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Coatings Adhesives

An Introduction to
CHE®-COAT and CHE®-BOND

LEL

CHE®-COAT- and CHE®-BOND Product Range

- Corrosion Inhibitors	CHE®-COAT-CI
- Defoamer	CHE®-COAT-DF CHE®-BOND-DF
- Thickener	CHE®-COAT-VT
- Anti-Shrink Additives	CHE®-BOND-AS

Corrosion and Flash-Rust

- Corrosion is a chemical reaction at the bounding surface between metal and coating, enhanced by water, acids or salts

- Water-based coatings are attacked by **flash-rust** as a result of corrosion during storage, application or film-formation

- Corrosion and flash-rust lead to damage of the metal and loss of essential material properties

→ To prevent this, we recommend to use CHE®-COAT-CI

Corrosion Protection

- CHE®-COAT-CI products are water-based solutions of anti-corrosive salts, e.g. nitrites, amines, carboxylates, phosphates, borates, in synergistic combinations

➔ They are effective between coating and metal and they avoid corrosion and flash-rust through

  - improvement of the film-adhesion
  - formation of a passivation layer
  - decrease of film-permeability
  - electrical inhibition

Special Product
CHE®-COAT-CI L8AF, L8NF

- Two-component product of
  - L8AF, amine-free part
  - L8NF, nitrite-free part

➔ Prevent the formation of toxic nitrosamines and the loss of effectiveness during storage

➔ Easy to handle: both components are added without premix

Selection and Application of CHE®-COAT-CI

- Suitable grades offered for several applications of water-based coatings, different binder systems and protected metals

- All grades are effective on steel and iron

- There are special grades for application on other substrates:

  - copper: L52, LNF1, LNF2
  - aluminium, zinc: LAF1, LNF1, LNF2, LNFA4

- Typical dosage level 0.2 – 2.0 w/w %, post-addition recommended

Selection of CHE®-COAT-CI by Binder and Protected Metal

Protected Metal/ Binder	Alkyd	Acrylic, Styrene-Acrylic	2K-EP	PU	Vinyl	Acid Latices
Iron, Steel		L2		L2		
Iron, Steel		L8AF/NF	L8AF/NF	L8AF/NF		
Aluminium, Iron, Steel	L32					
Aluminium, Iron, Steel		L42	L42	L42	L42	L42
Aluminium, Iron, Steel	LAF1	LAF1	LAF1	LAF1		
Zinc, Aluminium, Iron, Steel	LNFA4	LNFA4	LNFA4	LNFA4	LNFA4	LNFA4
Zinc, Aluminium, Iron, Steel	LNFA5	LNFA5				
Copper, Zinc, Aluminium, Iron, Steel	LNF1	LNF1	LNF1	LNF1		
Copper, Zinc, Aluminium, Iron, Steel		LNF2	LNF2	LNF2	LNF2	

Overview CHE®-COAT-CI

				Application					Protected Metals			
CHE-COAT-CI	VOC-free	Nitrite-free	free from	WB primers and paints	WB decorative paints and coatings	Wood coatings	In can protection	Others	Steel, iron, cast iron	Aluminium	Zinc	Copper and copper alloys
L2	X	X		X		X		Rust removing	X			
L32	X	X			X		X	Metal working, coolants, lubricants	X	X		
L42	X	X			X	X	X	Cleaning agents	X	X		
L52	X	X						Metal working, coolants, lubricants	X	X		X
L8AF*	X		Amine	X	X				X			
L8NF*	X	X		X	X				X			
LAF1	X		Amine	X	X		X		X	X		
LNF1	X	X	Amine		X	X			X	X	X	X
LNF2	X	X		X	X	X		Metal working	X	X	X	X
LNFA4	X	X		X	X	X		In-can protection	X	X	X	
LNFA5	X	X	Amine Phosphate Borate	X	X			In-can protection	X			
* Products to be used together												

Need for Defoamer in Coatings

- At the presence of surfactants foam could appear
  - during coatings production
  - during application
  - due to chemical reaction
  - due to the coated substrate (e.g. porous wood)

➔ Foam leads to defects during the film-drying

➔ Defoamer, like CHE®-COAT-DF enables the formation of a smooth surface

Formation of Foam

- Foam consists of stabilized air/gas bubbles in a liquid
- Pure liquids do not foam
- Surfactants, **surf**ace **act**ive **a**ge**nts** are foam stabilizing substances
- Additives like emulsifiers, wetting agents or dispersing agents could react as surfactant

→ Orientation of their hydrophobic and hydrophilic groups enables the formation of gas bubbles

Foam Prevention

Defoamer destroy existing foam and prevent the formation of gas bubbles, therefore they

- must be **insoluble** in the system
- must have a **low surface tension**
- must have a **positive penetration coefficient**
- must have a **positive spreading coefficient**
- should be **dispersible** in the system

Selection of Defoamer

- **Limited controlled incompatibility** of defoamer is essential!
- Very compatible means no defoaming effect, foam stabilization
- Too incompatible means very good defoaming, but cratering, hazy

➔ Optimal: good defoaming, no surface damages, no turbidity

➔ Criteria for selection:
Balance between effectiveness and compatibility, many tests are neccessary

CHE®-COAT-DF
based on Mineral Oil

DF 6684	- Emulsion of mineral oil, silica, non-ionic surfactants - Long lasting	- Deco, plasters, systems with low pigment concentration, emulsion polymerisation
DF 6689	- Mineral oil, silica, non-ionic surfactants, - Easy to incorporate	- Deco, polymers, adhesives, low viscosity products, emulsion polymerisation
DF 681F	- Mineral oil, 95 % active substance - Long lasting	- Deco, latex, adhesives, emulsion polymerisation, water-based systems
DF 6681	- Mineral oil, hydrophobic, 100 % - Very effective and long lasting	- Clear wood, inks, deco, adhesives, water-based systems
DF 6575GM	- Mineral oil, 95 %	- Adhesives, starch adhesives
DF 581B	- Mineral oil, 100 % - Very fast defoaming, short time working	- Deco, adhesives

CHE®-COAT-DF
based on Silicone Oil

DF 6750	- Emulsion of modified silicones, 20 %	- High gloss varnishes, inks, elastomeric coat, polymers
DF 6752	- Emulsion of modified silicones, 12 %	- Deco, plasters, polymers
DF 6342	- 100 % modified silicone - Very effective	- Inks (in grind stage)
DF 4004	- Based on silicones and silica	- PU, ACR industrial coatings, wood, inks, adhesives

CHE®-COAT-DF
based on Polyglycols

DF 6760	- Emulsion of polyglycols - Low to high viscosity compatible	- Spray coatings, deco, polymers, adhesives, plasters
DF 999Z	- 100 % polyglycol - Low to high viscosity compatible	- Inks, polymers, adhesives, plasters

CHE®-COAT-DF
based on Blends

DF 6700	- Polyglycols and mod. silicones, 100 %	- Wood, high gloss varnish, clear coatings, for water-based systems
DF 4003	- Blend of surfactants and silica	- PU, ACR industrial coatings adhesives, inks, wood
DF 311M	- Blend mineral oil, polymers, 100 % - Easy to incorporate	- Clear wood, 2K-EP, UP, for solvent-based systems
DF 6421	- Blend solvents, surfactants, 100 % - Easy to incorporate	- ACR, ALK, EP, Stoving, inks adhesives, for solvent-based systems
DF 6466	- Blend of polymers in solvents - Air release	- PE, EP, ACR, for solvent-based sytems

CHE®-BOND-DF

Dry defoamer which are recommended for usage in powder products for construction industry (e.g. plasters, fillers, mortar)

- Free flowing powders, based on silica as a substrate

  - CHE®-BOND-DF 200P: blend of hydrocarbons, non-ionic surfactants
  - CHE®-BOND-DF 300P: blend of alkoxane-copolymer, non-ionic surfactants; for systems containing polycarboxylate superplasticisers

CHE®-COAT-DF Product Selection

* emulsion type defoamer
** blend of polygloycol and modified silicones
*** based on vegetable oil

System	Silicone-based	Mineral oil-based	Polyglycol-based	Others (Blends, Powder, Solvent)
Adhesives (Starch-, Casein-, PVA-, Latex-based)	4004*, 6750*	681F, 6575GM, 6689, 581B	999Z, 6760*	4003
Clear coatings, varnishes	6750*			6700**
Elastomeric (flexible) systems	6750*			
Emulsion paints, gloss			6760*	6700**
Emulsion paints, matt, semi gloss	6752*	6002, 6684*, 681F	6755*, 6760*	
Emulsion polymerization		681F, 6684*, 6689		
Fast defoaming agent		581B		
High Performance Coatings, wood and industrial	4004*	6681		4003
Polyurethane emulsion systems	4004*			4003
Low viscosity coatings		6689	6760*	
Low VOC and VOC-free paints	6750*, 6752*		999Z, 6755*	
Non Aqueous coatings and adhesives				311M, 6421, 6466
Paints based on natural resources				6900***
Plasters, high viscosity systems, cement-based		6005	999Z	
Plasters, high viscosity systems, latex-based	6752*	6684*	6760*	
Silicate paints, high pH systems	6342	6684*	6760*	
Spray paints			6760*	
Waterborne flexographic inks (applied by rubber rolls)	4004*, 6342		999Z, 6760*	4003
Waterborne flexographic inks (not appl. by rubber rolls)		6005		
Wood coatings pigmented				6700**
Defoamer for construction, cement, mortars				200P, 300P
Anti shrink additives for powder systems				AS100, AS1100
Anti shrink additives for powder systems, low odour				AS1200

Application of CHE®-COAT-VT

- CHE®-COAT-VT products are thickener based on HEUR: **H**ydrophobic modified **E**thoxylated **UR**ethane copolymer

- They are made for application in several water-based systems at pH-value 4 – 10:
  - Paints (Interior, Facade)
  - Emulsion (Alkyd, PU)
  - Coatings (Industrial, DIY)
  - Plasters
  - Inks
  - Adhesives

CHE®-COAT-VT - Range

Thickener show different flow-properties:

- CHE®-COAT-VT 1P, CHE®-COAT-VT 4P
  - pseudoplastic properties

- CHE®-COAT-VT 2P, CHE®-COAT-VT 5P
  - strongly pseudoplastic properties

- CHE®-COAT-VT 3P
  - newtonian performance

Properties of CHE®-COAT-VT

Beside thickening by formation of a 3-dimensional network, CHE®-COAT-VT products improve other properties:

- Gloss
- Levelling
- Anti-sagging
- Edge covering
- Spatter resistance
- Application properties (Brush, Roller, Spray)
- Water resistance
- Anti-settling (Paint stability)

CHE®-BOND-AS

Anti-Shrink Additives are recommended for applications in cement based construction materials

- Based on Neopentyl-glycol:
  CHE®-BOND-AS 1000 and
  especially for hot climate zones CHE®-BOND-AS 1100

- Based on Alkylglycol:
  CHE®-BOND-AS 1200 for low odor