Case study

Case study
Cold storage with Frigotherm iQ+

We conducted a study comparing the iQ+ range's energy use with that of standard systems. We were able to quantify the energy and consumption gains that helped reduce CO_2 emissions.

The geometric model used for the various simulations is a parallelepiped. The chosen dimensions are the following:

- Floor and roof surface area of 6,000 m² (L = 150 m, W = 40 m)
- Height of 12 m
- Vertical wall surface area: 4,560 m²

Main orientation: North-South.

	Configuration 1 140 mm / 2 °C	Configuration 2 200 mm / -25 °C
PRT - Hexacore consumption	366,663 kWh/year	875,413 kWh/year
iQ+ consumption	345,769 kWh/year	832,530 kWh/year
Difference in consumption	20,894 kWh/year	42,883 kWh/year
Reduction in CO_2 emissions	- 8,692 kgCO_2-eq	- 17,839 kgCO_2-eq
Equivalent to no. of cars travelling 20,000 km/year	> 3	> 6

(Source : Thinkstep – data 2014 based on official statistics from International Energy Agency – EU-28)
Car reference: 130 g of CO2/km

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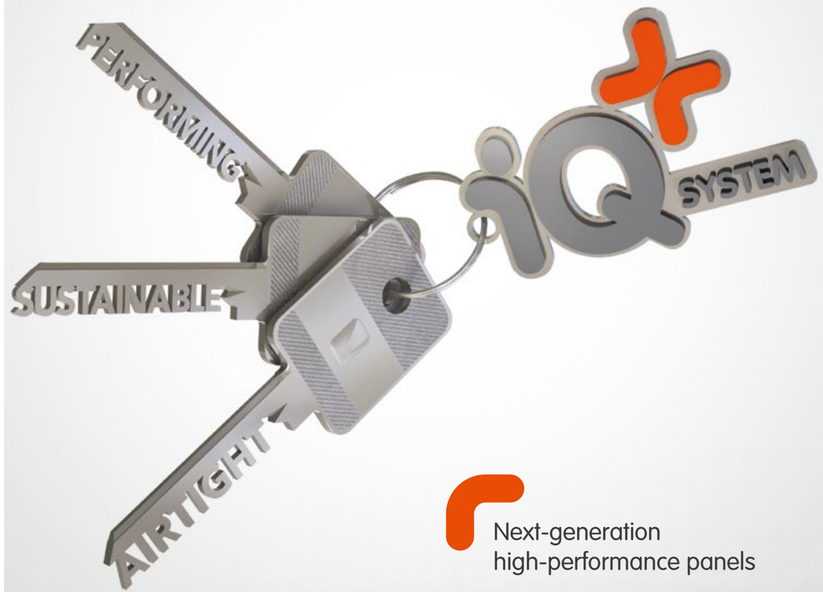
iQ+ System
Unlocking the future of construction



Next-generation high-performance panels

- Enhanced insulation
- Sustainable coating
- Optimal airtightness

ArcelorMittal Construction is committed to improving the performance of buildings and reducing their environmental footprint

As part of its efforts to improve the environment we share, ArcelorMittal Construction is launching a series of new building envelope systems branded iQ+ System. This range features the latest technologies for improving thermal performance and reducing the environmental impact from manufacturing, transportation and use.

At ArcelorMittal Construction, we set high standards, rigorously maintain them, and guarantee a high level of performance for all our sandwich panels.

ArcelorMittal Construction has invested heavily in R&D and industrial solutions as part of its commitment to addressing these challenges through a programme of innovation in steel and system components, aimed at reducing the environmental footprint of buildings.

The new Ondatherm iQ+, Promisol iQ+ and Frigotherm iQ+ panels contain iQ+ foam, a high-performance component which offers enhanced thermal performance, including a lambda value of 0.018 W/m.K, and a reaction to fire of B,s1-d0. ArcelorMittal Construction offers a warranty of up to 40 years.

Thickness	mm	80	100	120	140	160	170	180	200
Thermal conductivity* (λ)	W/mK	0.018							
Thermal Uc-value	W/m²K	0.222	0.178	0.149	0.128	0.112	0.106	0.099	0.090
Thermal Rc-value	m²K/W	4.33	5.45	6.54	7.64	8.76	9.31	9.93	10.94
Reaction to Fire	-	B,s1-d0							
Airtightness	m³/m²h	Over Pressure 50Pa ≥ 5x10-15							
		Under Pressure 50Pa ≥ 0.0057							

Please note, thicknesses and performances displayed are given for cladding panels with visible fixings.
* λ according to EN13165 & Position Paper NB-CPR/SG19/N165

Enhanced thermal performance
for improved thermal insulation

The new iQ+ foam formula reflects ArcelorMittal Construction's commitment to significantly reduce the environmental impact of construction. This new solution delivers a 15% increase in thermal performance at constant panel thickness, for all applications.

iQ+ foam also generates less CO_2 for each panel manufactured, cutting emissions by up to 4,000 kg for a 2,000 m² facade.

+15%

Increase in thermal performance

We are now able to effectively reduce panel thickness from 140 mm to 120 mm while maintaining thermal efficiency. For every 2,000 m² of panels, we use 1.6 t less foam and 50 kg less steel (flashings, screws, etc.), with an added bonus of streamlined transport costs.

Sustainable coating
for a reduced environmental footprint

The new generation of ZMevolution® galvanized coatings are even more attractive, offering improved aesthetics and exceptional surface quality, as well as being incredibly lightweight. The reduced weight improves the coating application process and streamlines transport costs, while also providing superior corrosion protection and a lifespan up to three times longer than standard zinc coating.

Protecting the environment also means caring about the impact on people's health. The finish does not contain any carcinogenic substances or PVC, limits VOC emissions, and does not leach zinc into the ground.

-46%

Reduction in CO_2 generated from galvanizing one kg of steel

Switching from pure zinc coatings to ZMevolution® achieves a 46% reduction in the CO_2 emissions generated from galvanizing a kg of steel. For a single production site, this represents the equivalent of 13,000 vehicles each traveling 13,000 km per year.

Ondatherm® iQ+
Promisol® iQ+
Frigotherm® iQ+

Optimal airtightness
for improved building comfort and reduced energy use

The iQ+ sandwich panel system and its assembly method deliver a level of airtightness which can improve a building's energy performance by up to 25%. The importance of airtightness is increasingly being recognized, as it also improves acoustic comfort, indoor air quality, ventilation system efficiency, and structural integrity.

+25%

Increase in energy performance