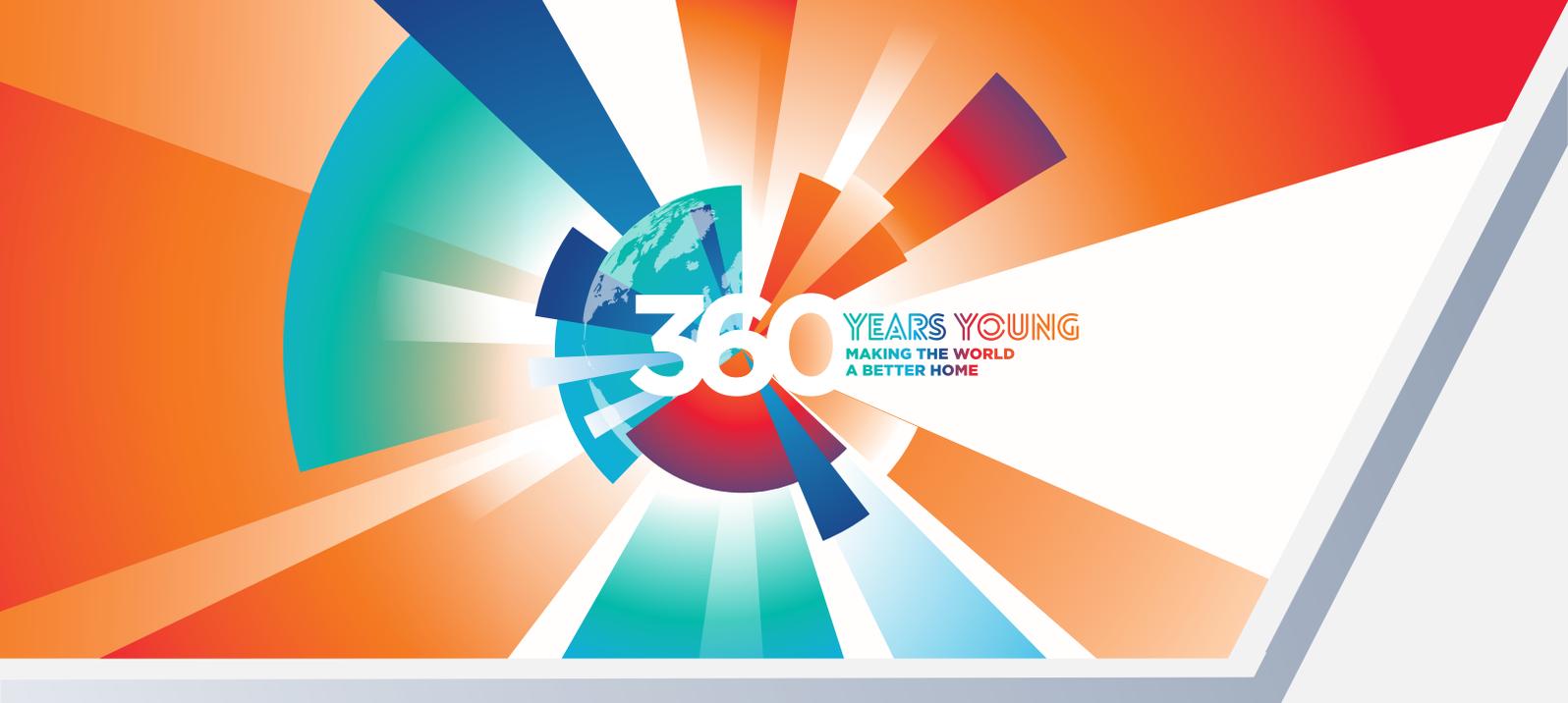


Rockinsul™

Twigainsul®

INSULATION FOR INDUSTRY





360 YEARS YOUNG
MAKING THE WORLD
A BETTER HOME

SAINT-GOBAIN AT A GLANCE



INSULATION

■ Started in 1937

■ World leader in mineral wool (Isover)

360° IN 360 YEARS

360° is our global reach:

Our 160,000 employees are committed everyday to transforming construction.

360° is our approach:

We create innovative, high-performance, and sustainable solutions for people's well-being and the planet's preservation.

360° is also the overall commitment of Saint-Gobain to MAKING THE WORLD A BETTER HOME.



SELECTION OF INSULATION

REASONS TO INSULATE EQUIPMENT



1. MINIMIZE HEAT LOSS / HEAT GAIN



2. REDUCE FUEL CONSUMPTION, GAIN ENERGY SAVINGS



3. CONTROL TEMPERATURE DROP



4. PERSONNEL PROTECTION : PREVENT BURN / FROSTBITE INJURIES



5. ACOUSTIC INSULATION



6. PROCESS STABILITY

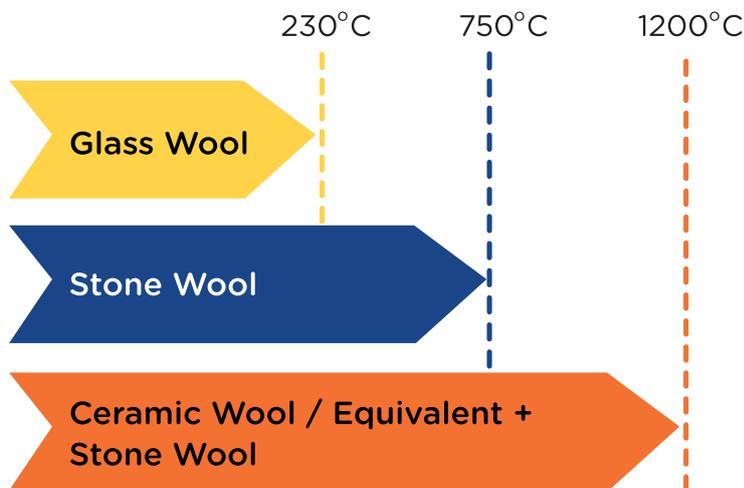


7. CORROSION CONTROL

FACTORS AFFECTING INSULATION SELECTION

TYPE OF INSULATION

Operating temperature



Type of equipment



Flexible product for curved surface



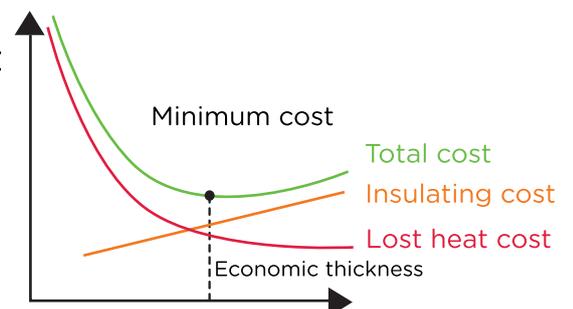
Rigid / semi-rigid product for flat surface or of low curvature



Pre-formed sections for pipe

CALCULATION OF INSULATION THICKNESS

- Type of fluid (medium) and its temperature
- Ambient temperature
- Location and orientation of equipment
- Wind speed (if outdoor)
- F-factor and thermal bridges
- Targeted outcome of insulation
- Economic insulation thickness



INDIAN STANDARD IS 8183

BONDED MINERAL WOOL - SPECIFICATION

- Published by Bureau of Indian Standards.
- Specifies requirements for bonded mineral wool used in thermal insulation.
- Includes stone (rock) wool and glass wool (fiberglass) insulation
- Previously reaffirmed in 1993, now updated in 2024

Major revisions in 2024

Sr. No.	Clause No.	Parameter	IS 8183 : 1993	IS 8183 : 2024	Benefits to Customer
1.	4.2	Bulk Density	Group 1 to 4: upto 160 kg/m ³ for maximum 750°C	Added Group 5: ≥1 61 kg/m ³ for upto 800°C Density from lower group for higher temperature also allowed.	Wider coverage of applications, multiple choices of lightweight products
2.	4.2	Bulk Density Tolerance	Maximum ±15% of declared value	Tightened to ±10%	More consistent thermal and acoustic performance
3.	4.4	Shot Content	Maximum limit: 5% for 500 μ, 15% for 250 μ	Added 150 μ; Combined shot content (500 μ, 250 μ, and 150 μ) ≤ 25%	Reduced non-performing content, improved performance, easier handling
4.	4.7	Thermal Conductivity	Specified for mean temperature 50°C to 300°C	Extended range: 10°C to 427°C	Enhanced performance control across a wider range of temperatures
5.	4.8	Sulphur Content	Maximum limit: 0.6%	Maximum limit reduced to 0.2%	Low risk of corrosion (CUI), longer equipment life
6.	4.9.2	Dimensional Tolerance	For thickness : -2 mm; excess in all dimensions permitted	Stricter limit : -2 mm to +6 mm	Uniform insulation layer, minimizes cladding overuse, better reliability
7.	4.11	Linear Shrinkage	Not specified	Limited to 2%	Prevents void formation/ heat leakage
8.	4.12.7	Leachable Chloride Content	Recommended permissible limit: 0.01% (100 ppm)	Stricter limits: 20 ppm; 10 ppm for alloy steels or austenitic stainless-steel applications	Low risk of corrosion, longer equipment life

TYPES OF MINERAL WOOL INSULATION

Stone (Rock) Wool : Major raw material is volcanic rocks

Glass Wool : Major raw material is recycled glass

STONE WOOL V/S SLAG WOOL

- Beware of slag wool product which is misrepresented as stone (rock) wool insulation
- Stone wool is better than slag wool in terms of product quality, performance and health safety

Parameter	Stone Wool 	Slag Wool 	Benefits of Stone Wool for Customers
Raw Material	Volcanic rocks	Slag	Better insulation properties, more energy savings, fewer CO ₂ emissions, high strength
Suitability upto 750°C	Yes	No	Stable performance at high temperatures, no deformation
Shot Content	<15%	Can be as high as 25 to 30%	Lower density / thickness required, better thermal performance
Nature of Fiber	Less brittle, less dust, fibers do not settle	Highly brittle and dusty, fibers easily disintegrate and settle	Easier to install, long-lasting
Water Repellency	Yes	No	No moisture absorption through capillary action, longer life of insulation, lesser risk of CUI
Chloride content	<10 ppm	>20 ppm	Lesser risk of CUI
EUCEB certification	Yes	No	Bio-soluble, Health-safe
Acceptability	Yes, everywhere	No	Proven track record, reliability
Dimensions	Uniformity in density & thickness	Non-uniform wool distribution, density and thickness varies across material	Uniform insulating performance across the entire length / area



RANGE OF INSULATION

Rockinsul™

STONE WOOL INSULATION

 **Twigainsul®**

GLASS WOOL INSULATION

PROPERTIES OF Rockinsul™ STONE WOOL INSULATION

- Maximum Service Temperature : 750°C
- Non-Combustible
- Melting Temperature : > 1200°C
- Bio-soluble and Health-Safe

Parameter	Values	Standards
Non-combustibility	Non-combustible / Incombustible	BS 476 Part 4, IS 8183
Surface Spread of Flame	Class 1	BS 476 (Part 7)
	Class 0	BS 476 (Part 6 and 7)
Surface Burning Characteristics		
Flame Spread Index	≤ 25	ASTM E84, UL 723
Smoke Developed Index	≤ 50	ASTM E84, UL 723
Shot Content (500 μ, 250 μ and 150 μ)	≤ 25%	IS 3144, IS 8183
Chloride Content	<20 ppm*	IS 8183
Resistance to Vibration	Height of settlement <1%	IS 8183
Resistance to Jolting	Height of settlement <3%	IS 8183
Linear Shrinkage	<2%	IS 8183, ASTM C356
Moisture Content	<2%	IS 8183
Moisture Absorption	<2%	IS 8183
Water Vapour Sorption (Moisture Resistance)	Less than 5% by volume	ASTM C1104, ASTM C1104M
Water Absorption (Partial Immersion) (kg/m ²)	Less than 0.5	BS 2972 Part 11
Mold Growth	No fungal growth	IS 8183, ASTM C1338-00
Alkalinity	7 to 10	IS 8183

* Chloride content <10 ppm can also be offered

OUR OFFERINGS FOR INDUSTRY STONE WOOL

LRB MATTRESS

- Flexible
- Stitched with SS/GI wire mesh#
- Suited for most shapes

Range

Density	:	70 to 160 kg/m ³
Width	:	1.22 m
Length	:	1.52 to 5 m*
Thickness	:	25 to 100 mm



RB SLAB

- Rigid / semi-rigid
- Easy to handle
- Dimensionally stable
- Suitable for flat / low curvature surfaces

Range

Density	:	40 to 144 kg/m ³
Width	:	0.6 m
Length	:	0.6 to 1.2 m
Thickness	:	25 to 150 mm
*Facings	:	Aluminium : FSK, Alu Glass Cloth

*Also available in unfaced form



NOTE

- For any other non-standard density or dimensions, please contact our nearest sales office
- For details of both side wire mesh, please contact our nearest sales office
- For other material properties, please refer our website
- # Can be offered on single or double side
- * Maximum length will depend on thickness required
- Maximum operating temperature on facing side for RB slab: 100°C

PREFORMED PIPE-SECTION

- Rigid
- High compressive strength
- Easy to handle
- Dimensionally stable
- Lower wastage

Range

Density	:	100 to 160 kg/m ³
Diameter	:	15 to 600 mm (NB)
Length	:	1.2 to 1.25 m
Thickness	:	25 to 150 mm

Available in unfaced form or with Aluminium facing



LOOSE WOOL

- Unbonded stone wool fibers
- No specific density or thickness
- Suitable for complex shapes and contours of process equipments



NOTE

- For any other non-standard density or dimensions, please contact our nearest sales office
- Maximum operating temperature on facing side: 100°C

OUR OFFERINGS FOR INDUSTRY GLASS WOOL

ROLL

- Flexible
- Suited for most shapes

Range

Density	:	10 to 48 kg/m ³
Width	:	1.1 to 1.2 m
Length	:	7.5 to 30 m
Thickness	:	25 to 130 mm
*Facings	:	Aluminium : FSK, Aluglass, MRSG
	:	Polypropylene : WMSG 10, WMSG 50, WMP 50
	:	Tissue : FGT, BGT



*Also available in unfaced form

PREFORMED PIPE-SECTION

- Rigid
- Dimensionally stable
- Easy to handle
- Lower wastage

Range

Density	:	80 kg/m ³
Diameter		
Pipe-section	:	25 to 450 mm (NB)
Lamella Mat	:	350 to 1400 mm (NB)
Length		
Pipe-section	:	1.2 m
Lamella Mat	:	0.9 m
Thickness	:	25 to 75 mm



Available in unfaced form or with aluminium facing

NOTE

- For any other non-standard density or dimensions, please contact our nearest sales office

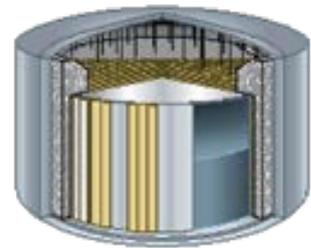
CRYOLENE

INSULATION FOR CRYOGENIC APPLICATION

LNG, LPG, Liquid Oxygen and Liquid Nitrogen Storage Tanks

CRYOLENE

- Unique solution for insulating cryogenic tank walls and roofs
- Available with facing made of reinforced glass tissue or reinforced aluminium foil
- Suitable for use in combination with perlite and other cryogenic insulation materials
- Temperature range -170°C to +120°C
- Conforms to relevant EN standards



RANGE

- Density : 12 to 24 kg/m³
- Width : 1.2 to 2 m
- Length : Upto 40 m
- Thickness : 50 to 200 mm



KEY FEATURES

- Highly resilient mineral wool rolls
- High tensile strength
- Optimum fire performance with low binder content
- Consistent long term thermal performance despite temperature shocks
- Low corrosion risk, can be used with aluminium, steel or copper
- Non-hygroscopic
- Does not promote fungal growth



APPLICATIONS

- Boiler
- Pipe
- Storage Tank
- Diesel Generator Set
- Industrial Oven
- Flange, Valve and Other Fittings
- Exhaust Duct, Chimney
- Vessel
- Reactor
- Cryogenic Application



Storage Tanks



LNG Tank



Pipe



Flange, Valve and Other Fittings

SECTORS

- Power
- Chemical
- Iron and Steel
- Paper
- Oil and Gas
- Cement
- Textile
- Sugar and Distillery

FUELING YOUR NEXT MOVE

At Saint-Gobain, we are committed to making your insulation planning smarter and more efficient and that's where **TechCalc** comes in. With this powerful tool, we help you accurately calculate heat loss, energy savings, and insulation thickness based on your specific process conditions and standards. Whether you are designing for a new project or optimizing existing systems, TechCalc ensures data-driven decisions that enhance performance, reduce energy costs, and meet compliance requirements. Our team is here to guide you through every step, providing tailored support and insights to maximize the value of your insulation investments.

OPTIMIZATION THROUGH TECHCALC

THERMAL CALCULATION SOFTWARE FOR THERMAL INSULATION

Based on ■ EN ISO 12241 ■ VDI 2055 ■ ASTM C 680

Helps to Achieve

- Energy Efficiency
- Temperature Study
- Weight Reduction
- Thickness Reduction



COMPARATIVE STUDY BY TECHCALC



Benefits of using Saint-Gobain product (insulation system version 2)

Weight	Thickness	Heat Loss
-48%	-8.1%	-3.5%

PROJECT REFERENCES



Oil and Gas

RELIANCE INDUSTRIES LIMITED, INDIA (JAMNAGAR, GUJARAT)

Objective

- Replace insulation for energy savings

Application

- Pipelines
- Tanks

Tech Solution

- Customized solutions
- Contractor collaboration

Benefits

- Energy savings
- Lower CO₂ emissions



Chemical

DCM SHRIRAM LIMITED, INDIA (JHAGADIA, GUJARAT)

Objective

- Minimize steam temperature drop between plants

Application

- Utility pipelines

Temperature

- 100°C to 120°C

Tech Solution

- Product selection
- Optimized insulation proposal via TechCalc

Benefits

- Energy savings
- Reduced temperature loss



Textile

ALOK INDUSTRIES LIMITED, INDIA (VAPI, GUJARAT)

Objective

- Minimize temperature drop

Application

- Process & utility pipes of 12 km

Temperature

- 350°C to 450°C

Tech Solution

- Customized diameters of pre-formed pipe sections for aerogel + stone wool system

Benefits

- Lower temperature drop
- Energy savings
- Process stability
- Thinner insulation
- Reduced cladding cost



Cement

SHREE CEMENT, INDIA (RAJASTHAN AND CHHATTISGARH)

Objective

- Energy savings
- Temperature control

Application

- Waste heat recovery system (WHRS)
- Pipelines

Temperature

- Upto 400°C

Tech Solution

- High performance stone wool insulation
- Flexible insulation

Benefits

- Energy Savings
- Personnel Protection



Power

POWER PLANTS, TAIWAN

Objective

- Energy savings
- Personnel protection

Application

- Pipelines
- Boilers

Temperature

- Upto 700°C

Tech Solution

- Multi layer pre-formed pipe section
- Customization (diameter and thickness)
- Special facing for LRB mattress

Benefits

- Quick ROI
- Energy savings
- Waste heat recovery (WHR)



LNG

AL ZOUR LNG TERMINAL, KUWAIT

Objective

- Simultaneous construction of 8 LNG storage tanks

Application

- 2,25,000 m³ LNG tanks on reclaimed sea site

Tech Solution

- Resilient blankets (Cryolene)
- Insulation with long lengths

Benefits

- Excellent thermal, fire and tensile performance
- Fewer joints
- Reduced thermal bridges
- Up to 75% faster installation
- Enhanced safety and efficiency

EUCEB

European Certification Board for Mineral Wool Products



Glass Wool and Stone Wool are
Bio-Soluble, Non-Hazardous and Health-Safe

MAJOR CERTIFICATION



Fire safety certification for Metal building and Duct wrap



BIS License in conformance with IS 8183 standard



Health safe fibers: Certification on Bio-solubility



Indian Green Building Council: Green Product certification



The Energy Resource Institute: Green Product certification

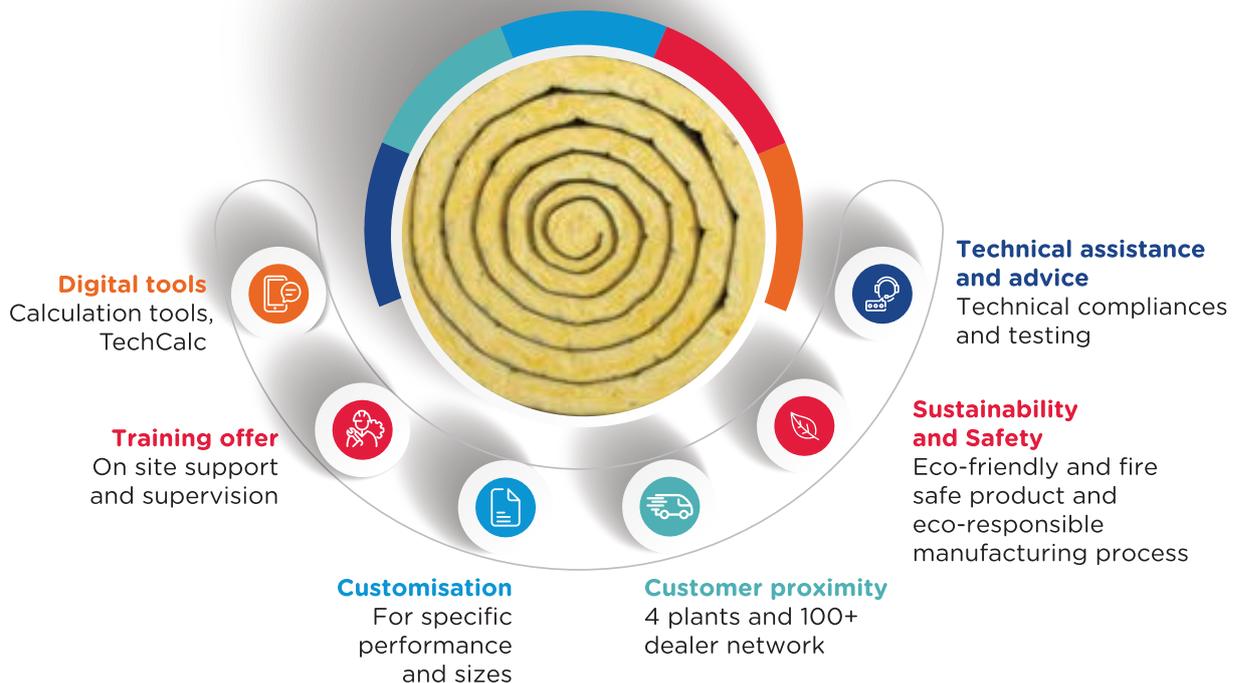


Singapore Green Building Council: Green Product certification



Environmental Product Declaration

WHY SAINT-GOBAIN INSULATION



OUR PRESENCE



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