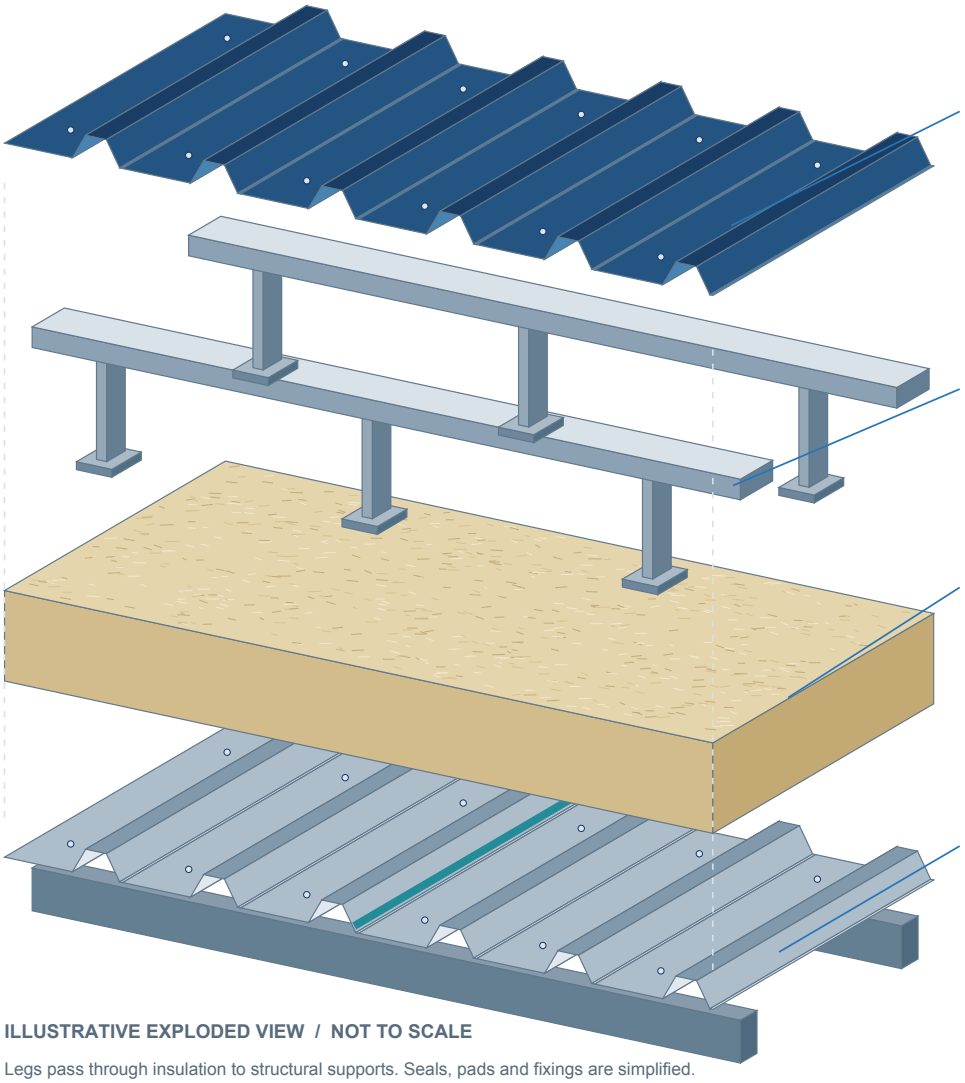
ROOF SYSTEM / TEXAS

Twin-skin insulated metal roofing

A site-assembled roof with a steel liner, adaptable insulation zone and separate metal weather sheet.



1 **Outer R-panel**
Roofing-rated weather sheet

2 **Spacer rails + legs**
Depth and fixings engineered

3 **Fiberglass blanket**
Loose-laid; full design thickness

4 **R-panel liner**
Sealed air / vapor-control plane

ILLUSTRATIVE EXPLODED VIEW / NOT TO SCALE

Legs pass through insulation to structural supports. Seals, pads and fixings are simplified.

A system developed around your project

For architects, specifiers and commercial property teams exploring new roofs or planned replacements. Concept guide: final components and performance require project-specific design.

ASSEMBLY / CONTROL LAYERS

Four layers. Coordinated details.

Each layer has a defined role. The connections between them determine how the roof performs.

01 Outer R-panel weather sheet

Specify a roofing-rated profile, finish, slope, spans, fasteners and weather seals. Coordinate flashings, drainage, penetrations and thermal movement.

02 Engineered spacer rails and legs

Select leg height to preserve the usable insulation depth. Rails and brackets transfer loads into verified structural supports. Deeper legs need their own capacity and thermal-bridge checks.

03 Loose-laid fiberglass blanket

Lay unfaced blankets at full recovered thickness, fitted around brackets. Stagger joints in multiple layers and keep insulation dry. Loose-laid means blanket insulation, not blown loose-fill.

04 Sealed R-panel liner

Detail a continuous air and vapor-control plane at laps, perimeter closures, brackets and penetrations. Confirm the vapor strategy for the building climate and internal humidity.

Liner sealing: metric intent to US procurement

Location	Design intent	US procurement guide
Side laps	50 x 1 mm	Approx. 2 in wide x 40 mil thick
End laps	5 x 6 mm section	Approx. 3/16 x 1/4 in section
Profile closures	Matched foam + butyl	Nonvented filler; compatible mastic

US candidates: Alpha Q131 tape; SFS metal-panel butyl tape and R-panel closures; SikaLastomer-511 concealed-joint mastic. Exact dimensions, bead shape, foam/coating compatibility and joint compression need supplier confirmation. A 3/16-in SFS bead is not an exact 5 x 6 mm rectangular substitute. [2-4]

THERMAL OPTIONS / US + METRIC

Choose depth. Verify the roof.

Compare nominal insulation options, then calculate the complete assembly with its actual steel spacers and fixings.

Insulation-only values - not whole-roof ratings

Thickness	Nominal US R	RSI m²·K/W	U (SI) W/m²·K	U (US) Btu/h·ft²·°F
5 in / 127.0 mm	16	2.818	0.355	0.0625
6 in / 152.4 mm	19	3.346	0.299	0.0526
8 in / 203.2 mm	25	4.403	0.227	0.0400
10 in / 254.0 mm	32	5.636	0.177	0.0312
12 in / 304.8 mm	38	6.692	0.149	0.0263
14 in / 355.6 mm	44	7.749	0.129	0.0227
16 in / 406.4 mm	50	8.806	0.114	0.0200

Basis: Knauf Performance+ Metal Building Cavity Insulation: R-16 at 5 in, R-19 at 6 in and R-25 at 8 in. The 10/12/14/16-in options combine 5+5 / 6+6 / 6+8 / 8+8-in layers. Multilayer figures are calculated, not tested TCR roof assemblies. [1]

Why spacer design matters

Steel legs, rails, fasteners, liner profiles and compressed insulation create additional heat-flow paths. Whole-roof U-factors must account for them; nominal blanket R-values cannot be used as the roof rating. [6]

Depth is a design dimension

Allow for ribs, rail intrusion, tolerances and deflection. A 12-in insulation option does not automatically mean a 12-in spacer leg. Coordinate the dimensioned section with structural and condensation checks.

Calculation: RSI = US R / 5.6783; U(SI) = 1/RSI; U(US) = 1/US R. Surface films, air spaces and thermal bridges are excluded. US R units: h·ft²·°F/Btu.

PROJECT BRIEF / NEXT STEPS

Develop a Texas specification.

Bring the roof geometry, building use and performance brief together before selecting components.

Why consider this approach?

The separate layers allow the insulation zone, interior metal finish and external sheet to be specified around the building. For Texas projects, assess heat flow, air-conditioned interiors, humidity, wind uplift, storm exposure and the condition of the supporting steel. Savings, hail resistance and code compliance depend on the final design; they are not assigned by this concept.

Fire performance: state what is demonstrated

The proposed unfaced fiberglass has documented ASTM E136 noncombustibility. That is a material property, not an hourly roof rating. Review closures, sealants and the complete construction against applicable roof-covering and assembly fire requirements. No TCR assembly fire rating is claimed. [1,5]

Architects and specifiers: start the conversation

Send the project location, plans, roof slope and spans, new-build or replacement scope, indoor conditions, target whole-roof U-factor, fire criteria and bid/program dates.

Contact Total Cladding and Roofing

Sources and document scope

[1] Knauf: fiberglass thickness, R-values and material fire data
[2] Alpha Systems: Q131 metal-building butyl tape
[3] SFS: metal-panel butyl tape and product selection sheet
[4] Sika: SikaLastomer-511 US product data
[5] UL: roof-covering and assembly fire tests
[6] MCRMA TP14: thermal bridging in metal cladding

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