

# Train Insulation

## **ISOVER Ecodesigned Solutions for Railway Rolling Stock and Equipment**

Thermo-Acoustic Insulation  
and Fire Protection



**ISOVER**  
SAINT-GOBAIN

# ISOVER Solutions for Trains

## ISOVER ecodesigned trains

As the world's leading insulation company, ISOVER offers a wide range of efficient insulation solutions for technical markets, such as marine, offshore, HVAC and railway. We have used our recognized innovation skills to bring:

- ***Lower environmental impact through optimal eco-design***
- ***Improved energy efficiency***
- ***Comfort and safety for passengers***

SAINT-GOBAIN ISOVER train products are proven solutions in Europe and around the world, where they have been used for decades in the train industry by major operators and builders such as Alstom, Bombardier, CAF, Deutsche Bahn, RATP, Siemens, SNCF.

## ISOVER part of SAINT-GOBAIN group

For more than three centuries, the SAINT-GOBAIN Group has earned a reputation for innovation, responsiveness and productivity through its ability to anticipate and provide solutions for customers' increasingly complex requirements.

SAINT-GOBAIN's presence in more than 64 countries allows an ongoing exchange of ideas and provide synergies that help to deliver the most innovative and appropriate solutions.



# ISOVER Material Range

SAINT-GOBAIN ISOVER offers a wide range of mineral wool products for railway applications. Manufactured with high-technology based on glass wool, stone wool and ULTIMATE, a unique and exclusive material made by ISOVER. The solutions that ISOVER offers for use within a train combine excellent thermal, acoustic and fire resistance. Our product range for trains provide high mechanical strength, good resistance to vibrations, flexibility, resilience, with easy transportation and handling for high performance.

## Glass wool

Key Strengths. Perfectly combined by ISOVER



Excellent thermal insulation



Flexibility



Easy installation



Optimal acoustic performance



Lightweight solutions



Active environmental protection



Non-combustibility and low smoke release



Fast installation



## Stone wool

Adapted for applications with higher mechanical demands



Excellent thermal insulation



Non-combustibility, fire resistance and low smoke release



Strong mechanical resistance



Optimal acoustic performance



Active environmental protection



## ULTIMATE

The new high performance mineral wool



Excellent thermal insulation



Flexibility



Easy installation



Optimal acoustic performance



Lightweight solutions



Active environmental protection



Non-combustibility, fire resistance and low smoke release



Fast installation





# ISOVER Performance Guide

ISOVER has developed a wide range of high-performance insulation products and materials to meet the demanding requirements of the railway market.



## Safety: Inherent Fire and Smoke properties

### EN 45545-2 conformity up to HL3 highest safety class

Fire properties are inherent to ISOVER mineral wool, allowing it to achieve non-combustibility and low smoke release. HL3, the highest safety class can be maintained regardless of the encapsulation of edges and joints by specific tapes, and beyond 45545-2 requirements. Saint-Gobain Isover offers a product range adapted to each country 's needs and regulations.

### Fire barriers system requirements

Both stone wool and ULTIMATE mineral wool can be incorporated to create fire barriers on steel, aluminium and composite structures.

Please consult ISOVER for the conformity to particular standards regarding fire reaction & smoke to design the right insulation solution for fire barrier systems.



## Environment, Health & Safety

All ISOVER mineral wool products are biosoluble and 100 % recyclable, made of natural raw materials. ISOVER mineral wool products are non-carcinogenic in accordance with EU criteria, as indicated by the EUCB and RAL quality labels «Products made of mineral wool». Our products are also non-combustible, according to the existing train safety standards.



On the safe side  
with ISOVER mineral  
wools



## Eco-Design and Recycling

For decades, SAINT-GOBAIN ISOVER has acquired the expertise to deliver to its customers the maximum in energy saving and the ability to protect the environment. Providing our partners industrial eco-design solutions is paramount for ISOVER.

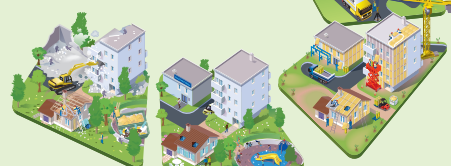
ISOVER can perform LCAs (Life Cycle Assessments) on representative products on request. ISOVER train solutions are made with up to 80 % recycled materials. Most ISOVER plants are certified according to ISO 14001 and ISO 50001.



**LCA (Life Cycle Assessment) =**  
**All steps of a product's life cycle,**  
**from production / extraction until removal / reuse.**



**From Cradle to Grave**

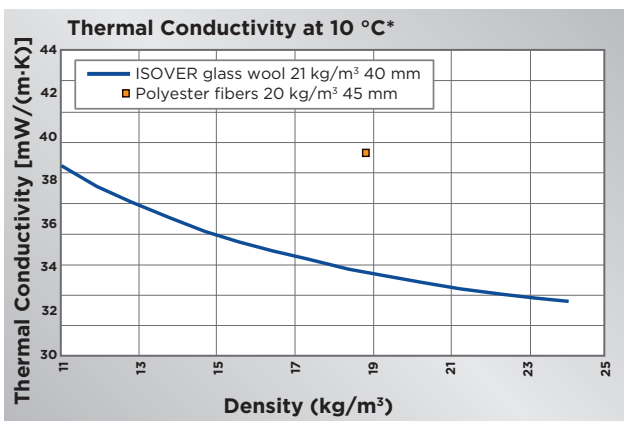




## Thermal Insulation

Superior performance simply means additional comfort and more space for passengers. Through ISOVER's decade long experience, the thermal efficiency of our products have been able to be measured.

Compared to newly installed polyester fibers, even after 25 years the mineral wool resistance of ISOVER products remains 15 % more effective.

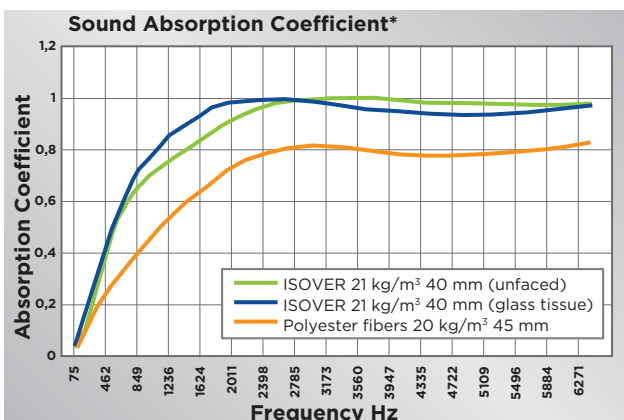


\*Thermal Conductivity at 10°C according to EN 12667



## Acoustic Performance

ULTIMATE and glass wool offer improved acoustic comfort due to their high-level sound absorption properties as well as very good sound reduction with minimum weight.



\*Sound Absorption Coefficient according to ISO 10534-2



## Fast Installation and Flexibility

ISOVER mineral wool products are easy to handle and quick to install. They are flexible enough to adapt to irregular surfaces and can be cut with simple tools, either in a workshop or on train sites, into various shapes according to the requirements.

**Since 2016, certain ISOVER insulation solutions are available in self-adhesive version. Example: Train Comfort V2 Fix.**

**NEW**

EN 45545-2, the highest safety class HL3, can be maintained for ISOVER self-adhesive solutions regardless of the encapsulation of edges and joints by specific tapes.



## Resistance to Vibrations

ISOVER glass wool offers proven performance in real conditions onboard trains, attesting to its durability, reliability and resistance to vibrations. After 25 years of use in trains, ISOVER products have been found to maintain their physical integrity, thickness and thermal performance offering undisputable durability over time.



## Lightweight Insulation

ISOVER mineral wool products offer optimal acoustic, thermal and fire insulation, with a minimal weight. On top of faster installation, lightweight solutions also lower operation costs during the total lifetime of the train.



## Logistic Cost Savings

### ULTIMATE and Glass Wool Compression

More product per roll not only saves space - it saves you money! When it comes to transportation and storage, you can count on the benefits of glass wool and ULTIMATE's highly flexible and resilient fiber structure.



# ISOVER Insulation Solution for every Train Application

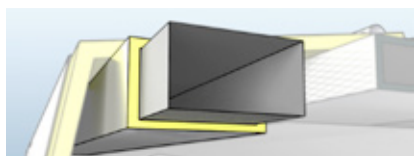


## High performing, cost-effective Insulation Solutions

With more than 30 years of experience, ISOVER's solutions offer proven durable performance and best value for money. Considering acoustics, fire behaviour, thermal resistance, resilience

& resistance to vibrations, lightweight and lowest environment impact, ISOVER solutions provide the optimal contribution to eco-design, comfort and safety onboard the train.

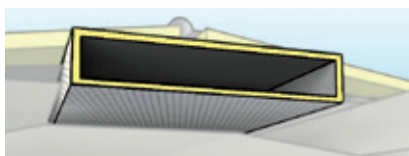
### HVAC external duct insulation



#### **A** TRAIN COMFORT Alu1

Light thermal insulation solution faced with reinforced aluminium acting as a vapor barrier to insulate metal air ducts from outside.

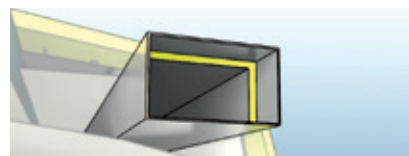
### Self-supporting HVAC ducts



#### **B** TRAIN CLIMAVER

Light self-supporting insulation ducts for air conditioning and distribution in trains. Offers a high level of acoustic comfort and easy cleaning.

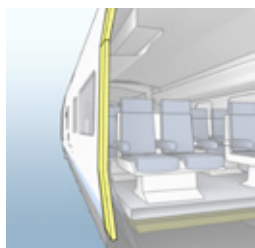
### HVAC internal duct insulation



#### **C** TRAIN LINER 05 mm Roll TRAIN LINER 15 mm/25mm Roll TRAIN LINER Slab CLEANTEC TRAIN LINER Slab V2

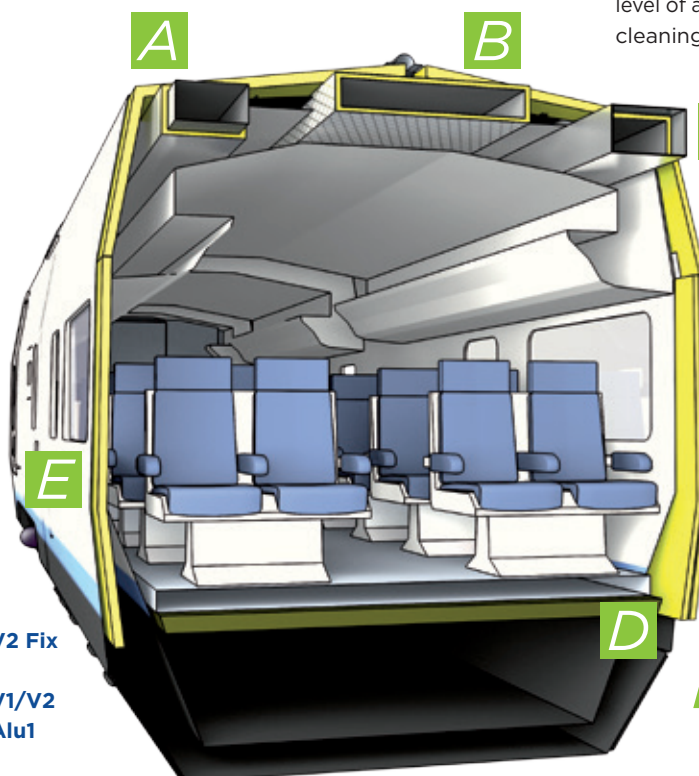
Thermal and acoustic insulation faced with adapted glass tissue or fabric to be installed inside air ducts. Offers a high level of acoustic comfort. Cleantec allows cleaning inside HVAC ducts.

### Insulation for train walls and ceilings

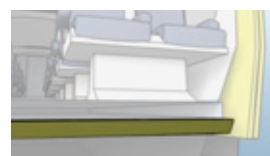


#### **E** TRAIN COMFORT V2 Fix (self-adhesive) TRAIN COMFORT V1/V2 TRAIN COMFORT Alu1

Light insulation with high thermal, acoustic and fire-resistant performance. Available with various facings.



### Insulation under floors



#### **D** TECH Slab ULTIMATE Solutions TRAIN COMFORT Range

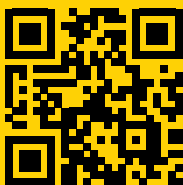
Insulation for applications where thermal, acoustic and/or fire barriers are required.



	Range	Facing	Thermal Conductivity at 10°C	Standard Dimension	Standard thickness Range	Normal Density	Fire behaviour	
						EN 45545		
		mW/(m·K)	mm	mm	kg/m³	Class	Certification	
Vertical and Horizontal Insulation	NEW: self-adhesive version TRAIN COMFORT V2 Fix	Self-adhesive & Black glass tissue	31 to 33	1350 x 600 (slabs)	From 25 to 100 (for thinner solutions : see HVAC solutions)	From 21 to 69	HL3	OK
	TRAIN COMFORT V1 TRAIN COMFORT V2	Yellow or Black glass tissue (1 or 2 faces)		1350 x 600 (slabs) 1200 width (rolls)		From 20 to 70 depending on products and applications	HL3	OK for main range Rest by end of 2017*
	TRAIN COMFORT Alu1	Reinforced Aluminium						By end of 2017*
	TRAIN COMFORT	Unfaced						OK
HVAC Inside Air Ducts	TRAIN LINER Slab CLEANTEC	Glass fabric & glass tissue	33	2000 x 1000 (slabs)	25	From 20 to 110 depending on products and applications	HL3	OK
	TRAIN LINER Slab V2 / Climaver 274	Glass tissue	33	2000 x 1200 (slabs)	25			OK
	TRAIN LINER 25 mm Roll TRAIN LINER 15 mm Roll / Climaver 502	Glass tissue	33	1200 width (rolls)	25/15			OK
	TRAIN LINER 5 mm Roll / Climaver 504	Tarlatan glass fabric	34	1200 width (rolls)	5			OK
HVAC Self-Supporting Ducts	TRAIN CLIMAVER	Glass fabric & Kraft-Aluminium	31	3000 x 1190 (slabs)	25		HL3	OK
HVAC Outside Air Ducts	TRAIN COMFORT Alu1	Reinforced Aluminium	31 to 33	1350 x 600 (slabs) 1200 width (rolls)	From 25 to 100		HL3	By end of 2017*
Under Floors & Fire Barrier	TECH SLAB	Unfaced	39 to 41 (at 50 °C mean T °C)	1200 x 600 (slabs)	From 20 to 100 depending on density	From 40 to 140 depending on thickness	HL3	OK
	ULTIMATE Solutions	Unfaced	35 to 37 (at 50 °C mean T °C)	1200 x 600 (slabs) 1200 width (rolls)	From 30 to 100	Please contact us for product details	HL3	Please contact us for product details
	For under floors if there is no fire-barrier requirements: TRAIN COMFORT Solutions See Vertical and Horizontal Insulation							

For more information, visit [www.isover-technical-insulation.com](http://www.isover-technical-insulation.com)

\* information to be confirmed



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