



InsulSafe[®] 4

The Premier Insulation

Installation Instruction Manual

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Introduction

This installation manual presents standardized guidelines for installing InsulSafe®4 Fiber Glass Blowing Insulation using appropriate pneumatic blowing equipment.

CertainTeed has field tested InsulSafe with most of the blowing machines designed to install fiber glass insulation. The information in this manual is based on that field testing and the recommendations of the major equipment manufacturers.

This manual covers the basics. Of course, we cannot cover all variables which will occur in the field. Therefore, whenever you encounter a situation not covered here, we encourage you to call your local CertainTeed representative for consultation.

Product Description

InsulSafe is a virgin fiber glass insulation product specifically designed for pneumatic applications. It can be used for attic open blow, retrofitting existing walls and insulating behind netting or fabric in new construction with the Blow-In-Blanket® System.

InsulSafe offers these benefits:

- Thermally Efficient
- Noncombustible
- Noncorrosive
- Won't Rot or Decay
- Odor Free
- Won't Settle
- Won't Absorb Moisture
- Doesn't Provide Sustenance for Vermin
- Tested and Certified by NAHB Research Center

Working at a construction site always offers the potential for accidents. During any installation, you should be fully aware of all OSHA regulations and practice sound work habits not only at the site, but while proceeding to and from each location.

In particular, working with blowing machines requires taking basic safety precautions. Here is a brief summary of the key points to remember. Of course, if your company has stated safety regulations, you should be familiar with and follow them as well.

1. Take care when loading bags of insulation and other equipment onto your truck. Handle only one bag at a time, being sure to always use proper lifting procedures.
2. When loading the hopper, lift only one bag at a time. When opening each bag, always cut away from yourself.
3. Never overfill the hopper; usually, three bags is maximum. This may vary by machine.
4. Never put your hands, broom handles or other foreign objects into the hopper for any reason while the machine is in operation.
5. If you drop something into the hopper, always turn the machine completely off before trying to retrieve the object.
6. Never adjust the machine with its engine running. Turn it completely off first.
7. Make sure the engine exhaust is vented to the outside of the truck.
8. Always wear a disposable dust respirator and ear protection when loading the machine, or even when standing nearby.
9. Always follow CertainTeed's recommended safety procedures, such as wearing a disposable dust respirator, when installing InsulSafe. Read the section called WARNING on the bag for details.
10. Clean up periodically during installation so that you don't trip over the materials you've laid out for the job.

Glossary of Terms

You should be familiar with the following terms:

Arc Length

The distance conditioned insulation is thrown from the end of the blowing hose.

Area

The square footage of the space to be insulated after subtracting for obstacles such as joists, studs, and openings.

Bag Count

The number of bags required to insulate a given area.

Blow Back

Air pressure escaping from the feeder (airlock) preventing a smooth flow of insulation into the shredder, caused by worn feeder seals.

Blowing Machine

Pneumatic device to condition and install loose-fill insulation.

Coverage

The maximum square footage that a bag of insulation should cover at or above the minimum thickness required for the specified R-value.

Cupping

Using a hand to direct the insulation as it leaves the hose. This should be minimized and always done wearing a glove.

Density

The weight per cubic foot of blown insulation expressed in pounds per cubic foot.

Feed Rate

The rate at which insulation passes through the machine and hose, usually expressed in pounds per minute or minutes per bag.

Joists

The wood framing members in the floor/ceiling assemblies.

Overblow

The condition when more than the required number of bags is needed to be installed to achieve the minimum specified thickness.

Product Conditioning

The process of opening and sizing the blowing insulation to achieve the specified installed thermal performance.

R-value

The measure of a material's resistance to heat flow. The higher the R-value, the greater the insulating power.

Underblow

The condition when less than the required number of bags is needed to be installed to achieve the minimum specified thickness.

Weight

The pounds per square foot necessary to achieve the desired R-value as listed on the bag label.

For additional terms, see Blowing Machine Components in the next section.

Blowing Equipment

While there are many pneumatic insulation machines available today, only certain ones are recommended for use with this product. Recommended initial machine settings for the most commonly used machines appear on page 6.

In order to apply InsulSafe properly, the machine you use must meet CertainTeed performance criteria of:

- Proper fiber conditioning
- Uniform material flow
- Proper air volume

To meet these criteria, pneumatic equipment normally requires:

- An adequate shredding system
- An airlock on the feeder section
- Adequate air volume and pressure
- An adequate feed control into and out of the shredder section
- Control of all the above

With any recommended machine, there are two ways of controlling application density: adjusting machine settings and modifying application technique. The latter method tends to be the most important.

Blowing Machine Components

Most blowing machines contain the following components:

Jack Shaft

The mechanism that transfers mechanical power from the machine's engine to its other components.

Hopper

The box or holding tank located on top of the blowing machine which holds material being fed into the machine. Most large blowing machines have hoppers designed to hold several bags of material and work most efficiently when their hoppers are loaded near capacity.

Agitator Arms

The arms which rotate inside the hopper, serving to break up material before it enters the shredder.

Slide Gate

An adjustable gate which directly affects the feed rate of blowing material by controlling the amount of material entering or exiting the shredder. It is an important factor in proper material conditioning.

Shredder

The shredder contains one or more rotating shafts with bars or tines which condition the material into a smaller, more uniform size before moving the material to the feeder section at a constant rate.

Feeder (Airlock)

A series of rotating vanes inside a cylinder at the point where air is introduced to the insulation to yield a desired material-to-air ratio. When well-maintained, the seals on these vanes prevent air leakage in each chamber.

Blower

The blower provides the air pressure necessary to move the blowing material from the feeder through the blowing hose. Its air relief cap uses either weights or an air bypass valve to regulate the amount of air pressure into the feeder.

Air Relief/Bypass Valve

The number of weights on, or adjustment to, this valve can affect the installed product density. Air pressure also relates to length and type of hose and elevation.

Blowing Hose

The flexible plastic hose which delivers the conditioned insulation from the machine to the area being insulated. Since final product conditioning is accomplished in the hose, CertainTeed recommends using an internally corrugated hose a minimum of 150' in length. The hose should be 3", but smaller machines use 2½" and larger machines use 3½" to 4". A decrease in the hose diameter usually increases the arc length.

Blowing Equipment Cont'd

Initial Machine Settings

CertainTeed has tested and evaluated a number of blowing machines to determine the initial machine settings for InsulSafe 4 Fiber Glass Insulation. The chart below provides Initial Machine Settings for these machines. Settings may vary depending on machine condition, climatic factors and application techniques.

These machine settings were developed using machines in good working order and application techniques considered to be acceptable in normal field operation. In some cases, it may be necessary to adjust initial settings in order to fine tune the performance of your blowing equipment as well as to achieve target density.

In other words, directions on our chart will get you started, but it takes flexible application technique to finish the job off properly. Make it a habit to experiment and adjust accordingly to achieve optimal results. With InsulSafe and the proper equipment, application technique is the most important factor.

Initial Machine Settings

General Settings

When using most machines recommended for fiber glass application by their manufacturers, it is best to follow the general settings that follow:

Engine RPM

As a general rule, the engine RPM should be set at the maximum recommended by the manufacturer, 1,800 to 2,400 RPM. A reduction will result in reduced output and poorly conditioned material, machine stalling or clogging of the shredder or hose.

Air Pressure

InsulSafe is designed to be installed at air pressure settings lower than many other fiber glass products, generally 1 to 2½ PSI. To lower the pressure, remove a weight or further open the air bypass valve. This will reduce overblow, dust and shorten the arc. Machines using an air relief cap and weights generally require a cap plus only one weight. If air pressure can not be mechanically reduced, add an additional length of hose.

Gate Openings

A typical setting is three-fourths to fully open. Reducing the opening will improve coverage and decrease feed rates.

Gear Settings

Many machines have a four-speed gear box. InsulSafe installs most efficiently in third gear. Decreasing the transmission setting will decrease the feed rate but improve the conditioning.

Arc Length

When holding the hose horizontal at the waist, properly conditioned product should land 10 to 12 feet from the end of the hose.

To increase the arc length, increase the air pressure or decrease the feed rate. To decrease the arc length, do the opposite.

MANUFACTURER MACHINE(S)	ABIFF BLOW-MATIC 8	ARK-SEAL BIG BLOWER DELUXE	CAPITOL MODEL 125	DAHL MONSOON 1000	MEYER 1300 SERIES 1400 SERIES	MEYER 800 SERIES	UNISUL VOLU-MATIC II VOLU-MATIC III	UNISUL ATTIC-MATIC
ENGINE / PTO RPMSET ENGINE / PTO RPM IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS.....							
AIR PRESSURE	AIR BYPASS, ¼" OPEN 1-5 RODS	2 PSI	1 WT.	2½ PSI	3 WTS.	1 WT.	1WT./ 2½ PSI	2 PSI
GATE OPENING	5½" OPEN (BOTH GATES)	OPEN W/ 5 RODS	½ OPEN	10 TH HOLE	6"	¾ OPEN	12"-14" W/STATOR BAR	12" W/STATOR BAR
GEAR SETTING	NONE	NONE	NONE	NONE	3 RD	3 RD	3 RD	NONE

ABIFF Blow-Matic 8

ABIFF Manufacturing Corporation
2185 South Jason
Denver, CO 80223
1-800-852-1369
1-303-934-2175

Engine RPM

The Blow-Matic 8 is typically equipped with a heavy duty 2 cylinder air-cooled gas engine. Set the RPM to ABIFF'S recommendations to insure proper engine performance.

Gate Openings

The Blow-Matic 8 has double micro slide gates. Both gates should be open 4"–5½". These gate openings will maximize product conditioning. Smaller gate openings can cause product damage.

Gear Settings

The Blow-Matic 8 has no gearbox to control the feed rate. The number of rods used controls feed rate. The more rods used, the more the feed rate will slow down.

Ark•Seal Big Blower

Ark•Seal International
2190 South Kalamath
Denver, Colorado 80223
1-800-525-8992
1-303-934-7772 (Colorado)

Engine RPM

The Big Blower is typically equipped with an Onan engine with a recommended 2600–2900 RPM setting for InsulSafe4. This RPM setting is controlled by the engine throttle. Operating below this recommended level may result in inadequate product performance, and reduced material coverage.

Gate Openings

The Big Blower utilizes a series of pins or rods to control the feed rate of material into the shredder section.

There are two basic versions of the Big

Blower, one with 0 to 5 rods and one with 0 to 10 rods. The use of all rods is recommended when blowing InsulSafe with either version. Removing rods increases the feed rate and reduces blowing time, but may reduce the material coverage.

Either one or two 6" slide gates are used to control the flow of material from the shredder section. The slide gates should be fully opened.

Gear Settings

The Big Blower does not have a gear box to control the auger and speed of the hopper arms. This is done by varying the engine RPM. In most cases, this RPM setting is effective at the recommended level, however, a slight reduction in RPM is acceptable, if a reduction of machine speed is desired to reduce feed rate.

Atticmatic

Unisul, Inc.
P.O. Box 1310
Winter Haven, Florida 33880
1-800-237-7841
1-941-294-3206 (Florida)

Engine RPM

These machines are equipped with different engines that vary by type and size. The jack shaft RPM is controlled by the engine throttle and should be maintained at approximately 1,000 RPM. Failure to maintain this jack shaft RPM level may cause engine damage due to overheating.

Gate Openings

Machine has a 12" slide gate, which should be fully opened for InsulSafe. Closing the slide gate will decrease feed rate and, in extreme cases, may cause clogging in the shredder section.

Gear Settings

The Atticmatic does not have a gear box to control the auger and hopper arms speed. This is done by varying the engine RPM. A slight reduction of RPMs is acceptable if a reduction of machine speed is desired to reduce feed rate.

Capitol 125

Capitol Machine and Equipment
702 Day Street Road
Montgomery, AL 36108
1-800-421-6473
1-334-263-0570

Engine RPM

This machine is designed to operate at a recommended engine speed of 2400 RPM and can be safely operated up to 3000 RPM.

Gate Openings

The slide gate should be half open when blowing InsulSafe. Closing the gate will reduce material feed rate and extend blowing time.

Gear Settings

This machine does not have a multi-speed gearbox.

Dahl Monsoon1000

Monsoon International
14660 E. Manning Avenue
Parlier, CA 93648
1-209-646-2756
1-800-843-7798

Engine RPM

The Monsoon 1000 is powered by a 23 horse power Kohler Model K5825 engine, and is designed to operate at an engine RPM of 2,100–2,300 RPM. This would be the fifth notch on the engine throttle setting.

Gate Openings

Note: The feed gate settings are in 1" increments. The recommended gate opening for the Monsoon 1000 is 10". Closing the slide gate will reduce material feed rate and extend blowing time.

Gear Settings

The Monsoon 1000 does not have a multi speed gearbox. Dahl does offer sifting gates and screens as optional equipment. They are not necessary to blow InsulSafe. Keep them out of the machine.

Meyer 1400, 1300 & 800 Series

William E. Meyer & Sons, Inc.
8261 Elmwood Avenue
P.O. Box 105
Skokie, Illinois 60077
1-847-673-0312
1-800-797-8227

Engine RPM

The Meyer series blowing machines are designed to operate at the following recommended machine speeds: 1150 RPM for the 1400 and 1300 series and 1550 RPM for the 800. Engine RPM will vary depending on the type and size of the engine, however, all engines should rotate the jack shaft at the same RPM level. The speed of the jack shaft may be controlled

by changing the engine RPM by way of the engine throttle.

Gate Openings

The Meyer Series has a 6" slide gate to control the material feed rate. InsulSafe should be installed with the slide gate three-quarters opened. Closing this gate will extend the blowing time.

Gear Settings

Although this machine installs InsulSafe most efficiently in 4th gear, CertainTeed recommends reducing to 3rd gear to increase the material conditioning and decrease the feed rate. This will extend the blowing time.

Unisul Volu-Matic II & III

Unisul, Inc.
P.O. Box 1310
Winter Haven, Florida 33880
1-800-237-7841
1-941-294-3206 (Florida)

Engine RPM

These machines are equipped with different engines that vary by type and size. The jack shaft RPM is controlled by the engine throttle and should be maintained at approximately 1,000 RPM.

Gate Openings

The Volu-Matic II & III have an 18" slide gate. We recommend this gate be opened 14". Closing the slide gate will reduce material feed rate and extend blowing time.

Gear Settings

These machines are equipped with a four speed gear box. Third gear is recommended for the installation of InsulSafe.

Installation

Open Blow

Open blow applications refer to those installations in residential or commercial buildings where loose-fill insulation is installed pneumatically in flat horizontal surfaces like attic, ceiling and roof spaces. Sloped surfaces up to 6:12 can also be properly insulated with InsulSafe.

Open blow applications provide complete uniform coverage especially in hard to reach areas. InsulSafe can be installed to any thickness to achieve practically any desired R-value. Because coverage is so complete, such installations provide an excellent thermal blanket covering every nook or cranny.

To assure that the right amount of insulation is installed on each job, follow these steps:

1. Calculate the net attic space to be insulated by deducting framing, access openings, ductwork and other obstructions from the gross attic square footage.
2. Using the coverage chart for InsulSafe, calculate the number of bags required to cover the net square footage for the required R-value.
3. Install attic rulers, at least one for every 250 square feet. They should be positioned to be visible from the attic opening.
4. Using the recommended initial machine settings in this brochure, get your blowing machine ready to start and load material into the hopper.
5. Attach a minimum 3" diameter corrugated plastic hose at least 150 ft. long.
6. Mentally divide the attic space into four sections and start blowing, using one-quarter of the bags for each section.
7. When you are finished, you should have installed the total number of bags for the job at or above the minimum thickness required to achieve the R-value.

For more information, view the CertainTeed video “Blowing Attics”.

THERMAL RESISTANCE		BAG REQUIREMENTS, BAGS/1000FT ² (100M ²) OF NET AREA		MAXIMUM COVERAGE: CONTENTS OF BAGS SHOULD NOT COVER MORE THAN:		MINIMUM WEIGHT: INSTALLED INSULATION SHOULD NOT BE LESS THAN:		MINIMUM THICKNESS: SHOULD NOT BE LESS THAN:	
R-VALUE FT ² ·H·°F/BTU	RSI M ² ·K/W	FT ²	M ²	FT ²	M ²	LBS/FT ²	KG/M ²	IN	MM
60	10.6	36.5	39.3	27	2.5	0.986	4.814	22	559
49	8.6	29.6	31.9	34	3.1	0.800	3.906	18½	470
44	7.7	26.4	28.4	38	3.5	0.712	3.476	16¾	425
38	6.7	22.8	24.5	44	4.1	0.615	3.003	14¾	375
30	5.3	18.0	19.3	56	5.2	0.485	2.368	12	305
26	4.6	15.5	16.7	65	6.0	0.418	2.041	10½	267
22	3.9	13.1	14.1	77	7.1	0.353	1.724	9	229
19	3.3	11.1	12.0	90	8.3	0.301	1.470	7¾	197
13	2.3	7.7	8.3	129	12.0	0.209	1.020	5½	140
11	1.9	6.6	7.1	151	14.0	0.179	0.874	4¾	121

Sidewall Retrofit

Use only blowing machines approved for fiber glass insulation. Before you get your machine and hose ready to blow, follow these procedures:

1. Check structural soundness of wall facings. Facings can be damaged by blowing pressure if they are weak or loosely attached. Do not begin insulating until suspect facings are corrected. Since InsulSafe can be installed from either the outside or inside, this applies to both wall surfaces.
2. Check for symptoms of moisture problems such as blistering paint, mildew, staining, odor, etc. on interior or exterior wall surfaces. Any such problem should be brought to the owner's attention.
3. Check for fire stops. If present, they will be at mid-height and holes must be drilled above and below these obstructions.
4. Note and mark all areas that must not be drilled (location of wall ducts, vents, recessed cabinets, service panels, etc.).
5. Make certain all wall openings through which insulation could enter the living space are sealed.

The recommended method for insulating sidewalls with InsulSafe is the directional nozzle method. In this method, air pressure must be reduced substantially compared to the open blow technique to insure that no damage is done to the sidewall. The blowing machine should be equipped with an air relief valve. The actual setting of the equipment will vary depending on the type of hose, equipment limitations and job conditions. When properly filled, wall cavities should have a nominal density of 1.6 lbs. per cubic foot. Your CertainTeed representative can instruct you on how this can be tested.

After the above procedures have been completed, follow these steps:

1. Drill two 2¹/₄" to 2³/₄" diameter holes (depending on the size of the plugs you will be using) into each stud cavity, one hole 3' up from the base of the wall and one hole 2' down from the top plates. Don't blow more than 3' down or 2' up from any hole.
2. Drill holes into cavities below windows and into cavities above windows when there is no solid header.
3. Use 200' of internally corrugated hose stepped down in diameter to a 2" or 2¹/₂" I.D. nozzle (50' of 3" to 100' of 2¹/₂" to 50' of 2" hose or 50' of 3" to 150' of 2¹/₂").
4. Insert the nozzle into lower hole first and blow downward, filling the cavity up to the level of the hole. Insert nozzle in upper hole and blow downward and then upward until the cavity is completely filled.

THERMAL RESISTANCE		BAG REQUIREMENTS BAGS/1000FT ² (100M ²) OF NET AREA		MAXIMUM COVERAGE: CONTENTS OF BAGS SHOULD NOT COVER MORE THAN:		MINIMUM WEIGHT OF INSTALLED INSULATION SHOULD NOT BE LESS THAN:		MINIMUM THICKNESS SHOULD NOT BE LESS THAN:	
R-VALUE FT ² ·H·°F/BTU	RSI M ² ·K/W	FT ²	M ²	FT ²	M ²	LB/FT ²	KG/M ²	IN.	MM
29	5.1	35.8	38.5	28	2.6	0.967	4.720	7 ¹ / ₄	184
22	3.9	27.2	29.2	37	3.4	0.733	3.581	5 ¹ / ₂	140
16	2.8	19.8	21.3	51	4.7	0.533	2.604	4	102
15	2.6	17.9	19.3	56	5.2	0.483	2.363	3 ⁵ / ₈	92
14	2.5	17.3	18.6	58	5.4	0.467	2.279	3 ¹ / ₂	89

Blow-In-Blanket® System

To properly install InsulSafe in BIBS®, follow these steps:

1. Install mesh or fabric over the areas to be covered. Start at the top plate and staple every 1½" to 2". Keep the mesh tight. Gluing with drywall adhesive is also acceptable.
 2. Staple around the perimeter of windows and doors.
 3. Then, staple across the bottom plate.
 4. Cut holes in the mesh or fabric big enough to fit the hose end. Either one or two holes will be required depending on the cavity size. Usually one hole is sufficient for standard 93" cavities.
 5. Insert the hose downward about 2' to 3' and start blowing, continuously moving the hose back and forth and gradually raising the hose as the cavity fills. When the bottom is filled, turn the hose and fill the upper portion.
 6. If obvious light-density areas are observed, cut additional holes in the mesh or fabric and install additional insulation.
 7. When starting to blow using InsulSafe with netting and adhesive, switch on the InsulSafe feed first and then the adhesive feed. When stopping, reverse the procedure.
 8. Finally, cut out window and door openings and around utility boxes.
- For more information, view the CertainTeed video on installing BIBS.

THICKNESS				DENSITY		MINIMUM WEIGHT		MAXIMUM COVERAGE PER BAG	
IN.	MM.	R-VALUE	RSI	LBS./CU. FT.	KG/CU. METER	LBS./SQ. FT.	KG/SQ. METER	SQ. FT.	SQ. METERS
3½ (2X4)	89	14	2.5	1.8	28.8	0.525	2.563	51	4.7
3½ (2X4)	89	15	2.6	2.3	36.8	0.671	3.276	40	3.7
5½ (2X6)	140	22	3.9	1.8	28.8	0.825	4.028	33	3.1
5½ (2X6)	140	23	4.1	2.3	36.8	1.054	5.146	26	2.4
7¼ (2X8)	184	29	5.1	1.8	28.8	1.087	5.307	25	2.3
7¼ (2X8)	184	31	5.5	2.3	36.8	1.389	6.782	19	1.8
9¼ (2X10)	235	37	6.5	1.8	28.8	1.387	5.772	20	1.9
9¼ (2X10)	235	39	6.9	2.3	36.8	1.772	8.652	15	1.4

Trouble Shooting

This section is intended to help correct the most common problems associated with the installation of loose-fill insulation. These recommendations assume that the blowing machine and hose are in proper working condition.

Application Techniques

- Install material using a uniform arc of 10' to 12'.
- Install material parallel with the joists on open blow.
- Bouncing material off the roof or blowing across the joists reduces coverage.
- Cupping material can reduce coverage.
- Start at the furthest point from the attic opening and work back toward the opening.
- Check material usage at the quarter point including bag usage, thickness and coverage. Make any adjustments required due to job conditions.

Coverage—Overblow

- Reduce air pressure and check arc length.
- Increase material feed rate.
- Check to assure that at least the minimum thickness is being installed.
- Compare job ticket requirements with the actual job site area.

Coverage—Underblow

- Increase air pressure and check arc length.
- Decrease material feed rate.
- Minimize cupping.
- Minimize material impact against joists, roof ductwork and other obstructions.
- Verify that the compressed insulation expands when bags are cut open.

Dust

- Decrease air pressure and check arc length.
- Increase material feed rate.
- Observe material expansion when bags are cut open and note the feel of the insulation.

Productivity

- Increase material feed rate.
- Use 3½" or 4" diameter hose.
- Maintain full hopper.

Static

- Note weather conditions: hot and dry, cold and dry.
- In hot or cold temperatures with low humidity, add a small amount of water to the insulation in the hopper.

Helpful Tips

1. On retrofit jobs, be extra careful not to damage the homeowner's shrubbery or furnishings. Cover if necessary.
2. When blowing, make sure that all openings to the living space are blocked. Be especially careful that the hose is not dropped onto the living area.
3. Carry a trouble light with a long extension cord and extra bulbs to use when attics are not sufficiently lighted.
4. Make sure you have enough attic cards, attic rulers and baffles.
5. When insulating an existing attic, make sure items stored in the attic are moved out of the way so they do not interfere with the hose-man. Items should be covered or removed from the attic.
6. Recessed lighting fixtures and fan motors protruding into the attic must not be covered with insulation. It should be held 3" from the heat source. This does not apply to Type IC fixtures.

CertainTeed

CertainTeed Corporation
a Saint-Gobain Company
P.O. Box 860 • Valley Forge, PA 19482

1-800-441-9850

www.certainteed.com • Fax-on-demand: 1-800-947-0057


SAINT-GOBAIN
INSULATION

CertainTeed was the first fiber glass insulation manufacturer to have its manufacturing plants, R&D center and corporate headquarters registered to ISO 9000 standards.