DURATEX® FABRICATION GUIDE

GRIMCO®

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TESTING IS RECOMMENDED TO ENSURE SUITABILITY FOR THE PROPOSED APPLICATION AND FABRICATION BEFORE FULL-SCALE COMMERCIALIZATION.

Duratex Foamboard is suitable for a wide variety of application and fabrication methods. It can be mounted on or direct printed. It can be easily cut with knife like tools or open edge die cutting.

Applications

- POP Displays
- Exhibits & Fixtures
- Framing
- Interior Signs

MOUNTING

Mounting is defined as the attachment of the graphic to the substrate.

Lamination is the application of a covering (film or liquid) over the mounted item to either protect the graphic or provide a certain appearance i.e. matte or glossy finish.

Bonding also conveys affixing one thing to another. This can involve a graphic to a substrate or one substrate to another.

In regard to adhesive, mounting consideration should follow the adhesive manufacturer's instructions. It is advisable to leave the boards for a period of time to setup. Consult the adhesive manufacturer's instructions to see what specific times are recommended.

Methods for Mounting

- Hot mounting provides a heat source to activate the adhesive. Typically, this is accomplished with a heat source associated with either a vacuum press or a roller press.
- Cold mounting typically utilizes a spray or pressure-sensitive film or coating in combination with a roller press. Printed papers, foils, and fabrics can all be mounted to the substrate provided that the proper types of adhesives are selected.

Mounting can be accomplished on most standard equipment capable of applying adhesive and laminating sheets or roll stock to rigid boards.

Surface Preparation

Surface should be cleaned and free of any surface contaminates (i.e. oils, dust particles, etc.) prior to commencing.

Considerations

- Care should be taken when using laminate films on only one side of the mounted graphic. Moisture pickup will be sealed on one side while the other side in not protected from moisture pickup. Bowing may occur because of moisture imbalance.
- Care should be taken when mounting only one side with spray adhesives. As the mount cures out, tensile forces within the adhesive may cause the substrate to bow. It may be necessary to apply a counter-mount of comparable strength on the backside.

Considerations Continued

- Use the minimum amount of tension when mounting with film or pressure sensitive adhesives as too much tension will cause the substrate to bow; too little will cause the graphic to wrinkle.

Hot Mounting

Duratex Foamboard can be hot mounted utilizing dry mount tissues or you can use Duratex Foamboard Heat Activated.

The following settings are recommendations; trialing is necessary before commercialization:

- Maximum temperature not to exceed 190°F.
- Maximum time not to exceed two-to-three minutes
- Panels in excess of 3/16" should be placed in the press and pre-heated prior to mounting
- Be sure to follow the adhesive supplier's recommendations.

Duratex Heat Activated has a low activation temperature that is designed to protect the art-work/graphic from heat damage, so there is no need to increase heat to achieve proper adhesion. The heat and dwell times should remain at the recommended levels to get the best results. *Excessive high heat can cause the adhesive to boil out the adhesive and can damage the graphic, the laminate, or the substrate.

Conditions can vary depending on: the thickness of the graphic, the type of graphic (paper, vinyl, cloth, etc.) to be mounted and the use of a laminate film over the graphic. Trialing FOME-COR SINGLESTEP Heat-Activated with various types and thicknesses of graphic material and laminating film is recommended.

Type of Dry Mount Equipment	Temperature & Time Duration*
Vacuum Press	165° to 170°F 2 to 2½ minutes
Roll Laminator	Roller Temperature 225° to 230°F Roll Speed 2-3 feet/minute

*Trialing graphic material and any laminating film is recommended for best results. Temperatures and speeds may vary depending on equipment.

Steps for Mounting with Duratex Heat-Activated

1. Preheat equipment – keep your equipment calibrated to ensure proper temperature control.
2. Align the graphic to the Heat-Activated substrate. The adhesive faces the underside of the graphic.
3. Protect the graphic and press with the provided release liner. The release liner may be used more than once.
4. Set the temperature and determine dwell time before running the project. (Trialing the graphic material and any laminating film is recommended for best results.)
5. Run the mount.
6. For best results, allow the mounted graphic to cool approximately 30 seconds to enhance the bond. Place weight on the mounted panel during the cooling period to ensure the panel will lie flat as it stabilizes to room temperature.

Cold Mounting:

Getting Good Adhesion

- To cold mount pressure-sensitive adhesives, you need sufficient pressure. You also must make sure that proper spacers are used. Because effective mounting depends on equal force exerted across the entire width of the substrate being mounted, the top roll must move down evenly left and right. Even contact between the top and the bottom mounting rolls is essential. It is recommended that the clearance of the mounting rolls be adjusted so that the substrate is compressed slightly (0.010" – 0.020") to assure a good bond.
- Adequate pressure helps squeeze out air from between the adhesive, the substrate and the print.
- The mount obtained after 3 hours will generally allow for processing. Maximum mount is usually obtained within 24 hours after mounting.
- To test adhesion, flex the finished mount. It should not come loose in the center.
- Moisture can become trapped between layers of porous material (such as paper) and cause blisters. The level of moisture in the atmosphere should be reduced before press work. Prints may even have to be pre-dried.
- When tacking prints to the substrate, some shops will hang a number of tacked pieces in an upside-down position until they are ready to pass them through. As a precaution, it is advisable not to hold them any longer than 10 minutes or the prints may absorb moisture, change in dimension and cause bubbles and wrinkles.
- Please contact the film manufacturer for recommendations concerning the use of their respective laminating material in conjunction with the substrate as film choice is the most important consideration.
- It is advisable to use a film with a high "green tack" strength. When using pressure sensitive films, the substrate should be at room temperature to achieve optimal results.

Demounting Bad Mounts

- Pressure-sensitive adhesives may be demounted if done within 5 minutes after mounting. The print will probably be ruined, but the substrate may be reused.
- Beyond 5 minutes, the adhesive has set, and other methods will have to be used, such as a hot air gun or a hair dryer to peel off the laminate. The remaining adhesive may be taken off with isopropyl alcohol or mineral spirits.

Avoiding Wrinkles & Surface Blemishes

- Wrinkles can be caused by misalignment of adhesive roll, too much pressure, or unparallel rolls.
- Small bumps, particularly visible with Cibachrome or glossy prints, are caused by trapped dirt or hardened adhesive. Good housekeeping and an ionizing static eliminator on the press are important to minimize dirt pick-up.
- During mounting, the back of the print should be checked and wiped down before it is processed. If bumps are caused by hardened adhesive (cut open to check), use a fresh roll or sheet of transfer adhesive. To prevent strikethrough, consider using a print made with thicker paper (.007+).
- Pressure roller applicators can compress the leading edge of the mounting substrate. In order to keep the leading edge from rounding as it goes through the roller, use a plastic lead or guide of the same thickness of the mounted substrate.

Clear Overlays

- Clear high-gloss overlays enhance color and protect against fading indoors and outdoors. To avoid blistering, do not use overlays, clear coatings, or sprays which contain solvents.

Cold Mounting Procedures:

Cold Mounting by Hand Using Transfer Adhesive

- Take a sheet of transfer adhesive (both sides covered by release paper) and fold back release paper on one side approximately 1/2" from one edge.
- Tack on edge of print to exposed adhesive.
- Lift the print slightly, remove the rest of the release paper and use a roller or squeegee to smooth the print onto the adhesive. The back of the print is now coated with an adhesive which is protected by release paper.
- Before mounting to the substrate, remove excess air between print and adhesive. This is done by turning the print over so that the release paper is up and smoothing out from the center with a squeegee.
- Now peel off approximately 1/2"–1" of release paper from upper edge and fold back.
- Tack on to the substrate, lining up edges.
- Using a hand roller or squeegee, closely follow the removal of the liner to eliminate bubbles caused by air entrapment. Work with a small surface at a time (approximately 12"). Continue this step until the mounting is complete.

Cold Mounting by Hand or Press Using Spray Adhesive

- Select a spray mounting adhesive that is safe to use with polystyrene and the artwork to be mounted; solvent based adhesives should be used with caution.
- Spray adhesive on the back of the piece to be mounted. Spray 6"– 8" away from the surface. A double coat is best, with the second coat applied in a cross direction to the first coat. For mounting most art materials, adhesive need only be applied to one surface, preferably the print. Avoid using excessive bonding adhesive.
- Before mounting, allow adhesive to dry to the touch; the adhesive must be aggressively tacky. If there are blisters due to trapped solvent, allow slightly longer than 4 minutes of drying time.
- Carefully position piece on the substrate and smooth out if possible, to eliminate any wrinkles and trapped solvent.
- If using a press, simply turn on the press to complete the mount.
- If mounting is done by hand, place a clean sheet of the substrate over the laminated piece and weigh down for 15 minutes to obtain the maximum bond. Depending upon the type of adhesive, allow 24 hours for maximum cure out before exposing the laminate to sudden temperature or humidity changes.

Cold Mounting by Roller Laminator with an Adhesive-backed Graphic

- Adjust the rollers to slightly compress the substrate to provide adequate pressure for mounting.
- Peel off a 1/2"– 1" section of release paper from the upper edge of the preprinted adhesive backed paper.
- Tack on to the substrate, lining up edges.
- Feed tacked edge into nip of rollers keeping printed piece bent away from the substrate.
- As it passes through the rollers, strip away the release paper. (Make sure there are no wrinkles or trapped dirt.)

Cold Mounting Non-Porous Graphics

For non-porous material such as PVC, other plastics or metal, the following types of contact adhesive with solvent may be used.

- Neoprene, nitrile, polyurethane or other synthetic rubber types.
- Adhesive must be applied to both faces. Parallel beads of adhesive are often preferred because it allows evaporation of solvent providing faster cure.
- For mounting the substrate to flexible PVC sheets, only plasticizer-resistant types of adhesives should be used.

Cold Mounting Porous Graphics

For porous materials such as paper, textiles, fabrics or wood, the following adhesives may be used.

- Contact adhesive with solvent: Same systems as for non-porous materials.
- Construction mastic, structural silicone adhesives.
- Considerations such as expected temperature ranges (expansion/contraction), porous material, and size of substrate should be taken into careful consideration when deciding on a method of attachment.

Cold Mounting with Pressure Sensitive Tapes

Pressure sensitive tapes can be used for:

- Less demanding applications that are stress-free.
- Adhering parts during installation work.
- Holding parts while the primary adhesive is curing.
- It is recommended to trial pressure sensitive tapes prior to use.

DIGITAL PRINTING

Large format digital printing on flatbed printers has excellent application for the substrate. Duratex Foamboard heat Activated and High Tack are not recommended for this fabrication method.

Surface Preparation

Surface should be cleaned and free of any surface contaminates (i.e. oils, dust particles, etc.) prior to beginning.

Ink

The substrate readily accepts all types of inks including:

- Aqueous
- Solvent-Based
- UV-Curable

*Actual ink type depends upon the printer make and model. Consult the printer owner's manual for recommendations. Trialing for ink compatibility is always recommended.

SCREEN PRINTING

Large format screen printing has excellent application for the substrate. Duratex Foamboard Heat Activated, and High Tack are not recommended for this fabrication method.

Surface Preparation

Surface should be cleaned and free of any surface contaminates (i.e. oils, dust particles, etc.) prior to beginning.

Ink

The substrate readily accepts all types of inks including:

- Vinyl/Acrylic
- Solvent-Based
- UV-Curable

Screen Printing inks should be tested in a manner which duplicates your printing process before initiating production. It is advised that you contact the equipment and ink supplier to provide you with specific recommendations to achieve maximum results.

Ink Curing

The ink, once applied, must be given proper time and treatment to completely adhere and cure. Oven temperature must be controlled to a maximum of 180°F to prevent deterioration of the foam and possible warping.

PAINTING

Surface Preparation

Surface should be cleaned and free of any surface contaminates (i.e. oils, dust particles, etc.) prior to beginning.

Suitable Paints

- Poster colors
- Acrylic paints
- Tempera
- India ink
- Latex-based pigments
- Lacquers
- Vinyls
- Some water-based paints may also be suitable, depending upon the application.

Suitable Paints Continued

Lacquers, shellacs, and solvent-based paints should be used only when not allowed to penetrate the liner or contact the foam edge. The types of paints are likely to attack and deteriorate the polystyrene foam.

When coating the majority of one side of the substrate, the backside should also be coated to maintain more perfect long-term flatness. Place weights at the edges when allowing the substrate to dry. Heavy paint coating will warp the substrate; therefore, it is advisable to trial the paint coating to determine the proper coat thickness before proceeding to production.

Application

Paints can usually be applied with a brush or roller; however conventional air spray equipment will provide a more consistent appearance.

Consult paint manufacturer's literature for recommended application technique and thinning requirements.

Drying

For drying and cure times, consult paint manufacturer's literature.

Due to the wide variety of paint products on the market, testing is recommended for the initial use of any coating system before commercialization.

CUTTING

Knife Cutting

The substrate can be cut by hand with mat knives, utility knives, and razor blades. Mat cutters make smooth, excellent cuts, either right-angled or beveled. Cardboard and glass cutters also work well. The key to getting a smooth, clean cut is to use a very sharp thin blade held at as low an angle as possible to the board, which reduces friction and allows the foam to slice rather than tear. If a straight edge is being used as a guide, it may be practical to make the cut in more than one pass which also helps eliminate any foam tearing.

Shearing

Though not generally recommended because they can compress and fray the edges of the board, a guillotine cutter can be used to cut one or more sheets at a time. Caution must be observed to prevent the foot-clamp from indenting the board's edge. A stop block placed on each side of the foot-clamp may be necessary. A sheet of cardboard on top of the substrate may reduce compression. The blade must be maintained sharp and cut with a scissor-like motion.

Saw Cutting

Saw cutting is generally not recommended for paper-faced foam board cutting. However, some custom saw blades can be utilized. General Saw Company makes a blade for this use. Other manufacturers make thin-rimmed, high-speed carbide-tipped plastic cutting blades (72-80 25° alternating teeth on a 10" blade) acceptable for cutting the substrate.

Band Saws

- Band saws with a similar tooth design and a linear speed approximating 9000 ft/min can be used.
- Trialing this type of cutting is a must to ensure the cut meets the desired customer result.

Saw Cutting Continued

Intricate Shapes

- Cutting intricate curves and shapes can be accomplished with a Cutawl model K-11 power tool.
- Cutawl 21D or 23D blades are available for cutting the substrate.

Routing

The substrate is not recommended for this fabrication method.

Die Cutting/Punching

Die cutting and/or Punching is a method for the rapid production of flat shapes or cutouts. Typical applications would include the die cutting of:

- Letters and shapes.
- Openings in a sheet used as part of an assembly.
- Puzzle pieces.
- 3D assemblies - die cutting part-way through to form hinges. Hinges can be reinforced by Mylar Tape. The flat die-cut piece can be folded into a three-dimensional shape such as a picture frame or display.

Die cutting and punching processes are similar in that they both can provide a curved shape by cutting through a substrate. Die cutting, however, uses one steel rule die that comes in contact with a flat platen, whereas a punch has two designed shapes; a male and a female that cut the shape when pressed together.

Die cutting is typically used with lighter weight paper or foam type materials, where punches are used for heavier materials. The die cut process can utilize one of the unique features of the substrate; edge pillowing (not including FOME-COR with ENCORE Technology).

Prior to die cutting, the substrate can be painted or screen printed.

A Note on Punching

The substrate does not require “punching” tools, as die cutting works very well.

Steel Rule Die Cutting Process

Cutting with steel rule dies (SRD) is the most common, which work basically the same way as a cookie cutter. SRD are made of a 1”- wide strip steel with one pre-sharpened edge. The cut strips are called “rules.” The strip steel is typically made in a thickness range of .014”– .166”. The strips are bent to the shape of the design’s trim line and held in place in a block called a “die body.”

- In order to facilitate ejection of the part, strips of a compressible material such as neoprene are glued along the perimeter and protrude above the cutting edge of the rule. The strips can also be glued to the top or bottom platen to hold the substrate in position.
- During die cutting, the SRD assembly is fixed under the top platen, and the substrate is placed on a steel bottom platen. Pressure is applied to force the rules of the SRD through the often preheated-substrate.
- The platens are then opened, and the parts removed. In some cases, additional work such as finishing the cut edge might be required.

Steel Rule Die Cutting Process Continued

The key elements to consider when die cutting are:

- The Substrate
- The Press
- The Steel Rules
- Ejection Rubber

Substrate Considerations:

- Duratex Foamboard consists of top and bottom linerboard layers and a polystyrene core. This laminated structure results in some unique considerations for die cutting, as each layer of the substrate is sequentially cut.
- The paper is the critical part of the laminate, which creates challenges while die cutting. Linerboard is a rigid product and is not flexible or ductile. Linerboard does not tend to stretch easily, and as a result, the top liner can tend to crack if improperly die cut.
- All machine-produced papers have a "grain". The grain runs along the length on the paper as it is manufactured. The grain direction is often referred to as the "machine direction". The opposite direction is referred to as the "cross machine direction". The properties of the paper are different in the machine direction vs. the cross machine direction. Paper is more rigid and will stretch less in the machine direction. Paper cuts more easily along the grain rather than across the grain.
- The foam core of Duratex Foamboard will not remain crushed when die cut, instead recovering to assume its original thickness and reveal open, clean cut edges.

Press Considerations:

- The substrate is typically die cut on flat bed presses, which can be either a "moving platen" type or a "clam shell" type.
- The key press consideration is proper "make ready",or preparing the press bed (anvil) to assure that the steel rule cuts evenly through the substrate without dulling the steel rules.
- Typically, the substrate is cut on a "hard anvil."
- "Make ready" for this type of die cutting utilizes carbon paper.
    - The press is lowered to the point where the steel rule just touches the anvil.
    - The places where the rule fails to touch the anvil are built up with 1 mil thick shim-tape.
    - This process is repeated until a complete imprint of the steel rule is apparent.

"Make ready" is very important because the platen of the press does not necessarily close evenly. This can be caused by misalignment, uneven cutting loads or by deflection of the platen. As a rule of thumb, a four-post press will deflect one mil per foot. Steel rules that have been dulled by improper make ready will cut poorly, have increased cutting loads and can contribute to cracking problems.

Back-Up Plate

One problem with steel plates is that the die might not completely penetrate the substrate which can result in fracturing at the base of the cut. An alternative to a steel plate would be to use additional substrate or chipboard as a back-up. This would allow the die to penetrate beyond the thickness of the substrate so that a cleaner cut could be obtained.

Steel Rule Considerations

Steel rules are flat strips of steel with a uniform height. One edge of the steel rule is honed to yield a cutting surface. The key properties of cutting rules are hardness, flexibility, bevel type, thickness, uniformity of height and edge preparation.

1. Steel Rules That Apply To This Substrate are Listed Below:

Cutting Rules

- Most common when die cutting the substrate. These rules are used to cut the edge. Cutting rules are either center bevel or side bevel, which indicates where the cutting edge is located.
- Center bevel rules result in equal forces being placed on both sides of the piece to be cut and are used when both the inside and the outside of a cut needs to be saved, e.g., as in a puzzle. This distribution of forces can be important when attempting to minimize cracking.
- Side bevel rules have one side that is essentially flat and the opposite side is sloped or beveled. The flat side should be placed toward the substrate that will be kept, with the bevel facing the scrap piece. This results in additional compressive force being placed on the scrap side. Cracking tends to be directed in this direction.

Scoring or Creasing Rules

- Scoring or creasing rules are used to create a fold line in paper-faced substrates. Scoring rules are shorter than standard rules. These rules cut through the top liner but leave the bottom liner intact. This technique is also referred to as slit scoring or “short knifing”. This method is often used when additional materials are laminated to the substrate.
- Duratex Foamboard has the ability to crease cleanly. Creasing rules create a crease line on the top of the liner. Creasing rules should have curved edges and be shorter than cutting rules. The substrate is generally creased without the use of a matrix. Wider creasing rules make folding the substrate easier.

Serrated & Perforating Rules

- Serrated and Perforating rules have “teeth”, much like saw. The points of the teeth puncture the substrate, whereas the lower points of the teeth do not. This leaves a perforated edge in the substrate that can easily be torn by hand.

2. THE EDGE OF THE STEEL RULE CAN BE PREPARED IN EITHER TWO METHODS:

Grinding

- Ground edge rules have micro-scratches on the cutting edge. This can result in a blade that has a reduced cutting force.
- The disadvantage of this type of rule is that it is difficult to maintain the uniform blade height.

Drawn Edges

- Drawn edge blades are made by drawing the blade through a die.
- This produces a uniform blade height and a smooth blade surface.

After numerous die cuts, the cutting edge will become dull and may result in rough and/or incomplete cuts. Generally, it is not a good idea to resharpen the knives. Resharpening will often result in an uneven knife length. This in turn can cause uneven penetration or no penetration when the cut is made.

3. Length of Bevel

A long bevel will result in less deformation as the substrate is sheared. The length of the bevel is defined as the distance from the tip to the point where the honed (beveled) portion ends. The bevel should be 3/16"– 1/4" in length.

Strippers/Ejectors

- Ejection and stripping rubber is essential when cutting the substrate. It serves two purposes. The first purpose is to eject the part from the die after the press opens. The second purpose is to prevent cracking.
- When designing the figure to be die cut into Duratex Foamboard, it is best to avoid sharp corners and narrow spaces. A minimum distance of 1 inch is recommended between pieces. When sharp corners cannot be avoided, additional, very soft, foam rubber should be added on top of the ejection rubber to avoid localized cracking.

STORAGE GUIDELINES

Store in well-ventilated areas. Handling and storage near open flames must be avoided. Practice good personal hygiene when handling product. Avoid blowing dust with compressed air.

MATERIAL IDENTIFICATION AND INFORMATION

Product Identification

- **Tradename**: Duratex Foamboard
- **Synonym**: Expanded polystyrene foamboard

Hazard Identification

- **Physical Appearance**: Polystyrene foam sheet laminated with cellulose paper
- **Potential Health Effects**: This product is classified as a non-hazardous component when polymerized. Avoid breathing dust if cut, sanded, or routed.
- **Ingestion**: Swallowing is not anticipated. If swallowed, seek immediate medical advice.

Physical & Chemical Properties

Appearance:	Rigid polystyrene foam panel faced with paper
Odor:	None
Odor Threshold:	None
PH:	N/A
Melting Point:	> 132.22°C (> 270°F)
Initial Boiling Point:	N/A
Flash Point:	> 200°C (>392°F)
Evaporation Rate:	N/A
Flammability:	N/A
Upper/Lower Explosive Limit:	N/A
Vapor Pressure:	N/A
Vapor Density:	N/A
Specific Gravity:	Less than water
Solubility:	Insoluble in water
Partition Coefficient:	N/A
Auto-Ignition:	440°C (824°F)
Decomposition Temperature:	Not Available
Viscosity:	N/A

Chemical Composition

Ingredients (Common Name)	CAS Number	Percent (%) (By weight)
Polystyrene Liner (Paper)	9003-53-6	31 to 33 65 tp 67

First Aid Measures

- **Eye Contact**: Dust may mechanically irritate the eyes, resulting in redness or watering. Treat dust in eye as foreign object. Flush with water to remove dust particles. Get medical help if irritation persists.
- **Skin Contact**: Not anticipated for product in purchased form, wash with mild soap and water.
- **Inhalation**: Excessive dust concentrations may cause unpleasant obstruction in the nasal passages. If inhalation causes adverse effects, respirator selection, use and maintenance should be in accordance with the requirements of OSHA Respiratory Protection Standard, 29 CFR 1920.134. Remove to fresh air. Get medical help if persistent irritation, severe coughing or breathing difficulty occurs.
- **Note to Physician**: No special advice, treat symptomatically.
- **Ingestion**: Not likely to occur for product in purchased form.
- **Skin Absorption**: Product is not absorbed through the skin.

Fire Fighting Measures

- **Fire Extinguishing Media**: For small fires, use water spray, foam, carbon dioxide or dry chemical extinguishers. Larger fires should be extinguished immediately by drenching with water spray from fire hose.
- **Special Fire Fighting Procedures**: Wear positive pressure self-contained breathing apparatus and protective turnout clothing when involved in firefighting activities.
- **Unusual Fire and Explosion Hazards**: The fire hazards associated with this product are comparable to those known to exist for normally combustible paper products. Similar to precautions for all paper products, do not smoke or use open flames, space heaters or other ignition sources near fabrication operations.
- **Hazardous Combustion Products**: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. In smoldering or flaming conditions, carbon monoxide, carbon dioxide and carbon are generated. Studies have shown that the products of combustion of this material are not more acutely toxic than the products of common building materials such as wood.

Accidental Release

Sweep or vacuum up for recovery and disposal. Avoid creating dusty conditions whenever feasible. Maintain good housekeeping to avoid accumulation of cellulose dust on exposed surfaces. Use NIOSH approved filtering face piece respirator (“dust mask”) and goggles where ventilation is not possible and exposure limits may be exceeded or for additional worker comfort. Other Precautions: Minimize compressed air blow down or other practices that generate high dust levels.

Handling & Storage

Store in well-ventilated areas. Handling and storage near open flames must be avoided. Practice good personal hygiene when handling product. Avoid blowing dust with compressed air.

Exposure Controls:

Personal Protective Equipment

- **Respiratory Protection**: Use NIOSH-approved filtering face piece respirator ("dust mask") and goggles where ventilation is limited. Use respiratory protection in accordance with regulatory requirements such as the OSHA respiratory protection standard 29 CFR 1910.134.
- **Protective Gloves**: Not required. However, cloth, canvas, or leather gloves are recommended to minimize potential mechanical irritation or cuts from handling product.
- **Eye Protection**: Approved goggles or tight-fitting safety glasses are recommended when exposures to dust may occur (e.g. during clean up) and when eye irritation may occur.
- **Other Protective Clothing or Equipment**: Not applicable for product in purchased form. Outer garments may be desirable in extremely dusty areas.
- **Work/Hygiene Practices**: Follow good hygiene and housekeeping practices. Clean up areas where dust settles to avoid excessive accumulation. Minimize compressed air blow down or other practices that generate high airborne-dust concentrations.

Ventilation

- **Local Exhaust**: Provide local exhaust as needed so that exposure limits are met. Use with adequate ventilation to ensure exposure levels are maintained below the limits provided above. Use local exhaust ventilation, and process enclosure if necessary, to control airborne dust. Ventilation to control dust should be considered where potential explosive concentrations and ignition sources are present.
  The design and operation of any exhaust system should consider the possibility of explosive concentrations of cellulose dust within the system. See "SPECIAL" section below.
- **Mechanical (General)**: Provide general ventilation in processing and storage areas so that exposure limits are met.
- **Special**: Ensure that exhaust ventilation and material transport systems involved in handling this product contain explosion relief vents or suppression systems designed and operated in accordance with applicable standards if the operating conditions justify their use.

Ingredient	OSHA Exposure Limit		ACGIH
Polystyrene (as nuisance dust)	Total	Respirable	TLV
	15 mg/m^3	5 mg/m^3	10 mg/m^3 inhalable particulate
			3 mg/m^3 resperable particulate

Regulatory Information:

Proposition 65: California Only

Additional Requirements for the State of California:"**WARNING**: This product can expose you to chemicals including Styrene, which is known to the State of California to cause cancer. For more information, go to www.P65Warnings.ca.gov."

Storage Guidelines

Duratex Foamboard is to be stored inside in a dry and clean area. Material must be stored flat.