

# ACHIEVING GRADE I INSULATION WITH **FIBERGLASS BATTS**

**Advanced Energy Corporation, under contract with Owens Corning Insulating Systems, LLC has developed this document to help Builders, Contractors, and Home Energy Raters understand how fiberglass batt insulation can be used to achieve required Grade I rated insulation, in accordance with the ENERGY STAR® Qualified Homes Inspection Checklists for National Program Requirements, Version 3.0. All references come directly from the ENERGY STAR® Version 3.0 Thermal Enclosure Rater Checklist (TERC).**

**Home Energy Raters** may use this document to understand how fiberglass batts are an option for builders and contractors who choose to build to the ENERGY STAR® Version 3 standards. During the planning or plan review stages, the Home Energy Rater should use this document to educate the builders and contractors on the correct installation methods.

**Builders** may use this document as an internal QA process for achieving Grade I insulation every time without additional visits from the insulation contractors and re-inspections from the Home Energy Rater. The process that is provided gives a way for the contractor to address any problems with framing prior to beginning their work and also simplifies the insulation requirements on the Thermal Enclosure Rater Checklist. Instead of sifting through the numerous line items of the checklist, this document specifically addresses what the insulators will be responsible for onsite with regards to ENERGY STAR® requirements.

**Contractors** may find this document especially useful to ensure correct installation of fiberglass batts in accordance with Grade I Insulation. The process and critical detail sheets give a specific checklist for insulation contractors that simplifies what they are responsible for in the ENERGY STAR® process and also illustrates those specifications through pictures. These references are very useful to have in the field as the job is being completed. Also on the checklist is a list of critical details that need to be accomplished from the framer before the insulator begins work. Understanding these requirements will be valuable in the process and will help eliminate the need for re-inspection or rework for all subcontractors working on ENERGY STAR® new homes.

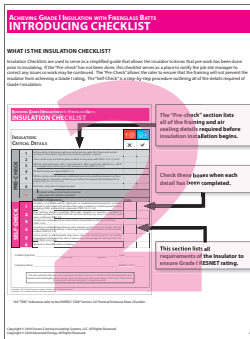
# ACHIEVING GRADE I INSULATION WITH FIBERGLASS BATTS

## TABLE OF CONTENTS



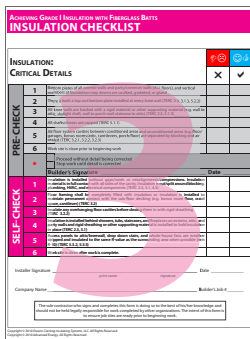
### INSULATION AWARENESS SHEET

Brief outline describing RESNET's definition of Grade I rated insulation and how to inspect if the insulation has been properly installed.



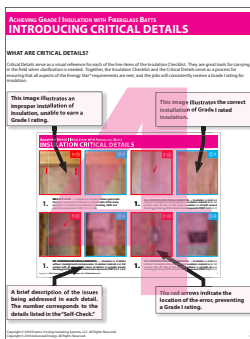
### INTRODUCING INSULATION CHECKLIST

Diagrammatic explanation of the Insulation Checklist, and how to best use and understand this document.



### INSULATION CHECKLIST

A step by step process for reviewing properly installed Grade I insulation, also ensuring that the builder has successfully completed the necessary pre-work.



### INTRODUCING CRITICAL DETAILS

Diagrammatic explanation of the Critical Details, and how to best use and understand these documents.



### CRITICAL DETAILS

A visual guide identifying both the correct and incorrect procedures for installing insulation that can occur when trying to achieve Grade I rating for fiberglass batts.

# ACHIEVING GRADE I INSULATION WITH FIBERGLASS BATTS

## INSULATION AWARENESS

### IDEAL INSTALLATION OF INSULATION

Properly installed insulation consists of insulation framed on all six sides, including top and bottom plates, rigid backing, and sheathing. Ensure that framing is correctly installed prior to the start of insulation.

### WHAT IS GRADE 1 INSULATION?

*Text from the RESNET Mortgage Industry National HERS Standards*

“Grade I” installation requires that the insulation material uniformly fills each cavity side-to-side and top-to-bottom, without substantial gaps or voids around obstructions (such as blocking or bridging), and is split, installed, and/or fitted tightly around wiring and other services in the cavity.

To attain a rating of “Grade I”, wall insulation shall be enclosed on all six sides, and shall be in substantial contact with the sheathing material on at least one side (interior or exterior) of the cavity.

For faced batt insulation, Grade I can be designated for side-stapled tabs, provided the tabs are stapled neatly (no buckling), and provided the batt is only compressed at the edges of each cavity, to the depth of the tab itself, and provided it meets the other requirements of Grade I.

*Exception: the interior sheathing/enclosure material is optional in climate zones 1-3, provided insulation is adequately supported and meets all other requirements.*

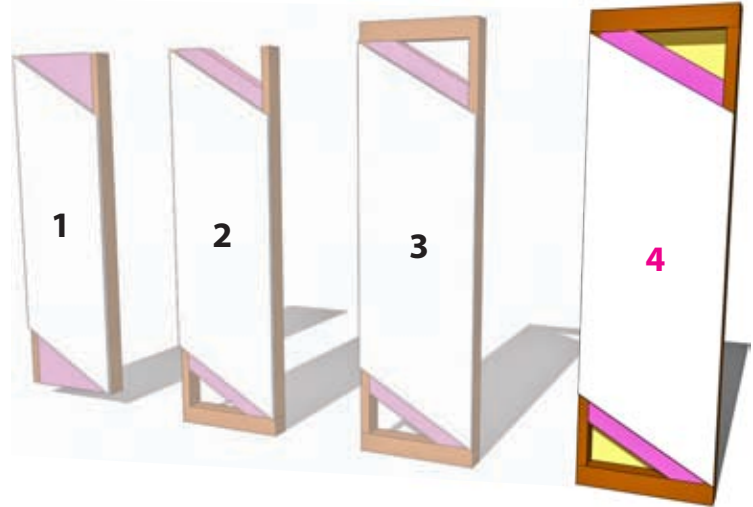
### HOW DO RATERS INSPECT INSULATION?

Home Energy Raters are required to inspect, probe in, around, or through the insulation and/ or vapor retarder in several places to see whether these requirements are met.

During inspection, insulation and vapor retarders may be cut or pulled away so Home Energy Raters can see installation details. Home Energy Raters should replace or repair the vapor retarder and insulation as necessary. During inspection (typically before drywall is installed), if the exterior sheathing is visible from the building interior through gaps in the cavity insulation material, it is not considered a “Grade I” installation.

For rim or band joist insulation, use the inspection guidelines under “Walls—Insulation value” to assess “Grade I”, “Grade II”, or “Grade III” installation.

*Exception: the interior sheathing/enclosure material is optional in all climate zones, provided insulation is adequately supported and meets all other requirements.*



*Progression of installments from least ideal to most successful (above):*

1. No top or bottom plate and no backing
2. Bottom plate, but no top plate and no backing
3. Top and bottom plate, but no backing
- 4. Top and bottom plate, includes backing (best design)**



*Properly installed inset-stapled fiberglass insulation, resulting in a Grade I rating.*

# ACHIEVING GRADE I INSULATION WITH FIBERGLASS BATTS INTRODUCING CHECKLIST

## WHAT IS THE INSULATION CHECKLIST?

Insulation Checklists are used to serve as a simplified guide that allows the insulator to know that pre work has been done prior to insulating. If the "Pre-check" has not been done, this checklist serves as a place to notify the job site manager to correct any issues so work may be continued. The "Pre-Check" allows the rater to ensure that the framing will not prevent the insulator from achieving a Grade I rating. The "Self-Check" is a step-by-step procedure outlining all of the details required of Grade I insulation.

INSULATION: CRITICAL DETAILS			
		X	✓
PRE-CHECK	1	Bottom plates of all exterior walls and party/common walls (ALL floors), and vertical members at foundation step downs are caulked, gasketed, or glued	
	2	There is both a top and bottom plate installed at every knee wall (TERC 2.3, 3.1.3, 5.2.2)	
	3	All knee walls are backed with a rigid material or other supporting material (e.g. wall to attic, skylight shaft, wall to porch roof, staircase to attic) (TERC 2.3, 3.1.3)	
	4	All shafts/chases are capped (TERC 5.1.1)	
	5	All floor system cavities between conditioned areas and unconditioned areas (e.g. floor/garages, bonus rooms/attic, cantilevers, porch/floor) are separated by blocking and air sealed (TERC 3.2.1, 3.2.2, 3.2.3)	
	6	Work site is clean prior to beginning work	
*	Proceed without detail being corrected Stop work until detail is corrected		
Builder's Signature _____		Date _____	
SELF-CHECK	1	Insulation is installed without gaps/voids or misalignments/compressions. Insulation material is in full contact with all sides of the cavity. Insulation is cut/split around blocking, plumbing, HVAC, and electrical components (TERC 2.3, 3.1, 4.3)	
	2	Floor framing shall be completely filled with insulation or insulation is installed to maintain permanent contact with the sub-floor decking (e.g. bonus room floor, crawl space, cantilever) (TERC 3.2)	
	3	Insulate any overhanging floor cavities before closing them in with rigid sheathing (TERC 3.2.2)	
	4	Insulation is installed behind showers, tubs, staircases, and fireplaces on exterior, attic, and party walls and rigid sheathing or other supporting material is installed to hold insulation in place (TERC 2.3, 3.1)	
	5	Access panels to attic/kneewall, drop down stairs, and whole-house fans are weather stripped and insulated to the same R-value as the surrounding area when possible (min R-10) (TERC 5.3.2, 5.3.3)	
	6	Work site is clean after work is complete.	
Installer Signature _____		Date _____	
print name _____		signature _____	
Company Name _____		Builder's Job # _____	
<div style="border: 1px solid black; padding: 5px; text-align: center;">                     The sub-contractor who signs and completes this form is doing so to the best of his/her knowledge and should not be held legally responsible for work completed by other organizations. The intent of this form is to ensure job sites are ready prior to beginning work.                 </div>			

The "Pre-check" section lists all of the framing and air sealing details required before insulation installation begins.

Check these boxes when each detail has been completed.

This section lists all requirements of the Insulator to ensure Grade I RESNET rating.



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3

\*All "TERC" references refer to the ENERGY STAR® Version 3.0 Thermal Enclosure Rater Checklist.

# ACHIEVING GRADE I INSULATION WITH FIBERGLASS BATTS

## INSULATION CHECKLIST

INSULATION: CRITICAL DETAILS				
		X	✓	
<b>PRE-CHECK</b>	1	Bottom plates of all exterior walls and party/common walls (ALL floors), and vertical members at foundation step downs are caulked, gasketed, or glued		
	2	There is both a top and bottom plate installed at every knee wall (TERC 2.3, 3.1.3, 5.2.2)		
	3	All knee walls are backed with a rigid material or other supporting material (e.g. wall to attic, skylight shaft, wall to porch roof, staircase to attic) (TERC 2.3, 3.1.3)		
	4	All shafts/chases are capped (TERC 5.1.1)		
	5	All floor system cavities between conditioned areas and unconditioned areas (e.g. floor/garages, bonus rooms/attic, cantilevers, porch/floor) are separated by blocking and air sealed (TERC 3.2.1, 3.2.2, 3.2.3)		
	6	Work site is clean prior to beginning work		
	*	<input type="checkbox"/> Proceed without detail being corrected <input type="checkbox"/> Stop work until detail is corrected		
<b>Builder's Signature</b> _____		<b>Date</b> _____		
<b>SELF-CHECK</b>	1	Insulation is installed without gaps/voids or misalignments/compressions. Insulation material is in full contact with all sides of the cavity. Insulation is cut/split around blocking, plumbing, HVAC, and electrical components (TERC 2.3, 3.1, 4.3)		
	2	Floor framing shall be completely filled with insulation or insulation is installed to maintain permanent contact with the sub-floor decking (e.g. bonus room floor, crawl space, cantilever) (TERC 3.2)		
	3	Insulate any overhanging floor cavities before closing them in with rigid sheathing (TERC 3.2.2)		
	4	Insulation is installed behind showers, tubs, staircases, and fireplaces on exterior, attic, and party walls and rigid sheathing or other supporting material is installed to hold insulation in place (TERC 2.3, 3.1)		
	5	Access panels to attic/kneewall, drop down stairs, and whole-house fans are weather stripped and insulated to the same R-value as the surrounding area when possible (min R-10) (TERC 5.3.2, 5.3.3)		
	6	Work site is clean after work is complete.		
Installer Signature _____ Date _____ <small>print name signature</small>				
Company Name _____ Builder's Job # _____				
<p>The sub-contractor who signs and completes this form is doing so to the best of his/her knowledge and should not be held legally responsible for work completed by other organizations. The intent of this form is to ensure job sites are ready prior to beginning work.</p>				

# ACHIEVING GRADE I INSULATION WITH FIBERGLASS BATTS INTRODUCING CRITICAL DETAILS

## WHAT ARE CRITICAL DETAILS?

Critical Details serve as a visual reference for each of the line items of the Insulation Checklist. They are great tools for carrying in the field when clarification is needed. Together, the Insulation Checklist and the Critical Details serve as a process for ensuring that all aspects of the Energy Star® requirements are met, and the jobs will consistently receive a Grade I rating for insulation.

This image illustrates an improper installation of insulation, unable to earn a Grade I rating.

This image illustrates the correct installation of Grade I rated insulation.

**ACHIEVING GRADE I INSULATION WITH FIBERGLASS BATTS  
INSULATION CRITICAL DETAILS**

 <p><b>1. NO GAPS/VOIDS</b> — Insulation is installed without gaps/voids. Insulation material is in full contact with all sides of the cavity. Insulation is cut/split around blocking, plumbing, HVAC and electrical components (TERC 2.3, 3.1, 4.3)</p>		 <p><b>1. NO COMPRESSIONS/MISALIGNMENTS</b> — Insulation is installed without misalignments/compressions. Insulation material is in full contact with all sides of the cavity. Insulation is cut/split around blocking, plumbing, HVAC and electrical components (TERC 2.3, 3.1, 4.3)</p>	
 <p><b>1. NO COMPRESSIONS/MISALIGNMENTS</b> — Insulation is installed without misalignments/compressions. Insulation material is in full contact with all sides of the cavity. Insulation is cut/split around blocking, plumbing, HVAC and electrical components (TERC 2.3, 3.1, 4.3)</p>		 <p><b>1. NO COMPRESSIONS/MISALIGNMENTS</b> — Insulation is installed without misalignments/compressions. Insulation material is in full contact with all sides of the cavity. Insulation is cut/split around blocking, plumbing, HVAC and electrical components (TERC 2.3, 3.1, 4.3)</p>	

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A brief description of the issues being addressed in each detail. The number corresponds to the details listed in the "Self-Check."

The red arrows indicate the location of the error, preventing a Grade I rating.

# ACHIEVING GRADE I INSULATION WITH FIBERGLASS BATTS INSULATION CRITICAL DETAILS



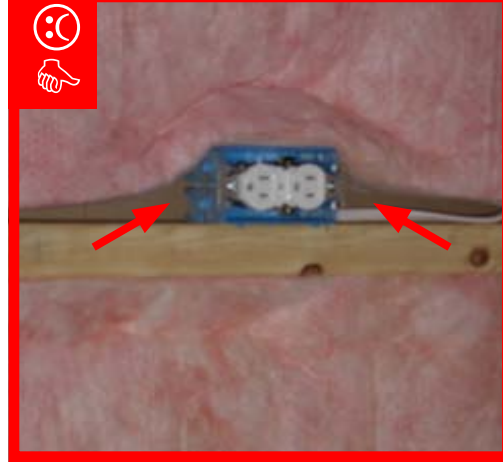
**1.** **NO GAPS/VOIDS** — Insulation is installed without gaps/voids. Insulation material is in full contact with all sides of the cavity. Insulation is cut/split around blocking, plumbing, HVAC and electrical components (TERC 2.3, 3.1, 4.3)



**1.** **NO COMPRESSIONS/MISALIGNMENTS** — Insulation is installed without misalignments/compressions. Insulation material is in full contact with all sides of the cavity. Insulation is cut/split around blocking, plumbing, HVAC and electrical components (TERC 2.3, 3.1, 4.3)



**1.** **NO COMPRESSIONS/MISALIGNMENTS** — Insulation is installed without misalignments/compressions. Insulation material is in full contact with all sides of the cavity. Insulation is cut/split around blocking, plumbing, HVAC and electrical components (TERC 2.3, 3.1, 4.3)



**1.** **NO COMPRESSIONS/MISALIGNMENTS** — Insulation is installed without misalignments/compressions. Insulation material is in full contact with all sides of the cavity. Insulation is cut/split around blocking, plumbing, HVAC and electrical components (TERC 2.3, 3.1, 4.3)





# ACHIEVING GRADE I INSULATION WITH FIBERGLASS BATTS INSULATION CRITICAL DETAILS



**1.** **NO COMPRESSIONS/MISALIGNMENTS** — Insulation is installed without misalignments/compressions. Insulation material is in full contact with all sides of the cavity. Insulation is cut/split around blocking, plumbing, HVAC and electrical components (TERC 2.3.3, 1.4.3)

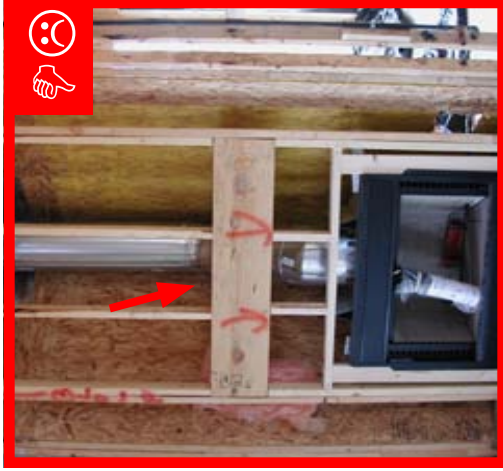
**2.** **FLOOR SYSTEMS** — Floor framing shall be completely filled with insulation or insulation is installed to maintain permanent contact with the sub-floor decking (e.g. bonus room floor, crawl space, cantilever) (TERC 3.2)



**3.** **CANTILEVERS** — Insulate any overhanging floor cavities before closing them in with rigid sheathing (TERC 3.2.2)

**4.** **TUBS/SHOWERS/FIREPLACES** — Insulation is installed behind showers, tubs, and fireplaces on exterior, attic, and party walls and rigid sheathing or other supporting material is installed to hold insulation in place (TERC 2.3, 3.1)

# ACHIEVING GRADE I INSULATION WITH FIBERGLASS BATTS INSULATION CRITICAL DETAILS



**4.** **TUBS/SHOWERS/FIREPLACES** — Insulation is installed behind showers, tubs, and fireplaces on exterior, attic, and party walls and rigid sheathing or other supporting material is installed to hold insulation in place (TERC 2.3, 3.1)

**5.** **ATTIC ACCESS** — Access panels to attic/kneewall, drop-down stairs, and whole-house fans are weather stripped and insulated to the same R-value as the surrounding area when possible (min. R-10) (TERC 5.3.2, 5.3.3)



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