

Magnelis® for HVAC systems

High protection against corrosion

Magnelis® is an exceptional steel coating which provides breakthrough corrosion protection. Steels coated with Magnelis® are highly suitable for heating, ventilation, and air conditioning (HVAC) equipment in many types of buildings including: residential, commercial, industrial, data centres, hospitals, marine structures, warehouses, waste treatment centres, swimming pools and sports centres, and agricultural buildings and animal housing.

HVAC equipment is often at risk of oxidation due to condensation or the aggressive atmospheres found in industrial and agricultural buildings. The local environment can also play a part, particularly if the building is located in a marine or tropical climate.

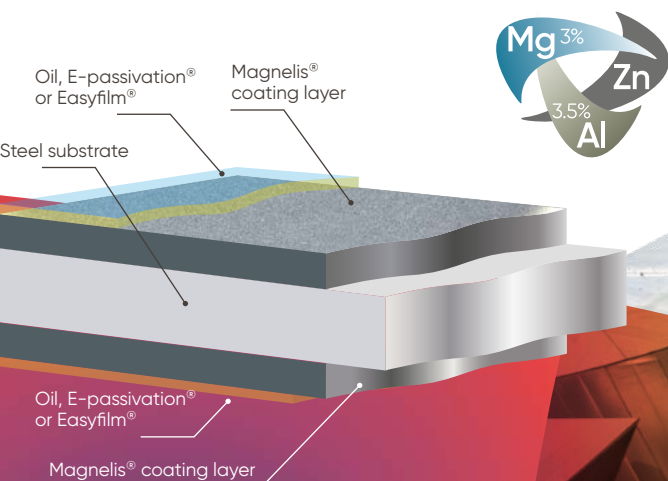
These factors can impact the HVAC equipment's structural integrity, its external appearance, and the overall durability of the HVAC system.

What is Magnelis®?

Thanks to its unique composition, Magnelis® provides an unprecedented level of surface and cut-edge protection, even in the most hostile environments.

Magnelis® is produced on a continuous hot dip galvanising line which molten bath has a unique chemical composition including zinc, aluminium, and magnesium.

This innovative coating alloy, compatible with high strength steels, is an ideal solution for durable casings, frames, structures, ducts, ventilators, blades, supports, containers, air handling units and ventilation grills in HVAC systems.



Proven outdoor corrosion resistance

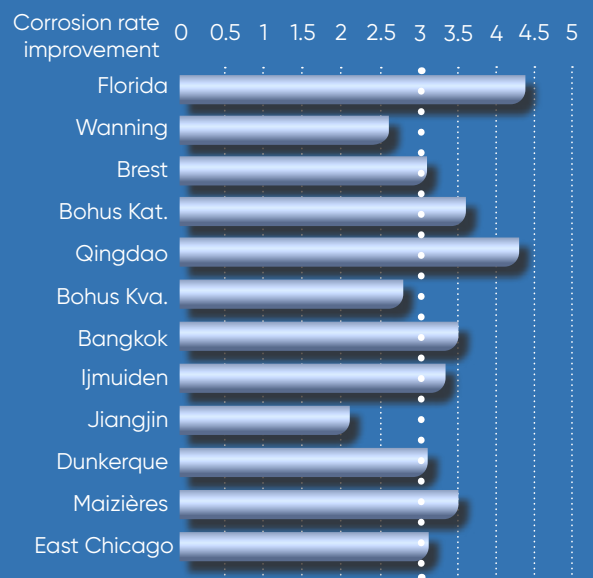
HVAC equipment can be at risk of corrosion due to condensation or extreme environments. This makes durability a key consideration when selecting materials for HVAC systems. As a durable coating with excellent corrosion resistance properties, Magnelis® is ideally suited for HVAC applications.

More than a thousand Magnelis® samples have been exposed to a variety of different environments around the world in outdoor tests.

Every test has confirmed the optimal protection provided by Magnelis® against long-term corrosion.

Magnelis® offers at least twice the corrosion resistance of galvanised steel in all types of environments. In very aggressive environments, the performance of Magnelis® is even higher.

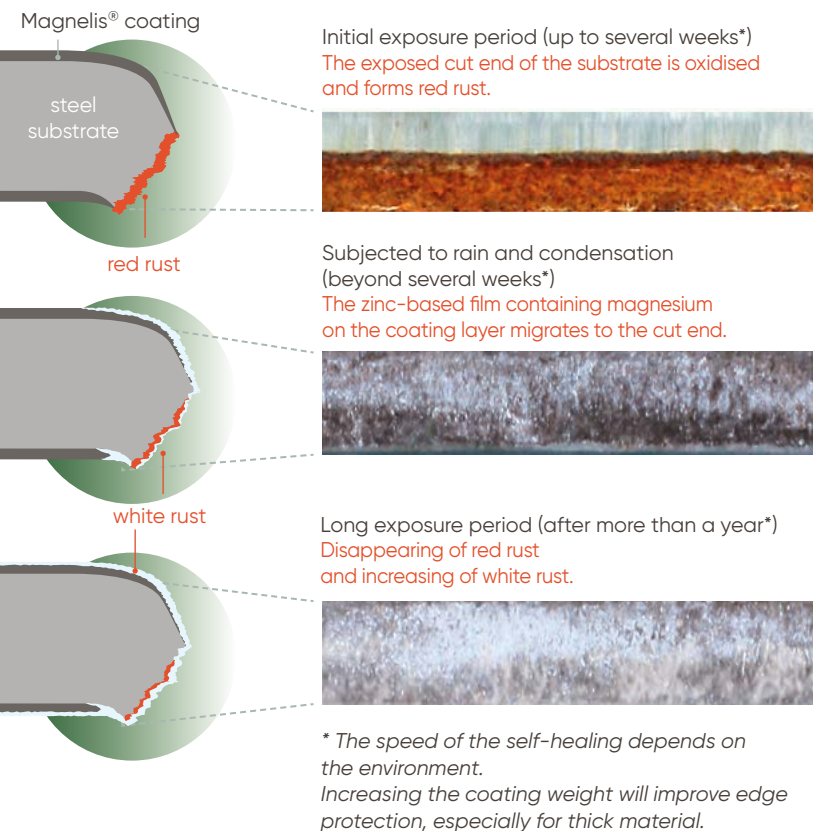
Improvement factor between Magnelis® and regular galvanised steel in field testing



Average improvement: ~ 3 compared to regular galvanised steel



Technical features of Magnelis®



Edge protection with self-healing effect

Steel sheets are typically punched, perforated, and assembled to create complete HVAC systems. The self-healing effect of Magnelis® ensures the protection of cut edges, scratches, and perforations.

When exposed to the environment, Magnelis® forms a very dense, protective film, unlike galvanised coatings where the film is very porous. If red rust is present on uncoated zones, it will gradually be covered by a film of Magnelis®. The speed of this effect depends on local environmental conditions and Magnelis® coating thickness.

It is almost impossible for the environment to penetrate this film. The result is perfect protection of the whole structure, even when the coating is scratched, cut, or perforated.

Magnelis® is available as XCarb® recycled and renewably produced steel with a CO₂ footprint of -70% versus the conventional blast furnace production route.

XCarb®
Recycled and renewably produced

Technical specifications

Coating designation	ZM70	ZM90	ZM120	ZM175	ZM200	ZM250	ZM310	ZM430	ZM620*
Coating mass (total both sides) g/m ²	70	90	120	175	200	250	310	430	620
Coating thickness μm/per side	5	7	10	14	16	20	25	35	50
Aspect	MA and MB aspect*								
Surface treatment	C (E-Passivation® CrVI-free), O (oiled), S (Easyfilm®)*								
Thickness	0.4 to 6.0 mm								
Width	Up to 1680 mm								
Steel grades*	DX51D to DX57D+ZM S220GD to S450GD+ZM (according to EN 10346:2015) S420GD-HyPer® to S700GD-HyPer®+ZM (Eurocode compliant) HX260LAD up to HX500LAD+ZM (according to EN 10346:2015) HX600LAD and HX700LAD+ZM								

* contact us for detailed feasibility

The coating weight selected must match the environment where the HVAC equipment will be installed. ArcelorMittal teams can advise on the appropriate coating weight for each application and location.

Protected by
Magnelis®

Air and ventilation systems

Air handling units, ducts, air filters, humidifiers, ventilation systems, smoke/heat exhaust fans, air diffusion equipment, industrial fans, heat exchangers, drain pans, dampers, silencers

Indoor air quality is a key consideration in modern building design and a key driver for HVAC systems design. Due to its excellent resistance to corrosion, Magnelis® limits the formation of oxide particles which affect air cleanliness. It is also free of volatile organic compounds (VOCs). The excellent scratch resistance of Magnelis® also limits damage caused by maintenance during the system's lifetime. This significantly improves the durability of air and ventilation systems.



Magnelis® ZM120 can be used as an alternative to Z275 galvanised steel. Magnelis® provides at least equivalent corrosion protection plus an improved cut-edge protection.

Within an air handling unit, all metal parts must be corrosion-resistant.



Benefits of using Magnelis®:

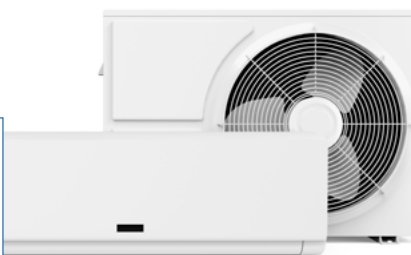
- Improved durability
- Reduced maintenance costs
- Suitable for retrofitting and re-use for a second life
- Better behaviour in roll forming and bending operations thanks to a low friction coefficient
- Resistance to fire: rated A1 (non-combustible)
- Coating is free of VOCs

Cooling and refrigeration systems

Air conditioning equipment, cooling towers, cooling exchangers, water chillers, compressors, transport refrigeration systems

Durability is a key requirement for air conditioners and cooling systems in any environment. Magnelis® is certified for use in C5 marine environments and can resist corrosion in extreme outdoor conditions. The durability of Magnelis® leads to an increase in the service life of HVAC equipment, particularly in marine and tropical climates. Magnelis® can be applied on high strength steels up to S550GD-HyPer®.

In extreme outdoor conditions, choose a thicker Magnelis® coating to protect against corrosion. In C5 environments, the appropriate coating weight for HVAC equipment is ZM310 or higher.



Benefits of using Magnelis®:

- Improved durability
- Less maintenance thanks to self-healing effect and improved scratch resistance due to the hardness of the Magnelis® coating
- Better behaviour in roll forming and bending operations due to lower friction coefficient
- Improved corrosion resistance after painting
- Cost-effective solution compared to aluminium and stainless steel

Heating systems

Boilers (gas, oil, biomass), burners, fume extraction systems, buffers, radiators, heat pumps

Heating systems can be at risk of corrosion due to condensation inside the equipment or if they are installed outside. Magnelis® provides better corrosion protection and a longer life for the internal and external surfaces of heating equipment.

Magnelis® ZM430 can be used as alternative to stainless steel.



Benefits of using Magnelis®:

- Resistance to fire: rated A1 (non-combustible)
- Improved scratch resistance
- Ensures the durability of heating systems and lower maintenance costs

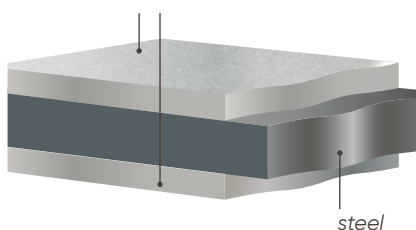
If the temperature of the heating system will exceed 200°C, ArcelorMittal recommends Alusi®.

Alusi® offers:

- Heat resistance up to 800°C
- Heat reflectivity
- Corrosion resistance
- RoHS compliance

industry.arcelormittal.com/alusi

Alusi® coating
(90% Al, 10% Si)



Protected by Magnelis®

Magnelis® for HVAC in a nutshell

Benefits at every stage of an HVAC system's lifecycle.

Manufacturing

- Excellent manufacturability (forming, welding, painting...)
- Cost savings possible when used as a substitute for aluminium or stainless steel
- Also available as XCarb® recycled and renewably produced steel

In use

- Lower maintenance costs
- Reduced oxidation
- Improved scratch resistance, healing effect on cut edges, and cleanliness
- Increased service life

End-of-life

- Suitable for reuse and remanufacturing
- Can be easily removed from waste streams with magnets
- 100% recyclable



More information about Magnelis®

Visit the Magnelis® homepage at industry.arcelormittal.com/magnelis

Documentation available:

- Safety datasheet
- Environmental product declaration (EPD)
- Corrosion certificate
- Fire certificate
- RoHS certificate



Visit also

industry.arcelormittal.com/HVAC

Any questions?

Ask them via our contact form on

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