Protective & Marine Coatings
PRODUCT DATA SHEET

EG SYSTEM PLUS

ECONOMICAL HEAVY DUTY CORROSION PROTECTION COATING SYSTEM

Revised 07/2023 Issue 1

PRODUCT DESCRIPTION

EG System Plus is a combination of 2-pack epoxy primer and intermediate coats and polyurethane topcoats with high weather resistance.
Zinc Clad® R Plus, Macropoxy® EG Phosphate N and Macropoxy® EG-1 Plus have low solvent content according to Protective Coatings Directive of German Paint Industry Association (VdL-RL 04).

- Very good corrosion resistance
- Low consumption per square meter
- Fast curing, with short overcoating time
- Direct to steel, hot-dip galvanized steel, zinc spraying, stainless steel and aluminium
- Good resistance to abrasion, shock and impact

Zinc Clad® R Plus
A 2-pack high solids, fast curing epoxy zinc rich primer.

Macropoxy® EG Phosphate N
A 2-pack high solids, fast curing epoxy primer containing zinc-phosphate as an active anti-corrosion pigment.
In a film thickness of approx. 20 µm it can also be used as a weldable shop primer.

Macropoxy® EG-1 Plus
A 2-pack high solids, fast curing epoxy intermediate coat containing micaceous iron oxide.
In a layer thickness of approx. 20 µm it can also be used as sealer for thermal-sprayed zinc coatings.

Acrolon® EG-4
A 2-pack solvent based acrylic-polyurethane topcoat in DB colour shades, containing micaceous iron oxide.

Acrolon® EG-5
A 2-pack solvent based acrylic-polyurethane topcoat in RAL colour shades.

RECOMMENDED USE

Can be used as a robust corrosion protection coating system for steel, stainless steel, aluminium and galvanized surfaces providing a durable and decorative effect.
Mainly for bridges, pipelines, containers, industrial and harbour installations, sewage treatment plants and large machinery; submerged or non-submerged in industrial or marine environments.
Particularly suited for in shop application as heavy duty travel coat system.

PRODUCT TECHNICAL DATA

Volume Solids:

Zinc Clad® R Plus: 71 ± 2%
Macropoxy® EG Phosphate N: 62 ± 2%
Macropoxy® EG-1 Plus (MIO): 69 ± 2%
Macropoxy® EG-1 Plus (white): 70 ± 2%
Acrolon® EG-4: 55 ± 2%
Acrolon® EG-5: 61 ± 2% (ISO 3233-3)

Weight Solids:

Zinc Clad® R Plus: 89 ± 2%
Macropoxy® EG Phosphate N: 80 ± 2%
Macropoxy® EG-1 Plus (MIO): 81 ± 2%
Macropoxy® EG-1 Plus (white): 81 ± 2%
Acrolon® EG-4: 70 ± 2%
Acrolon® EG-5: 74 ± 2%

VOC:

Zinc Clad® R Plus:
253 g/l determined practically in accordance with Protective Coatings Directive of German Paint Industry Association (VdL-RL 04).
289 g/l calculated from formulation to satisfy EC Solvent Emissions Directive.
126 g/kg calculated from formulation to satisfy EC Solvent Emissions Directive (UK).

Macropoxy® EG Phosphate N:
320 g/l determined practically in accordance with Protective Coatings Directive of German Paint Industry Association (VdL-RL 04).
335 g/l calculated from formulation to satisfy EC Solvent Emissions Directive.
209 g/kg calculated from formulation to satisfy EC Solvent Emissions Directive (UK).

Macropoxy® EG-1 Plus (MIO):
285 g/l determined practically in accordance with Protective Coatings Directive of German Paint Industry Association (VdL-RL 04).
326 g/l calculated from formulation to satisfy EC Solvent Emissions Directive.
217 g/kg calculated from formulation to satisfy EC Solvent Emissions Directive (UK).

Acrolon® EG-4:
420 g/l determined practically in accordance with Protective Coatings Directive of German Paint Industry Association (VdL-RL 04).
437 g/l calculated from formulation to satisfy EC Solvent Emissions Directive.
312 g/kg calculated from formulation to satisfy EC Solvent Emissions Directive (UK).

Acrolon® EG-5:
338 g/l determined practically in accordance with Protective Coatings Directive of German Paint Industry Association (VdL-RL 04).
359 g/l calculated from formulation to satisfy EC Solvent Emissions Directive.
276 g/kg calculated from formulation to satisfy EC Solvent Emissions Directive (UK).

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PRODUCT TECHNICAL DATA (cont.)

Colours:

DB (MIO), RAL, NCS colour shades, further colour shades upon request.
Slight colour deviations are possible due to raw material characteristics.

Zinc Clad® R Plus:
- Zinc grey, material no. 687.03
- Tinted red, material no. 687.04

Macropoxy® EG Phosphate N:
- Sand-yellow, approx. RAL 1002,material no. 687.02
- Red-brown, approx. RAL 8012,mat.-no 687.06
- Zinc grey, approx. RAL 7005

Macropoxy® EG-1 Plus:
- Grey metallic (MIO) approx. DB 702, material no. 687.12
- Grey metallic (MIO) approx. DB 703, material no. 687.13
- Green metallic (MIO) approx. DB 601, material no. 687.14
- White (MIO-free)

Acrolon® EG-4:
- MIO colour shades, material no. 687.30 - 687.74

Acrolon® EG-5:
- RAL colour shades, material no. 687.75 - 687.99

Flash Point:

Zinc Clad® R Plus: Base: 26°C, Hardener: 31°C
Macropoxy® EG Phosphate N: Base: 23°C, Hardener: 48°C
Macropoxy® EG-1 Plus: Base: 23°C, Hardener: 48°C
Acrolon® EG-4: Base: 25°C, Hardener: 38°C
Acrolon® EG-5: Base: 23°C, Hardener: 38°C

Cleaner/Thinner:

Cleaner 26 (for cleaning)
Thinner EG for thinning with max. 5% to adapt the viscosity of Macropoxy® EG Phosphate N, Macropoxy® EG-1 Plus, Acrolon® EG-4 or Acrolon® EG-5.
Thinner K for thinning with max. 3% to adapt the viscosity of Zinc Clad® R Plus.
If used Macropoxy® EG-1 Plus as a sealer, dilute with 20% Thinner EG and use the heavily diluted material immediately and under continuous stirring.
Thinning will affect VOC compliance, sag tolerance and dry film thicknesses.

Spraying equipment must be rinsed with Thinner EG before using PUR topcoats.

Pack Size:

Two component materials supplied in separate containers to be mixed prior to use:
Zinc Clad® R Plus: 30 kg (13 litre), 22 kg (9.5 litre), 15 kg (6.5 litre) and 6 kg (2.6 litre) units when mixed
Macropoxy® EG Phosphate N: 30 kg (18.7 litre), 15 kg (9.3 litre) and 3 kg (1.8 litre) units when mixed
Macropoxy® EG-1 Plus (MIO): 30 kg (20 litre), 15 kg (10 litre) and 3 kg (2 litre) units when mixed
Acrolon® EG-4: 30 kg (21.4 litre) and 12.5 kg (8.9 litre) units when mixed
Acrolon® EG-5: 30 kg (23 litre) and 10 kg (7.7 litre) units when mixed

Volume will vary with colours and density.

Mixing Ratio:

By weight and by volume.

Zinc Clad® R Plus: 94 parts base to 6 parts hardener by weight.
6.1 parts base to 1 part hardener by volume.
Macropoxy® EG Phosphate N: 90 parts base to 10 parts hardener by weight.
4.6 parts base to 1 part hardener by volume.
Macropoxy® EG-1 Plus: 90 parts base to 10 parts hardener by weight.
5.7 parts base to 1 part hardener by volume.
Acrolon® EG-4: 92 parts base to 8 parts hardener by weight.
8.9 parts base to 1 part hardener by volume.*
Acrolon® EG-5: 90 parts base to 10 parts hardener by weight.
7.1 parts base to 1 part hardener by volume.*

*Note:
The mixing ratio by volume varies depending on the colour shade. If in doubt, please contact Sherwin-Williams.
We recommend only mixing complete units.

Density:

Zinc Clad® R Plus: 2.3 kg/l
Macropoxy® EG Phosphate N: 1.6 kg/l
Macropoxy® EG-1 Plus (MIO): 1.5 kg/l
Macropoxy® EG-1 Plus (white): 1.4 kg/l
Acrolon® EG-4: 1.4 kg/l
Acrolon® EG-5: 1.3 kg/l
(may vary with colours)

Shelf Life:

Zinc Clad® R Plus: 1 year
Macropoxy® EG Phosphate N: 3 years
Macropoxy® EG-1 Plus: 2 years
Acrolon® EG-4: 2 years
Acrolon® EG-5: 2 years
from date of manufacture, stored in originally sealed containers in a cool and dry environment.

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PRODUCT TECHNICAL DATA (cont.)

Recommended Application Methods:
Airless Spray, Conventional Spray, Brush, Roller

Typical Thickness:

Recommended Spreading Rate Per Coat

Zinc Clad® R Plus		
Dry	60 µm	80 µm
Wet	85 µm	113 µm
Theoretical Consumption*	0.194 kg/m² | 0.085 l/m²	0.259 kg/m² | 0.113 l/m²
Theoretical Coverage*	5.14 m²/kg | 11.83 m²/l	3.86 m²/kg | 8.88 m²/l
Macropoxy® EG Phosphate N		
Dry	20 µm	80 µm
Wet	32 µm	129 µm
Theoretical Consumption*	0.052 kg/m² | 0.032 l/m²	0.206 kg/m² | 0.129 l/m²
Theoretical Coverage*	19.38 m²/kg | 31.00 m²/l	4.84 m²/kg | 7.75 m²/l
Macropoxy® EG-1 Plus (MIO)		
Dry	80 µm	160 µm
Wet	116 µm	232 µm
Theoretical Consumption*	0.174 kg/m² | 0.116 l/m²	0.348 kg/m² | 0.232 l/m²
Theoretical Coverage*	5.75 m²/kg | 8.63 m²/l	2.88 m²/kg | 4.31 m²/l
Macropoxy® EG-1 Plus (MIO-free)		
Dry	80 µm	160 µm
Wet	114 µm	229 µm
Theoretical Consumption*	0.160 kg/m² | 0.114 l/m²	0.320 kg/m² | 0.229 l/m²
Theoretical Coverage*	6.25 m²/kg | 8.75 m²/l	3.13 m²/kg | 4.38 m²/l
Acrolon® EG-4		
Dry	80 µm	
Wet	145 µm	
Theoretical Consumption*	0.204 kg/m² | 0.145 l/m²	
Theoretical Coverage*	4.19 m²/kg | 6.88 m²/l	
Acrolon® EG-5		
Dry	60 µm	80 µm
Wet	98 µm	131 µm
Theoretical Consumption*	0.128 kg/m² | 0.098 l/m²	0.170 kg/m² | 0.131 l/m²
Theoretical Coverage*	7.82 m²/kg | 10.17 m²/l	5.87 m²/kg | 7.63 m²/l

* This figure makes no allowance for surface profile, uneven application, overspray or losses in containers and equipment.

Film thickness will vary depending on actual use and specification.

Zinc Clad® R Plus: Apart from small areas the dry film thickness should not exceed 150 µm per coat.
Macropoxy® EG Phosphate N: The dry film thickness should not exceed 240 µm per coat.
Macropoxy® EG-1 Plus (MIO): The dry film thickness should not exceed 320 µm per coat.
Macropoxy® EG-1 Plus (MIO-free): The dry film thickness should not exceed 400 µm per coat.
Acrolon® EG-4 and Acrolon® EG-5: The dry film thickness should not exceed 240 µm per coat.

In case of high air humidity CO_2 bubbles may occur.

Pot Life:

Zinc Clad® R Plus

+ 10°C	+ 20°C	+ 30°C
12 hours	8 hours	5 hours

Macropoxy® EG Phosphate N

+ 10°C	+ 20°C	+ 30°C
12 hours	8 hours	5 hours

Macropoxy® EG-1 Plus

+ 10°C	+ 20°C	+ 30°C
12 hours	8 hours	5 hours

Acrolon® EG-4 and Acrolon® EG-5

+ 10°C	+ 20°C	+ 30°C
7 hours	6 hours	4 hours

Acrolon® EG-4 and Acrolon® EG-5 accelerated

+ 10°C	+ 20°C	+ 30°C
5 hours	3 hours	2 hours

Pot life is dependent on temperature and volume.

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AVERAGE DRYING TIMES

Zinc Clad® R Plus for 80 µm Dry Film Thickness:

	+ 5°C	+ 10°C	+ 20°C	+ 30°C
Dry to handle (Drying Stage 6*)	3 hours	2.5 hours	2 hours	0.75 hours
To Recoat	3 hours	2.5 hours	2 hours	0.75 hours

Macropoxy® EG Phosphate N for 80 µm Dry Film Thickness:

	+ 5°C	+ 10°C	+ 20°C	+ 30°C
Dry to handle (Drying Stage 6*)	10 hours	7 hours	3.5 hours	1 hour
To Recoat	10 hours	7 hours	3.5 hours	1 hour

Macropoxy® EG-1 Plus for 80 µm Dry Film Thickness:

	+ 5°C	+ 10°C	+ 20°C	+ 30°C
Dry to handle (Drying Stage 6*)	12 hours	8 hours	4 hours	2 hours
To Recoat	12 hours	8 hours	4 hours	2 hours

Acrolon® EG-4 for 80 µm Dry Film Thickness:

	+ 5°C	+ 10°C	+ 20°C	+ 40°C
Dry to handle (Drying Stage 6*)	19 hours	16 hours	12 hours	1.5 hours
To Recoat	19 hours	16 hours	12 hours	1.5 hours

Acrolon® EG-5 for 80 µm Dry Film Thickness:

	+ 5°C	+ 10°C	+ 20°C	+ 40°C
Dry to handle (Drying Stage 6*)	21 hours	18 hours	14 hours	3 hours
To Recoat	21 hours	18 hours	14 hours	3 hours

Acrolon® EG-4 accelerated for 80 µm Dry Film Thickness and + 1% w/w PUR Accelerator:

	0°C	+ 5°C	+ 10°C	+ 20°C
Dry to handle (Drying Stage 6*)	48 hours	16 hours	12 hours	4 hours
To Recoat	48 hours	16 hours	12 hours	4 hours

Acrolon® EG-5 accelerated for 80 µm Dry Film Thickness and + 1% w/w PUR Accelerator:

	0°C	+ 5°C	+ 10°C	+ 20°C
Dry to handle (Drying Stage 6*)	52 hours	18 hours	13 hours	5 hours
To Recoat	52 hours	18 hours	13 hours	5 hours

*ISO 9117

Maximum recoat time is 1 year for Zinc Clad® R Plus and Macropoxy® EG Phosphate N, 4 years for Macropoxy® EG-1 Plus and unlimited for Acrolon® EG-4 and Acrolon® EG-5. Prior to further applications all contamination must be removed. In the case of extended recoating times consult Sherwin Williams customer service.

Final cure: 1-2 weeks, depending on film thickness and temperature.

These figures are given as a guide only. Factors such as air movement, film thickness and humidity must also be considered.

APPROVALS & ENDORSEMENTS

- EG System Plus is approved according to German standard 'TL KOR Stahlbauten, Blatt 87'.
- Certificates for C4 high, C5 high and C5 very high according to ISO 12944 are available.
- Certificate for weldable shop primer according to DIN EN ISO 17652-2 is available.

SURFACE PREPARATION

Ensure surfaces to be coated are clean, dry and free from all surface contamination such as oil, grease, dirt and corrosion products to achieve satisfactory adhesion.

For contaminated and weathered surfaces e.g. primed areas we recommend to clean with Cleaner Wash.

Steel surfaces shall be blast-cleaned to Sa 2½ according to ISO 8501-1 (ISO 12944-4)

Hot-dip galvanized surfaces, stainless steel and aluminium shall be prepared by degreasing or, in case of permanent immersion or condensation, sweep blasting according to ISO 12944-4 with a non-ferrous blasting abrasive.

Thermal-sprayed metallic zinc coating shall be thoroughly cleaned of spray dust and loose spray particles. Sealing must be started immediately after the spraying process and before visible oxidation of the surface occurs and to avoid contamination by dirt or moisture.

MIXING

Stir component A very thoroughly using an mechanical paint mixer (start slowly, then increase up to approx. 300 rpm). Add component B carefully and mix both components very thoroughly (including sides and bottom of the container). Mix for at least 3 minutes until a homogeneous mixture is achieved. We recommend to fill the mixed material into a clean container and mix again shortly as described above to avoid incorrect mixing. During mixing and handling of the materials always wear protective goggles, suitable gloves and other protective clothing.

APPLICATION CONDITIONS

Substrate temperature shall be above + 5°C (0°C for Acrolon® EG-4 and Acrolon® EG-5 by adding Acrolon PUR Accelerator) and at least 3°C above the dew point.
The surface must be dry and free from ice.
Material temperature shall be above + 5°C.
Relative air humidity shall be below 85%.

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APPLICATION EQUIPMENT

The following is a guide. Changes in pressures and tip sizes may be needed for satisfactory application characteristics. Always purge spray equipment before use with listed cleaner. Any reduction must be compliant with existing VOC regulations and compatible with the existing environmental and application conditions.

Airless Spray
Unit: Efficient airless equipment
Tip Size: 0.38 – 0.53 mm (0.015 – 0.021 inch)
Fan Angle: 40° - 80°
Operating Pressure: min. 180 bar (2600 psi)

The airless spray details given above are intended as a guide only.
Details such as fluid hose length and diameter, paint temperature and job shape and size all have an effect on the spray tip and operating pressure chosen. However, the operating pressure should be the lowest possible consistent satisfactory atomisation.
As conditions will vary from job to job, it is the applicators responsibility to ensure that the equipment in use has been set up to give the best results.
If in doubt consult Sherwin-Williams customer service.

Conventional Spray
Atomising Pressure: 3 - 5 bar (43 - 73 psi)
Tip Size: 1.5 – 2.5 mm (0.06 – 0.10 inch)

Brush and Roller
The coating system is suitable for brush and roller application. Application of more than one coat may be necessary to give equivalent dry film thickness to a single spray applied coat.
Note: Zinc Clad® R Plus is not suitable for roller application.

RECOMMENDED SYSTEMS

Steel:
2-coat system:
1 x Macropoxy® EG Phosphate N or 1 x Macropoxy® EG-1 Plus
1 x Acrolon® EG-4 or 1 x Acrolon® EG-5

3 or 4-coat system:
1 x Zinc Clad® R Plus or 1 x Macropoxy® EG Phosphate N
1-2 x Macropoxy® EG-1 Plus
1 x Acrolon® EG-4 or 1 x Acrolon® EG-5
In case of permanent submersion or exposure to condensation prime with Zinc Clad® R Plus only.

Hot-dip galvanized steel, stainless steel and aluminium
1 x Macropoxy® EG-1 Plus
1 x Acrolon® EG-4 or 1 x Acrolon® EG-5

Thermal-sprayed metallic zinc coatings
1 x Macropoxy® EG-1 Plus as sealer
1 x Macropoxy® EG-1 Plus
1 x Acrolon® EG-4 or 1 x Acrolon® EG-5

Certain shades of Acrolon® EG-5 for example, yellows and reds may require additional coats to achieve full opacity.

For use as a sealer on thermal-sprayed metallic zinc coatings, thin Macropoxy® EG-1 Plus with 20% Thinner EG. Apply the thinned material immediately and under constant stirring as a thin mist-coat to fill substrate porosity without applying a full coat at this stage. After a waiting time of approx. 15 minutes, spray 'wet on wet' the remaining thickness of Macropoxy® EG-1 Plus.

ADDITIONAL NOTES

Drying times, curing times and pot life should be considered as a guide only.

Chemical resistance:
Resistant to weather, water, seawater, smoke, de-icing salts, acid and alkali vapours, oils, grease and short term exposure to fuels and solvents.

Temperature resistance:
Dependent on the primer used
Zinc Clad® R Plus
Dry heat up to + 150°C, short term up to + 180°C.
Increased humid ambient temperature up to approx. + 50°C.
Macropoxy® EG Phosphate N or Macropoxy® EG-1 Plus
Dry heat up to + 150°C, short term up to + 200°C.
Increased humid ambient temperature up to approx. + 50°C.
In case of higher temperatures consult Sherwin-Williams customer service.
An exposure to high temperatures can lead to colour changes.

Numerical values quoted for physical data may vary slightly from batch to batch.

HEALTH & SAFETY

Consult Product Health and Safety Data Sheet for information on safe storage, handling and application of this product.

WARRANTY

Whilst all statements made about our products (whether in this data sheet or otherwise) are correct and accurate to the best of our knowledge, we have no control over the quality or the condition of the substrate, the application conditions or the many other factors affecting your use and application of our product.

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