ZINC FLAKE COATING

GEOMET® 321

GEOMET® 321 is applied to protect fasteners and many type of metallic parts from corrosion and is used in many industries. It can be combined with PLUS®, DACROLUB® or GEOKOTE® topcoats to provide a very broad range of friction coefficients. It is the most widely used product in zinc flake technology.

Characterictics and performance*

- The coefficient of friction can be adjusted to targeted values ranging from 0.06 to 0.20 (ISO 16047) with NOF METAL COATING GROUP’s selected topcoats
- It can be used with or without topcoat
- No hydrogen embrittlement
- Excellent assembly and multi-tightening behavior (with lubricated topcoat)
- Good mechanical damage (test method D24 1312, USCAR 32) and chemical (test VDA 621-412) resistance
- Performance maintained at elevated temperatures (up to 300° C)
- Paintable coating
- Electrical conductivity for most application processes
- Bimetallic compatibility with aluminum
- Thin dry-film, non-electrolytic
- Water-based chemistry
- Passivated zinc and aluminium flakes in a binder, patented chemistry
- Chrome free alternative to DACROMET® 320
- Metallic silver appearance

High corrosion resistance*

Coating Weight	Salt Spray Test (IS0 9227/ASTM B117)	Cyclic Test
GRADE A > 24 g/m2	> 240 hours without white rust > 720 hours without red rust	-
GRADE A > 24 g/m2+ topcoat	> 720 hours without red rust	4 cycles ACT 60 cycles GMW 14872 60 cycles SAE J2334
GRADE B > 36 g/m2	m2 > 1000 hours without red rust	-

*Results may vary depending on substrate, geometry of parts and type ok application processes.

Application process

GEOMET® 321 can be applied by Dip-Spin, Spray, Dip-Drain-Spin using bulk or rack

Health and Safety

- Aqueous dispersion
- Complies with REACh
- Complies with the 2000/53/CE and 2002/95/CE directives

International standards:

EN ISO 10683 - Fasteners: non-electrolytic zinc flake coatings

EN 13858 - Non-electrolytic zinc flake coatings on iron and steel parts

ASTM F1136 / F1136 M - Zinc/Aluminum Corrosion Protective Coatings for Fasteners

GEOMET® 500

GEOMET® 500 is applied to fasteners and many type of metallic parts to protect from corrosion, and it is used in many industries

- Thin dry-film, non-electrolytic, self-lubricated
- Water-based chemistry
- Passivated zinc and aluminium flakes in a binder, patented chemistry
- Chrome free alternative to DACROMET® 500
- Metallic silver appareance

Characteristics and performance*

- Coefficient of friction: 0,15 ± 0,03 (ISO 16047)
- No topcoat required
- No hydrogen embrittlement
- Excellent assembly and multi-tightening behavior
- Good mechanical damage (test method D24 1312, USCAR 32) and chemical (test VDA 621-412) resistance
- Performance maintained at elevated temperatures (up to 300° C)
- Paintable coating
- Electrical conductivity for most application
- Bimetallic compatibility with aluminum
- Application cost savings

High corrosion resistance*

Coating Weight	Salt Spray Test (ISO 9227 / ASTM B117)	Cyclic Test
(GRADE A) > 24 g/m2	> 240 hours without white rust > 720 hours without red rust	25 cycles APGE
(GRADE B) >36 g/m^2	> 240 hours without white rust > 1000 hours without red rust	6 cycles ACT 50 cycles APGE

*Results may vary depending on substrate, geometry of parts and type ok application processes.

Application process:

GEOMET® 500 can be applied by Dip-Spin, Spray, Dip-Drain-Spin using bulk or rack**Sicurezza e Ambiente**

Health and Safety

- Aqueous dispersion
- Complies with REACh
- Complies with the 2000/53/CE and 2002/95/CE directives

International standards:

EN ISO 10683 - Fasteners: non-electrolytic zinc flake coatings

EN 13858 - non-electrolytic zinc flake coatings on iron and steel parts

ASTM F1136 / F1136 M - Zinc/Aluminum Corrosion Protective Coatings for Fasteners

GEOBLACK®

GEOBLACK® 180 BLACK-ON-BLACK	GEOBLACK® M BLACK-ON-BLACK	GEOBLACK® 500M BLACK ON SILVER	GEOBLACK® ML BLACK ON SILVER
GEOMET® 430 + PLUS® VLh Black Black basecoat + black topcoat Even, consistent black color after handling and damage Coefficient of friction: 0,09 — 0,14	GEOMET® 430 + PLUS® ML Black Black basecoat + black topcoat Even, consistent black color after handling and damage Coefficient of friction: 0,12 — 0,18	GEOMET® 500 + PLUS® Black 500 M Silver basecoat + black topcoat Coefficient of friction: 0,11 — 0,17	GEOMET® 321 + PLUS® ML Black Silver basecoat + black topcoat Coefficient of friction: 0,10 — 0,16

Characteristics and Performance*

- Thin dry-film, non electrolytic
- Strong resistance to chemical attack: solvents, fuels, brake fluids (VDA 621 412)
- Possibility of extremely high chemical resistance, including wheel cleaning solutions, with GEOKOTE black topcoat
- Water-based chemistry
- No hydrogen embrittlement

High resistance to corrosion*

Salt Spray Test (ISO 9227 / ASTM B117)
> 1000 hours without red rust

*Results may vary depending on substrate, geometry of parts and type ok application processes.

Application process

GEOBLACK® can be applied by Dip-Spin, Dip-Drain-Spin, using bulk or rack.

Health and Safety

- Aqueous dispersion
- Complies with REACh
- Complies with the 2000/53/CE and 2002/95/CE directives

International standards

ISO 10683 - Fasteners: non-electrolytically applied zinc-flake coatings

EN 13858 - Non-electrolytically applied zinc-flake coatings on iron or steel parts

ASTM F1136 / F1136 M - Zinc/Aluminum Corrosion Protective Coatings for Fasteners.

DACROLUB® 10

DACROLUB® 10 is an organic topcoat made from water-based chemicals. This topcoat can be applied to GEOMET® and DACROMET® coatings, whereby the friction coefficient of threaded parts can be reduced and controlled.

Characteristics and performance*

- Dry lubrication film
- Friction coefficient: 0,08 — 0,14 on parts with GEOMET® or DACROMET® measured according to EN ISO 16047
- DACROLUB® 10 gives freedom from possible stick-slip problems when tightening (VDA 235-203)
- No induced hydrogen embrittlement
- Appearance: clear
- Salt Spray Test according to ISO 9227 : No effect on the corrosion resistance of the GEOMET® base-coat
- The combination GEOMET® / DACROLUB® 10 is particularly suited to fasteners since it provides them with optimal protection and assembly properties
- Being easy to apply, the DACROLUB® 10 can be coloured to be used for part identification (green or blue in standard)
- Competitive coating cost

Application process

DACROLUB® 10 can be applied in one single thin coat by Dip-Spin or spray.

Environmental safety

- Aqueous dispersion
- Complies with REACH
- Complies with the 2000/53/CE and 2011/65/CE directives

*Results may vary depending on substrate, geometry of parts and type ok application processes.

DACROLUB® 15

DACROLUB® 15 is an organic topcoat made from water-based chemicals. This topcoat can be applied to GEOMET® and DACROMET® coatings, whereby the friction coefficient of threaded parts can be reduced and controlled.

Characteristics and performance*

- Dry lubrication film
- Friction coefficient: 0,12 — 0,18 on parts with GEOMET® 321 or DACROMET® 320 measured according to EN ISO 16047
- No induced hydrogen embrittlement
- Appearance: clear
- Salt Spray Test according to ISO 9227 : No effect on the corrosion resistance of the GEOMET® base-coat
- The combination GEOMET® / DACROLUB® 15 is particularly suited to fasteners since it provides them with optimal protection and assembly properties
- Competitive coating cost

Application process

DACROLUB® 15 can be applied in one single thin coat by Dip-Spin or spray

Environmental safety

- Aqueous dispersion
- Complies with REACH
- Complies with the 2000/53/CE and 2011/65/CE directives

*Results may vary depending on substrate, geometry of parts and type ok application processes.

GEOKOTE®

Resistance to chemicals and abrasion, improved control of the friction coefficients are requirements increasingly demanded by markets. The combination of the GEOMET® coating with the GEOKOTE® topcoats can respond to new expectations in many industrial sectors.

Characteristics and performance*

- Strong resistance to hydrochloric, phosphoric, sulfuric acids, automobile fluids and other chemical agents
- Stronger resistance to repetitive abrasions
- No hydrogen embrittlement
- The black, clear or other shades of GEOKOTE® gives freedom from possible stick-slip problems when tightening (VDA 235-203)
- The GEOMET® / GEOKOTE® combination is particularly suited to fasteners since it provides them with optimal protection and assembly properties
- Salt Spray Test according to ISO 9227
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Alta resistenza alla corrosione*

	Salt Spray Test (ISO 9227 / ASTM B117)
GEOMET® 321/500+GEOKOTE®	> 720 ORE SENZA RUGGINE ROSSA

*Results may vary depending on substrate, geometry of parts and type ok application processes.

Application processes

These water-based organic topcoats can be applied in one single thin coat by Dip-Spin, Spray, Dip-Drain-Spin using bulk or rack processes.

Environmental safety

- Aqueous dispersion
- Complies with REACh
- Complies with the 2000/53/CE and 2011/65/CE directives

PLUS® VLh

PLUS® VLh is a clear water-based topcoat. It can be applied to GEOMET® 321 coating and has similar parameters to PLUS®VL. It has been developed to radically improve the friction performance for cases of difficult tightening (i.e.with aluminium or catophoretic paint) and complies with new automotive industry expectations (i.e. VW 01131-1/2).

Characteristics and performance*

- Friction coefficient on GEOMET® 321 base-coat grade A (>24g/m²) PLUS® VLh : μ tot = 0,09 - 0,14
- Salt Spray Test according to ISO 9227 / ASTM B117 GEOMET® 321 + PLUS® VLh > 720 hours without red rust
- Coating weight of PLUS VLh: 5 g/m2 minimum
- Same IMDS as for PLUS® VL
- No induced hydrogen embrittlement
- Improvement of friction performance on and in aluminium (double tightening within elastic limit on aluminium according to VW 01131-1)
- Improvement of friction performance regarding multitightening (5x) onto catophoretic paint while avoiding stick-slip problems for cases of difficult tightening
- Excellent behaviour in tests of loosening at high temperatures (VDA 235/203 ; VW 01131-2)
- Excellent resistance to solvents, fuels and brake fluids (VDA 621 412)

Application process

These water-based inorganic products can be applied in one single thin coat by Dip-Spin or spray, using bulk or rack coating process.

Health and safety

- Aqueous dispersion
- Complies with REACh
- Complies with the 2000/53/CE and 2011/65/CE directives

International standards:

ISO 10683 - Fasteners: non-electrolytic zinc flake coatings

EN 13858 - Non-electrolytic zinc flake coatings on iron and steel parts

*Results may vary depending on substrate, geometry of parts and type ok application processes.

PLUS® XL-L-VL-ML-M- 10

The PLUS® brand of topcoats are lubricated sealers. When applied to DACROMET® or GEOMET® base-coats, they provide controlled friction coefficient of threaded parts and increase the resistance to corrosion.
The controlled sacrificial corrosion protection mechanism of DACROMET® and GEOMET® is improved further with the PLUS® topcoats.

Characteristics and performance*

FRICTION COEFFICIENT ON GEOMET® 321 BASE-COAT (ISO 16047)	
TRATTAMENT	FRICTION
PLUS® XL	0.06-0.09
PLUS® L	0.08-0.14
PLUS® VL	0.09-0.14
PLUS® ML	0.10-0.16
PLUS® M	0.12-0.18
PLUS®	0.14-0.20
PLUS® 10	NOT LUBRICATED

- Appearance: matte metallic silver (clear topcoats)
- Salt Spray Test according to ISO 9227 / ASTM B117 GEOMET® 321/500 + PLUS® XL, L, VL, M, ML, 10 > 720 hours without red rust (with a GEOMET® 321/500 coating weight > 24 g/m²)
- Increased field performance of parts
- Improved contact corrosion resistance (to magnesium, rubber, aluminum, etc)
- Excellent resistance to solvents, fuels and brake fluids (VDA 621 412)
- Competitive production cost

Application process

These water-based inorganic products can be applied by Dip-Spin, Spray, Dip-Drain-Spin, using bulk or rack

Health and Safety

- Aqueous dispersion
- Complies with REACh
- Complies with the 2000/53/CE and 2002/95/CE directives

International standards:

EN ISO 10683 - Fasteners: non-electrolytic zinc flake coatings

EN 13858 — Non-electrolytic zinc flake coatings on iron and steel parts

*Results may vary depending on substrate, geometry of parts and type ok application processes.