

# Low-VOC coating solutions





# Low-VOC coating solutions

Increasing pressures on the environment are making it necessary for regulators to implement stricter VOC limits across all industrial segments. Hempel's coatings extend the service life of structures and equipment, and so reduce their overall environmental impact. However, many of our coatings also contain VOCs. As a result, we're constantly working to reduce the amount of VOCs our coatings contain. We also offer a wide range of high-performance waterborne and hybrid coating systems that enable applicators and asset owners to reduce VOC emissions considerably.

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## What is VOC?

Volatile Organic Compounds (VOCs) are organic chemicals that easily evaporate at room temperature. Most VOCs are perfectly safe. However, some can have an adverse effect on human health and the environment. In coatings, VOCs are present in the solvents, which control coating viscosity. During the evaporation process, these VOCs are released into the atmosphere.

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# Understanding VOC limits set by European regulations

There are multiple regulations in place that restrict solvents emissions. These regulations are designed to reduce pollution and protect the health and safety of workers, especially in enclosed workshops, where VOC concentrations are at their highest.

The European Union's VOC Solvents Emissions Directive (1999/13/EC) is the main EU standard for reducing industrial VOC emissions. The directive sets out the maximum VOC content limit for different paint applications. In addition, it stipulates limits for total VOC emissions in all exhaust gasses, including diffuse emissions (non-captured exhaust gases that enter the environment though doors, windows, ventilation shafts, etc.). To ensure adherence to the directive, the authorities monitor emissions on both an industry and company level.

Hempel's low-VOC coating solutions enable you to reduce VOC emissions from paint solvents without investing in additional filtering or burning systems at your facilities. To get a tailored VOC reduction plan, get in touch with our coating experts.

To get a tailored VOC reduction plan,  
**get in touch with our coating experts.**

Total annual VOC emissions (in tonnes)	Obligation to the coating line	Submit annual VOC balance sheet	Maximum solvent content allowed (in % of total paint weight)
<5	×	yes	No limit
5–15	Register	yes	37.5 %
>15	Approve	yes	27.3 %

# Sustainability in the building industry

As sustainability becomes increasingly important, a number of green building standards have been introduced to ensure new buildings and facilities have a lower impact on the environment and don't contain hazardous substances that could harm people's health. These include:

- LEED (Leadership in Energy and Environmental Design), the most widely used green building certification programme worldwide
- BREEAM (Building Research Establishment's Environmental Assessment Method), a sustainability rating system used in more than 70 countries
- Others, such as the DGNB system run by the German Sustainable Building Council and HQE, the standard for green building in France

Hempel's low-VOC solutions can help you meet green building standards and earn credit points.



# Low-VOC coating solutions

Hempel’s low-VOC coating solutions help you comply with regulations and meet green building standards.

To ensure the lowest possible VOC content, use a **waterborne coating system**. Alternatively, you can employ a hybrid system combining solvent-borne and waterborne products. Either way, you benefit from:

- Easy compliance with environmental regulations (less solvent, less VOC emissions)
- Reduced exposure to hazardous chemicals for workers (no solvent)
- Reduced risk of explosion and fire (non-flammable, non-combustible)
- Lower total VOC emissions without large investments (exhaust or burning systems)

**What are waterborne coatings?**

In waterborne coatings, the solvent is replaced by water, which considerably reduces VOC emissions. In general, waterborne coatings provide the same or higher durability than solvent-borne equivalent coatings and can offer faster drying times or shorter recoating intervals.

We recommend choosing waterborne coatings for:

- Primer or intermediate coats for steel constructions
- Topcoats for primed surfaces
- Direct-to-metal solutions in C2-C3 environments

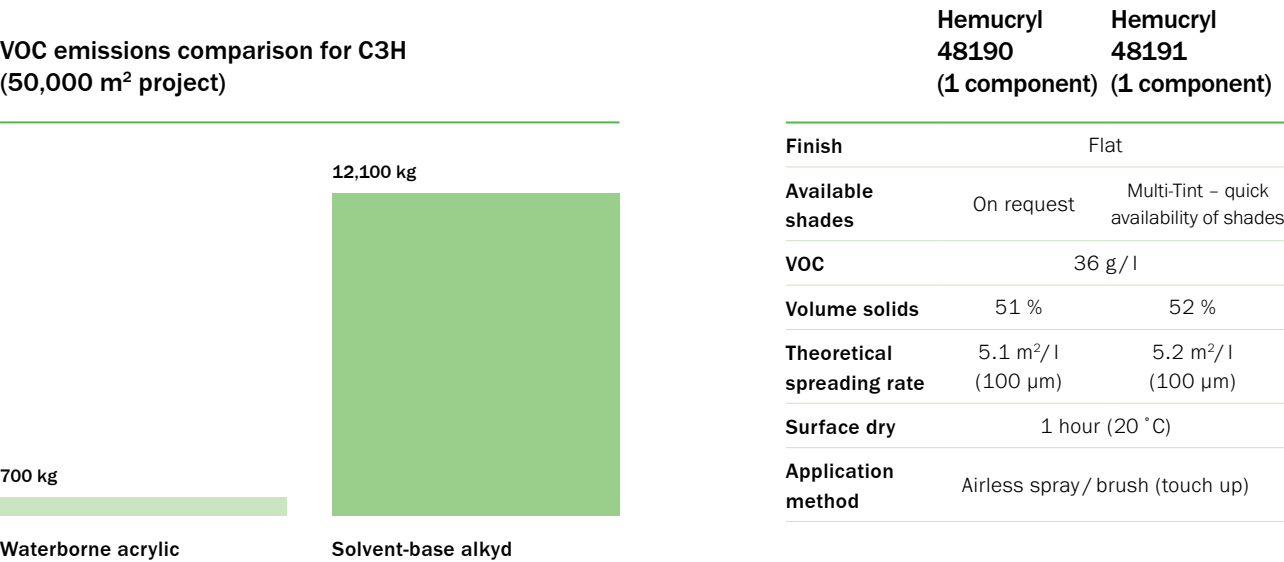
General information about waterborne coatings:

- Transport and storage temperature: 5–30 °C
- Application and drying temperature: Not below 5 °C
- Suitable for indoor application as VOC air pollution is low (high humidity during the drying process can extend the drying time)
- Proper curing/drying needed before exposure to humidity
- Edge retention has to be given special attention
- Easier equipment cleaning (only warm soapy water required)
- Proper surface preparation is essential

# Easy application with one product waterborne solutions

## Hemucryl 48190 and 48191

Extremely fast-drying direct-to-metal and topcoat solutions for newbuild and maintenance projects in mildly corrosive environments (especially steel hall constructions). Cost-efficient acrylic solutions with good UV resistance. Especially suitable for airless spray application. Excellent for industrial line application with fast handling processes.



Acrylics				
Corrosion category/ durability	Low < 7 years	Medium 7–15 years	High 15–25 years	Very high > 25 years
C2			1 × 160 µm	
C3		1 × 160 µm	2 × 100 µm	
C4	1 × 160 µm	2 × 100 µm		
C5	2 × 100 µm			

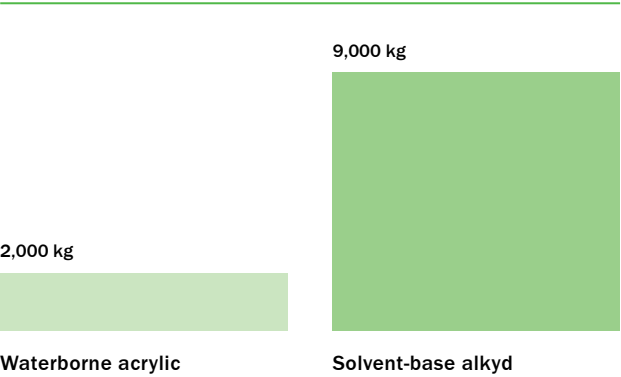
Minimum number of coats and dry film thickness on carbon steel (ISO 12944/2018).

# Easy application with one product waterborne solutions

## Hemucryl 48120

A direct-to-metal solution suitable for both interior and exterior newbuild steel projects (e.g. bridges), as well as one-coat maintenance onsite (e.g. high voltage towers) in highly corrosive environments. Cost-efficient acrylic solution with good UV resistance. Especially suitable for airless spray application. Ideal for field application and repair/maintenance work on existing constructions.

VOC emissions comparison for C3H (50,000 m² project)



Hemucryl 48120 (1 component)

Finish	Semigloss
Available shades	On request
VOC	89 g/l
Volume solids	44 %
Theoretical spreading rate	3 m²/l (150 µm)
Surface dry	1.5 hours (20 °C)
Application method	Airless spray brush / roller

### Acrylics

Corrosion category/ durability	Low < 7 years	Medium 7–15 years	High 15–25 years	Very high > 25 years
C2				2 × 100 µm
C3			2 × 100 µm	3 × 90 µm + 1 × 80 µm
C4		2 × 100 µm	3 × 90 µm + 1 × 80 µm	
C5	2 × 100 µm	3 × 90 µm + 1 × 80 µm		

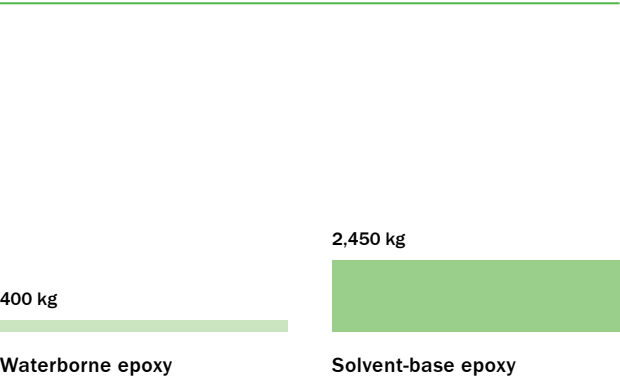
Minimum number of coats and dry film thickness on carbon steel (ISO 12944/2018).

# Easy application with one product waterborne solutions

## Hemudur 18500

A cost-efficient and fast-drying solution for applications where a harder surface, better chemical resistance and extremely competitive application time are required. Suitable when aesthetics are not a priority (e.g. OEM machinery).

VOC emissions comparison for C3H (50,000 m² project)



Hemudur 18500 (2 component)

Finish	Semigloss
Available shades	On request
VOC	22 g/l
Volume solids	50 %
Theoretical spreading rate	6.7 m²/l (75 µm)
Surface dry	2 hours (20 °C)
Application method	Airless spray / brush

### Epoxy

Corrosion category/ durability	Low < 7 years	Medium 7–15 years	High 15–25 years	Very high > 25 years
C2				2 × 90 µm
C3			2 × 90 µm	2 × 120 µm
C4		2 × 90 µm	2 × 120 µm	3 × 100 µm
C5	2 × 90 µm	2 × 120 µm	3 × 100 µm	

Minimum number of coats and dry film thickness on carbon steel (ISO 12944/2018).

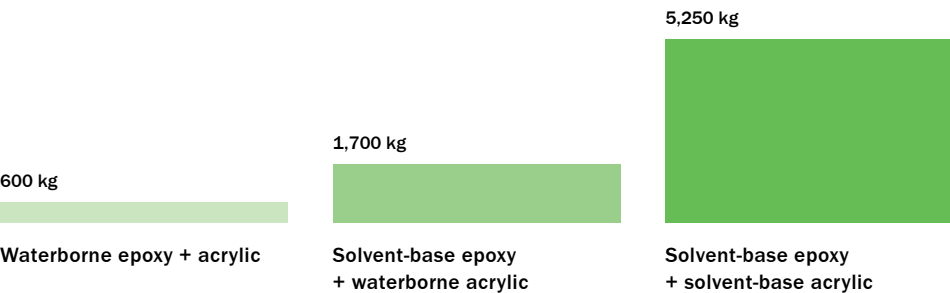
# Waterborne and hybrid system

## Hemudur 18500 Hemucryl Enamel Hi-Build 58030

A cost-efficient and fast-drying very low-VOC solution with excellent UV resistance, low dirt pick-up and high gloss retention. Suitable for both interior and exterior use in moderate to severely corrosive environments.

Hybrid alternative: When fast overcoating intervals and high productivity are key, combine with a very surface tolerant solvent-based high solids epoxy primer (Hempaprim e Multi 500) and still reduce VOC emissions considerably.

VOC emissions comparison for C3H (50 000 m² project)



	Hemudur 18500 (2 component)	Hempaprim e Multi 500 (2 component)	Hemucryl Enamel Hi-Build 58030 (1 component)
Finish	Semigloss	Semigloss	Gloss
Available shades	On request	Multi-Tint – quick availability of shades	Multi-Tint – quick availability of shades
VOC	22 g/l	192 g/l	52 g/l
Volume solids	50 %	85 %	44 %
Theoretical spreading rate	6.7 m²/l (75 µm)	5.7 m²/l (150 µm)	5.9 m²/l (75 µm)
Surface dry	2 hours (20 °C)	3 hours (20 °C)	20 minutes (20 °C)
Application method	Airless spray / brush	Airless spray / brush / roller	Airless spray / brush

Epoxy & acrylic

Hemudur 18500  
Hemucryl Enamel Hi-Build 58030

Corrosion category/ durability	Low < 7 years	Medium 7–15 years	High 15–25 years	Very high > 25 years
C2			1×80 + 1×40 µm	1×120 + 1×60 µm
C3		1×80 + 1×40 µm	1×120 + 1×60 µm	2×100 + 1×40 µm
C4	1×80 + 1×40 µm	1×120 + 1×60 µm	2×100 + 1×40 µm	
C5	1×120 + 1×60 µm			

Minimum number of coats and dry film thickness on carbon steel (ISO 12944/2018).

Hempaprim e Multi 500  
Hemucryl Enamel Hi-Build 58030

Corrosion category/ durability	Low < 7 years	Medium 7–15 years	High 15–25 years	Very high > 25 years
C2				1×120 + 1×60 µm
C3			1×120 + 1×60 µm	2×100 + 1×40 µm
C4		1×120 + 1×60 µm	2×100 + 1×40 µm	2×125 + 1×50 µm
C5	1×120 + 1×60 µm	2×100 + 1×40 µm	2×125 + 1×50 µm	

Minimum number of coats and dry film thickness on carbon steel (ISO 12944/2018).

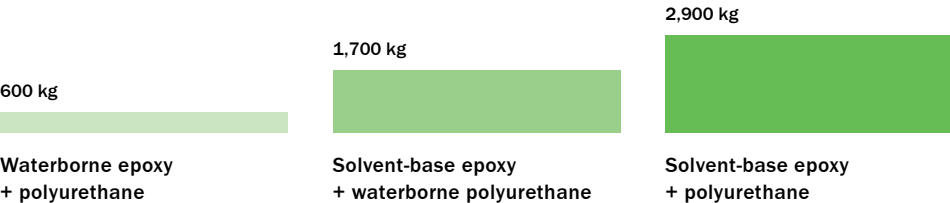
# Waterborne and hybrid system

## Hemudur 18500 Hemuthane Enamel 58510

A fast-drying waterborne solution with excellent UV resistance and colour retention, and good hardness and scratch resistance. Suitable for moderate to severely corrosive environments.

Hybrid alternative: When fast overcoating intervals and high productivity are key, combine with a very surface tolerant solvent-based epoxy primer (Hempaprim e Multi 500) and still reduce VOC emissions considerably.

VOC emissions comparison for C3H (50 000 m² project)



	Hemudur 18500 (2 component)	Hempaprim e Multi 500 (2 component)	Hemuthane Enamel 58510 (2 component)
Finish	Semigloss	Semigloss	Gloss
Available shades	On request	Multi-Tint – quick availability of shades	Multi-Tint – quick availability of shades
VOC	22 g/l	192 g/l	54 g/l
Volume solids	50 %	85 %	48 %
Theoretical spreading rate	6.7 m²/l (75 µm)	5.7 m²/l (150 µm)	12 m²/l (40 µm)
Surface dry	2 hours (20 °C)	3 hours (20 °C)	20 minutes (20 °C)
Application method	Airless spray / brush	Airless spray / brush / roller	Airless spray / Air mix

Epoxy & polyurethane				
Hemudur 18500 Hemuthane Enamel 58510				
Corrosion category / durability	Low < 7 years	Medium 7–15 years	High 15–25 years	Very high > 25 years
C2				1×120 + 1×60 µm
C3			1×120 + 1×60 µm	2×90 + 1×60 µm
C4		1×120 + 1×60 µm	2×90 + 1×60 µm	3×80 + 1×60 µm
C5	1×120 + 1×60 µm	2×90 + 1×60 µm	3×80 + 1×60 µm	

Minimum number of coats and dry film thickness on carbon steel (ISO 12944/2018).

Hempaprim e Multi 500 Hemuthane Enamel 58510				
Corrosion category / durability	Low < 7 years	Medium 7–15 years	High 15–25 years	Very high > 25 years
C2				
C3				1×160 + 1×80 µm
C4			1×160 + 1×80 µm	2×125 + 1×50 µm
C5		1×160 + 1×80 µm	2×125 + 1×50 µm	

Minimum number of coats and dry film thickness on carbon steel (ISO 12944/2018).



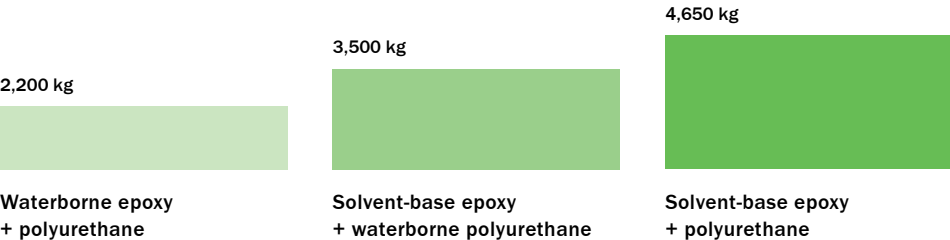
# Hybrid system for highly corrosive environments

## Hempadur Avantguard 750 Hemudur 18500 Hemuthane Enamel 58510

A hybrid solution based on our award-winning Avantguard technology with activated zinc. Excellent UV resistance and colour retention, and good hardness and scratch resistance. Suitable for severely corrosive environments (like NORSOK).

Use Hempadur Avantguard 550 to improve cost efficiency if NORSOK certification performance is not required.

VOC emissions comparison for C3H (50 000 m² project)



	Hempadur Avantguard 750	Hemudur 18500 (2 component)	Hemuthane Enamel 58510 (2 component)
Finish	Flat	Semigloss	Gloss
Available shades	On request	On request	Multi-Tint – quick availability of shades
VOC	330 g/l	22 g/l	54 g/l
Volume solids	65 %	50 %	48 %
Theoretical spreading rate	6.5 m²/l (100 µm)	6.7 m²/l (75 µm)	12 m²/l (40 µm)
Surface dry	¾ hour (20 °C)	2 hours (20 °C)	20 minutes (20 °C)
Application method	Airless spray / air spray / brush / roller	Airless spray / brush	Airless spray / Air mix

Epoxy & polyurethane

Hempadur Avantguard 750  
Hemudur 18500  
Hemuthane Enamel 58510

Corrosion category/ durability	Low < 7 years	Medium 7–15 years	High 15–25 years	Very high > 25 years
C2				
C3				
C4				1×60 + 1×140 + 1×60 µm
C5			1×60 + 1×140 + 1×60 µm	

Minimum number of coats and dry film thickness on carbon steel (ISO 12944/2018).





# Our reference projects

## Heat Exchangers (USA)

At a glance

Customer	JB Radiator Specialtie
Coating system	Waterborne DTM Acrylic (Hemucryl 48120, Hemucryl 48190 or Hemucryl 48191 available in Europe)
Application technique	Airmix spray
Surface	Hot rolled steel, cold rolled steel, galvanized, non-ferrous
Surface preparation	Cleaning

## Energy transmission line mast system (the Netherlands)

At a glance

Customer	Tennet
Coating system	Hemucryl 48120 (2 × 80 µm)
Surface	Galvanized steel
Surface preparation	High-pressure cleaning, hand or powertool cleaning to ST2 (ISO 8501-1)
More details	Successfully tested, final phase of field application



# Hempel's commitment to sustainability

Sustainability is at the heart of what we do. When it comes to products, we think sustainability into all our work, from the way we design and produce them to packaging them.

We have been producing waterborne coatings for more than 20 years. We were the first company to develop a fully waterborne coating system for shipping containers. Our waterborne solutions meet the same or higher standards as our solvent-base coatings in terms of performance, cost efficiency and return on investment. In addition, each year we successfully reformulate a large number of our solvent-base coatings to reduce VOC content.

We have committed to helping our customers reduce their emissions by at least 30 million tonnes of CO<sub>2</sub> by 2025.





As a world-leading supplier of trusted coating solutions, Hempel is a global company with strong values, working with customers in the protective, marine, decorative, container and yacht industries. Hempel factories, R&D centres and stock points are established in every region.

Across the globe, Hempel's coatings protect surfaces, structures and equipment. They extend asset lifetimes, reduce maintenance costs and make homes and workplaces safer and more colourful. Hempel was founded in Copenhagen, Denmark in 1915. It is proudly owned by the Hempel Foundation, which ensures a solid economic base for the Hempel Group and supports cultural, social, humanitarian and scientific purposes around the world.

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