AIRTIGHT SANDWICH PANELS

RAUTA

Facades ▪ Roofs ▪ Buildings

Rauta

- ✓ Expert in steel construction
- ✓ Exclusive supplier of Ruukki commercial products to Ukraine
- ✓ Design, supply, installation

Ruukki sandwich panels

- ✓ High quality mineral wool and PIR
- ✓ Structural steel grades
- ✓ Warranty up to 30 years
- ✓ Certificate DSTU B EN 14509
- ✓ Certificates LEED, BREAM, FM
- ✓ High durability in an aggressive environment

Airtight sandwich panels

- ✓ Energy consumption reduction up to -30% compared to standard panels
- ✓ Complete airtightness of the building $q_{50} \leq 1\ m^3/(m^2h)$
- ✓ High water resistance
- ✓ Quick and easy installation
- ✓ Increase level by LEED, BREEAM, FM
- ✓ Microclimate improvement
- ✓ Improving company image and value of the building
- ✓ CO_2 emissions reduction up to -30%

Airtight package

Products

Energy panels, Accessories

Our promise

Air tightness promise. Money back -guarantee

Services

Energy simulation

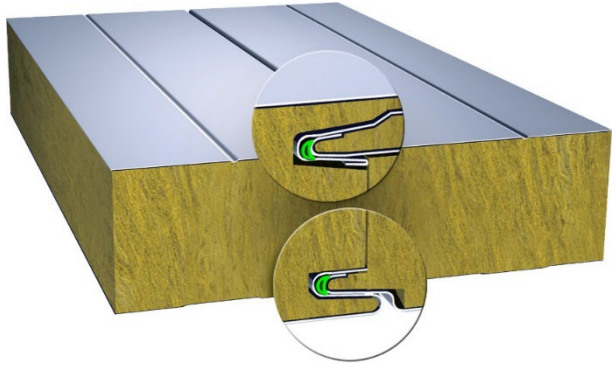
Installation support

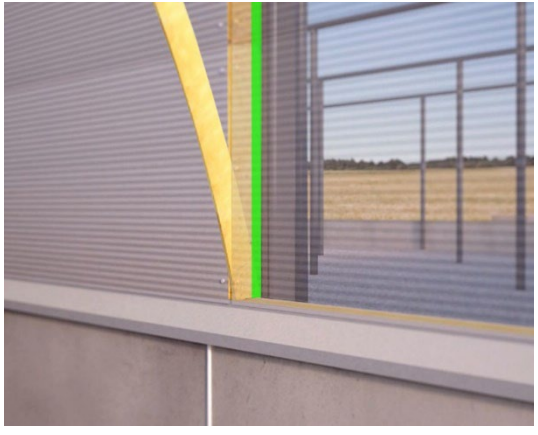
Trained and certified installers. Wide installation network

Details

Airtight details. Climate change considered. Tested structures

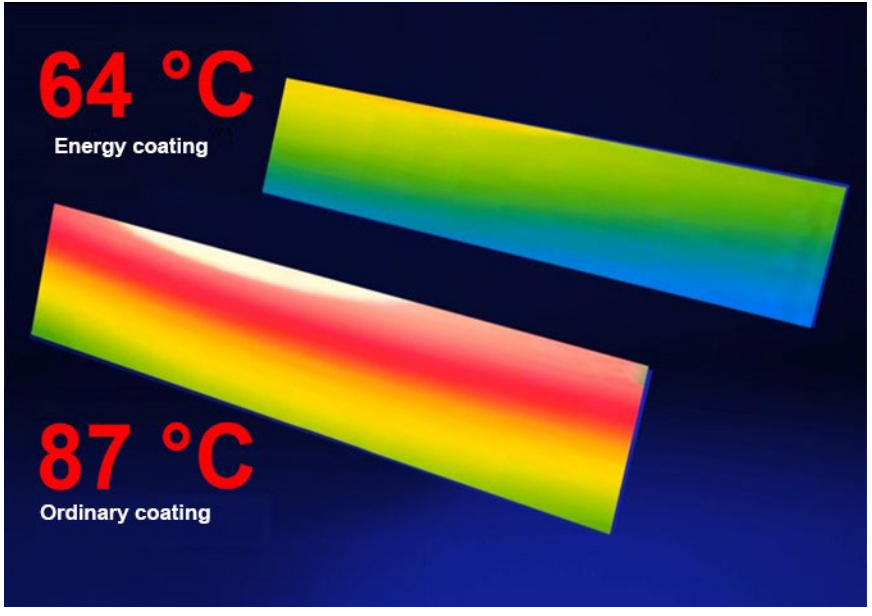
How it works?





- ✓ Airtightness of all enclosing structure including walls, roof, floor:
  - Sealant in the lock
  - Sealant between panels and at joints
- ✓ Airtightness test

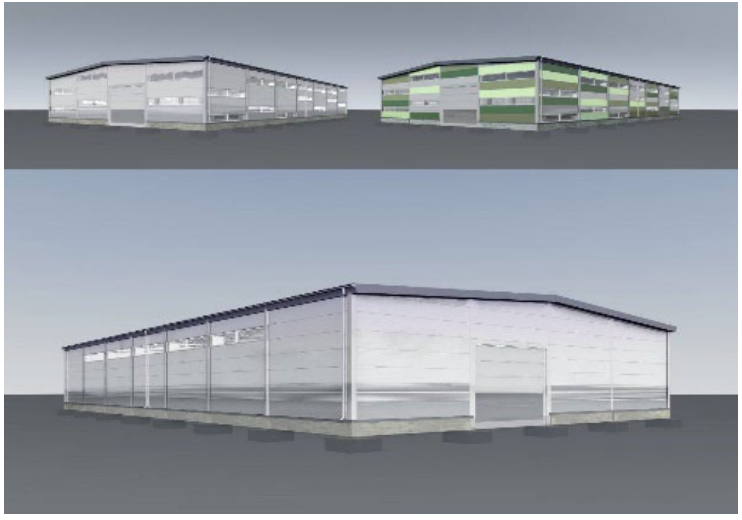
How it works?

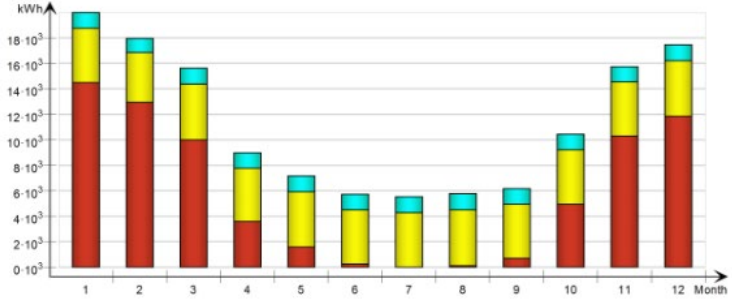


Hiarc energy-reflecting coating

- ✓ Excellent resistance to UV radiation
- ✓ Surface temperature reduction
- ✓ Increased resistance to dirt and scratches

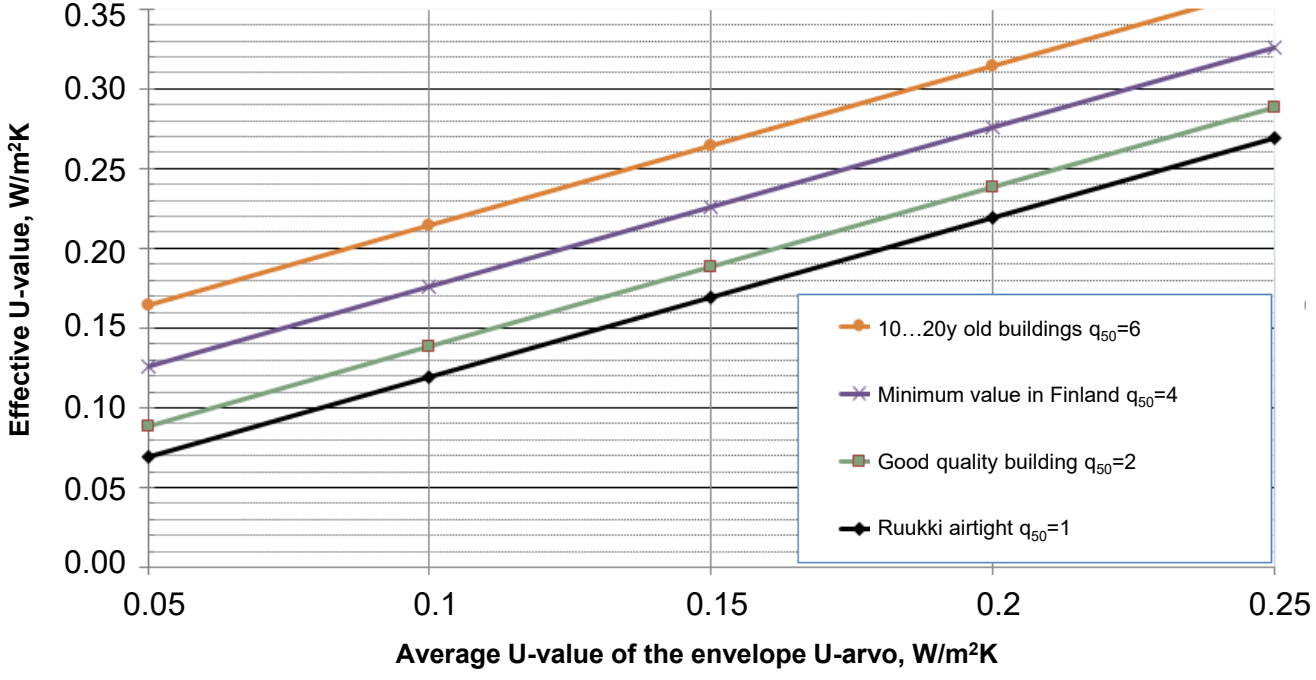
Energy simulation





- ✓ Building envelope optimization
  - Air tightness
  - Insulation thicknesses
  - Lighting
  - Daylight window
- ✓ Calculates heating savings brought by energy envelope system

Whole envelope “effective U-value” including air-tightness effect q_{50}, $m^3/(m^2h)$

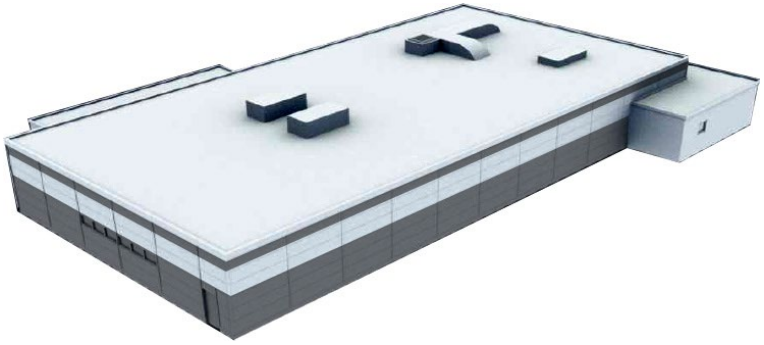


Example:
$U_{envelope}$ = 0.20

-q_{50} = 1, U_{eff} = 0.22
-q_{50} = 2, U_{eff} = 0.24
-q_{50} = 4, U_{eff} = 0.28

Change
q_{50}: form1.0 to 4.0
Equivalent to increase the thickness of mineral wool ~50 mm

Example of Ruukki energy-saving technologies application at the mall



Building parameters

- ✓ Region: Finland
- ✓ Area: 8,400 m^2
- ✓ Area of envelope structures: 20,000 m^2
- ✓ Area of windows: 10% of external walls area
- ✓ Construction volume: 67,000 m^3
- ✓ Coefficient of recuperation: 0.55
- ✓ Air and central heating

Thermal conductivity, W/m*K

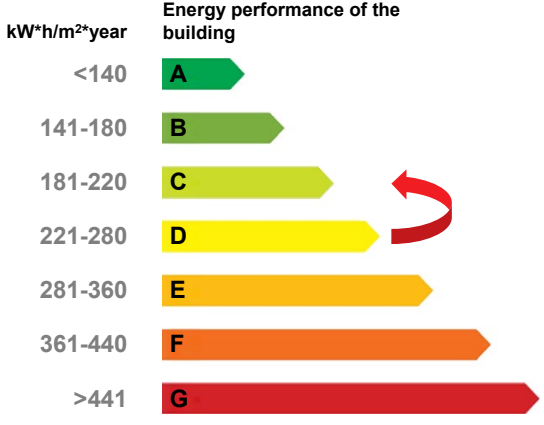
- ✓ Walls: 0.17
- ✓ Roof: 0.09
- ✓ Floor: 0.16
- ✓ Windows and doors: 1.0

Energy prices, €/kW*h

- ✓ District heating: 0.05
- ✓ Electricity: 0.10

Efficiency of application

Airtightness, 1/h	Saving, €/year			Saving, %
	Area 1 500 m²	Area 3 000 m²	Area 8 400 m²	
Standard RakMK 2010 (min. value) n_{50}=4	0	0	0	0%
Standard RakMK 2010 (max. value) n_{50}=2	6,000	12,000	34,000	-18%
Basic n_{50}=1.3	8,000	17,000	47,000	-25%
Plus n_{50}=0.9	-	19,000	54,000	-30%
Premium n_{50}=0.6	-	21,000	59,000	-31%



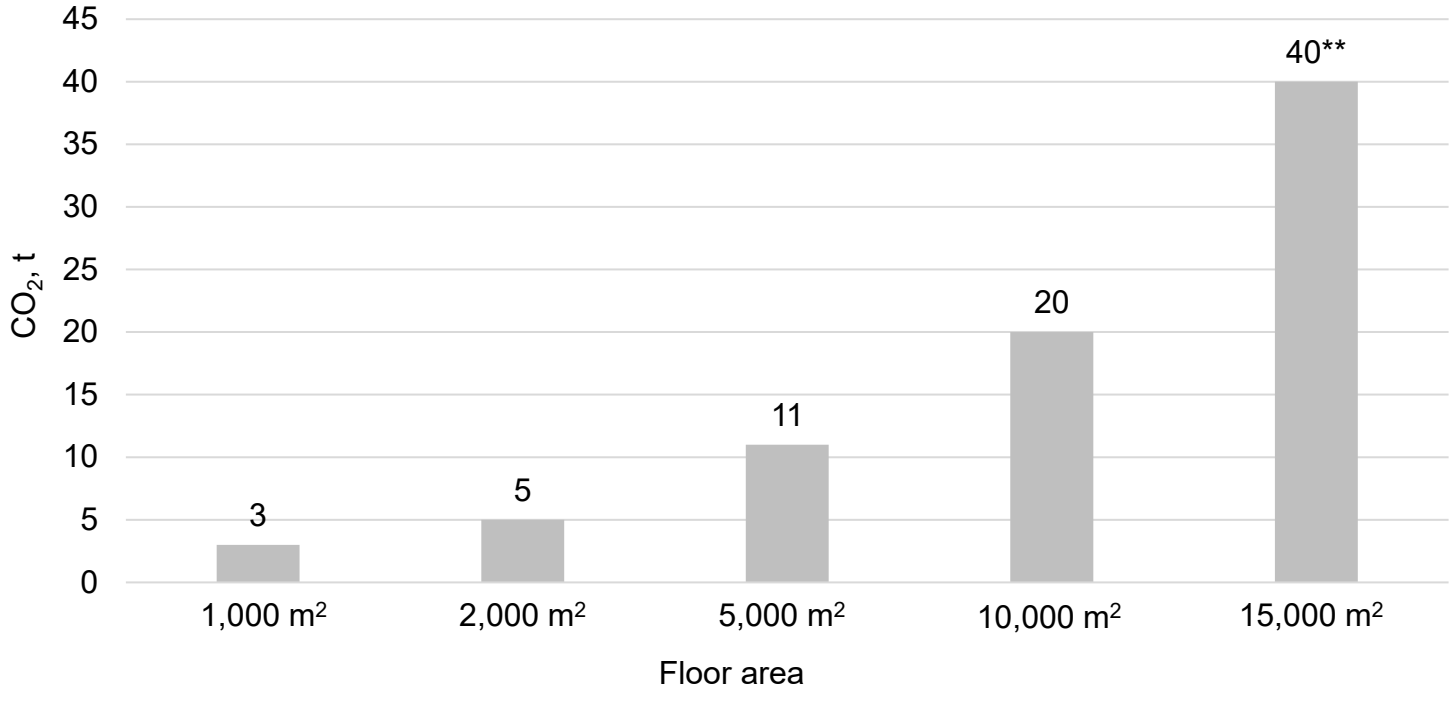
- ✓ Improved tightness
- ✓ Reduction of energy consumption by 84 kWh/m²*year
- ✓ Improving energy performance class from D to C

Ruukki offer for energy saving

Offer	Area			Scope of supply					Airtight-ness test
	Total	Walls	Openings	Design	Frame	Roof	Panels, windows, accessories	Installation	
Basic			≤ 40%			+	+		no
Plus	≥ 3,000 m^2	≥ 1,000 m^2	≤ 20%	+		+	+		Customer
Premium	≥ 3,000 m^2	≥ 1,000 m^2	≤ 20%	+	+	+	+	+	Rauta

Savings in CO_2 emissions

Annual savings in CO2 –emissions compared to minimum air tightness level, q_{50}=4 $m^3/(m^2h)$



** ** Equals emissions caused by a passenger car 8 times around the world (120g/km)

Logistic complex DHL

q_{50}<0,8 $m^3/(m^2h)$; airtightness class A

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Shopping center K-Rauta

q_{50}<1,0 $m^3/(m^2h)$; airtightness class B

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Kauppakeskus mall

q_{50}<1,0 $m^3/(m^2h)$; airtightness class B

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Logistic complex Schenker

q_{50}<1,0 $m^3/(m^2h)$; airtightness class B

Car showroom Motonet

q_{50}<0,8 $m^3/(m^2h)$; airtightness class A

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Logistic complex Broman

q_{50}<0,8 $m^3/(m^2h)$; airtightness class A

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THANK YOU
FOR ATTENTION!

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