

Technical Bulletin

The intent of this document is to provide guidance on the installation of Owens Corning thermal and acoustic building insulation products in residential and light commercial frame construction. This document, the reference documents cited herein and any/all information found on product packaging, literature, presentations and videos collectively constitute the “manufacturer’s installation instructions” referenced in the ICC family of building codes – specifically the Intl. Energy Conservation Code (IECC), Intl. Residential Code (IRC) and Intl. Building code (IBC).

I. General

Optimum performance of Owens Corning’s building insulation products is dependent on 1) selection of the correct product for the assembly or application into/on which it is to be placed and 2) following these installation instructions. General rules which apply to both selection and installation include:

- Cavity spaces in which the insulation is being placed should be completely filled – top to bottom, side to side and front to back. [NOTE: Even in cases where the code required R-value is met with a product of thickness less than the cavity depth, the cavity space should be completely filled.]
- Insulation should not be compressed when the full thickness space is available, as this results in a reduction of R-value.
- There should be no voids or gaps in the insulation itself, around obstructions in the cavity space or at the interface of the insulation and framing members.

- When the insulation is installed in the building thermal envelope it must be in alignment and substantial contact with the designated air barrier.
- Any openings in or penetrations through cavity spaces that would allow air leakage between the cavity and unconditioned areas should be air sealed before insulating.

II. Blanket

Owens Corning glass fiber blanket building insulation is manufactured in precut sizes. They are either (1) batts, used primarily for wall assemblies of either 8 ft. or 9 ft. height or (2) rolls, used primarily for roof/ceiling and floor assemblies, ranging in length from around 25 feet to over 75 feet. The width and thickness dimensions for all blanket products are intended to match standard framing member sizes and “on-center” spacing, as well as to meet code thermal performance (R-value) requirements.

Blanket insulation products are available either with a pre-applied facing or with no facing (“unfaced”). The facing provides a water vapor retarder required by the building codes for moisture control in some climate zones. NOTE: Kraft paper and foil facing are flammable and cannot be used in exposed applications. They must be installed in substantial contact with an approved ignition barrier. ‘FS25’ facings, both FSK and PSK are made specifically for exposed applications and do not have to be covered.

For cavities (usually in wall assemblies) that are not standard width or height, or are not rectangular in shape, the blanket insulation will have to be field fabricated. This is easily done by hand

with a sharp utility knife and straight edge. The finished piece should be cut slightly more than the non standard dimension(s), to provide a snug fit. Anything less may result in an incomplete cavity fill and/or misalignment with the air barrier. Anything more could cause the insulation to buckle in one or more directions and create voids that reduce the assembly thermal performance.

When the cavity contains obstructions such as electrical boxes, wiring or plumbing, the blanket insulation will again require some field fabrication. For electrical boxes a piece will need to be cut out. The piece should be slightly smaller than the dimensions of the box so the insulation fits snugly around the box but without bulging or buckling. The piece can be inserted behind the box to fill in the gap between the box and the finish material on the backside of the cavity, or the gap can be filled in with a foam sealant. The gap should never be left unfilled, nor should the insulation batt simply be tucked in behind or around the box without cutting the piece out. Failure to do so will result in voids around the box. For wiring or plumbing that runs through the cavity, vertically or horizontally, the blanket insulation must be either split or slit so that it fits around the obstruction and still fills the cavity. Placing the entire batt on one side of the obstruction or the other (all in front or all behind) will result in a void along the entire length of the obstruction and reduce the thermal performance of the insulation.

Installation of blanket insulation products is done by any of three methods: 1) friction fit (aka, “pressure fit”), 2) faced stapled or 3) inset



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stapled. For a detailed description of all three methods please see reference documents ASTM C 1320 and NAIMA publication BI402.

Faced products can be installed using any of the three methods listed above. [NOTE: the **PROPINK** FastBatt® products are faced but have no fold out tabs (or flanges) and are specifically designed for friction fit installation]. For all three methods it's important to ensure that the insulation has fully filled the cavity. After placing the insulation in the cavity space run a hand or putty knife along both sides of the batt to check for any places where the insulation has not fully expanded to the studs, especially in the back corners. Also, any tears or rips in the facing should be repaired with Kraft or similar construction grade tape

For friction fit installation, the facing must be flush with the open plane of the cavity to ensure substantial contact with the interior finish and to minimize voids. In some situations, friction fit application of standard faced products may necessitate supplemental mechanical support.

- Wall cavities with a continuous height of greater than 9 feet. Supplemental support can be provided by stapling both tabs at the top of the cavity and at no more than 9 foot intervals, or by placing horizontal blocking in the cavity at maximum 9 foot intervals.
- Floor assemblies where insulation contact must be maintained with the underside of the subfloor; there is no finish material at the bottom of the cavities and the insulation thickness is less than the depth of the cavities. Supplemental

support can be provided using insulation support wires (aka "tiger teeth") installed at intervals no greater than 2 feet and so as to not compress the insulation.

In cases where the insulation thickness is the same as the cavity depth, supplemental support can be provided by installing wire or plastic mesh, or twine running perpendicular to the floor joists, attached to the bottom face of the joists.

For face stapled and inset stapled installation, it's important to ensure that the insulation has fully filled the cavity before securing the facing to the framing members. After positioning the batt in the cavity fold out the facing tabs.

- When face stapling, hold the flange along one side of the cavity, over the facing surface of the stud and apply staples. The flange on the other side is fastened when the batt in the adjacent cavity is installed and the flange on that batt is lapped over the flange of the first batt. Both flanges are then secured at the same time, making sure the staples are fully embedded in the stud.
- When inset stapling, the flanges are secured to the inside surface of the studs. The end of the flange should be flush with the face of the stud and the staples applied as close to the face as possible. This is to 1) minimize voids along the edges of the cavity, 2) minimize tearing of the facing and 3) comply with the home energy rating industry's "Grade I" insulation installation rating

criteria (see reference document Home Energy Rating Standards, Appendix A, pages A11 to A16).

Unfaced products are only installed via friction fit. In some situations supplemental mechanical support is recommended.

- Wall cavities with a continuous height (no horizontal blocking) of 9 feet or more. Supplemental support can be provided by placing horizontal blocking in the cavity at maximum 9 foot intervals.
- Floor assemblies where insulation contact must be maintained with the underside of the subfloor; there is no finish material at the bottom of the cavities and the insulation thickness is less than the depth of the cavities. See recommendations above for friction fit installation of faced products.

III. Loosefill

Owens Corning glass fiber loosefill insulation is manufactured in two forms – bonded and unbonded. The former has a binder that, similar to blanket insulation, acts like a glue to hold the fibers together in small tufts. The latter has no binder and the fibers "nest" together, forming a pack as it is installed.

Both types of loosefill insulation are installed using a pneumatic "blowing machine". In addition to the "General" installation guidelines presented in part I of this document, loosefill insulation must also meet the requirements listed in the applicable coverage chart provided by the manufacturer. The coverage chart



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indicates the thickness and amount of material (density) that must be installed to achieve the desired R-value. The coverage information varies by product type and application – open cavity vs. closed cavity – so it is crucial that the installer follow the coverage data. Coverage charts are printed on all loosefill product packaging, on “attic cards” (as required by building codes) and on the manufacturer’s “Fact Sheet” (as required by the FTC’s regulation on labeling and advertising of home insulation).

Open cavity applications are done in attics, on flat ceilings or vaulted ceilings with a maximum slope of 5/12. Prior to installing the loosefill insulation, the attic space must be prepared by:

- Sealing any penetrations through the ceiling plane, to minimize air leakage between the conditioned living space below and the unconditioned attic space.
- Installing vent baffles in each rafter / truss bay to ensure ventilation of the attic space by

allowing the free flow of air in through the vented soffit and out through the ridge, gable end or square roof vents.

Closed cavity applications are used for wall, floor and cathedral ceiling assemblies. In new construction, the open side of the cavity is covered with a fabric that contains the loosefill insulation until the drywall or other finish material is installed. The blowing machine hose nozzle is inserted through the fabric and the cavity filled with the amount of material needed to achieve the desired R-value, per the coverage chart.

When retrofitting existing buildings access to the cavity spaces is gained by drilling small (~2” dia.) holes from either the exterior or interior of the assembly, or when practical, through the wall assembly top plate. Fill cavities per applicable coverage chart data. [NOTE: for this application method, the use of infrared thermography equipment is helpful in identifying any areas that were not accessed or completely filled.]

Reference Documents

- ASTMⁱ C 1320 – *Standard Practice for Installation of Mineral Fiber Batt and Blanket Thermal Insulation for Light Frame Construction*
- NAIMAⁱⁱ publication BI-402 – *Recommendations for Installing Mineral Fiber Insulation in Residential and Other Light-Frame Construction (Fiber Glass Home Insulation)*
- NAIMA publication BI-403 – *Recommendations for Installing Mineral Fiber Insulation in Residential and Other Light-Frame Construction (Fiber Glass Loose Fill Insulation)*
- *Mortgage Industry National Home Energy Rating Standards*; ©2006 by RESNETⁱⁱⁱ

i ASTM Intl; West Conshohocken, PA; <http://www.astm.org/index.shtml>

ii North American Insulation Manufacturer’s Association; Alexandria, VA; <http://www.naima.org/index.php>

iii Residential Energy Services Network; Oceanside, CA; http://www.resnet.us/standards/RESNET_Mortgage_Industry_National_HERS_Standards.pdf

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