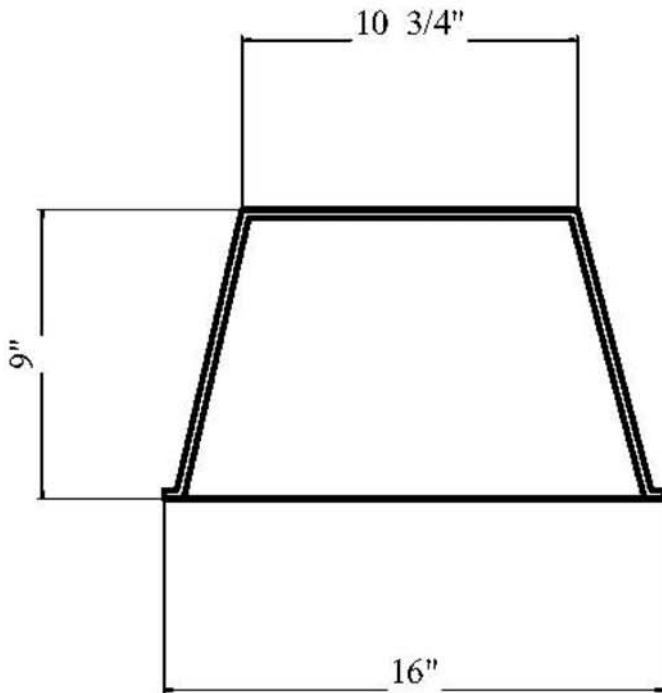
Recommendations:	
Removal of filter is recommended from both the spray gun and the pump to allow for the passage of solid content.	
*Manufacturer recommends max hose length of 50 ft.	
Airless sprayer hoses are recommended to have an inside diameter of 3/8" or larger.	

Always read all operating, application, and safety instructions before using any products from Commercial Thermal Solutions, Inc. 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. from all liability with respect to the materials or use thereof.

Note: Physical properties shown are typical and 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. Yields shown are based on theoretical calculations and will vary depending on ambient conditions and particular application. Read all product directions and safety information before use. Consult local building codes for specific requirements regarding the use of cellular plastics or urethane products in construction.



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

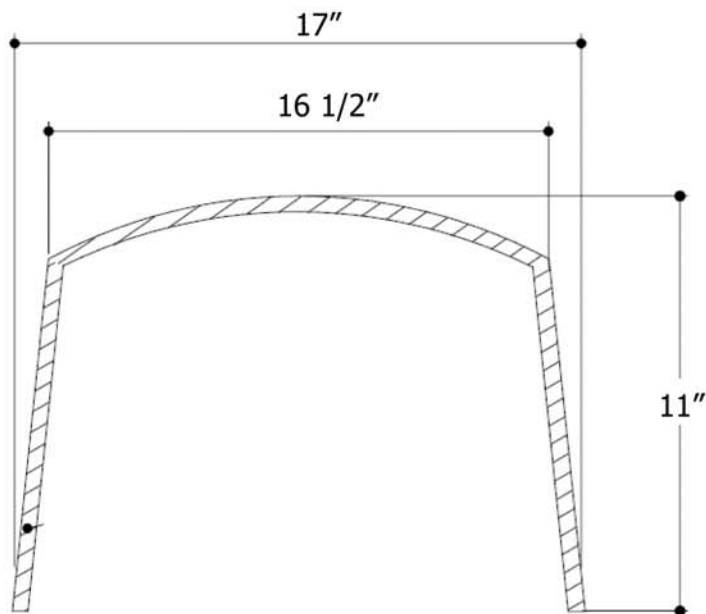
Sales and Technical Support:

Toll Free: 800.664.0063 • Fax: 877.415.1185

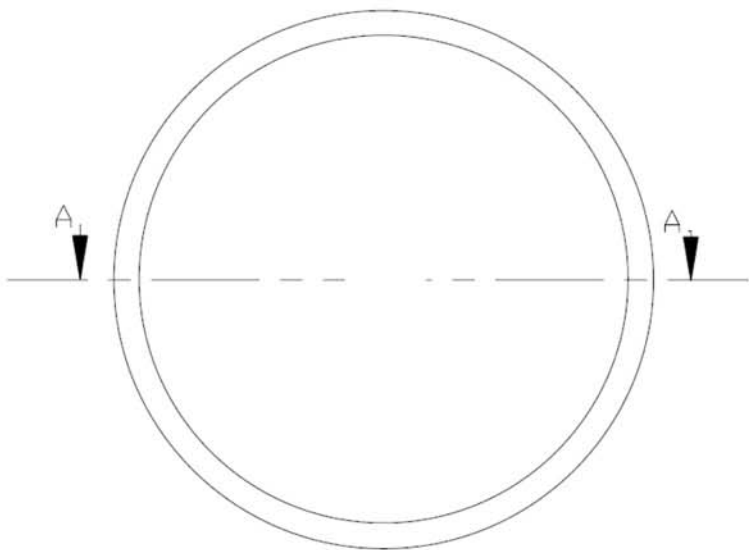
• International Phone: (001) 1+732.927.2090

• 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

MATERIAL DATA SAFETY SHEET

E84 Fire-Rated, Slow Rise, Quick Cure & Open Cell



"A" COMPONENT

ISSUE DATE: April 2005 Form # TFMDS-001

Last revision: March 2012

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Brand: Tiger Foam™ Insulation. This sheet covers the "A" Component of a self-contained, low pressure, portable two-component spray foam insulation kit comprised of an "A" and "B" side tank.

Product Description: Product is a urethane foam component that contains liquefied compressed gas blowing agent (Non-Flammable Compressed Gas). Containers should not be heated 120°F (49°C) to avoid excessive pressure build-up.

Item Numbers Covered: TF600FR, TF200FR, TF600SR, TF200SR, TF605, TF205, TF1350 and TF450

Note identical packaging with sticker on front to designate contents as being either "A" component or "B" component.

Manufacturer:

COMMERCIAL THERMAL SOLUTIONS, INC.
524 Brighton Ave, Suite 9
Spring Lake, New Jersey 07762

Product Information: 1-800-664-0063

International Phone: (001) 1+732.927.2090

IN CASE OF EMERGENCY CALL:

Transportation Emergency:

CHEMTREC (Domestic): 1-800-424-9300

CHEMTREC (Int'l): (703)527-3887

Reference: CHEMTREC ACCOUNT # 201586

2. HAZARDS IDENTIFICATION

Emergency Overview

WARNING! EYE, SKIN, LUNG IRRITANT. May cause eye irritation. May cause skin irritation. May cause allergic skin reaction. Skin Sensitizer. May cause allergic respiratory reaction. Harmful if inhaled. May cause lung injury. Respiratory sensitizer. Lung damage and respiratory sensitization may be permanent. May cause central nervous system effects. Keep upwind of spill. May cause anesthetic effects. Pressurized Containers: storage temperature should not exceed 120°F (49°C) in order to avoid excessive pressure build-up and possible release of contents. MDI will react with water to form CO₂ and water insoluble polyureas.

Potential Health Effects

The primary adverse health effects of this product are related to the Polymeric Isocyanate (MDI) component, and, to a lesser degree, the Fluorocarbon (134a) component. Therefore, use in a well ventilated area and with certified respiratory protection to avoid exceeding exposure limits listed in Section 8 of this MSDS.

Effects of Overexposure

Entry Route:

Inhalation: May irritate mucous membranes. Can cause runny nose, sore throat, coughing, chest discomfort, shortness of breath, wheezing, and reduced lung function. Extensive overexposure can lead to respiratory symptoms like bronchitis, bronchial spasm, and pulmonary edema. These symptoms could be immediate or delayed up to several hours after exposure. These effects are usually reversible, but increased lung sensitivity can persist for a longer period of time. Chronic overexposure to diisocyanates can cause permanent damage. Overexposure to 1,1,1,2 - Tetrafluoroethane may cause lightheadedness, headaches, or lethargy. Persons with cardiac arrhythmia are more susceptible to increased medical risk from severe exposure.

Eyes: May be irritating to eyes. Symptoms of irritation can include reddening, tearing, swelling, or stinging. May cause temporary corneal injury. Chronic overexposure may cause conjunctivitis.

Skin: May cause localized irritation, reddening or swelling. May cause an allergic reaction. Prolonged or repeated exposure may lead to sensitization and/or contact dermatitis.

Ingestion: May cause irritation of mucous membranes in the mouth and digestive tract. Symptoms may include abdominal pain, nausea, vomiting, and diarrhea. Small amounts are unlikely to cause symptoms or injury.

If accidental contact occurs, follow the appropriate first aid procedure described in Section 4 of this MSDS.

3. COMPOSITION

<u>Chemical Name (common names)</u>	<u>CAS Number</u>	<u>Percentage</u>
1,1,1,2 – Tetrafluoroethane (Non-Flammable Compressed Gas, HFC, Fluorocarbon) 134a	811-97-2	5 - 10%
4,4' – Diphenylmethane Diisocyanate (MDI)	101-68-8	30 - 60%
High Oligomers of MDI (Polymeric MDI)	9016-87-9	30 - 60%

(NOTE: See Section 8 of this MSDS for Exposure Guidelines)

(NOTE: See Section 11 of this MSDS for Toxicological Information-LC₅₀ and LD₅₀)

4. FIRST AID

Inhalation: If breathing difficulty is experienced, move to area free of exposure. Provide fresh air. If necessary, provide oxygen or artificial respiration by trained personnel and obtain medical attention.

Eye Contact: Flush with clean water for at least 15 minutes and obtain medical attention.

Skin Contact: Use a rag to remove liquid from skin and remove contaminated clothing. Contact may cause mild irritation or temporary darkening of skin. Persistent washing with soap and water will eventually remove all residues. If irritation persists, obtain medical attention.

Ingestion: Drink 1 to 3 glasses of water and seek immediate medical attention. Do not induce vomiting. Never give anything orally to an unconscious person.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Dry Chemical, carbon dioxide, Halon 1211, chemical foams, or water spray (if used in large quantities).

Firefighting Procedures: Isolate area. Stay upwind. Water is not recommended unless used in large quantities as a fine spray when other extinguishing agents are not available. The product is equipped with a pressure relief valve which can activate in a high temperature situation. Remove all personnel from the area at the first sound of releasing pressure.

Protective equipment: Wear self-contained breathing apparatus to protect against toxic decomposition by-products, including Carbon monoxide, Carbon dioxide, Nitrogen oxides, Isocyanates, Hydrogen fluoride and traces of Hydrogen cyanide. Wear all turn out gear (boots, trousers, helmet, gloves, and hood).

Unusual Fire/Explosion Hazards: Product reacts with water. Water Contamination will produce carbon dioxide. High temperatures will raise the pressure in the containers, which may lead to rupturing. Cured foam is organic and, therefore, will burn in the presence of sufficient heat, oxygen and an ignition source. Main hazards associated with burning foam are similar to burning of other organic materials (wood, paper, cotton, etc.) and precautions against exposure should be taken accordingly. Avoid welding or other "hot work" in the vicinity of exposed cured foam.

6. ACCIDENTAL RELEASE MEASURES / DISPOSAL CONSIDERATIONS

Personal Precautions: Evacuate all unnecessary personnel; contain the area if possible. Wear skin, eye, and respiratory protection and equipment. Ventilate the area.

Environmental Precautions: Containment should include preventing the spill from entering drains, sewers, waterways, groundwater, or soil.

Clean Up Procedures/Neutralization: Soak up material with absorbent and shovel into chemical waste container. Loosely cover container and remove from work area. Decontaminate waste and spill area with a solution of 0.2 – 0.5% liquid detergent and 3 – 8% concentrated ammonium hydroxide in water (5 – 10% sodium bicarbonate may be substituted for ammonium hydroxide). Use 10 parts of solution for each part of the spill and allow reacting for at least 10 minutes. Allow loosely covered container to stand for several days before disposing in accordance with all applicable federal, state and local regulations.

7. HANDLING AND STORAGE INFORMATION

Handling: Use only in a well ventilated area with certified respiratory protection or with a power air purifying respirator (PAPR). Wear protective glasses or goggles, Nitrile gloves, and clothing that protects from dermal exposure. Contents are under pressure. Do not puncture or incinerate.

Storage: Store in dry area below 120° F (49°). Optimal storage temperature is 60° F - 80° F (15° C to 26° C). Do not expose to open flame or temperatures above 120° F (49° C). Excessive heat or cold can cause premature aging of components resulting in a shorter shelf life. Storage at less than ideal temperatures can cause delays in production until the product is warmed or cooled to temperature.

Storage below 55°F (12.7°C) may affect foam quality if chemicals are not warmed to room temperature before use. Protect containers from physical abuse. Always store containers upright. KEEP OUT OF REACH OF CHILDREN
 Cold Weather: For best results, the foam chemical temperature must be between 75°F-85°F (24°-29°C). Warm kits for a minimum of 1 day at room temperature. In extreme cold conditions during shipment or storage are encountered, warm tanks for several days at room temperature and shake well, prior to using chemical for spray application.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Read all product instructions before using.

Personal Protective Equipment

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.

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.

Eye Protection: Use safety glasses with side shields or goggles. An eye wash station or portable eye wash bottle should be in the area.

Skin Protection: Avoid contact with skin. 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.

Medical Surveillance: Users whom have a history of adult asthma should be excluded from work with isocyanates. Some users can become sensitized to isocyanates. Once a user has become sensitized, no further exposure should be permitted. Skin or respiratory allergies should also be taken into account when using isocyanates.

General Hygiene: Do not eat, drink, or smoke while handling this product. Always use in well ventilated area. Wash after handling. Do not breathe vapors. Avoid contact with skin and hands.

Exposure Guidelines

4,4’ – Diphenylmethane	OSHA	.020 ppm ceiling	.200 mg/m ³ ceiling
Diisocyanate (MDI)	ACGIH	.005 ppm TWA	.051 mg/m ³ TWA
1,1,1,2 - Tetrafluoroethane	WEEL	1,000 ppm	4,240 mg

(None of the components in this product are listed by IARC, NTP, OSHA or ACGIH as a carcinogen).

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Amber to dark brown liquid. Froths to an off white to yellowish color when released from the container. (Note: Appearance may differ with the introduction of a dye/colorant.
Odor:	Slight musty odor
pH:	Not available
Melting/Freezing Point:	Not available
Boiling Point:	1,1,1,2 – Tetrafluoroethane (Non-Flammable Compressed Gas, HFC Fluorocarbon 134a) boils at -15°F (-26°C). MDI boils at 406°F (208°C).
Flash Point:	1,1,1,2 - Tetrafluoroethane (HFC 134a); none. MDI; 390°F (199°C).
Specific Gravity:	Approximately 1.2 (H ₂ O = 1) at 25°C
Solubility:	Water: Insoluble reacts slowly with water to liberating traces of CO ₂ .
Partition Coefficient N-octanol/water:	Not available
Auto-ignition Temperature:	Not available
Decomposition Temperature:	Not available
Odor Threshold:	Not available
Evaporation Rate:	Not available
Flammability:	Non flammable propellant
Flammability Limits:	Not available
Vapor Pressure:	Contents under pressure have vapor pressure greater than 50 psig/345 kPa. For MDI liquid less than 10 mm Hg at 77°F (25°C).
Vapor Density:	Not available

10. STABILITY AND REACTIVITY

Stability: This product is considered stable under normal and anticipated storage and handling conditions. Do not store above 120°F (49°C). For longest shelf life, avoid storage above 90°F (32.2°C).

Materials to Avoid: Alcohols, strong bases or amines, metal compounds, ammonia, strong oxidizers. Avoid contamination with water.

Conditions to Avoid: Avoid moisture. Material reacts slowly with water, releasing CO₂. High temperatures will raise the pressure in the containers, which may lead to rupturing. Product use is temperature sensitive. Avoid temperatures below 40°F (5°C) or temperatures above 95°F (35°C).

Thermal Decomposition: Toxic decomposition by-products, including Carbon monoxide, Carbon dioxide, Nitrogen oxides, Isocyanates, Hydrogen fluoride and traces of Hydrogen cyanide can be released in instances of fire.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Inhalation: LC₅₀ 490 mg/m³ (4h, rat)

Ingestion: LD₅₀ >5,000 mg/kg (rat, male/female)

Skin: LD₅₀>5,000 mg/kg (rabbit)

Sensitization

Skin: (rabbit, slightly irritating)

Eye: (rabbit, slightly irritating)

Repeated Dose Toxicity: 2 yrs, Inhalation, NOAEL .19, (rat, male/female, 6hrs/day, 5days/week) Irritation to lungs and nasal cavity

Chronic Toxicity/ Carcinogenicity: 6.3 mg/m (high level of exposure, 2years, 6hrs/day, 5days/week) Lung tumors observed.

Developmental Toxicity: rat, female, 6hrs/day, 12 mg/m³, days 6-15 (gestation period); 4 mg/m³ (maternal/fetotoxicity)

Genetic Toxicity In vitro: Inconclusive, In vitro studies were negative/positive, salmonella typhimurium

Ecological Data for Polymeric MDI:Biodegradation: Expected to have a short half-life

Bioaccumulation: Oncorhynchus mykiss (rainbow trout), 112 day exposure, <1 BCF. Does not bioaccumulate.

Acute Toxicity to Fish: LCO: >1000mg/l brachydanio rerio (zebra fish), 96 hour exposure

Acute Toxicity to Aquatic Invertebrates: EC50: >1000 mg/l Daphnia magna (water flea), 24h

Toxicity to Microorganisms: EC50: >100 mg/l, activated sludge, 3h

Ecological Data for MDI

Acute Toxicity to Fish: LC₅₀: >500mg/l brachydanio rerio (zebra fish), 24h

Acute Toxicity to Aquatic Invertebrates: EC50: >500 mg/l Daphnia magna (water flea), 24h

Ecological Data for 1,1,1,2-Tetrafluoroethane

Accumulation in aquatic organisms is unlikely

13. DISPOSAL CONSIDERATIONS

Disposable Cylinders:

1. DO NOT INCINERATE TANKS

2. After tanks are empty, the hose must be removed and the tanks must be vented. 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, PROVINCIAL, AND LOCAL REGULATIONS. CHECK WITH YOUR LOCAL WASTE DISPOSAL SERVICE FOR GUIDANCE.

14. TRANSPORTATION

Shipping Information

Containers Greater Than 1000 cu. cm. (1 liter)

Ground UN1956 Compressed Gas n.o.s. (Fluorocarbon) 2.2

DOT (Non-Flammable Gas Label)

Air UN1956 Compressed Gas n.o.s. (Fluorocarbon) 2.2

IATA (Non-flammable Gas Label)

Packing Instruction (Cargo & Passenger) 200

Water UN1956 Compressed Gas n.o.s. (Fluorocarbon) 2.2

IMDG (Non-flammable Gas Label)

Note Emergency Response Guide Numbers - Consumer Commodity # 171. For Aerosols and Compressed Gas # 126.

15. REGULATORY

OSHA Hazcom Standard Rating:

Hazardous

WHMIS Classification:

A

D2A (This classification is due to the potential for respiratory sensitization)

D2B

Toxic Substances Control Act (TSCA)/Domestic Substances List (DSL):

All ingredients are listed on the TSCA inventory, as well as the Canadian Domestic Substances List.

SARA Title III: Section 311/312:

Acute Health Hazard, Chronic Health Hazard, Sudden Release of Pressure Hazard

SARA Title III: Section 313:

Contains Diphenylmethane Diisocyanate (CAS #101-68-8) and Diphenylmethane Diisocyanate, Isomers and homologues (CAS #9016-87-9) which are subject to the reporting requirements of SARA Title III. Applicability must be determined by end user.

State Right-To Know Information: Massachusetts, New Jersey or Pennsylvania Right to Know Substance Lists:

Chemical Name (common names)	CAS Number	Percentage
Diphenylmethane Diisocyanate	101-68-8	30% - 60 %

California Proposition 65:

Based on information currently available, this product is not known to contain detectable amounts of any chemicals currently listed under California Proposition 65.

16. OTHER

NFPA: Health Hazard 2; Flammability 1; Reactivity 1

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

* =chronic health hazard

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.

LAST REVISION: MARCH 2012

BASED ON INFORMATION SUPPLIED BY MANUFACTURER



ISSUE DATE: April 2005 Form # TFMDS-001

Last revision: January 2011

Product Brand: Tiger Foam™ Insulation. This sheet covers the "B" Component of a self-contained, low pressure, portable two-component spray foam insulation kit comprised of an "A" and "B" side tank.

Product Description: Product is a urethane foam component that contains liquefied compressed gas blowing agent (Non-Flammable Compressed Gas). Excessive pressure build-up may occur if heated above 120°F (49°C).

Item Numbers Covered: TF600FR, TF600SR, TF605 and TF200FR, TF200SR, TF205

Note identical packaging with sticker on front to designate contents as being either "A" component or "B" component.

Manufacturer:

COMMERCIAL THERMAL SOLUTIONS, INC.
524 Brighton Ave, Suite 9
Spring Lake, New Jersey 07762

Emergency Overview and Contacts

Product Information: 1-800-664-0063
International Phone: (001) 1+732.927.2090

IN CASE OF EMERGENCY CALL:

Transportation Emergency:
CHEMTREC (Domestic): 1-800-424-9300
CHEMTREC (Int'l): (703)527-3887
Reference: CHEMTREC ACCOUNT # 201586

2. HAZARDS IDENTIFICATION Emergency Overview

WARNING! EYE, SKIN, LUNG IRRITANT. May cause eye irritation. May cause skin irritation. May cause allergic skin reaction. Skin Sensitizer. May cause allergic respiratory reaction. Harmful if inhaled. May cause lung injury. Respiratory sensitizer. Lung damage and respiratory sensitization may be permanent. May cause central nervous system effects. Keep upwind of spill. May cause anesthetic effects. Pressurized Containers: storage temperature should not exceed 120°F (49°C) in order to avoid excessive pressure build-up and possible release of contents. MDI will react with water to form CO₂ and water insoluble polyureas.

Potential Health Effects

The primary adverse health effects of this product are related to the individual components that make up the mixture, and the Fluorocarbon (134a) component. Therefore, use in a well ventilated area and with certified respiratory protection to avoid exceeding exposure limits listed in Section 8 of this MSDS.

Effects of Overexposure

Entry Route:

- Inhalation:**
- Tris (1-chloro-2-propyl) phosphate:** Existing medical conditions such as asthma and pulmonary diseases may be aggravated by prolonged exposure. This material is a weak cholinesterase inhibitor. Excessive exposure may result in these symptoms: salivation, sweating, headache, nausea, muscle twitching, incoordination, diarrhea, blurred vision, abdominal cramps, tears, tremor, and chest discomfort.
 - Tertiary Amine:** Can cause severe eye, skin, and respiratory tract burns. May cause nose, throat, and lung irritation. Inhalation of vapors in high concentration may cause irritation of respiratory system.
 - 1,1,1,2- Tetrafluoroethane:** Gas reduces oxygen available for breathing. Causes asphyxiation in high concentrations. May cause central nervous system effects. May cause cardiac arrhythmia. Vapors may cause drowsiness and dizziness.
 - Diethylene glycol:** May cause nose, throat, and lung irritation. Vapors in high concentrations may cause irritation of respiratory system.
- Eyes:**
- Tris (1-chloro-2-propyl) phosphate:** May cause eye irritation.
 - Tertiary Amine:** Can cause severe eye, skin, and respiratory tract burns.
 - 1,1,1,2- Tetrafluoroethane:** Can cause severe irritation, redness, tearing, and blurred vision.
 - Diethylene glycol:** May cause irritation to the eyes.

Skin: Tris (1-chloro-2-propyl) phosphate: Prolonged exposure is unlikely to result in absorption of harmful amounts.

Tertiary Amine: Can cause severe eye, skin, and respiratory tract burns. May cause nose, throat, and lung irritation. Inhalation of vapors in high concentration may cause irritation of respiratory system.

1,1,1,2- Tetrafluoroethane: Irritating to skin, may cause redness, may cause frostbite.

Diethylene glycol: May cause irritation to the skin.

Ingestion: Tris (1-chloro-2-propyl) phosphate: Existing medical conditions such as asthma and pulmonary diseases may be aggravated by prolonged exposure. This material is a weak cholinesterase inhibitor. Excessive exposure may result in these symptoms: salivation, sweating, headache, nausea, muscle twitching, incoordination, diarrhea, blurred vision, abdominal cramps, tears, tremor, and chest discomfort.

Tertiary Amine: Can cause severe eye, skin, and respiratory tract burns. Harmful if swallowed.

1,1,1,2- Tetrafluoroethane: Unlikely route of exposure. May cause gastrointestinal discomfort.

Diethylene glycol: Ingestion of large amounts may produce gastrointestinal disturbances including irritation, nausea, and diarrhea.

If accidental contact occurs, follow the appropriate first aid procedure described in Section 4 of this MSDS.

3. COMPOSITION

<u>Chemical Name (common names)</u>	<u>CAS Number</u>	<u>Percentage</u>
Non-Hazardous Polyol Blend	Not Available	30 - 60%
Tris (1-chloro-2-propyl) phosphate	13674-84-5	15 - 45%
1,1,1,2 – Tetrafluoroethane (Non-Flammable Compressed Gas, HFC, Fluorocarbon) 134a	811-97-2	10 - 30%
Tertiary Amine	3030-47-5	1 - 5%
Diethylene glycol	111-46-6	1 - 5%
Surfactants	Trade Secret	1 - 5%

(NOTE: See Section 7 of this MSDS for Exposure Guidelines)

(NOTE: See Section 11 of this MSDS for Toxicological Information-LC₅₀ and LD₅₀)

4. FIRST AID

Inhalation: If breathing difficulty is experienced, move to area free of exposure. Provide fresh air. If necessary, provide oxygen or artificial respiration by trained personnel and obtain medical attention.

Eye Contact: Flush with clean water for at least 15 minutes and obtain medical attention.

Skin Contact: Use a rag to remove liquid from skin and remove contaminated clothing. Contact may cause mild irritation or temporary darkening of skin. Persistent washing with soap and water will eventually remove all residues. If irritation persists, obtain medical attention.

Ingestion: Drink 1 to 3 glasses of water and seek immediate medical attention. Do not induce vomiting. Never give anything orally to an unconscious person.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Dry Chemical, carbon dioxide, Halon 1211, chemical foams, or water spray (if used in large quantities).

Firefighting Procedures: Isolate area. Stay upwind. Water is not recommended unless used in large quantities as a fine spray when other extinguishing agents are not available. The product is equipped with a pressure relief valve which can activate in a high temperature situation. Remove all personnel from the area at the first sound of releasing pressure.

Protective equipment: Wear self-contained breathing apparatus to protect against toxic decomposition by-products, including Carbon monoxide, Carbon dioxide, Nitrogen oxides, Isocyanates, Hydrogen fluoride and traces of Hydrogen cyanide. Wear all turn out gear (boots, trousers, helmet, gloves, and hood).

Unusual Fire/Explosion Hazards: High temperatures will raise the pressure in the containers, which may lead to rupturing. Cured foam is organic and, therefore, will burn in the presence of sufficient heat, oxygen and an ignition source. Main hazards associated with burning foam are similar to burning of other organic materials (wood, paper, cotton, etc.) and precautions against exposure

should be taken accordingly. Avoid welding or other “hot work” in the vicinity of exposed cured foam.

6. ACCIDENTAL RELEASE MEASURES / DISPOSAL CONSIDERATIONS

Personal Precautions: Evacuate all unnecessary personnel; contain the area if possible. Wear skin, eye, and respiratory protection and equipment. Ventilate the area.

Environmental Precautions: Containment should include preventing the spill from entering drains, sewers, waterways, groundwater, or soil.

Clean Up Procedures/Neutralization: Soak up material with sawdust or vermiculite and dispose of in accordance with all applicable federal, state, and local regulations. Wash spill area thoroughly with soap and water. Avoid uncontrolled reactions with isocyanates.

7. HANDLING AND STORAGE INFORMATION

Handling: Use only in a well ventilated area with certified respiratory protection or with a power air purifying respirator (PAPR). Wear protective glasses or goggles, Nitrile gloves, and clothing that protects from dermal exposure. Contents are under pressure. Do not puncture or incinerate.

Storage: Store in dry area below 120° F (49°). Optimal storage temperature is 60° F - 80° F (15° C to 26° C). Do not expose to open flame or temperatures above 120° F (49° C). Excessive heat or cold can cause premature aging of components resulting in a shorter shelf life. Storage at less than ideal temperatures can cause delays in production until the product is warmed or cooled to temperature. Storage below 55°F (12.7°C) may affect foam quality if chemicals are not warmed to room temperature before use. Protect containers from physical abuse. Always store containers upright. **KEEP OUT OF REACH OF CHILDREN**

Cold Weather: For best results, the foam chemical temperature must be between 75°F-85°F (24°-29°C). Warm kits for a minimum of 1 day at room temperature. In extreme cold conditions during shipment or storage are encountered, warm tanks for several days at room temperature and shake well, prior to using chemical for spray application.

Read all product instructions before using.

Personal Protective Equipment

Respiratory Protection: Use products only in a well ventilated area. 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 (N95). 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). Use local and general exhaust ventilation to control levels of exposure.

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.

Eye Protection: Use safety glasses or goggles. An eye wash station or portable eye wash bottle should be in the area.

Skin Protection: Avoid contact with skin. Use clothing that protects against dermal exposure.

General Hygiene: Do not eat, drink, or smoke while handling this product. Always use in well ventilated area. Wash after handling. Do not breathe vapors. Avoid contact with skin and hands.

Exposure Guidelines

1,1,1,2 - Tetrafluoroethane	<u>WEEL</u>	1,000 ppm	4,240 mg/m ³
Diethylene glycl	<u>WEEL</u>		10 mg/m ³

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Light yellow to amber colored liquid. Froths to an off white to yellowish color when introduction of a released from the container. (Note: Appearance may differ with the dye/colorant.)

Odor: Slight fluorocarbon and amine odor

pH: Not available

Melting/Freezing Point: Not available

Boiling Point: 1,1,1,2 – Tetrafluoroethane (Non-Flammable Compressed Gas, HFC Fluorocarbon 134a) boils at -15°F (-26°C). Other components boil at temperatures greater than 200°F (93.3°C).

Flash Point: 1,1,1,2 - Tetrafluoroethane (HFC 134a); none. Other components-not determined.

Specific Gravity:	Approximately 1.2 (H₂O = 1) at 25°C
Solubility:	Water: Partly soluble, does not react.
Partition Coefficient N-octanol/water:	Not available
Auto-ignition Temperature:	Not available
Decomposition Temperature:	Not available
Odor Threshold:	Not available
Evaporation Rate:	Not available
Flammability:	Non flammable propellant
Flammability Limits:	Not available
Vapor Pressure:	Contents under pressure have vapor pressure greater than 50 psig/345 kPa.
Vapor Density:	Not available

10. STABILITY AND REACTIVITY

Stability: This product is considered stable under normal and anticipated storage and handling conditions. Do not store above 120°F (49°C). For longest shelf life, avoid storage above 90°F (32.2°C).

Materials to Avoid: Alcohols, strong bases or amines, metal compounds, ammonia, strong oxidizers.

Conditions to Avoid: High temperatures will raise the pressure in the containers, which may lead to rupturing. Product use is temperature sensitive. Avoid temperatures below 40°F (5°C) or temperatures above 95°F (35°C).

Thermal Decomposition: Toxic decomposition by-products, including Carbon monoxide, Carbon dioxide, Nitrogen oxides, Hydrogen fluoride and traces of Hydrogen cyanide can be released in instances of fire.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity for Tris (1-chloro-2-propyl) phosphate:

Inhalation: LC₅₀: >4.6 mg/l, rat

Ingestion: LD₅₀: >2,800 mg/kg (rat, male/female)

Skin: LD₅₀: >5,000 mg/kg, rat

Acute Toxicity for Diethylene glycol:

Ingestion: LD₅₀: 12,565 mg/kg, rat

Skin: LD₅₀: >1,000 mg/kg, rabbit

Acute Toxicity for Tertiary amine:

Inhalation: LC₅₀: 290ppm, rat, 6h

Ingestion: LD₅₀: 1630 mg/kg, rat

Skin: LD₅₀: 280 mg/kg, rabbit

Acute Toxicity for 1,1,1,2-Tetrafluoroethane:

Inhalation: LC₅₀ >500,000 ppm, rat, 4h

Repeated Dose Toxicity:

Tris (1-chloro-2-propyl) phosphate which is reported to be a weak organophosphate-type cholinesterase inhibitor.

Excessive exposure may produce organophosphate type cholinesterase inhibition. Symptoms may include salivation, sweating, headache, nausea, muscle twitching, incoordination, diarrhea, blurred vision, abdominal cramps, tears, tremors, and chest discomfort. Target organs: kidney, liver, and or sternal bone marrow.

Diethylene glycol (minor component) has been reported to cause effects on human organs: gastrointestinal tract and kidney.

1,1,1,2-Tetrafluoroethane: NOEL 40000ppm, rat

Tertiary Amine: 12ppm, rat, 2 week inhalation, observed corneal opacities. 48ppm, rat, 2week inhalation, cloudy corneas, skin and respiratory tract irritation.

Mixture contains components which have been reported to cause effects on the following animal organs: liver, central nervous system, and bladder.

Chronic Toxicity/ Carcinogenicity: Components did not cause cancer in laboratory animals.

Developmental Toxicity: Diethylene glycol has caused toxicity to the fetus and some birth defects at maternally toxic, high doses in animals.

Genetic Toxicity In vitro: In vitro studies were negative.

12. ECOLOGICAL INFORMATION

Ecological Data for Tris (1-chloro-2-propyl) phosphate:

Acute Toxicity to Fish: LC₅₀: 84mg/l *Lepomis macrochirus* (bluegill), 96 hour exposure

Acute Toxicity to Aquatic Invertebrates: EC₅₀ 63 mg/l *Daphnia magna* (water flea), 48h

Toxicity to Microorganisms: EC₅₀: 784 mg/l, activated sludge, 3h

Ecological Data for Diethylene glycol:

Material is practically non toxic on the acute basis.

Acute Toxicity to Fish: LC₅₀: >1,000mg/l Oncorhynchus mykiss (rainbow trout), 96h

Acute Toxicity to Aquatic Invertebrates: EC₅₀: >48,900 mg/l Daphnia magna (water flea), 48h

Ecological Data for Tertiary amine:

Acute Toxicity to Fish: LC₅₀: 220mg/l Leuciscus idus (golden orfe), 96h

Ecological Data for 1,1,1,2-Tetrafluoroethane:

Accumulation in aquatic organisms is unlikely.

13. DISPOSAL CONSIDERATIONS

Disposable Cylinders:

1. DO NOT INCINERATE TANKS

2. After tanks are empty, the hose must be removed and the tanks must be vented. CAUTION: Tanks will still be under pressure. Turn valves to the off position before removing the hoses. Safety glasses 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, PROVINCIAL, AND LOCAL REGULATIONS. CHECK WITH YOUR LOCAL WASTE DISPOSAL SERVICE FOR GUIDANCE.

14. TRANSPORTATION

Shipping Information

Containers Greater Than 1000 cu. cm. (1 liter)

Ground UN1956 Compressed Gas n.o.s. (Fluorocarbon) 2.2
DOT (Non-Flammable Gas Label)

Air UN1956 Compressed Gas n.o.s. (Fluorocarbon) 2.2
IATA (Non-flammable Gas Label)
Packing Instruction (Cargo & Passenger) 200

Water UN1956 Compressed Gas n.o.s. (Fluorocarbon) 2.2
IMDG (Non-flammable Gas Label)

Note Emergency Response Guide Numbers - Consumer Commodity # 171. For Aerosols and Compressed Gas # 126.

15. REGULATORY

OSHA Hazcom Standard Rating:

Hazardous

WHMIS Classification:

A

D2B

Toxic Substances Control Act (TSCA)/Domestic Substances List (DSL):

All ingredients are listed on the TSCA inventory, as well as the Canadian Domestic Substances List.

SARA Title III: Section 311/312:

Acute Health Hazard, Chronic Health Hazard, Sudden Release of Pressure Hazard

SARA Title III: Section 313:

Does not contain chemical which require reporting requirements of SARA Title III. Applicability must be determined by end user.

State Right-To Know Information: Massachusetts, New Jersey or Pennsylvania Right to Know Substance Lists:

Chemical Name (common names)	CAS Number	Percentage
Diethylene glycol	111-46-6	1 - 5%

California Proposition 65:

Based on information currently available, this product is not known to contain detectable amounts of any chemicals currently listed under California Proposition 65.

16. OTHER

NFPA: Health Hazard 2; Flammability 1; Reactivity 1

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

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.

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“B” COMPONENT

ISSUE DATE: MARCH 2012 Form # TFMDS-002OC

Last revision: March 2012

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Brand: Tiger Foam™ Insulation. This sheet covers the “B” Component of a self-contained, low pressure, portable two-component spray foam insulation kit comprised of an “A” and “B” side tank.

Product Description: Product is a urethane foam component that contains liquefied compressed gas blowing agent (Non-Flammable Compressed Gas). Containers should not be heated 120°F (49°C) to avoid excessive pressure build-up.

Item Numbers Covered: TF1350 and TF450

Note identical packaging with sticker on front to designate contents as being either “A” component or “B” component.

Manufacturer:

COMMERCIAL THERMAL SOLUTIONS, INC.
524 Brighton Ave, Suite 9
Spring Lake, New Jersey 07762

Emergency Overview and Contacts

Product Information: 1-800-664-0063
International Phone: (001) 1+732.927.2090

IN CASE OF EMERGENCY CALL:

Transportation Emergency:
CHEMTREC (Domestic): 1-800-424-9300
CHEMTREC (Int'l): (703)527-3887

Reference: CHEMTREC ACCOUNT # 201586

2. HAZARDS IDENTIFICATION

Emergency Overview

WARNING! EYE, SKIN, LUNG IRRITANT. May be harmful if inhaled. Vapor reduces oxygen available for breathing. May cause lung injury. Respiratory sensitizer. May cause central nervous system effects. May cause liver damage. Toxic gases/fumes may be given off during burning. Pressurized Containers: storage temperature should not exceed 120°F (49°C) in order to avoid excessive pressure build-up and possible release of contents. May cause a temporary fogging of the eyes.

Potential Health Effects

The primary adverse health effects of this product are related to the individual components that make-up the mixture, and the Fluorocarbon (134a) component. Therefore, use in a well ventilated area and with certified respiratory protection to avoid exceeding exposure limits listed in Section 8 of this MSDS.

Effects of Overexposure

Entry Route:

Inhalation: **Tris (1-chloro-2-propyl) phosphate:** Existing medical conditions such as asthma and pulmonary diseases may be aggravated by prolonged exposure. This material is a weak cholinesterase inhibitor. Excessive exposure may result in these symptoms: salivation, sweating, headache, nausea, muscle twitching, incoordination, diarrhea, blurred vision, abdominal cramps, tears, tremor, and chest discomfort.

Ethylene Oxide: Irritating to respiratory system. Avoid breathing vapor or mist.

Tertiary Amine: Can cause severe eye, skin, and respiratory tract burns. May cause nose, throat, and lung irritation. Inhalation of vapors in high concentration may cause irritation of respiratory system.

1,1,1,2-Tetrafluoroethane: Gas reduces oxygen available for breathing. Causes asphyxiation in high concentrations. May cause central nervous system effects. May cause cardiac arrhythmia. Vapors may cause drowsiness and dizziness.

Alkanolamine: May cause nose, throat, and lung irritation. Inhalation of vapors in high concentration may cause irritation of respiratory system.

- Eyes:** **Tris (1-chloro-2-propyl) phosphate:** May cause eye irritation.
Tertiary Amine: Can cause severe eye, skin, and respiratory tract burns.
Ethyl Oxide: Severely irritating to eyes. Do not get into eyes.
1,1,1,2- Tetrafluoroethane: Can cause severe irritation, redness, tearing, and blurred vision.
Alkanolamine: Severe eye irritation. Product vapor in low concentrations can cause lacrimation, conjunctivitis and corneal edema when absorbed into the tissue of the eye from the atmosphere. Corneal edema can cause the perception of “blue haze” or “fog” around lights, although this is a temporary effect and has no know residual effect.
- Skin:** **Tris (1-chloro-2-propyl) phosphate:** Prolonged exposure is unlikely to result in absorption of harmful amounts.
Tertiary Amine: Can cause severe eye, skin, and respiratory tract burns. May cause nose, throat, and lung irritation. Inhalation of vapors in high concentration may cause irritation of respiratory system.
1,1,1,2- Tetrafluoroethane: Irritating to skin, may cause redness, may cause frostbite.
Ethyl Oxide: Slightly irritating to the skin.
Alkanolamine: Prolonged contact may result in chemical burns and permanent damage
- Ingestion:** **Tris (1-chloro-2-propyl) phosphate:** Existing medical conditions such as asthma and pulmonary diseases may be aggravated by prolonged exposure. This material is a weak cholinesterase inhibitor. Excessive exposure may result in these symptoms: salivation, sweating, headache, nausea, muscle twitching, incoordination, diarrhea, blurred vision, abdominal cramps, tears, tremor, and chest discomfort.
Tertiary Amine: Can cause severe eye, skin, and respiratory tract burns. Harmful if swallowed.
Alkanolamine: Harmful if swallowed.
1,1,1,2- Tetrafluoroethane: Unlikely route of exposure. May cause gastrointestinal discomfort.

If accidental contact occurs, follow the appropriate first aid procedure described in Section 4 of this MSDS.

3. COMPOSITION

<u>Chemical Name (common names)</u>	<u>CAS Number</u>	<u>Percentage</u>
Non-Hazardous Polyol Blend	Not Available	30 - 60%
Tris (1-chloro-2-propyl)phosphate	13674-84-5	10 - 30%
1,1,1,2 – Tetrafluoroethane	811-97-2	10 - 30%
Tertiary Amine	3030-47-5	0.5 - 1.5%
Ethylene Oxide	111-46-6	0.5 - 1.5%
Alkanolamine	2212-32-0	1-5%
Surfactants	Not Available	1 - 5%

(NOTE: See Section 8 of this MSDS for Exposure Guidelines)

(NOTE: See Section 11 of this MSDS for Toxicological Information-LC₅₀ and LD₅₀)

4. FIRST AID

- Inhalation:** If breathing difficulty is experienced, move to area free of exposure. Provide fresh air. If necessary, provide oxygen or artificial respiration by trained personnel and obtain medical attention.
- Eye Contact:** Flush with clean water for at least 15 minutes and obtain medical attention.
- Skin Contact:** Use a rag to remove liquid from skin and remove contaminated clothing. Contact may cause mild irritation or temporary darkening of skin. Persistent washing with soap and water will eventually remove all residues. If irritation persists, obtain medical attention.
- Ingestion:** Drink 1 to 3 glasses of water and seek immediate medical attention. Do not induce vomiting. Never give anything orally to an unconscious person.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Dry Chemical, carbon dioxide, Halon 1211, chemical foams, or water spray (if used in large quantities).

Firefighting Procedures: Isolate area. Stay upwind. Water is not recommended unless used in large quantities as a fine spray when other extinguishing agents are not available. The product is equipped with a pressure relief valve which can activate in a high temperature situation. Remove all personnel from the area at the first sound of releasing pressure.

Protective equipment: Wear self-contained breathing apparatus to protect against toxic decomposition by-products, including Carbon monoxide, Carbon dioxide, Nitrogen oxides, Hydrogen fluoride and traces of Hydrogen cyanide. Wear all turn out gear (boots, trousers, helmet, gloves, and hood).

Unusual Fire/Explosion Hazards: High temperatures will raise the pressure in the containers, which may lead to rupturing. Cured foam is organic and, therefore, will burn in the presence of sufficient heat, oxygen and an ignition source. Main hazards associated with burning foam are similar to burning of other organic materials (wood, paper, cotton, etc.) and precautions against exposure should be taken accordingly. Avoid welding or other “hot work” in the vicinity of exposed cured foam.

6. ACCIDENTAL RELEASE MEASURES / DISPOSAL CONSIDERATIONS

Personal Precautions: Evacuate all unnecessary personnel; contain the area if possible. Wear skin, eye, and respiratory protection and equipment (See Section 8). Ventilate the area.

Environmental Precautions: Containment should include preventing the spill from entering drains, sewers, waterways, groundwater, or soil.

Clean Up Procedures/Neutralization: Soak up material with sawdust or vermiculite and dispose of in accordance with all applicable federal, state and local regulations. Wash spill area thoroughly with soap and water. Avoid uncontrolled reactions with isocyanates.

7. HANDLING AND STORAGE INFORMATION

Handling: Use only in a well ventilated area with certified respiratory protection or with a power air purifying respirator (PAPR). Wear protective glasses or goggles, Nitrile gloves, and clothing that protects from dermal exposure. Contents are under pressure. Do not puncture or incinerate.

Storage: Store in a cool, dry place. Ideal storage temperature for disposable kits is 60°F to 80°F (15.5°C to 26.6°C). Storage at less than ideal temperatures can cause delays in production until the product is warmed/cooled to temperature. Do not expose the tanks/kits to open flame or temperatures above 120°F (49°C). Excessive heat can cause premature aging of components resulting in a shorter shelf life. Protect unused product from freezing.

Storage below 55°F (12.7°C) may affect foam quality if chemicals are not warmed to room temperature before using. Protect containers from physical abuse. Always store containers upright. KEEP OUT OF REACH OF CHILDREN.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Read all product instructions before using.

Personal Protective Equipment

Respiratory Protection: Use products only in a well ventilated area. 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 (N95). 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). Use local and general exhaust ventilation to control levels of exposure.

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.

Eye Protection: Use safety glasses with side shields or goggles. An eye wash station or portable eye wash bottle should be in the area.

Skin Protection: Avoid contact with skin. Use clothing that protects against dermal exposure. To ensure proper skin protection, wear PPE in such a manner that no skin is exposed.

General Hygiene: Do not eat, drink, or smoke while handling this product. Always use in well ventilated area. Wash after handling. Do not breathe vapors. Avoid contact with skin and hands.

Exposure Guidelines

1,1,1,2 - Tetrafluoroethane WEEL 1,000 ppm 4,240 mg/m³

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Light yellow to amber colored liquid. Froths to an off white to yellowish color when released from the container. (Note: Appearance may differ with the introduction of a dye/colorant.)
Odor:	Slight fluorocarbon and amine odor
pH:	Not available
Melting/Freezing Point:	Not available
Boiling Point:	1,1,1,2 – Tetrafluoroethane (Non-Flammable Compressed Gas, HFC Fluorocarbon 134a) boils at -15°F (-26°C). Other components boil at temperatures greater than 200°F (93.3°C).
Flash Point:	1,1,1,2 - Tetrafluoroethane (HFC 134a); none. Other components – not determined.
Specific Gravity:	Approximately 1.2 (H ₂ O = 1) at 25°C
Solubility:	Water: Partly soluble, does not react.
Partition Coefficient N-octanol/water:	Not available
Auto-ignition Temperature:	Not available
Decomposition Temperature:	Not available
Odor Threshold:	Not available
Evaporation Rate:	Not available
Flammability:	Non flammable propellant
Flammability Limits:	Not available
Vapor Pressure:	Contents under pressure have vapor pressure greater than 50 psig/345 kPa. .
Vapor Density:	Not available

10. STABILITY AND REACTIVITY

Stability: This product is considered stable under normal and anticipated storage and handling conditions. Do not store above 120°F (49°C). For longest shelf life, avoid storage above 90°F (32.2°C).

Materials to Avoid: Alcohols, strong bases or amines, metal compounds, ammonia, strong oxidizers.

Conditions to Avoid: High temperatures will raise the pressure in the containers, which may lead to rupturing. Product use is temperature sensitive. Avoid temperatures below 40°F (5°C) or temperatures above 95°F (35°C).

Thermal Decomposition: Toxic decomposition by-products, including Carbon monoxide, Carbon dioxide, Nitrogen oxides, Hydrogen fluoride and traces of Hydrogen cyanide can be released in instances of fire.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity for Tris (1-chloro-2-propyl) phosphate:

Ingestion: LD50: 2,800 mg/kg (rat, male/female)

Skin: LD50: >5,000 mg/kg, rat

Inhalation: LC50: >4.6 mg/l, rat

Acute Toxicity for Ethylene Oxide:

Ingestion: LD50: 2,000-5,000 mg/kg, rat

Skin: LD50: >2,000 mg/kg, rabbit

Acute Toxicity for Tertiary amine:

Ingestion: LD50: 1630 mg/kg, rat

Skin: LD50: 280 mg/kg, rabbit

Inhalation: LC50: 290ppm, rat, 6h

Acute Toxicity for 1,1,1,2-Tetrafluoroethane:

Inhalation: LC50 >500,000 ppm, rat, 4h

Acute Toxicity for Alkanolamine:

Ingestion: LD50: >1,580 mg/kg, rat

Skin: LD50: >2,000 mg/kg, rabbit

Inhalation: LC50: >20 mg/l, rat, 1h

Repeated Dose Toxicity:

Tris (1-chloro-2-propyl) phosphate which is reported to be a weak organophosphate-type cholinesterase inhibitor. Excessive exposure may produce organophosphate type cholinesterase inhibition. Symptoms may include salivation, sweating, headache, nausea, muscle twitching, incoordination, diarrhea, blurred vision, abdominal cramps, tears, tremors, and chest discomfort. Target organs: kidney, liver, and or sternal bone marrow.

1,1,1,2-Tetrafluoroethane: NOEL 40000ppm, rat

Tertiary Amine: 12ppm, rat, 2 week inhalation, observed corneal opacities. 48ppm, rat, 2week inhalation, cloudy corneas, skin and respiratory tract irritation.

Mixture contains components which have been reported to cause effects on the following animal organs: liver, central nervous system, and bladder.

Chronic Toxicity/ Carcinogenicity: Components did not cause cancer in laboratory animals.

Developmental Toxicity: Diethylene glycol has caused toxicity to the fetus and some birth defects at maternally toxic, high doses in animals.

Genetic Toxicity In vitro: In vitro studies were negative.

12. ECOLOGICAL INFORMATION

Ecological Data for Tris (1-chloro-2-propyl) phosphate:

Acute Toxicity to Fish: LC50: 84mg/l *Lepomis macrochirus* (bluegill), 96 hour exposure

Acute Toxicity to Aquatic Invertebrates: EC50 63 mg/l *Daphnia magna* (water flea), 48h

Toxicity to Microorganisms: EC50: 784 mg/l, activated sludge, 3h

Ecological Data for Ethylene Oxide:

No data available

Ecological Data for Tertiary amine:

Acute Toxicity to Fish: LC50: 220mg/l *Leuciscus idus* (golden orfe), 96h

Ecological Data for Alkanolamine:

No data available

Ecological Data for 1,1,1,2-Tetrafluoroethane

Accumulation in aquatic organisms is unlikely.

13. DISPOSAL CONSIDERATIONS

Disposable Cylinders:

1. DO NOT INCINERATE TANKS

2. After tanks are empty, the hose must be removed and the tanks must be vented. 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, PROVINCIAL, AND LOCAL REGULATIONS. CHECK WITH YOUR LOCAL WASTE DISPOSAL SERVICE FOR GUIDANCE.

14. TRANSPORTATION

Shipping Information

Containers Greater Than 1000 cu. cm. (1 liter)

Ground UN1956 Compressed Gas n.o.s. (Fluorocarbon) 2.2

DOT (Non-Flammable Gas Label)

Air UN1956 Compressed Gas n.o.s. (Fluorocarbon) 2.2

IATA (Non-flammable Gas Label)

Packing Instruction (Cargo & Passenger) 200

Water UN1956 Compressed Gas n.o.s. (Fluorocarbon) 2.2

IMDG (Non-flammable Gas Label)

15. REGULATORY

OSHA Hazcom Standard Rating:

Hazardous

WHMIS Classification:

A

D2B

Toxic Substances Control Act (TSCA)/Domestic Substances List (DSL):

All ingredients are listed on the TSCA inventory, as well as the Canadian Domestic Substances List.

SARA Title III: Section 311/312:

Acute Health Hazard, Chronic Health Hazard, Sudden Release of Pressure Hazard

SARA Title III: Section 313:

Does not contain chemicals which require reporting requirements of SARATitle III. Applicability must be determined by end user.

California Proposition 65:

This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

<u>Ingredient</u>	<u>Cancer</u>	<u>Reproductive</u>	<u>No Significant risk level</u>	<u>Maximum acceptable dosage level</u>
Ethylene	Yes	Yes	Yes	Yes

16. OTHER

NFPA: Health Hazard 2; Flammability 1; Reactivity 1

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

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.

LAST REVISION: MARCH 2012

BASED ON INFORMATION SUPPLIED BY MANUFACTURER



ISSUE DATE: SEPTEMBER 2011 Form # TFMDS-100

Last revision: September 1, 2011 2011

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Brand: Tiger Foam™ Ignition Barrier

Chemical Product: Intumescent Latex Coating

Manufacturer:

COMMERCIAL THERMAL SOLUTIONS, INC.
524 Brighton Ave, Suite 9
Spring Lake, New Jersey 07762

Emergency Overview and Contacts

Product Information: 1-800-664-0063
International Phone: (001) 1+732.927.2090

IN CASE OF EMERGENCY CALL:

Transportation Emergency:
CHEMTREC (Domestic): 1-800-424-9300
CHEMTREC (Int'l): (703)527-38873

*Tiger Foam™ Ignition Barrier is registered by the manufacturer, COMMERCIAL THERMAL SOLUTIONS, INC.

2. HAZARDS IDENTIFICATION

Emergency Overview

WARNING! EYE, SKIN, LUNG IRRITANT. May cause eye irritation. May cause skin irritation. Repeated exposure may cause allergic skin reaction. Skin sensitizer. Possible stomach irritation and nausea if swallowed.

Potential Health Effects

Use in a well ventilated area and with certified respiratory protection to avoid irritation.

Effects of Overexposure

Entry Route:

Inhalation: Short term exposure may cause irritation of nose, throat, and lungs.

Eyes: Causes irritation. Repeated exposure may cause allergic dermatitis.

Skin: Causes irritation. Repeated exposure may cause allergic dermatitis.

Ingestion: Possible stomach irritation and nausea. No other harmful effects anticipated.

If accidental contact occurs, follow the appropriate first aid procedure described in Section 4 of this MSDS.

3. COMPOSITION

<u>Chemical Name (common names)</u>	<u>CAS Number</u>	<u>Percentage</u>
Triamini-s-triazine	108-78-01	0 - 10%
Other Materials	Not Regulated	60 - 100%

(NOTE: See Section 8 of this MSDS for Exposure Guidelines)

(NOTE: See Section 11 of this MSDS for Toxicological Information- LC₅₀ and LD₅₀)

4. FIRST AID

Inhalation: If breathing difficulty is experienced, move to area free of exposure. Provide fresh air. If necessary, provide oxygen or artificial respiration by trained personnel and obtain medical attention.

Eye Contact: Flush with clean water for at least 15 minutes and obtain medical attention.

Skin Contact: Use a rag to remove liquid from skin and remove contaminated clothing. Contact may cause mild irritation or temporary darkening of skin. Persistent washing with soap and water will eventually remove all residues. If irritation persists, obtain medical attention.

Ingestion: Drink 1 to 3 glasses of water and seek immediate medical attention. Do not induce vomiting. Never give anything orally to an unconscious person.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Dry Chemical, carbon dioxide, or alcohol foam.

Firefighting Procedures: Wear self-contained breathing apparatus. Wear all turn out gear (boots, trousers, helmet, gloves, and hood).

Unusual Fire/Explosion Hazards: Dried solid residue is slightly combustible.

6. ACCIDENTAL RELEASE MEASURES / DISPOSAL CONSIDERATIONS

Personal Precautions: Evacuate all unnecessary personnel; contain the area if possible. Wear skin, eye, and respiratory protection and equipment. Ventilate the area.

Environmental Precautions: Containment should include preventing the spill from entering drains, sewers, waterways, groundwater, or soil.

Clean Up Procedures/Neutralization: Use Soap and Water to clean-up. Material may need to be placed in a container prior to disposal. Contact local waste disposal for guidance.

7. HANDLING AND STORAGE INFORMATION

Handling: Use only in a well ventilated area with certified respiratory protection or with a power air purifying respirator (PAPR). Wear protective glasses or goggles, neoprene gloves, and clothing that protects from dermal exposure.

Storage: Store at or between 40°F to 90°F (5°C to 32°C) and keep out of direct sunlight. DO **NOT** allow product to freeze. KEEP OUT OF REACH OF CHILDREN.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Read all product instructions before using.

Personal Protective Equipment

Respiratory Protection: Use products only in a well ventilated area. If applying the product with an airless sprayer, a NIOSH approved air purifying respirator equipped with an organic vapor cartridge and a particulate filter. If applying in a confined space or in an area with little or no ventilation 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).

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.

Eye Protection: Use safety glasses or goggles. An eye wash station or portable eye wash bottle should be in the area.

Skin Protection: Avoid contact with skin. Use clothing that protects against dermal exposure.

General Hygiene: Do not eat, drink, or smoke while handling this product. Always use in well ventilated area. Wash after handling. Do not breathe vapors. Avoid contact with skin and hands.

Exposure Guidelines

Triamini-s-triazine	<u>OSHA</u>	Not Available
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(None of the components in this product are listed by IARC, NTP, OSHA or ACGIH as a carcinogen).

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Opaque Liquid
Odor:	Low VOC paint-like odor
pH:	7-8
Melting/Freezing Point:	32° F
Boiling Point:	212° F
Flash Point:	Not Available
Specific Gravity:	1.25
Solubility:	Not Available
Partition Coefficient N-octanol/water:	Not Available
Auto-ignition Temperature:	Not Available
Decomposition Temperature:	Not Available
Odor Threshold:	Not Available
Evaporation Rate:	Not Available
Flammability:	Not Available
Flammability Limits:	Not Available
Vapor Pressure:	Not Available
Vapor Density:	Not Available

10. STABILITY AND REACTIVITY

Stability: This product is considered stable under normal and anticipated storage and handling conditions.

Materials to Avoid: Strong oxidizers.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity:

Inhalation: Not Available

Ingestion: Not Available

Skin: Not Available

12. ECOLOGICAL INFORMATION

Not Available

13. DISPOSAL CONSIDERATIONS

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

Pails and lids are recyclable HDPE 2 plastic. Check with your local waste disposal service for recycling guidance.

14. TRANSPORTATION

Shipping Information

Containers Greater Than 1000 cu. cm. (1 liter)

Ground **NON-REGULATED GOODS**

DOT

Air

NON-REGULATED GOODS

IATA

Water **NON-REGULATED GOODS**

IMDG

15. REGULATORY

OSHA Hazcom Standard Rating:

Non Hazardous Material

16. OTHER

NFPA: Health Hazard 1; Flammability 1; Reactivity 0

HMIS III: Health 1; Flammability 1; Physical Hazard 0

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.

LAST REVISION: September 2011 TFMSDS-100

BASED ON INFORMATION SUPPLIED BY MANUFACTURER

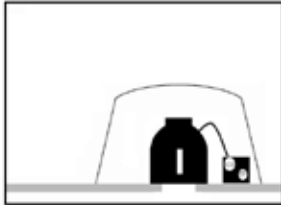


Installation and Safety Instructions

MODEL TC130 RECESSED LIGHT COVER

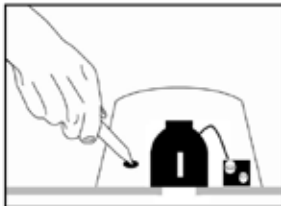
Step 1

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.



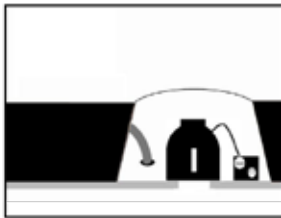
Step 2

If necessary, slit the cover to fit over the hanger bars and the wiring of the fixture.



Step 3

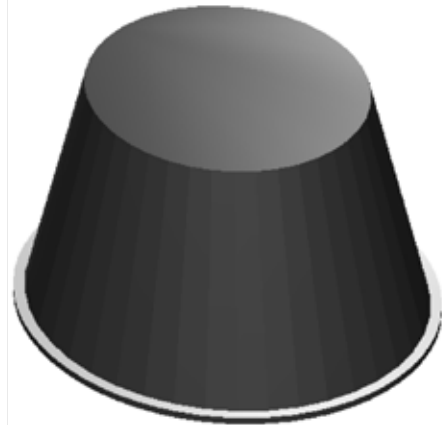
The Tiger Foam TC-130 Recessed Light Cover is compatible with all kind of insulation, including sprayed foam, mineral wool, fiber glass and blown-in cellulose.



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



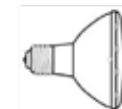
MAXIMUM LAMP WATTAGE AND TYPE

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

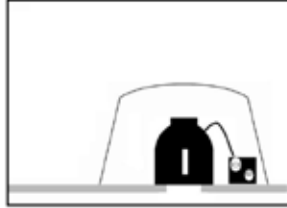
• International Phone: (001) 1+732.927.2090

• International Fax: (001) 1+732.927.2091

MODEL TC-135 RECESSED LIGHT COVER

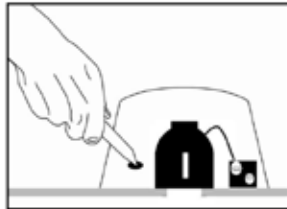
Step 1

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.



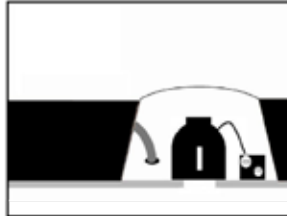
Step 2

If necessary, slit the cover to fit over the hanger bars and the wiring of the fixture.



Step 3

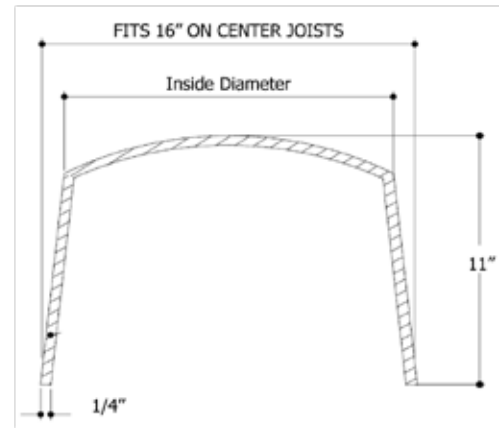
The Tiger Foam TC-135 Recessed Light Cover is compatible with all kind of insulation, including sprayed foam, mineral wool, fiber glass and blown-in cellulose.



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.

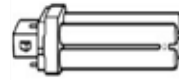
Model Number	Inside Height	Inside Diameter
TC135	10 3/4"	16 1/2"

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

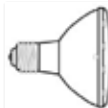
13W

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

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• International Phone: (001) 1+732.927.2090

• International Fax: (001) 1+732.927.2091

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

Toll Free 800-664-0063

International (001) +1-732-927-2090

Fax Number: (877) 415-1185

International Fax : (001) 1 +732.927.2091

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INSULATION

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INSULATION

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SPRAY POLYURETHANE FOAM INSULATION

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