



# R-Values: Applications & Air Space Requirements



## 1. Do-it-Yourself & Residential Applications (HVAC)

For any applications claiming R-Values, reflective insulations **MUST** face at least one open airspace cavity, or be installed within an enclosed air space (without free air flow). The charts below outlines various Air Space Requirements by application, the location of the airspace(s) needed to achieve the R-Values shown. and specific rFOIL™ products recommended for each application,

Application	R-Value / Benefit	rFOIL™ Products	Required Air Space(s)	Installation Specifics
Attic	Radiant Barrier	NT Radiant Barrier® (4800 Series)	Attic Air Space	Installed on Bottom of Rafters, or Directly to Inside of Roof Deck
Concrete Slab	R-1.1	Concrete UnderPad® (4320/4620 Series) (Double-Sided Reflective Insulation)	Airspace Within Product (Bubble Structure)	Directly Beneath Concrete Slab
Concrete Slab	R-1.1	Ultra CBF® - Concrete Barrier Foil (Double-Sided Reflective Insulation)	Airspace Within Product (Bubble Structure)	Directly Beneath Concrete Slab
Crawl Space (R-17)	R-17	2220 or 2290 Series (Double-Sided Reflective Insulation)	9.5" Floor (Min.) Joist Cavity	Installed to Underside of Joist
Crawl Space (R-21)	R-21	2220 or 2290 Series (Double-Sided Reflective Insulation)	Two Air Spaces at 4.75" each - Split within 9.5" (Min.) Joist Cavity	Insulation Centered Within 9.5" Cavity (Splitting Airspace)
Garage Door	R-3	2200 Series (Double-Sided Reflective Insulation)	Attach to Interior Side of Door	3/8" Spacer Between Garage Door and Insulation
House Wrap (Behind Brick)	R-3.4	Reflective House Wrap (4800 Series)	0.5" Behind Brick	Attach on Inside of Exterior Panel
House Wrap (Behind Siding)	R-2.5	Reflective House Wrap (4800 Series)	0.25" Behind Siding	Attach on Inside of Exterior Panel
Knee Wall (R-16)	R-16 (w / R-13 Batt)	2200 Series (Double-Sided Reflective Insulation)	Back of Knee Wall	Attach to Back (Attic Side) of Knee Wall Studs
Knee Wall (R-19)	R-19 (w / R-13 Batt)	2200 Series (Double-Sided Reflective Insulation)	Back of Knee Wall and 0.75" Air Space from Furring	Attach to 1" x 2" Furring (Added to Attic Side of Knee Wall Studs)
Wall - Exterior 2"x 4" Framing	R-14.4 (w / R-13 Batt)	2200 Series (Double-Sided Reflective Insulation)	0.75" - Within Wall Cavity (Offset from Interior Wall)	Installed Between Studs and Offset 0.75" Behind Interior Wall
Wall - Exterior 2"x 6" Framing	R-21 (w / R-19 Batt)	2200 Series (Double-Sided Reflective Insulation)	0.75" - Within Wall Cavity (Offset from Interior Wall)	Installed Between Studs and Offset 0.75" Behind Interior Wall
Wall - Masonry	R-3.7	2200 Series (Double-Sided Reflective Insulation)	0.75" - 1"x 2" nominal Furring	Attach to Masonry Wall, Behind 1" x 2" furring strips
Wall - Masonry	R-4.2	2200 Series (Double-Sided Reflective Insulation)	0.75" - 1"x 2" nominal Furring	Attach to Masonry Wall, Behind 2" x 2" furring strips
Wall - Masonry	R-6.1	2200 Series (Double-Sided Reflective Insulation)	Two Air Spaces at 0.75" each (split within 2" x 2" nominal furring)	Attach to Masonry Wall, Behind 2" x 2" furring strips



# R-Values: Applications & Air Space Requirements



## 2. Do-it-Yourself & Residential Applications (non-HVAC)

For any applications claiming R-Values, reflective insulations **MUST** face at least one open airspace cavity, or be installed within an enclosed air space (without free air flow).  
 The charts below outlines various Air Space Requirements by application, the location of the airspace(s) needed to achieve the R-Values shown. and specific rFOIL™ products recommended for each application,

Application	R-Value / Benefit	rFOIL™ Products	Required Air Space(s)	Installation Specifics
Behind Hot Water Radiator	R-3	<b>2220 or 2290 Series</b> (Double-Sided Reflective Insulation)	Between Radiator and Wall	Attach Directly to Interior Wall Behind Radiator
Duct Insulation (R-4.2)	R-4.2	<b>2290 Series Duct Insulation</b> (Double-Sided Reflective Insulation)	Exterior of Product	Duct (Direct-Wrap)
Duct Insulation (R-6 Option 1)	R-6	<b>2290 Series Duct Insulation Duct Offset Spacers ... Sold Separately</b> (Double-Sided Reflective Insulation)	Airspace Created by Spacers Between Duct and Insulation	.075" Spacer Between Duct and Insulation
Duct Insulation (R-6 Option 1)	R-6	<b>rFOIL Big 6° Duct Insulation Duct Offset Spacers ... BUILT-IN</b>	Airspace Built-In to Product ( <b>Multi-Layer Structure</b> )	Duct (Direct-Wrap)
Duct Insulation (R-8)	R-8	<b>rFOIL Big 8° Duct Insulation Duct Offset Spacers ... INCLUDED</b>	Airspace Created by Spacers Between Duct and Insulation	1/2" Spacer Between Duct and Insulation
Pipe Wrap	R-4	<b>2290 Series Duct/Pipe Insulation</b> (Double-Sided Reflective Insulation)	Exterior of Product	Pipe (Direct-Wrap)
Radiant Floor - Option 1 (Concrete Slab)	R-1.1	<b>Concrete UnderPad® (4320/4620 Series)</b> (Double-Sided Reflective Insulation)	Airspace Within Product (Bubble Structure)	Directly Beneath Concrete Slab
Radiant Floor - Option 2 (Concrete Slab)	R-1.1	<b>Ultra CBF® - Concrete Barrier Foil</b> (Double-Sided Reflective Insulation)	Airspace Within Product (Bubble Structure)	Directly Beneath Concrete Slab
Radiant Floor (Between Joists)	R-17	<b>2220 or 2290 Series</b> (Double-Sided Reflective Insulation)	9.5" Floor (Min.) Joist Cavity	Underside/Base of Floor Joist
Snow Melt (Concrete Slab)	R-1.1	<b>Concrete UnderPad® (4320/4620 Series)</b> (Double-Sided Reflective Insulation)	Airspace Within Product (Bubble Structure)	Directly Beneath Concrete Slab
Snow Melt (Concrete Slab)	R-1.1	<b>Ultra CBF® - Concrete Barrier Foil</b> (Double-Sided Reflective Insulation)	Airspace Within Product (Bubble Structure)	Directly Beneath Concrete Slab
Water Heater	R-4.5	<b>Hot Water Insulation Kit</b> (Double-Sided Reflective Insulation)	Airspace Created by Spacers Between Duct and Insulation	3/8" Spacer Between Hot Water Heater and Insulation

## 3. Metal Building Applications

For any applications claiming R-Values, reflective insulations **MUST** face at least one open airspace cavity, or be installed within an enclosed air space (without free air flow).  
The charts below outlines various Air Space Requirements by application, the location of the airspace(s) needed to achieve the R-Values shown. and specific rFOIL™ products recommended for each application,

### Metal Building Applications (Reflective BOTH Sides)

Application	R-Value / Benefit	rFOIL™ Products	Required Air Space(s)	Installation Specifics
Roof-New (with Furring)	R-9.2 Down R-4.1 Up	2200 Series (Double-Sided Reflective Insulation)	0.75" Above / Open Below	0.75" Thermal Break Between Roof and Purlin
Roof-New (without Furring)	R-7.6 Down R-3.9 Up	2200 Series (Double-Sided Reflective Insulation)	0.75" (Nominal) Above / Open Below	Installed Between Roof and Purlin
Roof-Retrofit (Under Purlin)	R-11 Down R-4.4 Up	2200 Series (Double-Sided Reflective Insulation)	8.75" Above / Open Below	Attached Below Purlin and 8.75" Below Roof
Wall-New (with Furring)	R-5.6	2200 Series (Double-Sided Reflective Insulation)	0.75" Outside / Open Inside	0.75" Thermal Break Between Exterior Wall and Purlin
Wall-New (without Furring)	R-4.7	2200 Series (Double-Sided Reflective Insulation)	0.75" (Nominal) Outside / Open Inside	Installed Between Exterior Wall and Girt
Wall-Retrofit (Inside of Girt)	R-4.5	2200 Series (Double-Sided Reflective Insulation)	8.75" Outside / Open Inside	Attached to 1"x 2" (nominal) Furring Inside Girt

### Metal Building Applications (White-Faced Reflective Insulation)

Application	R-Value / Benefit	rFOIL™ Products	Required Air Space(s)	Installation Specifics
Roof-New (with Furring)	R-6.6 Down R-3.4 Up	2500 or 2600 Series (White-Faced Reflective Insulation)	0.75" Above / Open Below	0.75" Thermal Break Between Roof and Purlin
Roof-New (without Furring)	R-4.0 Down R-3.2 Up	2500 or 2600 Series (White-Faced Reflective Insulation)	0.75" (Nominal) Above / Open Below	Installed Between Roof and Purlin
Roof-Retrofit (Under Purlin)	R-7.5 Down R-3.6 Up	2500 or 2600 Series (White-Faced Reflective Insulation)	8.75" Above / Open Below	Attached Below Purlin and 8.75" Below Roof
Wall-New (with Furring)	R-4.6	2500 or 2600 Series (White-Faced Reflective Insulation)	0.75" Outside / Open Inside	0.75" Thermal Break Between Exterior Wall and Purlin
Wall-New (without Furring)	R-3.7	2500 or 2600 Series (White-Faced Reflective Insulation)	0.75" (Nominal) Outside / Open Inside	Installed Between Exterior Wall and Girt
Wall-Retrofit (Inside of Girt)	R-3.5	2500 or 2600 Series (White-Faced Reflective Insulation)	8.75" Outside / Open Inside	Attached to 1"x 2" (nominal) Furring Inside Girt

## 4. Post-Frame Applications

For any applications claiming R-Values, reflective insulations **MUST** face at least one open airspace cavity, or be installed within an enclosed air space (without free air flow). The charts below outlines various Air Space Requirements by application, the location of the airspace(s) needed to achieve the R-Values shown. and specific rFOIL™ products recommended for each application,

### Post-Frame Applications (Reflective BOTH Sides)

Application	R-Value / Benefit	rFOIL™ Products	Required Air Space(s)	Installation Specifics
<b>Roof-New</b> (Bottom of Purlin)	<b>R-9.0</b> Down <b>R-4.4</b> Up	<b>2200 Series</b> (Double-Sided Reflective Insulation)	1.5" Above / Open Below	Installed Above Truss / Below Purlin
<b>Roof-New</b> (Above Purlin)	<b>R-6.4</b> Down <b>R-4.3</b> Up	<b>2200 Series</b> (Double-Sided Reflective Insulation)	0.75" (Nominal) Above / Open Below	Installed Between Roof and Purlin
<b>Roof-Retrofit</b> (Bottom of Truss)	<b>R-10.0</b> Down <b>R-3.7</b> Up	<b>2200 Series</b> (Double-Sided Reflective Insulation)	10" or More Above / Open Below	Attached to Bottom of Truss
<b>Roof-Retrofit</b> (Bottom of Purlin)	<b>R-9.0</b> Down <b>R-4.4</b> Up	<b>2200 Series</b> (Double-Sided Reflective Insulation)	1.5" Above / Open Below	Attached to Bottom of Purlin
<b>Wall-New</b> (Inside of Girt)	<b>R-5.3</b>	<b>2200 Series</b> (Double-Sided Reflective Insulation)	1.5" Outside / Open Inside	Attached to Inside of Girt
<b>Wall-New</b> (Outside of Girt)	<b>R-4.7</b>	<b>2200 Series</b> (Double-Sided Reflective Insulation)	0.75" (Nominal) Outside / Open Inside	Installed Between Exterior Wall and Girt
<b>Wall-Retrofit</b> (Inside of Girt)	<b>R-5.3</b>	<b>2200 Series</b> (Double-Sided Reflective Insulation)	1.5" Outside / Open Inside	Attached to Inside of Girt

### Post-Frame Applications (White-Faced Reflective Insulation)

Application	R-Value / Benefit	rFOIL™ Products	Required Air Space(s)	Installation Specifics
<b>Roof-New</b> (Bottom of Purlin)	<b>R-6.4</b> Down <b>R-4.3</b> Up	<b>2500 or 2600 Series</b> (White-Faced Reflective Insulation)	1.5" Above / Open Below	Installed Above Truss / Below Purlin
<b>Roof-New</b> (Above Purlin)	<b>R-3.8</b> Down <b>R-3.5</b> Up	<b>2500 or 2600 Series</b> (White-Faced Reflective Insulation)	0.75" (Nominal) Above / Open Below	Installed Between Roof and Purlin
<b>Roof-Retrofit</b> (Bottom of Truss)	<b>R-6.6</b> Down <b>R-3.0</b> Up	<b>2500 or 2600 Series</b> (White-Faced Reflective Insulation)	10" or More Above / Open Below	Attached to Bottom of Truss
<b>Roof-Retrofit</b> (Bottom of Purlin)	<b>R-6.4</b> Down <b>R-4.3</b> Up	<b>2500 or 2600 Series</b> (White-Faced Reflective Insulation)	1.5" Above / Open Below	Attached to Bottom of Purlin
<b>Wall-New</b> (Inside of Girt)	<b>R-4.3</b>	<b>2500 or 2600 Series</b> (White-Faced Reflective Insulation)	1.5" Outside / Open Inside	Attached to Inside of Girt
<b>Wall-New</b> (Outside of Girt)	<b>R-3.7</b>	<b>2500 or 2600 Series</b> (White-Faced Reflective Insulation)	0.75" (Nominal) Outside / Open Inside	Installed Between Exterior Wall and Girt
<b>Wall-Retrofit</b> (Inside of Girt)	<b>R-4.2</b>	<b>2500 or 2600 Series</b> (White-Faced Reflective Insulation)	1.5" Outside / Open Inside	Attached to Inside of Girt

## 5. HVAC Applications

For any applications claiming R-Values, reflective insulations **MUST** face at least one open airspace cavity, or be installed within an enclosed air space (without free air flow).  
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Application	R-Value / Benefit	rFOIL™ Products	Required Air Space(s)	Installation Specifics
Crawl Space (R-17)	R-17	<b>2220 or 2290 Series</b> (Double-Sided Reflective Insulation)	9.5" Floor (Min.) Joist Cavity	Installed to Underside of Joist
Crawl Space (R-21)	R-21	<b>2220 or 2290 Series</b> (Double-Sided Reflective Insulation)	Two Air Spaces at 4.75" each - Split within 9.5" (Min.) Joist Cavity	Insulation Centered Within 9.5" Cavity (Splitting Airspace)
Duct Insulation (R-4.2)	R-4.2	<b>2290 Series Duct Insulation</b> (Double-Sided Reflective Insulation)	Exterior of Product	Duct (Direct-Wrap)
Duct Insulation (R-6 Option 1)	R-6	<b>2290 Series Duct Insulation Duct Offset Spacers ... Sold Separately</b> (Double-Sided Reflective Insulation)	Airspace Created by Installing Spacers Between Duct and Insulation	.075" Spacer Between Duct and Insulation
Duct Insulation (R-6 Option 1)	R-6	<b>rFOIL Big 6® Duct Insulation Duct Offset Spacers ... BUILT-IN</b>	Airspace Built-In to Product <b>(Multi-Layer Structure)</b>	Duct (Direct-Wrap)
Duct Insulation (R-8)	R-8	<b>rFOIL Big 8® Duct Insulation Duct Offset Spacers ... INCLUDED</b>	Airspace Created by Installing Spacers Between Duct and Insulation	1/2" Spacer Between Duct and Insulation
Behind Hot Water Radiator	R-3	<b>2220 or 2290 Series</b> (Double-Sided Reflective Insulation)	Between Radiator and Wall	Attach Directly to Interior Wall Behind Radiator
Pipe Wrap	R-4	<b>2290 Series Duct/Pipe Insulation</b> (Double-Sided Reflective Insulation)	Exterior of Product	Pipe (Direct-Wrap)
Radiant Floor (Concrete Slab)	R-1.1	<b>Concrete UnderPad® (4320/4620 Series)</b> (Double-Sided Reflective Insulation)	Airspace Within Product (Bubble Structure)	Directly Beneath Concrete Slab
Radiant Floor (Concrete Slab)	R-1.1	<b>Ultra CBF® - Concrete Barrier Foil</b> (Double-Sided Reflective Insulation)	Airspace Within Product (Bubble Structure)	Directly Beneath Concrete Slab
Radiant Floor (Between Joists)	R-17	<b>2220 or 2290 Series</b> (Double-Sided Reflective Insulation)	9.5" Floor (Min.) Joist Cavity	Underside/Base of Floor Joist
Snow Melt (Concrete Slab)	R-1.1	<b>Concrete UnderPad® (4320/4620 Series)</b> (Double-Sided Reflective Insulation)	Airspace Within Product (Bubble Structure)	Directly Beneath Concrete Slab
Snow Melt (Concrete Slab)	R-1.1	<b>Ultra CBF® - Concrete Barrier Foil</b> (Double-Sided Reflective Insulation)	Airspace Within Product (Bubble Structure)	Directly Beneath Concrete Slab

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