



DELTA[®]MKS[®] System overview

For perfect results

The right corrosion protection system for all applications

DELTA[®]-TONE
DELTACOLL[®]

DELTA[®]-SEAL

DELTA-PROTEKT[®]

You want to be flexible in your response to every requirements. Innovation is important to you because this is the guarantee for success in the future. The coatings on your components must be chromium(VI)-free – without exception. These are the perfect systems for you:

DELTA^{MKS}: Micro-layer corrosion protection systems

The chromium(VI)-free coatings of the future



System	Version	B Steel	A	S High-strength steel ≥ 1000 N/mm ²	E	M Aluminium	E	T Stainless steel	A	L
Zinc-lamella system	DELTA [®] -TONE 9000	++			++			O*		-
	DELTA [®] -TONE 9000 et DELTA [®] -SEAL	++			++			++*		-
	DELTA [®] -TONE 9000 et DELTA-PROTEKT [®] VH 30x	++			++			+*		-
	DELTA-PROTEKT [®] KL 100	++			++			O*		-
	DELTA-PROTEKT [®] KL 100 & DELTA [®] -SEAL	++			++			++*		-
	DELTA-PROTEKT [®] KL 100 & VH 30x	++			++			+*		-
KTL	DELTA [®] -TONE 9000 & DELTA-PROTEKT [®] ML 500 & EK 80x	++			++			++		-
	DELTA-PROTEKT [®] KL 100 & ML 500 & EK 80x	++			++			++		-
	Zn/ZnFe/ZnNi & DELTA-PROTEKT [®] EK 80x	++			-			-		-
Sealing system	Zn/ZnFe/ZnNi & DELTACOLL [®]	++			-			-		-
Zn/ZnFe/ZnNi	Zn/ZnFe/ZnNi & DELTA-PROTEKT [®] VH 35x	++			-			-		-
	Zn/ZnFe/ZnNi & DELTA [®] -SEAL	++			-			-		-
Coating without cathodic protection	DELTA [®] -SEAL	O			O			++		++
	DELTA-PROTEKT [®] VH 35x	-			-			++		++
	DELTA-PROTEKT [®] EK 80x	O			O			++		++
	DELTACOLL [®]	-			-			++		++

Legend: +++ = exceptionally well-suited ++ = very well-suited + = well-suited O = conditionally suited - = unsuited

● ● ● **Delta MKS system overview – the right protection system for all applications**

With DELTA MKS®, you can be safe. This system provides perfectly tailor-made corrosion protection for every kind of application.

Our **Zinc-lamella system** provides outstanding protection for high-strength materials. For example, when coated with DELTA-PROTEKT® KL 100, tow chains made from high-strength steel can achieve long corrosion resistance times under dynamic stress. Where bolts with different requirements for the coefficient of friction have to be protected and coloured at the same time, the basecoat DELTA-PROTEKT® KL 100 used in combination with the topcoat DELTA®-SEAL represents the optimum solution.

If your components are small and complex, then the **KTL-System** is the ideal answer – e.g. small wood screws with cutting threads where it is important to keep open the cross-head recess or key cylinders where the pins have to be able to move freely.

On the other hand, if you are looking for the optimum protection for electroplated surfaces, then use our **Sealing system**. For example, you can use the topcoat DELTACOLL® to protect brake calliper mounting brackets which are subjected to high stresses and exposed to brake dust and spray. For steel lock nuts to prevent loosening, the ideal protection is provided by a topcoat from the DELTA-PROTEKT® VH 350 series.

Any of these systems provide you with opportunities achieve a perfect corrosion protection for your range of applications.

Being flexible, we can meet all your requirements.



Corrosion protection	Cathodic protection	Temperature	Ductility	Resistance in Kesternich test	Resistance to chemicals	Colour
++	Yes	+	+	-	O	Silver
++	Yes	+	+	+	++	Various
++	Yes	+	O	-	+	Silver
++	Yes	++	O	-	O	Silver
+++	Yes	++	O	+	++	Various
+++	Yes	+++	O	-	+	Silver
++	Yes	+	+	+	+	Black, silver-grey
++	Yes	++	+	+	++	Black, silver-grey
+/+ / ++	Yes/yes/conditional	++	O	+	++	Black, silver-grey
+ / + / ++	Yes/yes/no	+	O	- / O / +	+	Black, silver
+ / + / ++	Yes/yes/no	+	O	- / O / +	+	Silver
+ / + / ++	Yes/yes/no	+	O	++	++	Various
+ (O = steel)	No	+	+	O	++	Various
+ (- = steel)	No	++	O	O	+	Silver
+ (O = steel)	No	+	+	O	++	Black, silver-grey
+ (- = steel)	No	+	O	O	+	Black, silver

*Delay of contact corrosion.

The Zinc-lamella System

For your Safety

DELTA-PROTEKT® KL 100 is an inorganic basecoat which is suitable for:

- Steel
- High-strength steel $\geq 1000 \text{ N/mm}^2$
- Cast steel

Product description:

- Non-electrolytically applied zinc-lamella coating
- Dry film thickness: 5 - 15 μm
- Silvery appearance

Properties:

- Cathodic protection basecoat for a wide range of parts, such as bolts $\geq \text{M6}$

Excellent corrosion protection:

1. Cathodic protection by sacrificial corrosion of zinc
 2. Barrier effect due to overlapping of zinc and aluminium flakes
- Resistant to organic solvents
 - Temperature stable up to 180 °C (356 °F)
 - No hydrogen embrittlement caused by the coating process
 - Increased resistance to bi-metallic corrosion when used on aluminium

Application:

- Dip-Spin
- Dip-Drain
- Spraying
- Spin coating

Curing properties at object temperatures of:

- 200 - 240 °C for 20 min. (392 - 464 °F for 20 min.)



zinc lamella

DELTA®-TONE 9000 is a largely inorganic basecoat which is suitable for:

- Steel
- High-strength steel $\geq 1000 \text{ N/mm}^2$
- Cast steel

Product description:

- Non-electrolytically applied zinc-lamella coating
- Dry film thickness: 5 - 15 μm
- Silvery appearance

Properties:

- Cathodic protection basecoat for a wide range of parts; such as bolts $\geq \text{M6}$

Excellent corrosion protection:

1. Cathodic protection by sacrificial corrosion of zinc
 2. Barrier effect due to overlapping of zinc and aluminium flakes
- Resistant to organic solvents
 - Temperature stable up to 150 °C (302 °F)
 - No hydrogen embrittlement caused by the coating process
 - Increased resistance to bi-metallic corrosion when used on aluminium

Application:

- Dip-Spin
- Dip-Drain
- Spraying
- Spin coating

Curing properties at object temperatures of:

- 180 - 220 °C for 15 min. (356 - 428 °F for 15 min.)

DELTA

DELTA®-SEAL/DELTA®-SEAL GZ is suitable as a topcoat for:

- Zinc-lamella coatings such as DELTA-PROTEKT® KL 100 or DELTA®-TONE 9000
- Electroplating
- Mechanical zinc
- Steel, after suitable pre-treatment
- Aluminium and aluminium alloys, with suitable passivation
- Stainless steel
- Zinc die-castings

Product description:

- Organic, highly-crosslinked epoxy system
- Dry film thickness: 5 - 10 μm
- 8 standard colours (silver, black etc.)
- GZ variants with lubricant additive

Properties:

- Topcoat for a wide range of parts
- Barrier effect in salt spray test by reducing white and red rust
- Increased resistance in Kesternich and comparable tests
- Reduced bi-metallic corrosion
- Protects against chemicals such as acids, alkalines, cleaners, oils and petrol etc.
- Satisfies various coefficients of friction requirements

Application:

- Dip-Spin
- Dip-Drain
- Spraying
- Spin coating

Curing parameters at object temperatures of:

- 180 - 220 °C for 15 min. (356 - 428 °F for 15 min.)

DELTA-PROTEKT® VH 300/301 GZ/302 GZ

DELTA-PROTEKT® VH 300 series topcoats are tailor-made for use on zinc-lamella basecoats DELTA-PROTEKT® KL 100 and DELTA®-TONE 9000.

Product description:

- Inorganic, silicate-based binder system
- Water-based
- Dry film thickness: 1 - 3 μm
- Transparent
- GZ variants with lubricant additive

Properties:

- Topcoat for a wide range of parts
- Barrier effect in salt spray test by reducing white and red rust
- Protects against chemicals such as acids, alkalines, cleaners, oils and petrol etc.
- Satisfies various coefficients of friction requirements

Application:

- Dip-Spin
- Dip-Drain
- Spraying
- Spin coating

Curing parameters at object temperatures of:

- 180 - 220 °C for 15 min. (356 - 428 °F for 15 min.)

The KTL System

For Precision

- ● ● The EC-Automat 2000+ is a patented*, electrophoretic coating plant which maintains precise coating uniformity. This takes place in a continuous process.

Technical data

Size

Length: 2,500 mm

Width: 5,400 mm

Height: 2,900 mm

Rectifier

350 V, 50 A

Barrel revolution speed

adjustable

Ultrafiltration

Flow rate: Approx. 400 l/h

(2 UF modules at 200 l/h)

Throughput

Approx. 500 - 600 kg/h depending on the type and shape of the workpieces

Capacity per batch

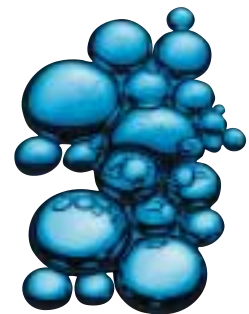
Approx. 4 - 8 kg

DELTA-PROTEKT® EK 800 series products are cathodically applied topcoats suitable for:

- Electroplating
- Mechanical zinc
- Zinc and iron phosphated steel
- Aluminium and aluminium alloys
- Stainless steel
- Zinc die-castings
- Zinc-lamella coatings such as DELTA-PROTEKT® KL 100 or DELTA-TONE 9000 (with a bonding agent)

Product description

- Cathodically immersion paint
- Developed for the EC-Automat 2000+
- Organic, cross-linked epoxy system
- Dry film thickness: 8 - 10 µm
- Available in black and silver-grey (other colours available on request)
- German Patent 196 23 962 of the Ewald Dörken AG



Properties:

- Water-based topcoat for small parts
- Remarkably uniform film formation
- Increases resistance in the salt spray test by reducing white and red rust
- Increases resistance in the Kesternich and other similar tests (such as ISO 6988)
- Delays bi-metallic corrosion
- Protects against chemicals such as acids, alkalines, cleaners, oils and petrol etc.

Application:

- Cathodically coating in EC-Automats 2000+

Curing parameters at object temperature of:

- 180 °C for 30 min. (356 °F for 30 min.)

Two basecoats possible:

- Zinc flake coating: E.g. DELTA-PROTEKT® KL 100 & DELTA-PROTEKT® ML 500 (refer to "Zinc-lamella System" as well)
- Electroplating: Electroplated coating consisting of zinc, zinc-iron or zinc-nickel as the basecoat plus a passivation or phosphate coating

DELTA-PROTEKT® ML 500 series

DELTA-PROTEKT® ML 500 series bonding agents provide the optimum bond between a zinc-flake coating and electrophoretic immersion paint.

The Sealing System

For increased Functionality

●●● **DELTA®-SEAL/DELTA®-SEAL GZ**
is suitable as a topcoat for:

- Zinc-lamella coatings such as DELTA-PROTEKT® KL 100 or DELTA®-TONE 9000
- Electroplating
- Mechanical zinc
- Suitably pretreated steel
- Suitably pretreated aluminium and aluminium alloys
- Stainless steel
- Zinc die-cast

Product description:

- Organic, highly-crosslinked epoxy system
- Dry film thickness: 5 - 10 µm
- 8 standard colours (including silver, black etc.)
- GZ variants with lubricant additive

Properties:

- Topcoat for a wide range of parts
- Increases resistance to white and red rust formation in the salt spray test
- Increased resistance in Kesternich and comparable tests
- Delays bi-metallic corrosion
- Protects against chemicals such as acids, alkalines, cleaners, oils and petrol etc.
- Satisfies various requirements for coefficients of friction

Application:

- Dip-Spin
- Dip-Drain
- Spraying
- Spin coating

Curing parameters at object temperatures of:

- 180 - 220 °C for 15 min. (356 - 428 °F for 15 min.)

DELTACOLL®/DELTACOLL® GZ
is suitable for:

- Zinc and zinc-alloy electroplates after suitable pretreatment
- Stainless steel
- Aluminium and aluminium alloys after suitable pretreatment
- Magnesium after suitable pretreatment

Product description:

- Inorganic, silicate and titanium-based system
- Dry film thickness 2 - 4 µm
- Available in two colours (black and transparent)
- GZ variants with lubricant additive

Properties:

- Topcoat for a wide range of parts
- Increases resistance to white and red rust formation in the salt spray test
- Protects against chemicals such as acids, alkalines, cleaners, oils and petrol etc.
- Satisfies various requirements for coefficients of friction

Application:

- Dip-Spin
- Dip-Drain
- Spraying
- Spin coating

Curing parameters at object temperatures of:

- 125 - 200 °C for 15 min. (257 - 392 °F for 15 min.)

As topcoats, products from the DELTA-PROTEKT® VH 350 series are suitable for:

- Zinc and zinc-alloy electroplates after suitable pretreatment
- Stainless steel
- Aluminium and aluminium alloys after suitable pretreatment
- Magnesium after suitable pretreatment

Product description:

- Inorganic, silicate-based system
- Soluble in water
- Dry film thickness 1 - 3 µm
- Available in transparent
- GZ variants with lubricant additive

Properties:

- Topcoat for a wide range of parts
- Increases resistance to white and red rust formation in the salt spray test
- Protects against chemicals such as acids, alkalines, cleaners, oils and petrol etc.
- Satisfies various requirements for coefficients of friction

Application:

- Dip-Spin
- Dip-Drain
- Spraying
- Spin coating

Curing parameters at object temperatures of:

- 125 - 200 °C for 15 min. (257 - 392 °F for 15 min.)

DELTAMKS®



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