

Improved properties of rock mineral wool for fire resistant sandwich panels

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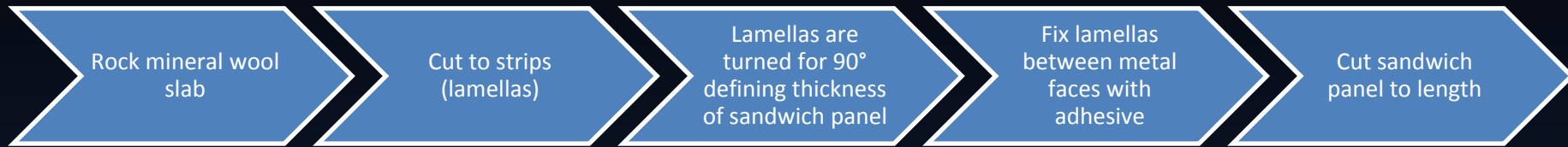


ARHANTI d.o.o.

- Main activity is consulting in the field of sandwich panels and steel constructions
- Helping sandwich panel companies to obtain CE marking
- Calculation and comparison of sandwich elements using SandStat software
- Organizing seminars with sandwich panel topics
- Representing companies:
 - IS engineering
 - OEST

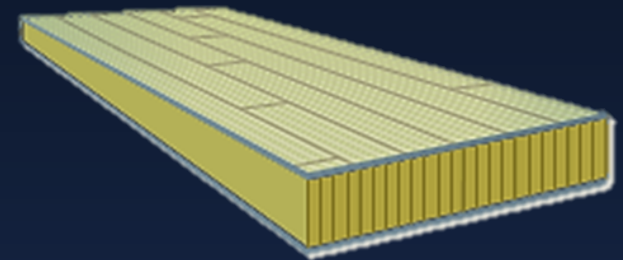


Rock mineral wool in sandwich panel is usually produced using mineral wool lamellas



What does rock mineral wool contribute to sandwich panel building?

- Thermal insulation properties (ensure requested U-value)
- Mechanical properties (higher loads, longer spans)
- Fire properties (reaction to fire, resistance to fire)



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What does rock mineral wool contribute to sandwich panel building?

- **Thermal insulation properties (contributes to energy efficiency)**
- Mechanical properties
- Fire properties (reaction to fire, resistance to fire)



Let's have a close look into background on energy efficiency as a way of saving our planet

EU environmental targets:

- Reduce greenhouse gas emissions
- Preserve natural resources
- Utilize energy efficient solutions

How do these incentives reflect in building sector?





EU 20/20/20
European 20% energy objective

20% reduction of annual primary
energy consumption by 2020

DIRECTIVE covering energy performance for buildings
EPBD – Energy Performance of Buildings Directive



EPBD – Energy Performance of Buildings Directive Recast (Directive 2010/31/EU)

- All new buildings will have to be nearly zero-energy rated till end of December 2020
- All public authority buildings need to be on the same level till end of 2018
- A system for certification for energy performance of buildings will have to be established by Member States



FACT:

40% of energy
is used in
buildings*

What to do?

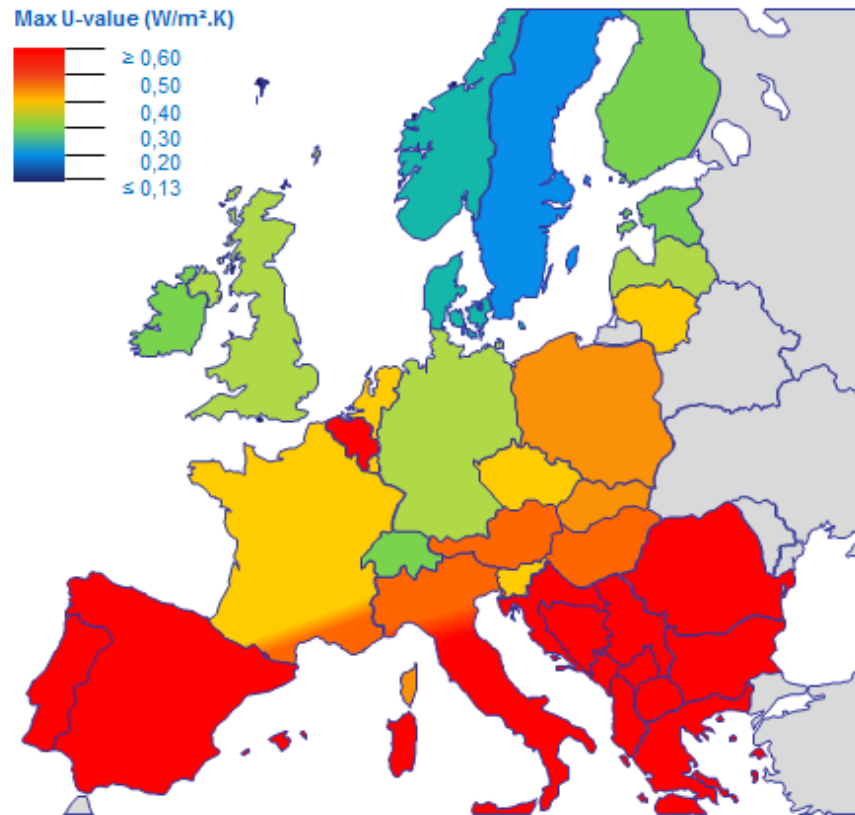
- REDUCE energy consumption for heating/ cooling with efficient building envelope insulation

How to do?

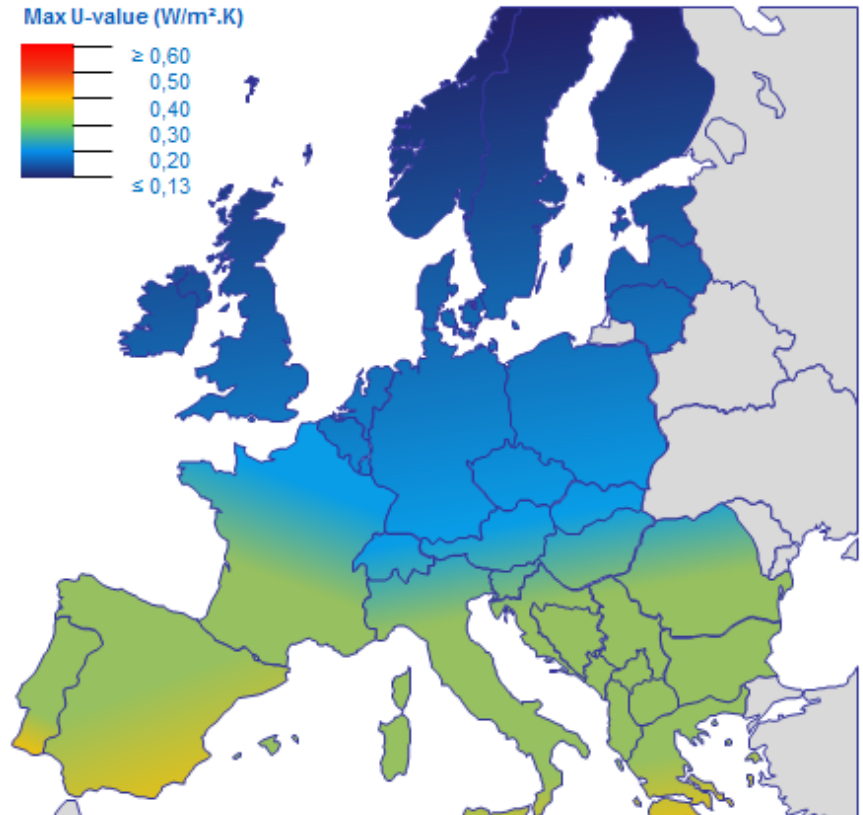
U-VALUE
REGULATION

U-value regulation (Current and recommended in peak price scenario – source: EURIMA), envelope wall

U-value map for walls, Average Building Regulations (INDICATIVE)



U-value map for walls, Peak Price Scenario



U-value regulation has direct effect on envelope

- Bigger thickness of sandwich panel
- Better U-value of sandwich panel



Energy efficient rock mineral wool as a core for sandwich panels
ensuring lower U-value



„Standard“ sandwich panel
with rock mineral wool

„Energy efficient“ sandwich panel
with lower thermal conductivity
mineral wool

~ 100	Density (kg/m ³)	~ 90
60-70	Compressive strength (kPa)	60
80-100	Tensile strength (kPa)	70-90
50-70	Shear strength (kPa)	50-60
172mm	Thickness at U-Value 0,25 W/m ² .K	150mm
220mm	Thickness at U-Value 0,20 W/m ² .K	200mm



Advantages of thermally improved rock mineral wool in sandwich panel:

- ✓ Better thermal insulation
- ✓ Lower thickness of sandwich panel
- ✓ Lower transport costs
- ✓ Lower weight of sandwich panel
- ✓ Easier on site manipulation and installation



Energy efficiency of building can be further enhanced with:

+ Windows

+ Doors

+ Airtightness

+ Heating / AC

+ Ventilation

+ Lightning



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What does rock mineral wool contribute to sandwich panel building?

- Insulation properties (lower energy consumption)
- **Mechanical properties**
- Fire properties (reaction to fire, resistance to fire)

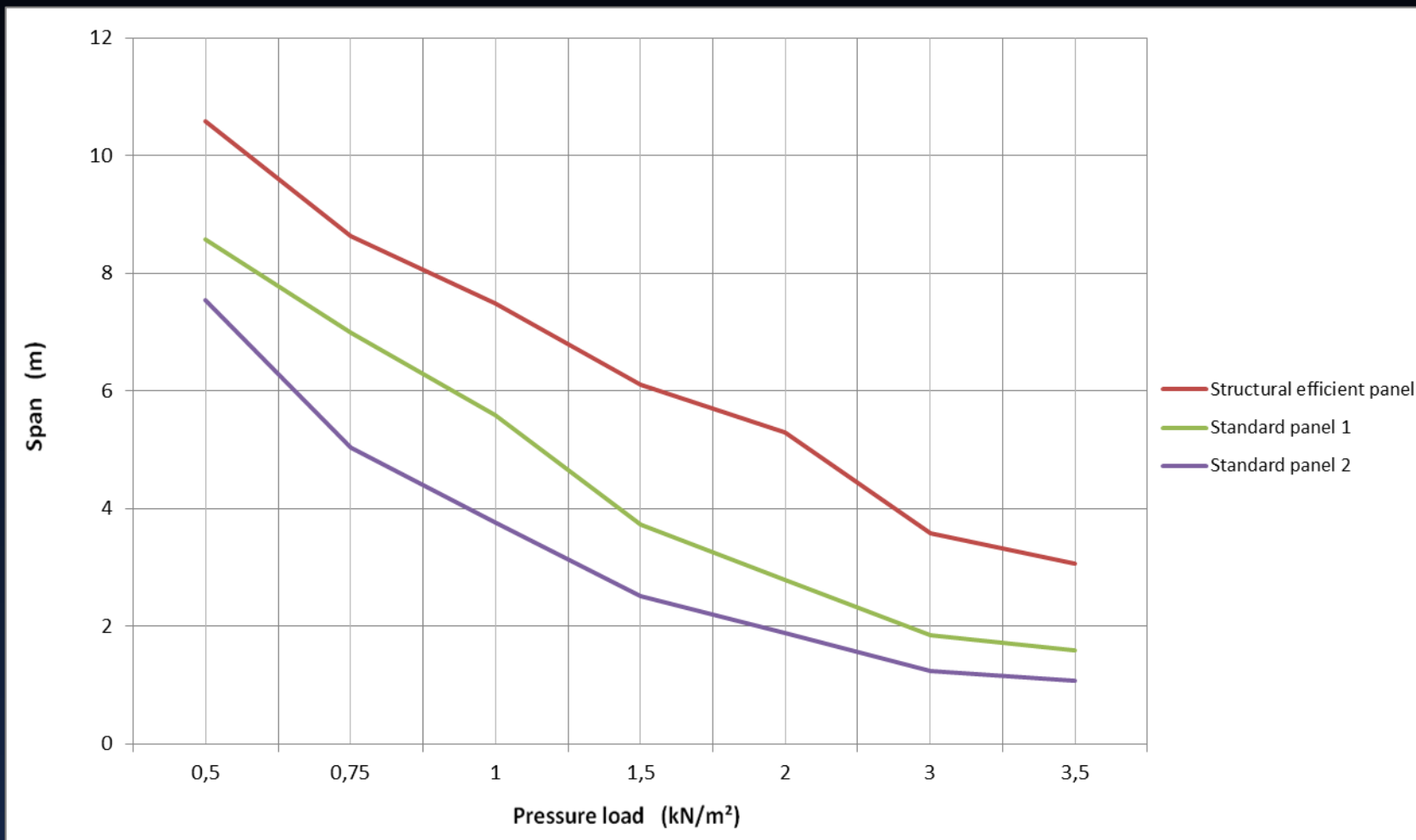
**„Standard“
sandwich panel**

**„Structural efficient“
sandwich panel**

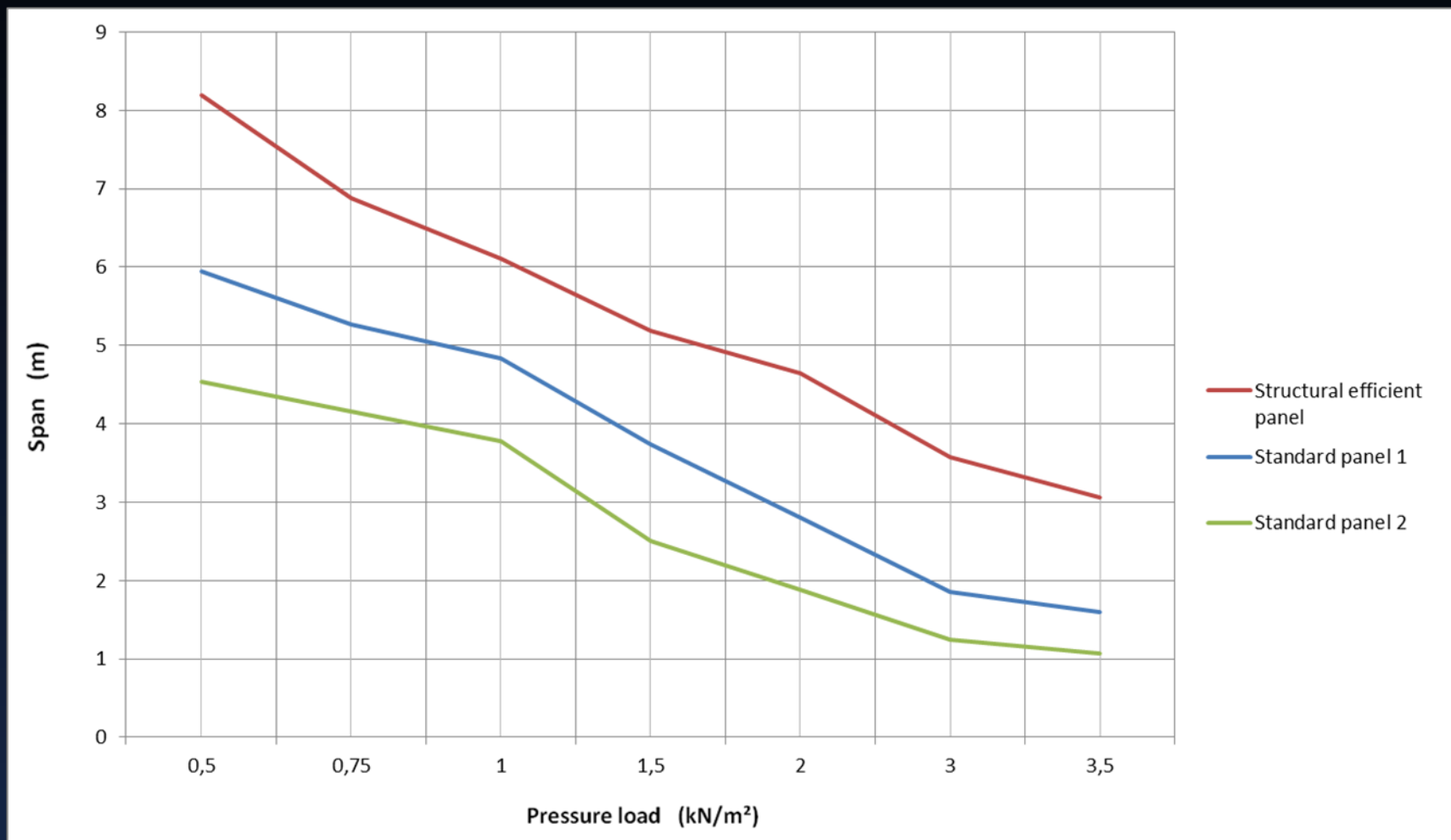
115 - 120	Density (kg/m³)	~ 115
70-90	Compressive strength (kPa)	100
80-110	Tensile strength (kPa)	100-150
50-70	Shear strength (kPa)	90
~ 6 m	Single span	up to 10 m



Structural efficient sandwich panel vs. Standard sandwich panel available on the market (single span):



Structural efficient sandwich panel vs. Standard sandwich panel available on the market (multi span):

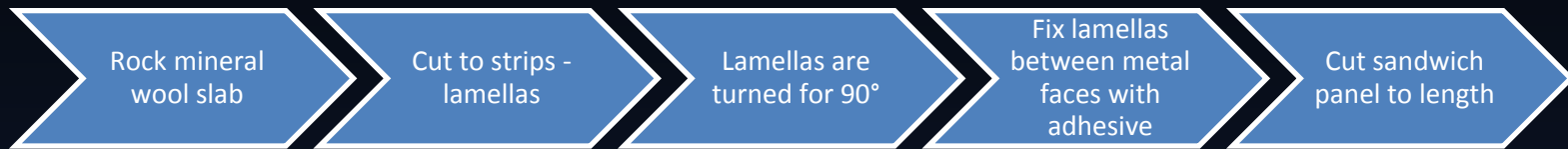


Advantages of rock mineral wool with improved mechanical properties in sandwich panel:

- ✚ Heavier load resistance
- ✚ Long span
- ✚ Savings on steel construction
- ✚ Savings on foundations and anchoring
- ✚ Better air tightness
- ✚ Quicker build up times
- ✚ Faster project finalization



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What does rock mineral wool contribute to sandwich panel building?

- Insulation properties (lower energy consumption)
- Mechanical properties
- **Fire properties (reaction to fire, resistance to fire)**



THANK YOU!

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