

INSTRUCTION MANUAL

Liquid SunMate® FIPS

Foam-In-Place Seating



ATTENTION

The Liquid SunMate® FIPS system may be used only by those who have completed the required training in safe product handling and use. Training consists of watching the FIPS Instructional Video AND reading this manual. Understanding of the training material must be verified with Dynamic Systems, Inc. (DSI) by the user before the product will be shipped. A Verification Statement of Training is included in this manual. Complete and fax, mail or e-mail the form to DSI. Once we have your statement on file, you may order as often as you like.



Dynamic Systems inc
Specialty Foam Manufacturer

NASA and U.S. Space Foundation Space Technology Hall of Fame Inductee
Engineered by Flexible Polyurethane Foam Hall of Fame Inductee, Charles A. Yost

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Liquid SunMate® FIPS (Foam-In-Place Seating) Instruction Manual

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Introduction

Award-Winning Technology

Dynamic Systems, Inc. (DSI) began research in 1969 to perfect foam cushion materials having both high energy absorption and soft pressure properties. In cooperation with NASA, DSI researched the application of the newly-developed materials for aircraft ejection seats and airline passenger seats. The technology soon expanded to provide seating systems for the severely disabled. More than five decades later, DSI continues to produce one of the most affordable advanced cushion materials available for support, comfort, and energy absorption.

In 1998, DSI was inducted into the U.S. Space Technology Hall of Fame for the successful development and commercialization of this seating technology. In May 2015, DSI's founder, Charles A. Yost, was inducted into the Flexible Polyurethane Foam Hall of Fame. Company growth and strength are a direct result of exceptional customer service, product quality and performance.



CUSHION MATERIALS DEVELOPED AND MANUFACTURED BY DYNAMIC SYSTEMS, INC.

SunMate®

polyurethane viscoelastic foam available in 10 levels of pressure support (cushions, sheets, wedges, buns, or shredded)

SunMate® FRG

SunMate® containing a non-halogenated fire-retardant additive

Liquid SunMate® FIPS (Foam-In-Place Seating)

direct mold, custom-contouring seating system

Pudgee®

gel-like cushion with very low shear force and cooling properties

Laminar™

dual-layer composite cushion combination of SunMate® and Pudgee®

Laminar III™

tri-layer composite cushion combination of SunMate® and Pudgee®

Contour Laminar™

Laminar™ with built-in generic contour

OTHER PRODUCTS OFFERED BY DSI

Waterproof Coatings

Fire Retardant (FRG) Additive for Liquid SunMate® FIPS Bowl Pack

Liquid SunMate® FIPS Accessories

Cushion Slipcovers and Fabrics

waterproof, velour, and stretch-knit

Liquid SunMate® FIPS (Foam-in-Place Seating)

Liquid SunMate® FIPS was developed in 1984 for wheelchair users with complex seating and positioning needs. Today the 3-chemical, mix-and-pour, direct custom-molding system is used most often to create seat, back, or total cushion inserts for advanced posture control. Liquid SunMate® FIPS is also used to mold custom seats for motorsport vehicles, boats, aircraft, and other applications requiring custom-molded parts.

The Molding Process

To make a cushion, the Liquid SunMate® FIPS ingredients are mixed in sequence and poured into a molding bag placed in a wheelchair or on another seating surface. The person to be molded is positioned on the bag, and the liquid foam rises and forms around the body within minutes. After the foam has cured, the cushion is finished with detail trimming, soft laminate, and protective fabric. Waterproofing is optional. The entire process can be completed in 2-4 hours depending on the cushion's size and contour complexity.

Cushion Properties

A finished cushion has the same exceptional qualities as SunMate®:

- slow springback, high-density, high-resilience
- flows to match body contours and slowly returns to its original shape once pressure is removed
- open-cell structure to maximize airflow to reduce heat buildup
- uniform pressure distribution and impact energy absorption to alleviate sitting fatigue
- a wide range of pressure supports to support any weight distribution need
- effective within a temperature range of -20°F to 150°F
- passes California Technical Bulletin #117, Section D, Part II without the use of fire-retardant additives, coatings or fabrics

Medical Professionals Choose FIPS

Orthopedic professionals, therapists and seating specialists use Liquid SunMate® FIPS to:

- slow progressive deformities, address fixed deformities or excessive tone problems
- improve body functions and blood circulation by distributing sitting pressure evenly
- relieve pressure points, soreness and fatigue associated with confined or prolonged seating
- control body positioning with gentle, fixed support

Safe, Versatile, and Inexpensive

In a fire, a FIPS cushion burns with inherently low levels of toxicity because natural plant ingredients constitute 33-42% of its make-up. This adds safety and a sense of freshness unique to SunMate®.

Liquid SunMate® FIPS was designed to be easy to transport, use, clean up, and proportion for custom sizes. It may be used with almost any open-mold design; and is one of the most affordable custom-molding systems on the market.

Time-Tested Quality and Reliability

Liquid SunMate® FIPS has been tested, proven and accepted by orthopedic and medical professionals worldwide for over 30 years. Dynamic Systems is ISO 9001:2015 certified, so quality is guaranteed for each product before it leaves the plant.

Basic Training

For your safety and the safety of the client, a basic understanding of the product and its use is required and must be verified with Dynamic Systems before your first order for Liquid SunMate® FIPS will be shipped. Basic training is achieved simply by reading this manual and watching the training video.

Instruction Manual and Training Video

By carefully reading this manual and watching the **Liquid SunMate® FIPS Training Video**, you will gain a thorough understanding of the entire foam-in-place process including important safety information, illustrated step-by-step instruction, finishing techniques, and tips for achieving the best results.

Additional copies of this manual are free and may be requested or downloaded online. The 20-minute video may be viewed online or on DVD, and includes bonus footage of the seating team at CarePartners Wheelchair Clinic in Asheville, NC, making a custom back cushion for a young client.

Once you have read the manual and watched the video, complete and return to Dynamic Systems the **Verification Statement of Training** (located in the back of this manual.) Once the form is on file, your first order for Liquid SunMate® FIPS will be shipped and you may continue to order as often as you like. Contact information on this form must be updated every 2 years.

Practice with an Introductory Kit

We encourage anyone new to the product to practice first using the Liquid SunMate® FIPS Introductory Kit. The kit comes with all the materials necessary to make one custom-molded seat or back cushion. This is an excellent way to become familiar with the process before molding an insert for a client.

The Introductory Kit includes:

- 1 unit of Liquid SunMate® FIPS (your choice of packaging and formulation)
- 1 16" x 37" x 1/4" SunMate® sheet laminate
- 2 16" x 18" x 1" SunMate® base cushions
- 2 pairs of disposable gloves
- 2 molding bags (1.4 mil, 33 gal)
- 1 pair of safety glasses
- 1 Instruction Manual (fabric/waterproofing materials not included.)

Workshops and Demonstrations

Liquid SunMate® FIPS demonstrations are often given at medical seating conferences in the U.S. and abroad. Special courses are sometimes offered by therapists, seating specialists and dealers who work with our products. If you would like to attend a workshop or see a product demonstration, contact DSI for more information.

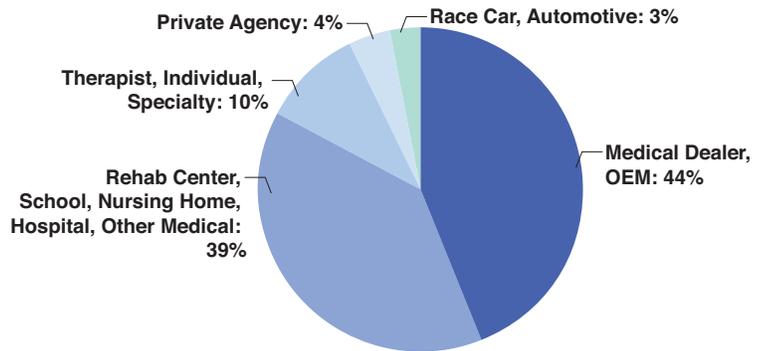
ORDERING REQUIREMENT

As a safety precaution, before your first order for FIPS will be shipped, you must:

1. Watch the **Liquid SunMate® FIPS Training Video** (available online or on DVD),
2. Read this **Instruction Manual**, and
3. Sign and return the **Verification Statement of Training** to DSI.



The Liquid SunMate® FIPS Instructional Video filmed at CarePartners Wheelchair Clinic in Asheville, NC, features a pour for a young wheelchair client using a fabric-finished mold-in-bag back.



FIPS Customer Demographics

Dynamic Systems
www.dynamic-systems.com

Revision: 4
 Effective Date: 10/01/17

**Verification Statement of Training
 for Liquid SunMate® FIPS (Foam-in-Place Seating)**

This form must be completed and returned to Dynamic Systems by the user performing the FIPS pour or by the customer's representative responsible for ensuring completion and instructing customers in the use and safe handling of FIPS.

As a measure to ensure customer success and safety in the use of the Liquid SunMate® FIPS system, Dynamic Systems requires verification that an understanding of basic product safety and handling has been achieved by the user or dealer before the first order will be shipped.

By signing this form you verify that you have completed at least one of the training requirements listed below, and understand the proper safety and handling procedures of the product and its application. Check all that apply:

I have read the Liquid SunMate® FIPS Instruction Manual AND watched the Liquid SunMate® FIPS Instructional Video.

I have successfully completed certification in a Liquid SunMate® FIPS Workshop.

Workshop Date: _____ Workshop Location: _____
 Instructor's Name: _____ Instructor's E-mail/Phone: _____

Signature: _____ Title: _____ Date: _____

Printed Name: _____ Phone: _____ Fax: _____
 Company Name/Address: _____ E-mail: _____
 Street Address: _____ City: _____ State: _____ Zip: _____

Do you receive Liquid SunMate® FIPS (Foam-in-Place Seating)? YES NO

As a condition of FIPS, by signing this agreement, you acknowledge that you are an end-user and you are responsible for ensuring that you are properly trained and equipped to use the product. You agree to use the product only for the intended purpose and to follow all safety instructions. If you are not properly trained and equipped to use the product, you should not use the product. Dynamic Systems will not be responsible for any injury or damage resulting from the use of the product. Dynamic Systems will not be responsible for any injury or damage resulting from the use of the product.

We will ship your order for Liquid SunMate® FIPS upon receipt of this verification. Thank you.

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 CS 811

Molding Process at a Glance

Liquid SunMate® FIPS is a versatile product and can be used in a wide variety of applications including aircraft, race car and motorcycle seating. However, the vast majority who order FIPS use it primarily for medical applications and wheelchair seating. The three most common molds created are for a seat cushion, a back cushion or a total chair insert which includes both the seat and back support.

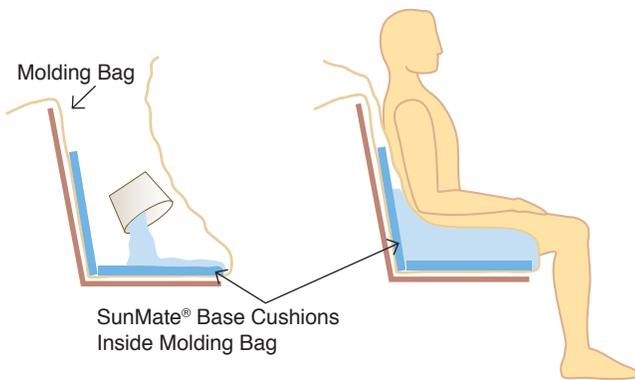
IMPORTANT: BASE CUSHIONS

Liquid flows to areas of least resistance, therefore Liquid SunMate® will not flow where the client's body meets the seating surface at the highest pressure points. It is essential to place SunMate® base cushions inside the molding bag onto which the liquid will be poured. The liquid binds to the base cushions which become an integral part of the mold. This will provide support where the liquid cannot go.

The thickness and pressure support (Soft, Medium, etc.) of the SunMate® base cushion(s) is determined by the therapist or seating specialist. A thickness of at least 1" is recommended to prevent bottoming-out.

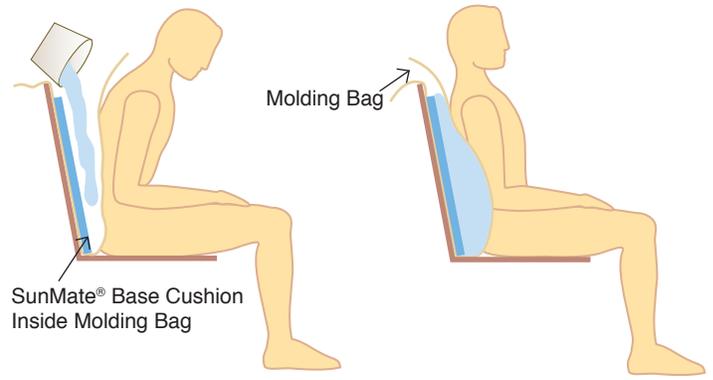
Making a Seat Cushion

First, the molding bag, with SunMate® base cushions inserted, is placed on the seat of the chair. The Liquid SunMate® is mixed and poured into the molding bag. The client is then quickly transferred to the chair, seated on the bag, and gently held in position while the liquid foams around the body's contour. After the cushion has set (about 5 minutes), it can be removed for finishing.



Making a Back Cushion

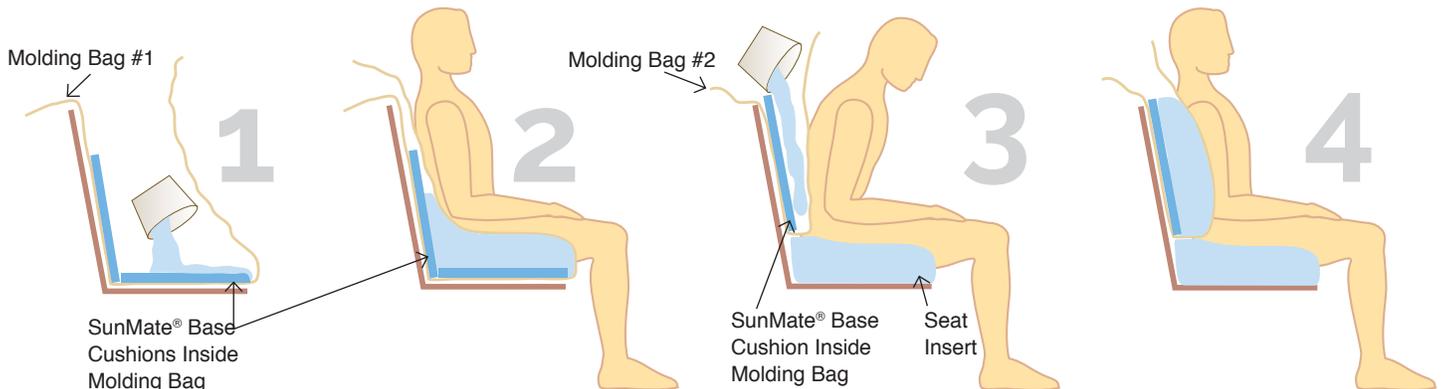
First, the molding bag, with SunMate® base cushion inserted, is placed against the back of the chair, and the client is seated in front of it. The client leans forward while the Liquid SunMate® mixture is poured into the molding bag. The client then leans back and is gently held in position while the liquid foams around the contour of the client's back. After the cushion has set (about 5 minutes), it can be removed for finishing.



Making a Total Insert

First, the seat cushion is made as described above left. Once the foam cures, it is removed from the chair, the excess is trimmed, and it is placed back in the chair.

Next, the client is seated and the back cushion is made as described above right. Once the foam has set, the excess is trimmed and any adjustments are made. The seat and back inserts are glued together, covered with a soft SunMate® laminate and fabric-finished to form a total chair insert.



A detailed description of the process begins on pg. 10.

Packaging Options

Liquid SunMate® FIPS comes packaged in either a Bowl Pack or a Bag Pack. With the Bowl Pack system, the chemicals are combined in a mixing bowl (included). With the Bag Pack system, the chemicals are mixed directly in the foil bag. Both methods produce the same result, but have different advantages.

Liquid SunMate® FIPS Bowl Pack

The Bowl Pack consists of 3 individual containers of pre-measured chemical ingredients, each labeled with safety and handling instructions.

First, the Polyol and Catalyst are combined in the mixing bowl and thoroughly mixed with an electric beater for 2 minutes. Next, the Iso is added and mixed on high speed for 15 seconds. The mixture is poured into the molding bag, and quickly, the person to be molded sits upon or leans against the bag while the foam rises and forms a solid cushion around the body. It takes about 5 minutes for the foam to rise and cure.

The Bowl Pack Advantage: It is easy to visually check the chemicals' consistency through the translucent containers and assess thorough mixing in the bowl.



Liquid SunMate® FIPS Bowl Pack

Liquid SunMate® FIPS Bag Pack

The Bag Pack is a unique, 3-compartment, foil-laminate bag. Each ingredient of Liquid SunMate® FIPS is contained in a separate, sealed section of the bag.

To combine and activate the ingredients, the separation clips are removed in sequence and the bag is vigorously massaged and shaken to achieve a uniform mixture. Mixing times and instructions are conveniently printed on the bag.

The Bag Pack Advantage: No mixing utensils are required. The process is clean and generates very little waste – just throw the bag away after all the ingredients have reacted. This method is fast, neat, efficient, and easy to transport.



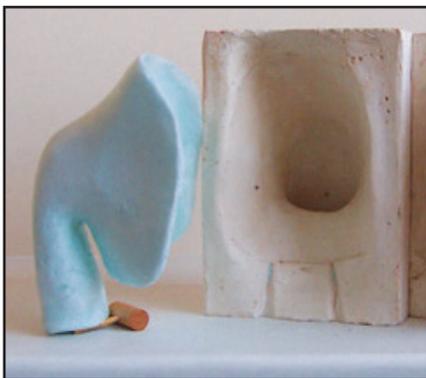
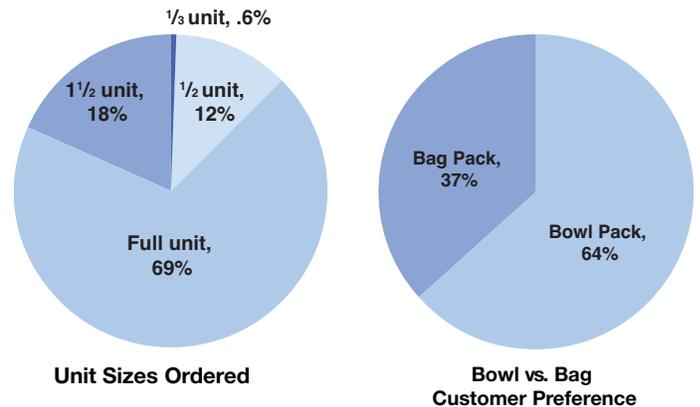
Liquid SunMate® FIPS Bag Pack

Unit Sizes and Applications

Liquid SunMate® FIPS comes packaged in the following standard sizes: 1/3, 1/2, 1, and 1 1/2 units. Chemicals also may be ordered separately or in bulk.

Some typical applications are described below. Mixing order and times are the same for all unit sizes. See Appendix A (pg. 17) for help apportioning chemicals for custom molding.

Ordering Trends For FIPS



1/3 and 1/2 units

Fractions of a unit are great for making small molds such as headrests, arm troughs, lumbar supports, etc. The mold shown above was made for a shoulder prosthesis.



1 full unit

A full unit size contains enough liquid to make one adult seat cushion or one adult back cushion. The back mold shown above was poured inside a fabric-finished molding bag.



1 1/2 units and Bulk Liquids

A 1 1/2 unit size is good for larger molds such as a high-back wheelchair cushion or a total wheelchair insert for a child. Several units may be used for a complex mold like the full-body cushion shown above.

Support Pressure Options

Liquid SunMate® FIPS is available in 3 standard formulations: Soft, Medium, and Semi-rigid. Choose the level of support to match the client's needs. Formulations are color-coded for easy identification, but can also be ordered without pigment for a white cushion.



Soft (pink)

The Soft formula offers greater immersion and low pressure support. It is noticeably softer and more elastic than the Medium formulation. Choose Soft to cushion sensitive areas on the body, to provide more comfort, to support mild deformations, or for small, lightweight clients.

Density 5.2 lb/ft³

Open Mold Expansion Factor* 7-8 times liquid volume

Support Low pressure, contour adaptation



Medium (blue)

The Medium formula is suitable for the average-sized adult and for body weights up to and including 300 lb. It yields less than the Soft formulation under pressure, providing more support, yet still allows for gentle immersion into the cushion.

Density 5.2 lb/ft³

Open Mold Expansion Factor* 7-8 times liquid volume

Support Medium pressure support



Semi-rigid (light green)

Semi-rigid is rarely used for wheelchair seating, but may be used to create a firm, lightweight base support. It is more often applied in specialty seating for race cars or aircraft.

Choose Semi-rigid when portability is a factor and carrying weight must be minimized, or when impact protection or vibration absorption is required.

This low-density foam is about 40% lighter than Medium, and expands to 30% more volume than Medium and 55% more volume than Soft.

Density 4.3 lb/ft³

Open Mold Expansion Factor* 9 times liquid volume

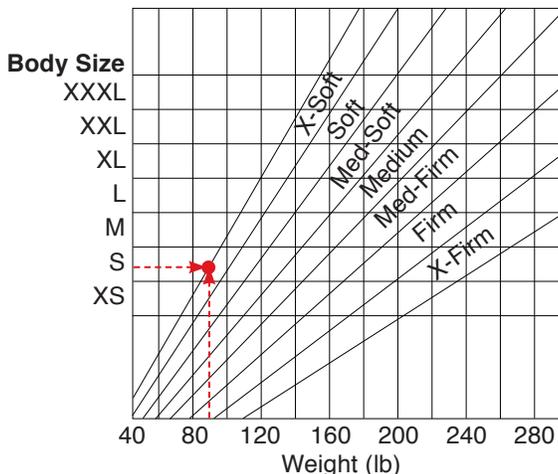
Support Extra-firm support, lightweight

***Expansion Factor:** comparison of the reacted SunMate® volume to the Liquid SunMate® volume.

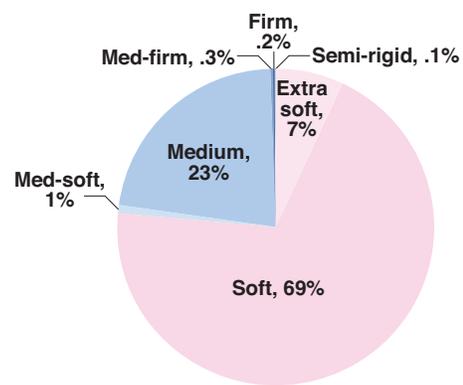
Extra-soft, Medium-soft, and Medium-firm are available upon request.

How to Choose Support Pressure

Select cushion support pressure based on the weight and build of the client, the degree of immersion required depending on the client's sensitivity to pressure, the client's comfort preferences or support needs, and specific application requirements. These charts show general recommendations and ordering trends of other seating specialists.



As shown in this chart, the Extra-soft formula would provide the necessary support and comfort for a 90 lb person with a small frame.



Support Pressure Order Trend

Safety and Handling

The chemicals used in Liquid SunMate® FIPS were selected due to their mild nature and minimal toxicity. These chemicals are safe to work with when proper precautions are taken. For complete details, read the Safety Data Sheets included with each unit.

PRECAUTIONS

- Keep containers tightly sealed until ready to use.
- Do not leave containers where the curious may handle.
- Wear protective clothing, gloves and safety glasses.
- Cover mixing area, floor and chair with drop cloths.
- Work in a well-ventilated area.
- People with certain allergies may be sensitive to FIPS.
- If containers feel cold, or the Iso appears cloudy or crystallized, follow the Cold Weather Heating Instructions before use.

Chemical Ingredients

Polyol

Polyol determines the support pressure of the cushion. It consists of many different ingredients, 32-42% of which are derived from plants. Some Polyol ingredients will settle over time, so it must be well-mixed before using to ensure the highest quality foam rise. Polyol is relatively inert and is not considered hazardous or toxic, but people with sensitive skin may experience mild skin irritation on contact.

Each batch of Polyol is quality tested before packaging. The lot number can be found on the outside of the packing box and on the Polyol container. (See Appendix B, pg. 18.)



Catalyst

The Catalyst must be mixed with the Polyol or the foaming action will not occur. The amount of Catalyst used determines the speed and temperature of the reaction.

The Catalyst is a skin and eye irritant. Take care not to get it on a gloved hand and accidentally transfer it to the eyes or an unprotected area of skin.



Iso

Iso is the reactive ingredient that produces carbon dioxide gas when added to the Polyol-Catalyst mixture. Iso, the mildest form of isocyanate (methylenediphenyl diisocyanate, or MDI), provides the chemical linkage necessary to generate an elastic foam. It does not release any volatile fumes at room temperature, however, if temperatures exceed 150°F, it can produce fumes. Persistent inhalation of fumes at high temperatures could cause temporary, asthmatic-like breathing difficulty. (See Appendix C, pg. 19.)

If skin comes into contact with the Iso, wash the exposed area as soon as possible, otherwise the Iso will react slowly with proteins and moisture in the skin and cause a layer of dead, dry skin to form over a few days. The dried skin will eventually slough off and be replaced by new skin.



Chemical Combination

Polyol, Catalyst and Iso, when combined, react and generate heat and slight fumes. The fumes are well within OSHA standards for safe exposure limits and are generally not noticeable or problematic.

No adverse effects will result from using this system unless exposed to chemicals in quantities significantly greater than the contents of the FIPS package, or excessively exposed by not following safe handling procedures.

Spill Protection and Prevention

- Both the person mixing and the person being molded should remove all jewelry, secure long hair, and wear old or disposable clothing.
- The person being molded should wear sufficient hair protection such as a shower cap.
- The person mixing should wear gloves and safety glasses.
- Cover the floor, wheelchair, and mixing area with drop cloths.
- Inspect the molding bag for holes or tears before the pour.
- Maintain a safe distance from others when mixing the chemicals.
- BOWL PACK TIP: Place the mixing bowl inside a cardboard box when mixing the ingredients to contain beater splashes or spills.
- BAG PACK: Firmly grasp the Bag Lock when shaking the foil bag to prevent premature opening.
- If a hole appears in the molding bag after pouring the liquid mixture, pinch the bag closed (using gloved fingers) until the foaming reaction stops.
- Place a large trash can nearby to dispose of the foil bag or mixing bowl after the mixture is poured, to catch any foam overflow, or to abandon a pour and throw away the mix in an emergency.

IN CASE OF SPILLS

Skin or Eye Contact

If any of the chemicals come into contact with the skin, immediately wash affected areas with soap and water. Repeat 2-3 times.

If any of the chemicals are transferred to the eye(s), immediately flush with tepid water for 15 minutes at a sink or eye wash station.

Spill and Leak Cleanup

Use an absorbent material such as cat litter or sand to clean up individual chemical spills. Neutralize the area with a mild ammonia solution. Dispose of the trash as a solid waste and clean the area with soap and water.

If a spill occurs after the 3 chemicals have been mixed together, they will react, foam, and adhere tenaciously to any surface onto which the mixture has spilled. The following treatments are recommended:

Foam on Clothing, Fabric or Carpet: If possible, remove the foam while it is still tacky, before it sets. Do not smear it. Use gloved fingers to carefully remove the foam from the affected surface. Due to the liquid foam's adhesive nature, any remaining residue becomes permanently embedded in the fibers.

Foam on Skin: Liquid foam spills to the skin are not toxic but may cause mild skin irritation until the foam residue peels off after a day or two. The body's natural oils will loosen the foam. Apply baby oil or lotion to soften the affected area.

Foam in Hair: Carefully separate the affected hair from unaffected hair with gloved fingers. Dab the liquid foam with an absorbent cloth. Do not smear it. Once the liquid becomes a solid foam, the only recourse is to cut it out of the hair.

Foam on Smooth, Hard Surfaces: Let the foam cure and carefully remove it with a putty knife.

Before You Pour

Prior to the molding day, check the shelf life of each Liquid SunMate® FIPS unit. Make sure it does not exceed the 9-month range recommended for good foam quality. If the Bag Pack Iso or Polyol sections feel thick and cold, or the Bowl Pack Iso appears cloudy or crystallized, follow the cold weather heating instructions. For the best, safest reaction, the chemicals MUST be at room temperature before using.

Adequate Work Space

Work in a well-organized, ventilated area spacious enough for the client, the wheelchair, and the seating team. Access to an electrical outlet may be necessary for using mixing or trimming tools. Collect all the necessary materials before beginning.

Schedule Enough Time

The mixing and pouring stage only takes about 10 minutes, however, the complete process, including setup, can take up to an hour. Finishing steps can take up to 2-4 more hours depending on fabric choice, waterproofing method, size and complexity of the mold. Finishing may be postponed to another day if the need for the cushion is not urgent.

Prepare the Chair

Chair Fit

It is important for the cushion to be molded in the client's own chair. There should be enough space between the client and the frame of the chair to allow for foam expansion.

Select the Proper Base

Molding on or against a firm, flat surface provides the best pressure control. If the chair has a "sling" seat or back, insert a more stable plywood or plastic base, or make a solid chair frame.

Additional Supports

Plywood, plastic or cardboard inserts can be used to direct the foam expansion and guide the liquid into areas where it needs to flow to accommodate positioning. Modifications such as lateral supports, abductors, adductors, or foot supports may be used to help shape the mold.

Drop Cloths

Err on the side of caution to protect valuable equipment, furniture and flooring. Place drop cloths over the mixing area, chair, and floor in case of accidental spills. Liquid foam adheres tenaciously to most surfaces once it cures.

MATERIAL CHECKLIST

Safety

- Disposable gloves and safety glasses (for person handling chemicals)
- Shower cap (to cover client's hair)
- Protective clothing or towels (for client and person mixing)
- Drop cloths (to cover mixing area, floor and chair)
- Large trash can
- Paper towels and absorbent materials (in case of spills)

Molding Bag Preparation

- Heavy-duty, light-colored, 33-gallon plastic garbage bag(s), at least 1.4 mil
- Permanent ink marker and yard stick (for marking centerline)
- SunMate® base cushion(s), 16" x 18" x 1"

Mixing the Chemicals

- Electric mixer (Bowl Pack only)

Chair Prep

- Optional supports or extensions (to direct foam expansion)

Trimming

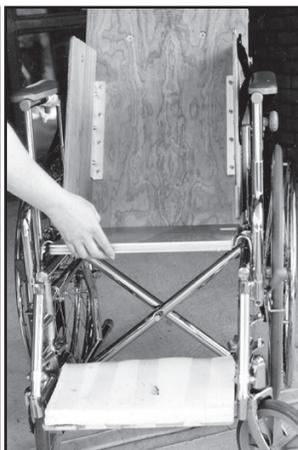
- Permanent ink marker (to mark areas to be trimmed)
- Electric knife, box cutting knife, and/or die grinder

Laminate and Fabric cover

- ¼" thick SunMate® sheet (size depends on size of insert)
- 3M™ Foam Fast 74 spray adhesive
- 2-way or 4-way stretch fabric (1-2 yd)
- Scissors (for trimming excess material)
- Tongue stick (for gluing seams)

Waterproofing

- Dow Corning® RTV 732 multi-purpose sealant (quantity depends on size of insert)
- Caulking gun and spreader(s)
- Disposable gloves
- Paper towels
- Masking tape (for creating neat edges)
- Tongue stick and dye (if you prefer a color other than white)



A temporary or permanent frame may be constructed to provide a sturdy base for the mold.

Cardboard may be affixed to the chair to direct the flow of liquid foam up and around the body.

Protect and Prepare the Client

Internal temperature of the reacting foam can reach 140°F. The client's skin must be protected from the heat generated by the rising foam. An additional layer of clothing or a towel placed between the molding bag and client's body should provide a sufficient barrier. Explain to the client what to expect in terms of the sensation of heat and foam expansion generated by the reaction. For most, it is a very soothing experience, like sitting in a warm bath.

Long hair should be secured and covered with a shower cap or hat to protect it from accidental spills.

When pouring a Liquid SunMate® FIPS mold for a young child, elderly or disabled person, a therapist or seating specialist should be on-hand to assist the client, if necessary, to help hold the body in position while the foam is rising. This ensures that the liquid can flow where it needs to to allow for correct alignment, support, comfort, and increased body function.

Prepare the Team

A trial run-through before the actual pour is good practice for the team, and the client if possible, to become familiar with the process and timing of events.

Assign responsibilities to each person. Decide who will:

- Adjust the chair frame or supports
- Prep the molding bag and hold it open for the pour
- Mix the liquids and pour them into the molding bag
- Transfer the client to and from the chair
- Position the client
- Monitor the foam rise

Trial Positioning

One way to ensure a successful pour is to allow ample time for a seating assessment with the client to determine the goals to be achieved with the cushion mold. Familiarize the team with their responsibilities and let the client know what to expect during the molding session.

- Check the height of the molding bag while the client is seated. It should be high enough to contain the rise and allow for clearance should the foam rise high enough to flow out of the bag opening.
- The chair should be large enough to allow the liquid to flow around the client as needed. Always have a trash can positioned behind or near the chair to catch any overflow.
- Using a seat belt or harness to hold the client in the chair is not recommended as it will restrict the flow of the foam.

After trial-positioning, remove the client from the chair and prepare the molding bag for the pour. Center the molding bag in the chair and open the top of the bag so the mixture can be poured quickly and easily.



Take simple safety precautions. Wear protective layers of clothing, disposable gloves, safety glasses, and hair protection. Use drop cloths to protect the chair and floor.



Assess the fit of the chair before the pour. There should be room to accommodate the molded insert. Make sure the molding bag height is sufficient to contain the rising foam and prevent overflow.

Prepare the Molding Bag

Use a tough (1.4 mil), plastic, polyethylene bag with a squared-off bottom for molding. Light-colored or transparent bags allow viewing of the foam rise. A 33-gallon bag is sufficient for molding a seat or back cushion for an adult. A 13-gallon bag works well for molding a seat or back cushion for a child or small-framed adult.

Only one molding bag is needed when making a seat or a back cushion, with the following exceptions:

A. Molding Large Adults

A tall or heavy person may require two bags taped together or a single, large bag. If using two bags, cut open the bottom of one bag and seal it well to the opening of the second bag with 2" packing tape. (Most medical tapes are unsuitable because the heat of the reaction softens the adhesive.)

B. Using the Semi-rigid Formulation

The Semi-rigid formulation expands 35-50% more in volume than the Soft or Medium formulation. Two bags taped together or one large bag may be required to allow for excess expansion.

For a Back or a Seat Cushion

Step 1: Place the molding bag on a table and draw a centerline down the middle with a felt marker. Use this guide to center the base cushion(s) in the bag and the bag in the chair.

Step 2: When molding a Back cushion, place one 16" x 18" x 1" SunMate® base cushion inside the molding bag. (See figure 2A.) When molding a Seat cushion, insert a second 16" x 18" x 1" base cushion into the molding bag (as shown in figure 2B). The base cushion(s) provides an underlying support surface onto which the liquid foam will adhere.

Step 3: Place the molding bag in the chair so that the base cushion(s) rests on the seat and/or against the back of the chair.

For a Total Insert

You will need two separate molding bags to mold a total insert: one for the seat and one for the back. A total insert requires three 16" x 18" x 1" base cushions. Prepare each molding bag using the steps listed above.

TIP

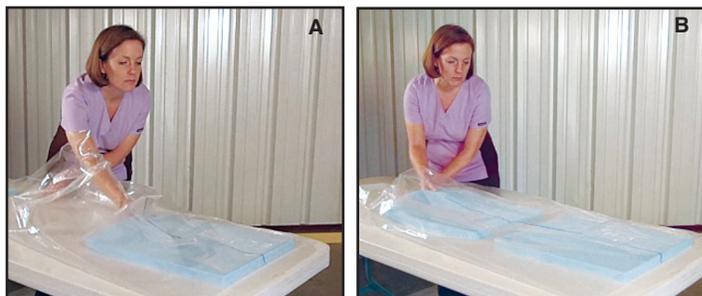
Trash compactor bags are a perfect size for molding inside a fabric-finished back bag for a child or small-framed person. The bags also peel away from the cured foam insert more easily than most garbage bags.

IMPORTANT

Never leave the molding bag on the foam insert. It must be removed shortly after the foam cures or else it will cause the cushion to become firm.



Step 1 Draw a centerline on the molding bag.



Step 2 A) When molding a Back cushion, insert one base cushion.
B) When molding a Seat cushion, insert two base cushions.



Step 3 Place the molding bag in the chair. This one has been prepared for molding a seat cushion.

Molding a Custom Seat Cushion with the FIPS Bag Pack

The Liquid SunMate® FIPS Bag Pack ingredients are contained in 3 sections of the foil bag separated by plastic clips. They are mixed by removing the clips in order and manually kneading and shaking the bag.



- ONE FULL BAG UNIT INCLUDES:**
- Polyol, 3 lb section
 - Catalyst, 1 oz section*
 - Iso, 1½ lb section*
 - FIPS Summary Guide (includes Safety Data Sheets and Cold Weather Heating Instructions)
- *Catalyst and Iso amounts vary by formulation.

INSPECT THE BAG FOR LEAKS

The day before the pour, inspect the Bag Pack carefully for leaks. If the Polyol or Iso sections feel cold or lumpy, follow the Cold Weather Heating Instructions in Appendix D, pg. 20.



1 PLACE MOLDING BAG IN CHAIR
Place the base cushion(s) inside the molding bag and position the molding bag in the chair. Have a trash can nearby.



2 MIX POLYOL FOR 2 MINUTES
Using kneading and shaking action, mix the Polyol section for at least 2 minutes to ensure any ingredients that have settled in storage are well-mixed into a uniform consistency.



3 REMOVE CLIP 1 TO ADD CATALYST
Remove Clip 1 between the Catalyst and Polyol by removing the red end cap and pulling the white rubber tubing out of the c-clip.



7 POUR MIX INTO MOLDING BAG
Lower the Bag Pack into the molding bag and pour the mixture onto the base cushion toward the front of the chair using a side-to-side motion. Squeeze any excess out of the bag and throw the empty Bag Pack into the trash can.



8 SPREAD MIXTURE EVENLY
Working from the outside of the molding bag, quickly spread the liquid evenly across the seat. You can only manipulate the mixture while it is in liquid form. Once the foaming action begins, additional handling or movement causes the bubbles to break, and creates hard spots in the finished cushion.



9 SEAT CLIENT
Quickly and carefully transfer the client onto the molding bag. **CAUTION:** Make sure the client's clothing does not shift to expose the skin during positioning.
The client must remain as still as possible for at least 5 minutes while the foam rises. Make sure nothing is restricting the flow of the foam so it can rise and fill any voids.
Place a trash can under the bag opening to capture any overflow, and stand away from the bag opening to avoid breathing any escaping gases.

**Temperatures
Below 50°F
Crystallize Iso.
Heat Carefully
per Instructions.**

SAFETY TIPS

Work in a well-ventilated area and protect the chair and floor with drop cloths.

Always hold the bag by the plastic clips when shaking to ensure the clips stay in place.

Stand over a drop cloth and shake the bag a safe distance away from others to avoid accidental spills.

IMPORTANT

When molding a seat insert, the client can easily slide out of position before foaming starts. Gently hold the client in position by the knees or pelvis. If a larger abductor is needed, hold the knees apart slightly during the rise.

Do not wait until the foam starts rising to seat the client on the molding bag. This will cause the small bubbles to break and will create hard spots in the finished cushion.

SHELF LIFE

The Liquid SunMate® FIPS Bag Pack has a shelf-life of 9 months from the purchase date. Each box is labelled with a sticker indicating the latest date by which the chemicals must be used.

SHIPPING AND STORAGE

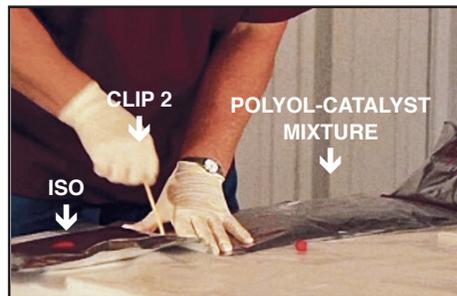
The U.S. Department of Transportation does not require the FIPS chemicals to carry a “hazardous” label when shipped. They may be safely handled, shipped, and stored using normal care.

The FIPS chemicals should be stored at room temperature (60-75°F). They are not volatile or readily flammable, however, they will react slowly with moisture. All containers should be sealed tightly until ready for use.



4 MIX CATALYST FOR 30 SECONDS
Knead, shake and slish the bag until the Polyol and Catalyst are uniformly mixed (about 30 seconds).

The Catalyst controls the temperature and speed of the reaction. No reaction will take place until the Iso is added in the next step. The process may be halted at this stage if necessary.



5 REMOVE CLIP 2 TO ADD ISO
Remove Clip 2 between the Polyol-Catalyst mixture and the Iso. Be prepared to move quickly.



6 SHAKE BAG FOR 15 SECONDS
Holding the ends of the bag securely, vigorously shake the bag from side to side and up and down for 15 seconds until it begins to feel warm. Slight warmth indicates that the foaming process is about to start.

Remove the Bag Lock before pressure builds up in the bag, and grip the bag opening securely. Grip the open end of the bag tightly as you move toward the molding bag to pour.

STOP! MAKE SURE EVERYONE IS READY BEFORE PROCEEDING.



10 RELEASE TRAPPED AIR
Just before the foam starts to set, release trapped air in the molding bag by poking small holes in the front corners of the bag or in theommel area between the legs. Protect the client from any liquid that may escape through the hole.



A COMPLETE RISE
After about 10 minutes, the foaming process is complete and the cushion is ready to be trimmed and finished.



THE CURED FOAM SEAT CUSHION
Once the foam has cured, remove the molding bag from the foam. Mark and trim away any excess cushion material. Laminate, fabric finish and waterproof as needed.

Molding a Custom Back Cushion with the FIPS Bowl Pack

The Liquid SunMate® Bowl Pack ingredients are packaged in 3 separate containers. They are combined in a bowl (included) in a specific order and mixed with electric beaters.



ONE FULL BOWL UNIT INCLUDES:

- Polyol, 3 lb container
- Catalyst, 1 oz bottle*
- Iso, 1½ lb container*
- Mixing Stick
- FIPS Summary Guide (includes Safety Data Sheets and Cold Weather Heating Instructions)

*Catalyst and Iso amounts vary by formulation.

SHELF LIFE

The Liquid SunMate® FIPS Bowl Pack has a shelf-life of 9 months from the purchase date. Each box is labelled with a sticker indicating the latest date by which the chemicals must be used.



1 INSPECT CONTAINERS
The day before the pour, unpack the chemicals and inspect them carefully. If the Polyol is cold and thick or the Iso is cloudy or crystallized, follow the Cold Weather Heating Instructions in Appendix D, pg. 20.

2 PLACE MOLDING BAG IN CHAIR
Place the base cushion inside the molding bag and position the molding bag in the chair. Place a trash can behind the chair, and seat the client.
(When making a Total insert, place the molding bag on top of the previously molded seat cushion, as shown in the above photo.)



6 ADD ISO. MIX FOR 15 SECONDS.
Place the mixer in the bowl. Turn it on high speed and quickly pour the Iso without splashing it onto the beaters. Mix for 15 seconds. The mixture should have a thin, aqueous consistency. Lift the mixer slightly above the liquid and briefly spin the beaters clean. Set the mixer aside.



7 POUR MIX INTO MOLDING BAG
Have the client lean forward, and lower the bowl into the molding bag. Pour the mixture quickly and evenly into the bottom of the bag. Set the bowl aside and have the client lean back into position. Adjust the molding bag to ensure it is not restricting the flow of the liquid foam.



8 LEAN CLIENT BACK
While the reaction is occurring, stand away from the bag opening to avoid breathing any escaping gases. Do not poke the foam as it rises as that will cause the tiny bubbles to break creating hard spots in the cushion.
Place a trash can beneath the opening of the bag to catch any overflow.

SHIPPING AND STORAGE

The U.S. Department of Transportation does not require the FIPS chemicals to carry a “hazardous” label when shipped. They may be safely handled, shipped, and stored using normal care.

The FIPS chemicals should be stored at room temperature (60-75°F). They are not volatile or readily flammable, however, they will react slowly with moisture. All containers should be sealed tightly until ready for use.

SAFETY TIPS

Work in a well-ventilated area and protect the chair and floor with drop cloths.

To minimize the risk of spills or splashes, place the mixing bowl inside the packing box to mix.



3 POUR POLYOL INTO MIXING BOWL
With the Polyol at room temperature, pour it into the 3-quart mixing bowl. Use the mixing stick to scrape **all remaining sediment** into the bowl. The older the unit, the thicker and more settled/separated the Polyol ingredients will be.

IMPORTANT

Chemicals must be mixed in the order specified.

Do not push on the molding bag while the foam is rising. This will cause the small bubbles to break and will create hard spots in the finished cushion.



4 MIX POLYOL FOR 2 MINUTES
Mix the Polyol on high speed for 2 minutes to obtain uniform consistency. Thorough mixing is key to creating a cushion with good cell structure and support properties.

**Temperatures
Below 50°F
Crystallize Iso.
Heat Carefully
per Instructions.**



5 ADD CATALYST. MIX FOR 30 SECONDS.
Add the Catalyst and mix for 30 seconds. The Catalyst controls the speed and heat of the reaction. The process may be halted at this stage if necessary. No reaction will take place until the Iso is added.
The foaming reaction occurs very quickly once the Iso is added to the mix.

STOP! MAKE SURE EVERYONE IS READY BEFORE PROCEEDING.



9 MONITOR FOAM RISE
Hold the client's shoulders or chest in position, as the rising foam may push the client forward. The client must remain seated, as still as possible, for at least 5 minutes while the liquid rises and cures.



10 A COMPLETE RISE
After about 10 minutes, the foaming process is complete and the back cushion is ready to be trimmed and finished.



TRIM EXCESS FOAM
Once the foam has cured, remove the molding bag from the foam. Mark and trim away any excess cushion material. Laminate, fabric finish and waterproof as needed.

BOWL PACK WASTE DISPOSAL

To minimize the risk of spills, always replace the lids on the containers after the chemicals have been used. To clean up, pour any Catalyst residue into the Iso bottle. Add a small amount of water and mix gently. Loosely recap the Iso bottle to allow resulting gases to escape. Once the chemicals react, they become a solid waste which may be disposed of in the trash. **Do not pour Iso down the drain.** It reacts with water and will produce hard crystals that will clog the drain.

Finishing the Cushion

Once the foam has cured, the cushion is ready for finishing. First, trim away any excess material. Then, adhere a ¼" layer of Soft SunMate® to the surface. Finally, cover the cushion with either a "hairnet", stretch-knit, or waterproof fabric. Waterproof coating application (shown on pg. 16) is optional depending on the fabric used and level of protection required.

Trimming



1 About 15 minutes after the pour, the foam will have finished curing and may be trimmed. Cut away all excess foam that will not provide any positioning, comfort or support need.



2 Remove the plastic molding bag. It CAN NOT be used as a waterproof barrier and will cause the cushion to harden if it is not removed.



3 For total inserts, mark the seat and back cushions so they can be re-aligned after they are removed from the chair.

TRIMMING TIP

Cutouts can be made beneath high pressure points or areas where tender skin is susceptible to heat or friction. Place a Pudgee®, gel, or air-cell insert into the void to reduce pressure, shearing, or temperature. Ventilation holes or slits for harnesses or belts can be added before laminating. Cut too much away? Simply glue it back!

Laminating

Before laminating, you must trim a ¼" layer away from the interior surface of the cushion maintaining the contour of the mold. This material will be replaced by gluing a ¼" thick sheet of Soft SunMate® to the surface to create a smooth, comfortable, aesthetically pleasing finish.



1 Lay the ¼" laminate over the cushion and fold it back over itself. Using a permanent foam adhesive, spray half of the seating surface and half of the ¼" laminate. Wait a minute for the glue to become tacky.



2 Press the two surfaces together, gently pulling and smoothing the laminate until an even contact is made. Repeat this process until the laminate is adhered to the remainder of the seating surface. Prevent air pockets from forming by pressing the laminate for a few minutes until the contact holds. This is particularly necessary in deep recesses.

Fabric Covering

Simple solutions to fabric covering are to mold directly into a fabric-finished molding bag, or to use a simple elastic "hairnet" cover. Otherwise, a 4-way stretch fabric may be glued to the surface to increase the protection, durability, and life of the cushion. Choosing a waterproof fabric eliminates the need to apply a waterproof coating, and makes the insert easy to clean or sterilize.



"Hairnet" cover made from stretch fabric



1 Lay the fabric over the cushion and fold it back over itself. Spray half of the cushion with foam adhesive, and wait for it to become tacky. Break the bubbles and spread the glue evenly using a tongue stick. DO NOT SPRAY THE FABRIC.



2 Starting in the deepest recess, press the fabric into place. Gently pull and stretch the fabric around the sides being careful not to pull the contour of the cushion out of shape. Repeat the process to adhere the fabric to the rest of the cushion.

TRIMMING ITEMS NEEDED

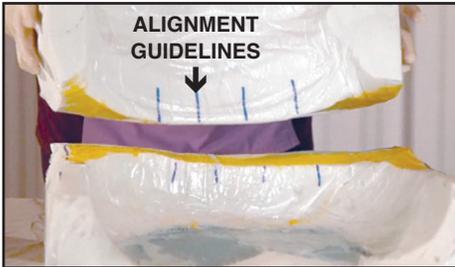
- Felt-tip marker
- Electric knife
- Paring knife or box cutter (optional)
- Die grinder (optional)

LAMINATION ITEMS NEEDED

- 16" x 37" x ¼" (or larger) SunMate® sheet
- 3M FoamFast 74™ spray contact adhesive
- Scissors

FABRIC COVERING ITEMS NEEDED

- 4-way stretch fabric (1 yd for seat or back, 2 or more yards for a total insert)
- 3M FoamFast 74™ spray contact adhesive
- Scissors



4 Glue the back and seat cushions together before surface-finishing with the laminate and fabric cover.



5 Reseat the client on the new cushion. Assess the fit and mark any areas that need additional trimming.
Use an electric knife to trim away any surface irregularities that might cause skin irritation or pressure points. A die grinder is useful for smoothing irregularities in deep contours of the insert.



6 Trim around the thigh depressions to allow room for air circulation and movement. Bevel any rough edges.
After the initial trim, temporarily cover the insert so the client may try it for a few days. Observe the client's fit and function during that time and make further adjustments as necessary. Once trimming is complete, the insert may be laminated.



3 At the corners of the insert, pinch the excess laminate together and trim it about a ¼" from the edge of the cushion.



4 Apply adhesive to the cut edges and pinch them together to make a seam.



5 Finish all seams before moving on to the fabric finishing stage.



3 Avoid creating any seams or wrinkles on the seating surface. Seams may be placed on the back, bottom or sides of the insert. To make a seam, pinch the excess fabric together to make a dart, and trim the fabric ¼" from the cushion edge.



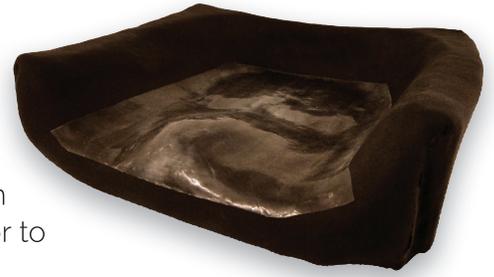
4 Use a tongue stick to push one side of the fabric underneath the other, adding glue to the seam to hold it together if necessary.



5 Accidental glue sprays on the top surface of the fabric may be removed with masking tape before the glue dries.

Waterproofing

Applying a silicone elastomer coating to your FIPS cushion creates a flexible waterproof seal that stretches with the foam as it compresses, and will not detract from the cushion's support properties. The surface is easily cleaned with soap and water and may be sterilized with steam or antibacterial disinfectant. Silicone may be applied directly to foam or to cotton-knit fabric, and is safe for skin contact.



MATERIALS NEEDED

- 2-4 tubes of Dow Corning® 732 RTV multi-purpose sealant
- Plastic spreader
- Disposable gloves
- Plastic drop cloths
- Masking tape

IMPORTANT

DO NOT COMBINE different brands of silicone on the same cushion as they may not be compatible.

The silicone coating will add slight firmness to your cushion. To combat this effect, if you know you will be applying the waterproof coating, order a formulation one-degree softer than necessary for support. For example, a waterproofed Extra-soft FIPS cushion will feel and perform like a Soft.

Free samples of each formulation as cured foam are available upon request.

Applying a Silicone Coating

Work in a well-ventilated area. The 732 RTV silicone has a highly acidic, vinegar smell. Once the silicone dries, the odor disappears. If you do not smell this strong odor when you begin to use the product, it may be beyond its shelf-life and may not dry properly. Always check the use-by date before buying or applying the sealant.

Wear disposable gloves and cover the work area with plastic drop cloths. Make sure the surface area being waterproofed is dry and oil-free.

The following steps describe waterproofing all sides of a seat or back cushion. Waterproofing only the seat cavity (as shown in the photos), requires only 1 tube of silicone.



When waterproofing just the seat cavity, outline the area to be treated with masking tape for neat edges. Remove the tape before the silicone dries completely.



1 To start, empty ½ of the tube onto the cushion surface. You may add more as you go if necessary.



2 Apply the silicone evenly, holding the spreader vertically for good penetration. Coat the top and sides of the insert and let it dry for 1 hour.



3 To apply the second coat, empty the remainder of the tube contents onto the seating surface.



4 Apply the second coat holding the spreader at a 45° angle. This coat should be thin and smooth.



5 To eliminate ridges, before the silicone dries, gently rub a mixture of warm water and dish detergent into the second coat using your fingertips.



6 When waterproofing the entire cushion, finish one side first and allow the coating to dry completely, then turn the cushion over and repeat steps 1-5.

TIP

If the waterproof coating generates uncomfortable heat buildup for the client, a thin towel may be placed between the body and the cushion to reduce perspiration.

Appendix A

Custom Sizes

Making Larger and Smaller Molds

One advantage of using the Bowl Pack is that the containers can be opened individually and the chemicals utilized in smaller quantities.

All chemicals must be proportioned by weight, not by volume. When preparing your own fractional mixture, refer to the table below. To proportion the ingredients, first weigh the desired quantity of Polyol. Then determine the amounts of Catalyst and Iso needed by multiplying the Polyol weight by the appropriate percentages listed.

Bulk chemicals are available upon request. Call for pricing.



Calculating Proportions of Liquid SunMate® FIPS for Custom Sizes

SOFT	WEIGHT for one unit	%	MEDIUM	WEIGHT for one unit	%	SEMI-RIGID	WEIGHT for one unit	%
Polyol	1420 g	100	Polyol	1360 g	100	Polyol	1280 g	100
Catalyst	20 g	1.5	Catalyst	20 g	1.5	Catalyst	12 g	1
Iso	612 g	43	Iso	680 g	50	Iso	756 g	59
Total Wt.	2052 g		Total Wt.	2060 g		Total Wt.	2048 g	

All weights are approximate. The exact amount varies somewhat with Soft, Medium and Semi-Rigid formulations as shown in the table.

Fire Safety Options

FRG Fire Retardant Additive for Liquid SunMate® FIPS Bowl Pack

A cushion made with Liquid SunMate® FIPS will pass the CAL 117 Section D, Part II burn test without the use of any fire-retardant additive, coating, or FR fabric cover. However, Dynamic Systems offers a non-halogenated fire-retardant additive that can be used with the Liquid SunMate® FIPS Bowl Pack to allow the cushion to pass the British Standard 5852 Part 2/1324 Source #5 (Crib 5) and the FAA 12-second vertical burn test, Vert FAR 25.853(a). The optional fire-retardant additive, called FRG, comes packaged with the FIPS unit in a separate container, and is added to the Polyol during the mixing process. An additional charge applies.

How to Dispose of Expired Chemicals

A "Use By" date is printed on each box of Liquid SunMate® FIPS. If the product has passed this date before you are able to use it, you have the following options:

1. Order replacement Iso (Bowl Pack only). The product will still be usable with new Iso.
2. Return unused chemicals to Dynamic Systems for disposal. Shipping charges apply.
3. Use the following method to dispose of the chemicals. (Comply with any local, state, and federal laws and regulations which may be more stringent.)

Always wear disposable gloves and eye protection when disposing of the chemicals.

Bowl Packaging Disposal Method

To dispose of the Iso and Catalyst:

- Pour an absorbent material such as cat litter or sand into the bottom of two double-bagged trash bags.
- Pour the contents of the Iso bottle into the trash bag.
- Pour the contents of the Catalyst bottle into the trash bag. Avoid breathing any resulting outgassing fumes.
- The trash bag and empty bottles may then be disposed of as household trash. Polyol, which is derived primarily from plants, may be thrown away as originally packaged in the container.

Bag Packaging Disposal Method

To dispose of the Iso and Catalyst:

- Pour an absorbent material such as cat litter or sand into the bottom of two double-bagged trash bags.
- Carefully cut open the end of the Iso section of the foil Bag Pack and pour the contents into the trash bag.
- Carefully cut open the Catalyst section and pour the contents into the trash bag. Avoid breathing any resulting outgassing fumes.
- The trash bag and remainder of the foil FIPS Bag Pack (containing only Polyol) may then be disposed of as household trash.

Appendix B – Reading Labels

Read all labels carefully before using the chemicals. They contain important safety and handling information.

Support Pressure Labels

FIPS formulations are color-coded for easy identification.



Soft Polyol is pink, and the chemical containers and packing boxes are all marked with small round red stickers.



Medium Polyol is blue, and the chemical containers and packing boxes are all marked with small round blue stickers.



Semi-rigid Polyol is white or light green, and the chemical containers and packing boxes are all marked with small round green stickers.

Polyol may be requested without dye to make a white cushion.



Important Safety and Handling Labels

For complete safety and handling information about each chemical, read the Safety Data Sheets enclosed with each FIPS unit.

ISO

reactive chemical

WARNING: Skin and eye contact hazardous.
HANDLING: Wear safety glasses & gloves. Read SDS.

If Iso is Cold: At temperatures below 50°F, Iso forms crystals and looks cloudy. It must be heated before use.

DO NOT HEAT IN A MICROWAVE OR ON A DIRECT HEAT SOURCE. THIS COULD CAUSE THE ISO TO VAPORIZE AND EMIT DANGEROUS FUMES.

To Heat Iso: Remove lid and foil seal. Loosely replace lid on container and place in a hot water bath (100-150°F) for 15 minutes. Do not exceed 150°F. Let cool to room temperature (70-80°F) before use.

FIRST AID

Eye Contact: Immediately flush with water for 15 minutes.
Skin Contact: Immediately wash with soap and water for 15 minutes.

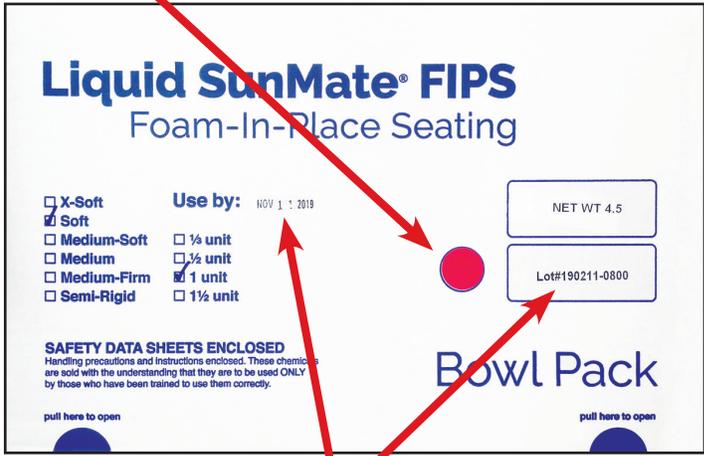
Fumes: Iso does not present a fume hazard unless heated in excess of 150°F. Fumes produced at 120°F are minimal. Work in a well-ventilated area.

Spills: Use an absorbent, granular material on spills. Cat litter, soil, or sand works well. Water will neutralize chemical to produce a non-toxic waste. Do not pour raw Iso down the drain.

CATALYST

reactive chemical

WARNING: Handle with care. Read SDS.
HANDLING: Wear safety glasses & gloves. In case of eye or skin contact, immediately flush with water for 15 minutes.



Important Dates on the FIPS Packing Box

Before using the product, check the expiration date. Both the Bowl and Bag Packs have a **shelf life** of 9 months from date of manufacture. Every unit is stamped with a **Use By** date and a **Lot#** record of the date and time a specific batch was made and packaged for delivery.

How to Read a Lot#

For example, in the above image, the Lot# 190211-0800, reading from left to right, “19” is the year 2019, “02” is the month of February, “11” is the day the unit was packaged, and “0800” is the time the batch was made (8:00 a.m.).

POLYOL

(polyether glycerol, polyether glycol)

Polyol is relatively inert and is not considered hazardous or toxic. However, skin irritation could result in some cases. Avoid eye contact. Store and use at room temperature (70-80°F).

If Polyol is Cold: If thick or cold, remove lid and foil seal. Loosely replace lid on container and place in a hot water bath (100-150°F) for 15-20 minutes. Let cool to room temperature and mix thoroughly before use.

WARNING: Do not heat in a microwave or on a direct heat source.
HANDLING: Wear safety glasses and gloves. Read SDS.

Appendix C – Iso Safety

MDI Information

Please read the sidebar information carefully. It contains a summary of the 1990 MDI Toxicity Report by CIVO and additional in-house research data.

The most essential safety factor is for all users of the Liquid SunMate® FIPS system to have a clear understanding of the proper handling procedures and use of this chemical.

Iso Safety Levels

The Occupational Safety and Health Administration (OSHA) has set safe isocyanate exposure limits, which are based on extensive studies and are set as low as is necessary to avoid all ill effects. According to OSHA guidelines, the concentration of isocyanate should not exceed 0.02 ppm (parts per million) in the work space. Research test results printed in the references cited below indicate that Iso fumes from normal Liquid SunMate® FIPS usage do not exceed the OSHA exposure limits.

1. *The Journal of Occupational Medicine* (April 1969, vol. ii, no. 4) cites research in which a 10-minute mixing and pouring of an MDI system (similar to the Iso system), performed in a sealed room, produced isocyanate levels of only 0.004 ppm. This is only 1/5 of the OSHA limit.
2. *Technical Bulletin 107* (Upjohn Co., 1980) indicated that a free-standing, open container of Iso will not produce fumes near its opening in excess of OSHA standards until the temperature reaches 100°F.
3. The International Isocyanate Institute, Inc. initiated a two-year study of polymeric methylenediphenyl diisocyanate (MDI) at CIVO Institutes, Zeist, The Netherlands, in June 1985. Preliminary results from this study are available and are briefly described in the following paragraphs.

Due to its physical characteristics, it was not possible to generate a vapor atmosphere of MDI high enough to carry out a meaningful study. Therefore, an aerosol was used to expose rats six hours per day, five days per week for two years to an atmosphere of MDI. Concentrations used were: 0, 0.2, 1.0 and 6.0 mg/m³. The current TLV for MDI is 0.005 ppm or 0.055 mg/m³.

The overall tumor incidence did not show statistically significant differences between the high exposure group and the control group. We do not believe these results require a change in our view of risk to people from exposure to MDI at otherwise acceptable levels. The currently suggested control levels, either the TLV of 0.005 ppm as a TWA or the OSHA PEL of 0.02 ppm ceiling (0.2 mg/m³), which are set to protect against a variety of other effects on the respiratory system, are well below levels that cause irritation to the respiratory tract.

Additionally, an inspection performed by OSHA at Dynamic Systems, Inc. on August 14 and September 3, 1997, showed no detection of MDI present during the manufacture of Liquid SunMate® FIPS or SunMate®. The permissible exposure limit (PEL) ceiling is 0.2 ppm.

SUMMARY OF MDI TOXICITY

- It is not possible to generate sufficient concentrations of MDI (Iso) vapor at room temperatures to produce unsafe MDI levels.
- CIVO had to use an MDI aerosol spray in order to reach unsafe MDI levels. An aerosol is not generated in the Liquid SunMate® FIPS process.
- The levels of fumes produced in the Liquid SunMate® FIPS process are well below the OSHA allowances, and well below the levels tested by CIVO wherein no toxic effects were detected.
- MDI produces minimal toxic fumes during the foaming process. In keeping with safe handling practices, however, we stress the need for good ventilation. Stand away from the bag opening, and keep the bag opening folded downwards to reduce fume escape.
- MDI fumes are not generated until the mixture starts to warm and produce gases during the foaming process. By this time, the mix is inside the molding bag and the bag opening may be totally restricted using the following method:
 - If the potential for fume generation concerns safety personnel, a simple filter can be made by removing the bottom from a 9 oz paper cup, placing a damp porous sponge into the cup, and wrapping the molding bag opening around the cup once the FIPS mixture has been poured into the bag. Secure the bag to the cup with a rubber band, and drape the bag away from the client and attendants. The damp sponge will neutralize any fumes, and reduce the fume level to zero by absorption. An activated charcoal filter may be added to the vent as an extra precautionary measure.

Excepting gross mishandling or the use of large quantities, the Liquid SunMate® FIPS product and process provided by Dynamic Systems, Inc. is safe without the need for taking extraordinary precautions. However, the simple and inexpensive optional safety measures listed above may be followed as safety personnel deem necessary.

Appendix D – Cold Weather Heating Instructions

Shipping and storage during the winter months may expose the product to temperatures below 50°F. The FIPS chemicals are formulated to be used at room temperature (between 60°-75°F). If the container feels cold to the touch, or the chemicals appear thick, cloudy or crystallized, the chemical reaction will be slow and incomplete. The chemicals may be brought back to the proper consistency using a simple hot water bath. Follow the instructions below to ensure a good foam rise.

DO NOT HEAT CHEMICALS IN A MICROWAVE OR DIRECTLY ON A STOVE OR HOT PLATE.

Bowl Pack

Heating the Polyol

- First, remove the foil safety seal underneath the lid and loosely place the lid back on the container.
- Place the Polyol container in a pan of water preheated to 120-150°F and let it sit for 15-20 minutes.
- Remove the container from the bath and let it cool to room temperature.*
- Once the Polyol has cooled, use the wooden mixing stick to scrape any sediment from the bottom and sides of the container, then thoroughly mix the Polyol with an electric beater for 2 minutes.



Remove the foil safety seal and loosen the lid of the container when heating the Polyol or Iso.

Heating the Iso

- First, remove the foil safety seal underneath the lid, and loosely place the lid back on the container.
- Place the Iso container in a pan of water preheated to 120-150°F, and let it sit for 15-20 minutes until the Iso appears the same color and consistency as apple juice. To avoid exposure to possible fumes, **do not exceed 150°F.**
- Remove the container from the bath and let it cool to room temperature.*



You must let the chemicals return to room temperature (60-75°F) before using. If the chemicals are too warm, the chemical reaction will be excessively fast and hot during the molding process.

Bag Pack

You cannot visually check the Iso or Polyol inside the foil bag, so it is a good idea to follow the Cold Weather Heating instructions any time the Bag Pack has been exposed to temperatures below 50°F.

Heating the Polyol

- Place the Polyol section of the Bag Pack in a pan of water preheated to 120-150°F, and let it sit for 15-20 minutes until the bag feels soft and pliable.
- Take the Bag Pack out of the bath and let it cool to room temperature.*
- Before use, massage and knead the Polyol section of the bag for about 2 minutes until the consistency feels uniform.



Place the Iso or Polyol section of the Bag Pack in a hot water bath to melt any crystals.

Heating the Iso

- Place the Iso section of the Bag Pack in a pan of preheated water (120-150°F), and let it sit for 10-15 minutes. **Do not exceed 150°F.**
- Take the Bag Pack out of the bath and let it cool to room temperature.*

- Cloudy or cold Iso will not react properly.
- Heat carefully per instructions.
- Return to room temp. (65-75°F) before using.

Temperatures Below 50°F Crystallize Iso. Heat Carefully per Instructions.

Verification Statement of Training for Liquid SunMate® FIPS (Foam-in-Place Seating)

This form must be completed and returned to Dynamic Systems by the user performing the FIPS pour or by the reseller's representative responsible for answering questions and instructing customers in the use and safe handling of FIPS.

As a measure to ensure customer success and safety in the use of the Liquid SunMate® FIPS system, Dynamic Systems requires verification that an understanding of basic product safety and handling has been achieved by the user or reseller before the first order will be shipped.

By signing this form you verify that you have completed at least one of the training requirements listed below, and understand the proper safety and handling procedures of this product and its application. Check all that apply:

- I have read the Liquid SunMate® FIPS Instruction Manual **AND** watched the Liquid SunMate® FIPS Instructional Video.
 I have successfully completed certification in a Liquid SunMate® FIPS Workshop.

Workshop Date: _____ Workshop Location: _____

Instructor's Name: _____ Instructor's E-mail/Phone: _____

Signature	Title	Date	
Printed Name	Phone	Fax	
Company Name/Facility	E-mail		
Street Address	City	State	Zip

Do you resell Liquid SunMate® FIPS (Foam-in-Place Seating)? YES NO

As a reseller of FIPS, by signing this agreement, you acknowledge that you or an employee with your company can competently answer questions about this product, including but not limited to: safe chemical handling, product shelf-life and proper disposal, cold weather heating, mixing and pouring techniques, client and technician safety. If your customers do not have the most recent FIPS Instructional Video and Manual published by Dynamic Systems, you will provide them. You understand that this basic level of training is required to ensure the safe handling of this product.

We will ship your order for Liquid SunMate® FIPS upon receipt of this verification. Thank you.

Dynamic Systems inc

Specialty Foam Manufacturer

Manufacturing Facility

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Hours of Operation

8:00am - 5:00pm EST, Monday-Friday

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