OPTIMA®

Installation Instruction Manual

SAINT-GOBAIN

OPTIMA®

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OPTIMA – Loose Fill Fiber Glass Insulation for Closed Cavity, Midfloor and Dense Pack Applications

This installation manual presents standardized guidelines for using the OPTIMA System with the expectation of product quality and uniform performance.

OPTIMA is specifically designed for closed cavity applications. Its fiber flows easily around obstructions within a wall cavity, resulting in a faster install time. Following proper installation procedures is essential, because they directly influence the physical properties and performance of the installed product.

This manual covers the basics. Of course, we cannot cover all variables that 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.

Please ensure you are in compliance with applicable OSHA and EPA regulations on all job sites.

System Description

OPTIMA also refers to the OPTIMA System, which includes both OPTIMA premium loose fill fiber glass insulation and OPTIMA non-woven fabric.

OPTIMA premium loose fill fiber glass insulation is highly engineered to provide outstanding thermal performance in closed cavity and midfloor applications.

OPTIMA non-woven fabric is specially designed to meet air permeability and strength criteria, as well as minimize fibrous dust during application.

The OPTIMA System requires that OPTIMA insulation be pneumatically installed behind OPTIMA fabric (or equivalent), using properly maintained and CertainTeed approved equipment, in full accordance with these installation instructions. Only then can OPTIMA perform consistently and uniformly.

OPTIMA insulation is also acceptable for retrofit closed cavity applications. See OPTIMA Sidewall Reinsulation Specification Sheet for more information.

IMPORTANT: The OPTIMA fabric should never be left exposed and should always be covered with a building material suitable to meet building code.

Installation Safety

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

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

1. Take care when loading bags of OPTIMA insulation and rolls of OPTIMA fabric onto the truck. Handle only one bag or roll at a time, being sure to always use proper lifting techniques.
2. When loading the hopper, lift only one bag at a time. To open each bag, always cut away from yourself.
3. Never overfill the hopper: usually, three bags is maximum. This will vary by machine.
4. Never put your hands, brooms 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. Make sure the engine has been completely turned 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 plugs when feeding the machine, or even when standing nearby.
9. Always follow CertainTeed's recommended safety procedures, such as wearing a NIOSH-certified disposable or reusable particulate respirator with an efficiency rating of N95 or higher when installing OPTIMA. Please read the WARNING section 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. Also, when installation is complete, be sure to clean up your workspace.

Fabric Installation

The OPTIMA System requires the use of OPTIMA non-woven fabric or an equivalent having the following properties:

- Frazier air permeability = 420 cfm ft² at 0.5″ H_2O
- Coulter average maximum pore size: 200 micrometers
- Grab tensile strength, lb./inch, average: MD: 22, CD: 22

Steps – Wood Framing

1. Select proper OPTIMA fabric size for the construction type (8-foot, 9-foot or 10-foot walls).
2. Cut a section of fabric from the roll that extends approximately 1 foot beyond each side of the wall to be covered. An experienced installer may be able to work with the roll of fabric without cutting individual pieces for each wall.
3. Staple or tack the corners on one side (top and bottom), making sure the fabric is stretched taut.
4. Staple or tack the opposite corners, pulling the fabric tightly to prevent any sagging. On long wall sections, staple along the top plate periodically while stretching the fabric until the opposite corners are reached.
5. Staple every 1 to 1-1/2 inches starting from one side along each stud face. Using your free hand, press on the fabric covering the next cavity space while stapling the fabric on the next stud face. Staple along the top and bottom plates as you go.
6. Verify that the fabric is evenly stretched over the entire wall section.
7. Using a utility knife, cut away fabric that is covering any openings (i.e., doors or windows) that require access before the installation is completed. Also, trim away any excess fabric.

Steps – Steel Framing

1. Select proper OPTIMA fabric size for the construction type (8-foot, 9-foot or 10-foot walls).
2. Purchase proper construction grade adhesive for bonding of the fabric to steel framing. CertainTeed has tested many adhesives. Three suggested construction grade adhesives are shown below:
   - OSI® Formula #38™ (F-38) Metal Framing and Drywall Adhesive
   - Loctite® PL®400® Sub-Floor and Deck Adhesive
   - Liquid Nails® Drywall Construction Adhesive

NOTE: These adhesives are flammable and give off dangerous/hazardous fumes. Observe all precautions mandated by OSHA and other safety-oriented agencies that exercise regulatory authority at the job site. Also, read and observe any safety precautions printed on the adhesive packaging. At the very least, keep the work area well ventilated and be sure that no open flame, intense heat source or smoking is permitted during adhesive application and curing.

3. Wipe down steel framing facing where adhesive will be applied with a rag or cloth. An oily film from the manufacturing process may be left on the steel framing. This film has the potential to interfere with an adhesive's ability to bond to the steel.
4. Apply 6-inch strips of double-sided carpet tape (a fast drying spray adhesive can be used instead, if preferred) to the left and right ends of the top and bottom plates. Place additional strips of tape every 3 to 4 feet along the length of the top and bottom plates. The tape strips should be parallel to the floor. The carpet tape is used to hold the fabric in place while the adhesive is applied and curing. The tape may remain in place after the adhesive is applied.
5. Cut a section of fabric from the roll that extends approximately one cavity width beyond the sides of the wall at corners.
6. Press the top corner of the fabric onto the first piece of tape at one end of the wall while your assistant stays 4 to 5 feet away, keeping the fabric positioned straight and fairly tight.
7. Apply a bead of adhesive, while your assistant holds the fabric out of the way, across the top plate between the first two studs, then down the face of those studs. Do not put adhesive along the bottom plate at this time.
8. Stretch the fabric over the adhesive, keeping it straight and tight. Press the fabric thoroughly into the bead of adhesive using a tool such as a putty knife or wallpaper roller.
9. Repeat steps 7 and 8 to the other end of the wall.
10. Apply a bead of adhesive along the bottom plate to secure the bottom of the fabric. After the adhesive is cured, the OPTIMA insulation can be blown into the cavities.
11. Using a utility knife, cut away fabric that is covering any openings (i.e., doors or windows) that require access before the installation is completed. Also, trim way any excess fabric.

Closed Cavity (Sidewall, Midfloor) Insulation Installation

Steps

1. Make a small (approximately 4-inch) x-shaped cut in the fabric at waist height on a typical sidewall. Make additional x-shaped cuts as needed. Another method is to use the tip of the nozzle to poke a hole in the fabric.

   For Midfloor: make an x-cut every 10-12 feet as needed.
2. Insert the hose or nozzle into the hole and down the cavity to approximately 18 inches from the bottom or below wiring and fill from the bottom up, working the hose side to side as you go and slowly pulling the hose back as you fill in.
3. Upon reaching the access hole, turn the hose or nozzle up and push the hose upward, filling the cavity from the top down to the access hole. As the top section fills, pull the hose back as you fill, turning the material flow off as you complete the fill process.
4. Perform density check every 3 to 4 stud cavities in the beginning until proper density is achieved, then every 1,000 square feet. Proper density is critical in achieving optimum R-Value. Confirm with coverage chart for proper installed density.
5. How to check insulation density (density = weight/volume): A one-cubic-foot test must weigh less than targeted R-Value density. Sample location should not be within six inches from where the nozzle was inserted.
   - For example: 2 x 4, 16 inches on center: remove 34 inches of insulation (sample will be 3.5 inches x 14.5 inches x 34 inches = 1 cubic foot) – sample should weigh 1.5 pounds.
6. If you have achieved target density as specified on the bag, proceed to step 7. If density is off, adjust your technique and/or machine setting until you repeatedly achieve proper density.
7. Cover density check areas with a piece of fabric and re-blow them.

   NOTE: Density higher than approximately 2.3 pounds does not increase R-Value, wastes material, reduces profits and can create drywall installation problems.
8. Once proper density is achieved, continue filling all cavities, checking density every 1,000 square feet. If you discover any voids, pierce fabric and fill void directly.
9. Properly installed fabric and product will have a slight bulge (3/8 inch); do not smooth. Insulation should make contact with drywall for optimum R-Value.

   For Midfloor: fill cavity space per design specification (to thermal value or specified density).

Notes

- Staples applied at a 45º angle hold better than when vertical or horizontal.
- Fabric is printed with vertical dashed lines to help you align it with studs.
- To ensure the required performance, pull fabric tight across studs as you staple or apply adhesive. If you leave slack, the insulation will bulge out, and drywall may not lay flush to the studs.

Some practice may be necessary to repeatably achieve the correct installed density.

Sidewalls, Cathedral Ceilings and Other Closed Cavities That Are Compression Filled

OPTIMA – Closed Cavity					Bag Weight 31 lbs
Cavity Framing Installed Thickness (in.)	Installed R-VALUE (hr•ft²•°f)/Btu	Installed Design Density lbs./ft³	Maximum Coverage Per Package net sq. ft.	Minimum Packages Per Area #/1,000 sq. ft.	Minimum Weight Per Unit Area lbs./sq. ft.
3 1/2" (2 x 4)	14	1.2	88.6	11.3	0.350
3 1/2" (2 x 4)	15	1.5	70.9	14.1	0.438
5 1/2" (2 x 6)	21	1.2	56.4	17.7	0.550
5 1/2" (2 x 6)	24	1.8	37.6	26.6	0.825
7 1/4" (2 x 8)	29	1.2	42.8	23.4	0.725
7 1/4" (2 x 8)	31	1.6	32.1	31.2	0.967

Coverage Chart – Floored Attics – Closed Cavities That Are Compression Filled

OPTIMA – Closed Cavity for TJI Trusses					Bag Weight 31 lbs
R-VALUE (hr•ft²•°f)/Btu	Minimum Installed Thickness (in.)	Density Design lbs./ft³	Maximum Coverage Per Package net sq. ft.	Minimum Weight Per Unit Area lbs./sq. ft.	Minimum Packages Per Area #/1,000 sq. ft.
40	9.5	1.6	24.5	1.267	40.9
50	11.875	1.6	19.6	1.583	51.1
59	14	1.6	16.6	1.867	60.2
68	16	1.6	14.5	2.133	68.8

OPTIMA Midfloor

Midfloor is a reference to the space between floors in residential, multifamily and commercial buildings. OPTIMA meets NFPA 13 standard for sprinkler substitution (at a reduced cost), improves acoustical performance, and provides extra fire protection when used in addition to sprinkler systems. For more information, please reference our OPTIMA MidFloor Brochure.

Midfloor – Closed Cavities That Are Not Compression Filled

OPTIMA – MidFloor Application Coverage Chart					Bag Weight 31 lbs
Minimum Installed Thickness (in.)	R-VALUE (hr•ft²•°f)/Btu	Design Density lbs./ft³	Maximum Coverage Per Package net sq. ft.	Minimum Weight Per Unit Area lbs./sq. ft.	Minimum Packages Per Area #/1,000 sq. ft.
8	28	0.8	58.1	0.53	17.2
9	32	0.8	51.7	0.60	19.4
10	35	0.8	46.5	0.67	21.5
11	39	0.8	42.3	0.73	23.7
12	42	0.8	38.8	0.80	25.8
13	46	0.8	35.8	0.87	28.0
14	49	0.8	33.2	0.93	30.1
15	53	0.8	31.0	1.00	32.3
16	56	0.8	29.1	1.07	34.4
17	60	0.8	27.4	1.13	36.6
18	63	0.8	25.8	1.20	38.7
19	67	0.8	24.5	1.27	40.9
20	71	0.8	23.3	1.33	43.0
21	74	0.8	22.1	1.40	45.2
22	78	0.8	21.1	1.47	47.3
23	81	0.8	20.2	1.53	49.5
24	85	0.8	19.4	1.60	51.6

Dense Packing with OPTIMA

OPTIMA premium loose fill fiber glass insulation can be used for dense pack applications where air permeance reduction is needed – typically, in the weatherization of existing homes. Historically, cellulose has been promoted as the only choice; however, loose fill fiber glass insulation can deliver a number of significant benefits. For more information, please see our Dense Pack Sell Sheet.

OPTIMA – Dense Pack Coverage Chart						31 lb. Bag
Construction Type	Cavity Depth	R-VALUE	Density – Installed (minimum)	Coverage – Net (maximum)	Weight per Unit Area (minimum)	Packages per 1,000 sq. ft. (minimum)
2 x 4	3.5	15	2.3	46.2	0.671	21.6
2 x 4	4	18	2.3	40.4	0.767	24.7
2 x 6	5.5	25	2.3	29.4	1.054	34.0
2 x 8	7.25	32	2.3	22.3	1.390	44.8
2 x 10	9.25	41	2.3	17.5	1.773	57.2

For dense packing walls to an air permeance of 3.5 cfm/ft^2 at 50 pascals pressure differential, use a minimum density of at least 2.3 PCF.

Blowing Machine:

Required – fiber agitation and conditioning with air pressure control

1. Machine speed – per manufacturer's recommendation
2. Slide gate – start with 1/3 to 1/2 open
3. Air pressure – 2.0 to 2.4 psi (55″ to 66″ of H_2O) (machine back pressure end of insert tube)
4. Transmission (if applicable) – 2nd gear

Blowing Hose:

1. Internally corrugated hose required (except for wall insert tube)
2. Smooth transition reducers
3. 10′ cavity insert tube:
   a. 1-1/4″ ID w/ 1/8″ wall thickness clear vinyl/plastic tube
   b. 1-1/2″ ID w/ 1/8″ wall thickness for larger cavities (2 x 6 or larger)
   c. 1-1/2″ or 2″ blow hose inserted into floor/ceiling cavities or large sidewall cavities from the attic

Blowing Hose Assembly*									
Machine Outlet Dia.	1st Section	Reduce to	2nd Section	Reduce to	3rd Section	Reduce to	4th Section	Reduce to	5th Section
4″	4″ x 0 – 25′	3-1/2″	3-1/2″ x 50′	Follow 3-1/2″ Machine Outlet Set Up					
3-1/2″	3-1/2″ x 0 – 25′	3″	3″ x 50′	Follow 3″ Machine Outlet Set Up					
3″	3″ x 50′ min.	2-1/2″	2-1/2″ x 50′	2″	2″ x 50′	1-1/2″	1-1/2″ x 10 – 25′	Insert Tube	10′
2-1/2″	2-1/2″ x 100′ min.	2″	2″ x 50′	1-1/2″	1-1/2″ x 10 – 25′	Insert Tube	10′		

* Hose length combination to be a minimum of 150′

Techniques:

1. Preferred – 1 hole with tube inserted filling both upwards and downwards until the cavity is filled
2. Alternative – 2 holes with tube inserted filling both upwards and downwards at each hole location until cavity is filled

Note:

See machine manufacturer recommendations for hose length. For mid-size to large machines, 150′ minimum is typical. Please ensure you are in compliance with applicable OSHA and EPA regulations on all job sites.

Equipment

Blowing Machines

While there are many pneumatic insulation machines available today, only certain ones are recommended for use with the OPTIMA System. Recommended initial machine settings for these machines appear below.

In order to apply OPTIMA 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 comprising one or more relatively high RPM fingered shafts
- A gasketed and vaned rotary airlock feeder section
- A positive displacment type blower capable of providing at least 2 psi air pressure
- A slide gate to control feed into and out of the shredder section
- Internally corrugated plastic blowing hose

With any recommended equipment, 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 Hose

Use internally corrugated hose of a minimum length of 200 feet. Refer to the Blowing Hose Assembly Chart on page 8.

Nozzle

The use of a nozzle for the installation of OPTIMA is optional. However, the use of garage vacuum accessories or thin wall aluminum as rigid hose extension is recommended. A diameter of 2 to 2-1/2 inches and a length of 4 to 6 feet with one end cut at a 60° angle is recommended for longer cavities, and a 2-foot extension is suitable for standard cavities.

Machine Settings

CertainTeed has tested and evaluated a number of blowing machines to determine the appropriate machine settings for OPTIMA fiber glass insulation. 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 operations.

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.

Make it a habit to experiment and adjust accordingly to achieve the best results. With the OPTIMA System and its recommended equipment, application technique is the most important factor.

Blowing Machine, Hose and Equipment Settings – Optima

MODEL	CERTAINTEED MACHINE WORKS VOLU-MATIC®	GENERAL MACHINE SETTINGS
RPM	1050 – 1150	Set in accordance with manufacturers' recommendations
Gear	3rd	2nd (if applicable)
Gate Opening	11"	1/3 to 2/3
Air Pressure	2.4 – 2.6 psi	Sufficient for minimum 6-foot throw out end of hose
Blowing Hose Diameter x Length	3 inches x 150 feet + 2-1/2 inches x 50 feet	
Nozzle	Approximately 2-foot section of thin-walled plastic piping cut to 60° angle on one end	

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