CHEMICAL RAW MATERIALS

WORLÉE
seit 1851

Additives

for paints and coatings

Raw Materials from Worlée – Modules towards your Success

'Our raw materials are important modules for our customers' success' says Reinhold von Eben-Worlée, CEO and General Manager.

For more than 160 years, Worlée has delivered raw materials from all over the world to its customers. The Hanseatic trading company has grown into an international production and service company with three business units: chemical raw materials, natural raw materials and cosmetic raw materials.

The combination of a high-quality approach, technical know-how and the intuition for trends and market developments is the reason why Worlée is a reliable partner – in all three departments.

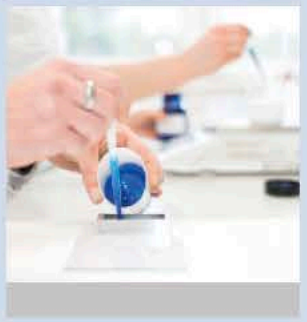
Chemical raw materials from Worlée

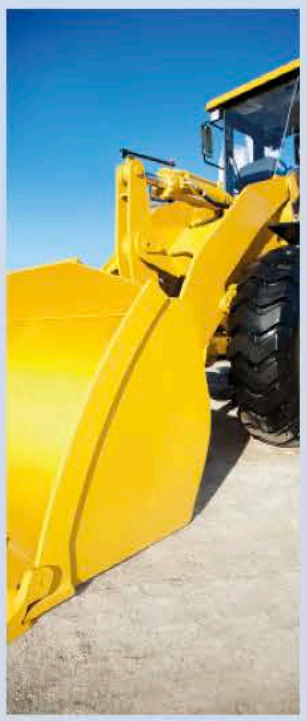
In its plants in Lauenburg and Lübeck, Worlée-Chemie GmbH produces a broad range of binders and additives for a large variety of different coatings. Specialties from well-known suppliers complete the delivery programme.

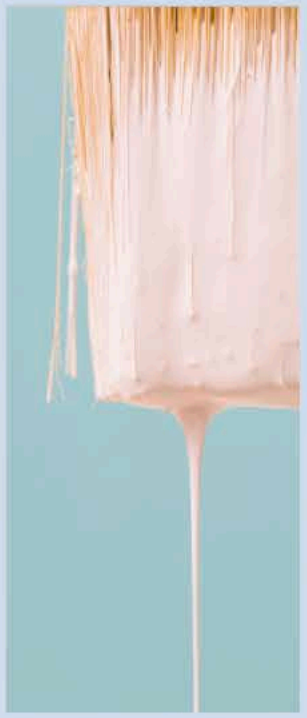
Its production plants comply with the highest environmental, quality and security standards. ISO 9001, ISO 14001, ISO 50001 and OHSAS 18001 standards certify that Worlée is a responsible company.

At Worlée, sustainability is not only a word. For its excellent management of energy, emission and resources, Worlée has received the 'Responsible Care' award of VCI Nord several times and has become the first so-called 'Klimaschutz-Unternehmen' of its type.

Worlée's continuous development of new and innovative products is an important contribution to the success of our customers. Module by module. Day by day.







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Wetting and dispersing agents

Process of pigment dispersing

The art of paint production is to combine raw materials in liquid and powdered ingredients in such a way that the end product fulfils the highest quality requirements.

The most complex and expensive part of the production process is the wetting and dispersing step. Pigments and fillers must be wetted by the liquids, ground to a minimum particle size and then homogeneously distributed to achieve maximum colour strength, gloss and hiding power. Finally this status needs to be stabilised to ensure the paint quality over the time.

Wetting and dispersing is a very time- and energy-consuming process and would not be possible without modern wetting and dispersing agents.

If the wetting and dispersing is not optimal, several problems may appear like, for example, loss of gloss, colour changes, separation and others.

Worlée offers a growing portfolio of high-quality wetting and dispersing agents for both aqueous and non-aqueous formulations.

Defoamers

Especially in aqueous paints and coatings, foam formation is a problem which may significantly disturb the production processes. These problems may appear in different situations. Wetting of powdered ingredients means that air between the particles is replaced by liquids and then distributed in the mill charge. Furthermore, the mixing itself leads to additional air entrapment. Both cases finally result in foam formation which can lead to problems if not removed. High levels of foam may increase the paint volume significantly and exceed the vessel volume. The same problems may arise during the filling of the end product. Finally, foam bubbles in the applied film may result in surface defects. Foam bubbles need to rise up to release the entrapped air at the surface. Bubbles of low air volume, which are distributed in the entire wet paint, tend to stabilise their position because their lifting power does not overcome the viscosity. This phenomenon is known as 'micro foam'. These small bubbles need to merge and form bigger bubbles with a higher lifting power which then can rise up to the surface. This is the task of so called 'de-airing agents' which have a balanced compatibility. They must be compatible enough to be active in the entire paint, but on the other hand incompatible enough to destabilise the air bubbles to enable them to merge. Defoamers act directly at the surface by destabilising the raised bubbles and destroying the foam. Defoamers have to be quite incompatible with the paint formulation to accumulate on the surface. They need to enter the foam lamella and destroy the tenside double layer and may be formulated on various raw material base. Some defoamer formulations also contain hydrophobic, insoluble solids which act as 'tenside catchers' and further destabilise the foam lamella.
Worlée offers defoamers for aqueous and non-aqueous formulations.

Defoamer selection guide for aqueous paint formulations

Selecting the right defoamer for a particular formulation is a balancing decision between compatibility and effectivity. A defoamer that is too compatible does not solve the foam problem and one that is too incompatible removes the foam but results in surface defects. A defoamer, or combination of defoamers, that is most effective at the lowest level of surface defects must be found.

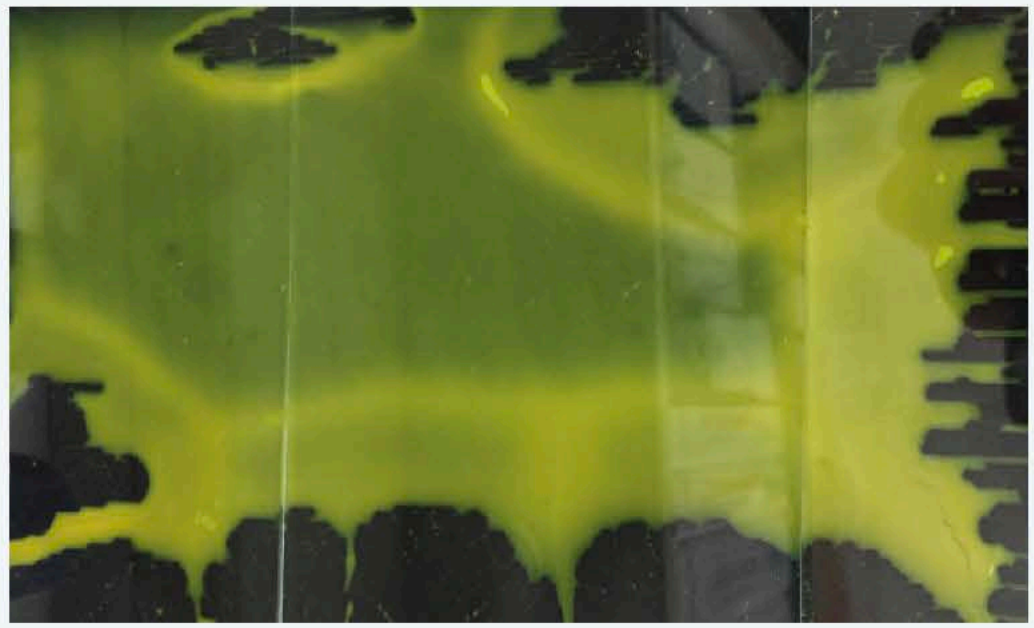
The following graph will help you find the correct defoamer from the Worlée portfolio:

Substrate wetting agents

Paints and coatings need to cover the coated area evenly to give a perfect impression, but sometimes problems occur due to differences in the surface tension of the paint and the surface energy of the substrate.

in these cases, the surface tension of the paint system must be reduced by using substrate wetting additives.

The WorléeAdd grades listed in the table on page 17 were designed to improve the wetting and coverage of substrates with low surface energy without increasing the surface slip of the dried film.



Acrylic flow and levelling agents

Differences in surface tension may not only be the cause for substrate wetting problems but also for defects on the coating surface. These differences can result from solvent evaporation, an advancing curing reaction, dust contamination or others.

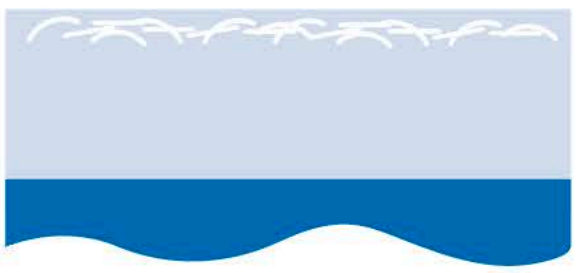
Acrylic flow and levelling agents need to have a certain incompatibility with the coating system, accumulate at the coating surface and slightly reduce the surface tension of the system.

The level of incompatibility despends on the chemical composition of the polymer; it is important to find the right additive for a particular formulation.

At the wrong level of incompatibility either nothing happens or defects occur – see graph.

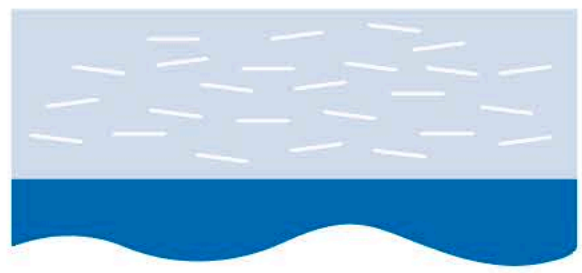
Acrylates offer only a low level of surface tension reduction which is sufficient in many cases. Furthermore, they do not influence the recoatability.

Whenever a stronger reduction or modifications of surface properties are required, silicone-based additives may be the better choice but have more influence on the recoatability as well.



optimal
slight turbidity in the clear coat, optimal levelling

strongly incompatible
levelling defects, strong turbidity, reduction of gloss, increase in haze

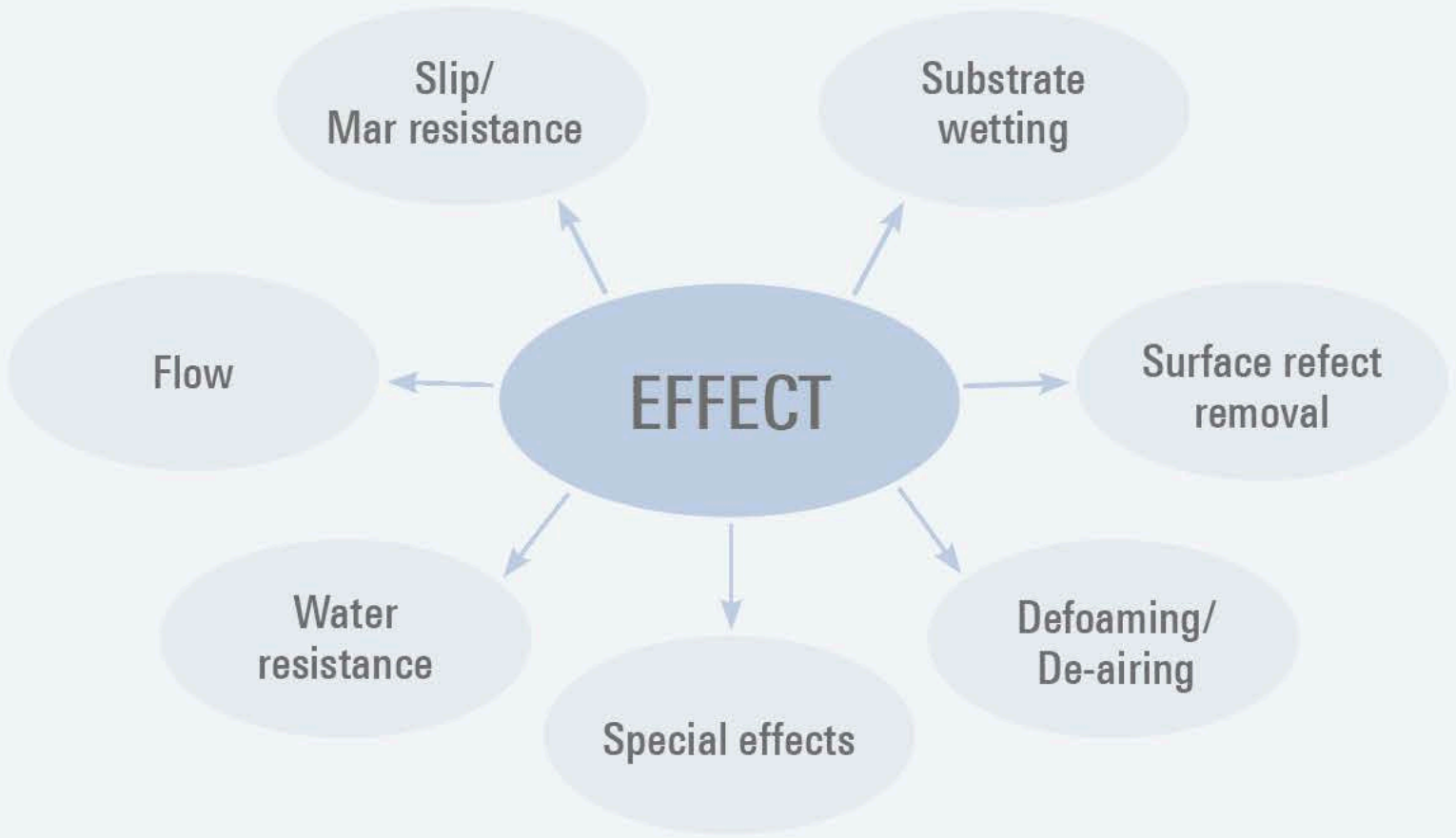


strongly compatible
levelling insufficient, no or slight turbidity

Silicone surface additives

Silicones are a very flexible source for the formulation of additives. The basis is in almost all cases polydimethylsiloxane (PDMS) which can be modified in many ways. PDMS has a very low surface tension and surfactant properties. Depending on both the molecular weight and chemical modification, PDMS additions can provide specific properties to aqueous and non-aqueous coating systems. Silicone-based additives generally have a strong effect on the surface tension of the coating which on the one hand makes them very effective, but on the other hand may negatively influence the recoatability of the dried coating film.

Worlée provides a number of silicone-based additives. The tables on pages 20 and 21 show a choice from the portfolio.



Adhesion promoters and special primers

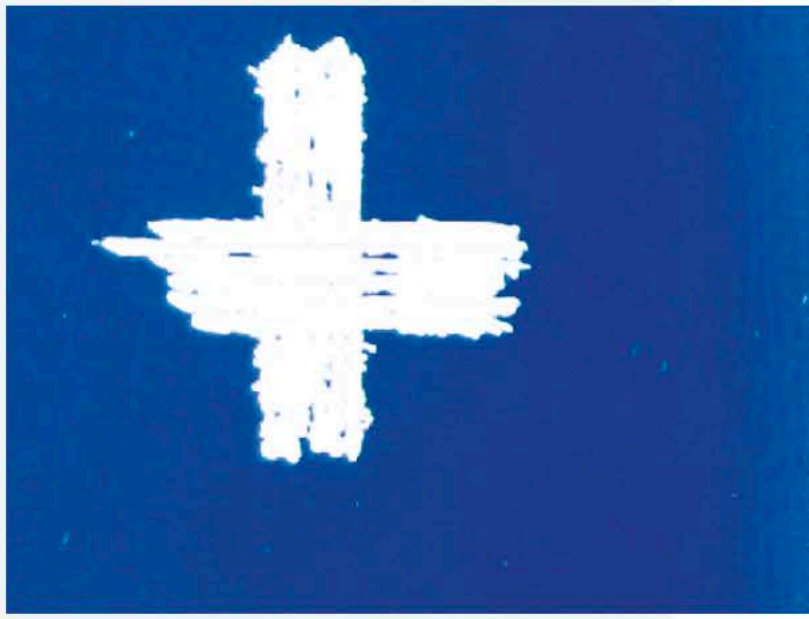
Proper adhesion of a coating film to the substrate is necessary to offer long-term protection and decorative properties. Weak adhesion may lead to accelerated degradation, destruction of the aesthetic impression and finally decrease corrosion resistance.

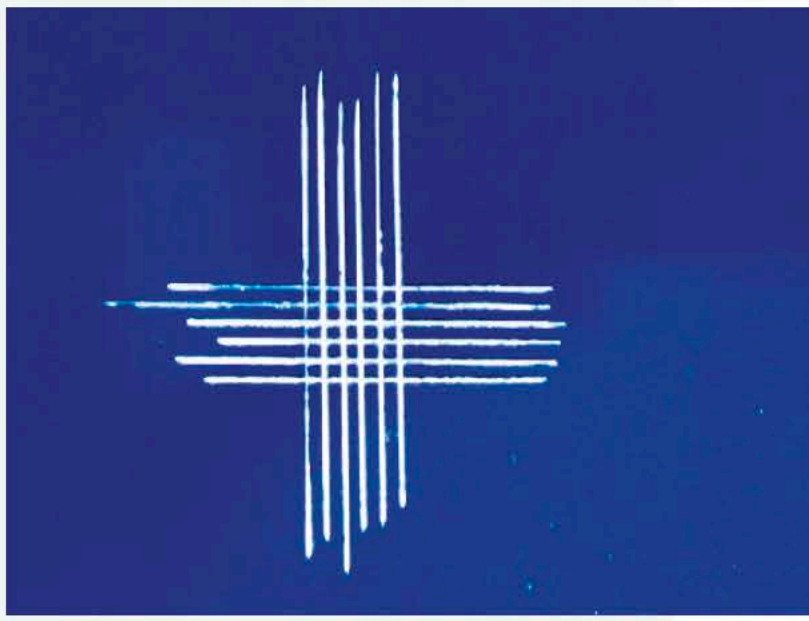
Substances that act as a kind of interface – by providing on one side of the molecule affinity to the coating and/or coating ingredients and on the other side to the substrate – are therefore chosen. The choice of functional groups depends on the coating system and the substrate.

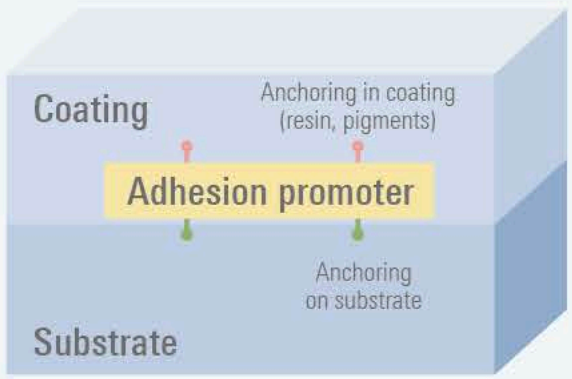
Adhesion improvement can be achieved by two different approaches: either by using a separate layer of a primer between substrate and coating or by adding the adhesion promoter directly to the coating formulation.

Adhesion promoters for coating applications are added to the liquid coating. After the application, they orientate on the substrate/coating interface and develop bonds both on the substrate as well as on the coating matrix. Ideally, a permanent covalent bond is created here, which significantly increases the adhesion of the coating to the substrate, thereby increasing its performance. Beside covalent bonds there are other effects which may improve adhesion.

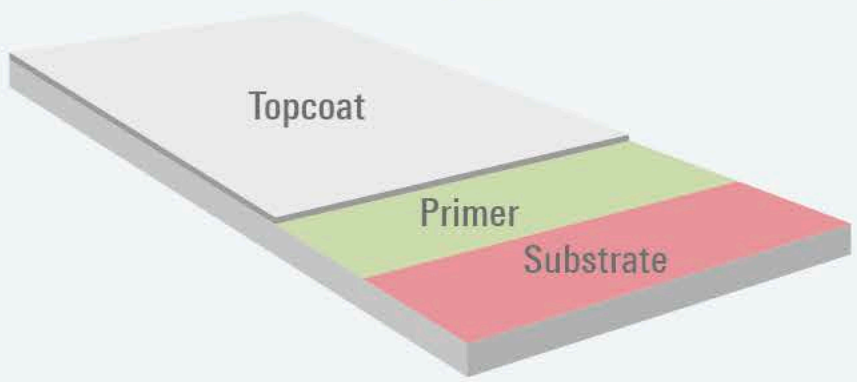
The choice of reactive groups determines the adhesion on specific substrates.







Schematic mechanism of adhesion promoters



Flash rust inhibitors

What does flash corrosion mean?

Flash corrosion is the general and rapid corrosion that instantly occurs when metals are exposed to corrosive environments.

Metals such as copper and aluminium can oxidise rapidly to form a layer for passivation. In this process, corrosion inhibitors are typically used to hinder formation of a passivation layer by keeping oxygen interaction on the surface.

Flash corrosion is also known as flash rusting or flashing.

Flash rust may occur during the drying process when aqueous DTM coatings are applied to ferrous substrates. This is problematic in cases of transparent coatings but also in the case of aqueous corrosion-protection coatings because the protective properties may be negatively influenced.

WorléeAdd flash rust inhibitors hinder the corrosion by forming stable complexes with the free iron particles and avoiding oxygen interaction.

Steel wool in water without (left) and with 2% of WorléeAdd 456 after 48 hours at room temperature

Worlée flash rust inhibitors

Overview of properties

Product	Chemical characteristic	Highlighted application / Effect	Active substance %	Use level % (on total formulation)
W'Add 456	Organic salts and morpholine derivative	VOC- and nitrite-free; for all waterborne DTM systems incl. 1K/2K PUR	30	0.5 - 2.0
W'Add 458	Organic salts	VOC- and nitrite-free; preferably for polymer-emulsion-based DTM systems	38	0.5 - 2.0

Miscellaneous additives

Beside the above-mentioned groups of coating additives, Worlée provides a number of products for various purposes.

Worlée miscellaneous additives
Overview of properties

Product	Appearance	Non-volatiles % approx.	Use level (% on total formulation)	Main uses and characteristics
W'Add 410 N	Clear to slightly turbid, yellowish, low-viscosity liquid	13	0.5–2.0	**Viscosity stabiliser**, anti-skinning and anti-gelling agent for solvent-based air-drying and stoving alkyd paints
W'Add 412	Clear, slightly turbid, yellowish, low-viscosity liquid	65	0.5–1.0	Solvent-free **compatibility agent** for easier incorporation of driers into water-based alkyd emulsion paints
W'Add 425	Clear, yellowish liquid	51	0.2–1.5	Silicone-free additive, **imparts an equal structure to wax-containing coil coatings**; improves degassing; reduces popping; also for clear coats
W'Add 428	Clear low-viscosity liquid	10	3.0–6.0	Silicone-free **additive for structured, wax-free coil coatings**; causes orange-peel effect; improves degassing
W'Add 781	Clear, medium-viscosity liquid	100	0.1–2.0	**Silicone-free flow and levelling additive** for solvent-borne, solvent-free and aqueous systems; improves levelling, flexibility and adhesion; reduces blistering in thick layers of two-pack PUR coatings
W'Add 2700	Clear, brownish liquid	12	0.1–1.0 (on resin solids)	**Cobalt-free primary drier for aqueous alkyd systems**; provides fast surface drying, good through drying and hardness development
W'Add 4220	Slightly yellowish liquid	50	0.2–0.8	**Cationic surface active additive**; increases the conductivity of electro-static sprayable paint systems; effective at low use levels
W'Add VP 2560	Brownish liquid	12	1.5–3.0 (on resin solids)	**Cobalt-free drier for alkyd systems**; free from 2-ethyl hexanic acid
W'Add VP 4415	Clear to slightly turbid, yellow-brownish, low-viscosity liquid	65	0.1–0.5	**Oxime-free anti-skinning agent** with pigment-wetting properties

01 Wetting and dispersing agents

WorléeDisperse

Overview of properties

Product	Chemical characteristic	Highlighted application / Effect	Active substance %	Solvent system: Aqueous	Solvent system: Solvent-borne	Solvent system: Solvent-free
W'Disperse VP 8100S	Modified block copolymer	Easy-to-use, universal dispersant for decorative and industrial coatings	100	○	●	◐
W'Disperse VP 8110S	Modified polymer	Easy-to-use, universal dispersant for decorative and industrial coatings; first choice for medium oil alkyds when gloss matters	100	○	●	◐
W'Disperse VP 8400W	Modified block copolymer	Universal, outstanding cost–performance ratio	50	●	○	○
W'Disperse VP 8404W	Modified block copolymer	40% version of WorléeDisperse VP 8400W	40	●	○	○
W'Disperse VP 8405W	Modified block copolymer	Similar to WorléeDisperse VP 8400W, optimised for micronised iron oxides	50	●	○	○
W'Disperse VP 8406W	Modified polyacrylate	For highly loaded concentrates of various pigments, especially effective with carbon blacks	50	●	○	○
W'Disperse VP 8450W	Modified polyacrylate	Universal, no effect on film hardness; for maximum pigment paste concentration take WorléeDisperse VP 8400W or VP 8470W	50	●	○	○
W'Disperse VP 8460W	Modified polyacrylate, amine-free	Universal, no effect on film hardness; lowest water uptake; for maximum pigment paste concentration take WorléeDisperse VP 8400W or VP 8470W	44	●	○	○
W'Disperse VP 8470W	Modified alcohol ethoxylate	Very effective, low use level, outstanding for printing inks	80	●	○	○

● recommended ◐ partially suitable ○ not recommended

Applications / Overview of Uses of WorléeDisperse

Product	Use in		Systems			Use levels (typical values)				
						Pigment concentrates (% on pigment)				
	Pigment concentrates	Direct grinding	Decorative	Industrial	Printing inks	TiO2	Inorganic pigments	Organic pigments	Carbon blacks	Mixed pigmentations (% on total formulation)
W'Disperse VP 8100S	○	●	●	●	○	●	●	●	●	0.2–4
W'Disperse VP 8110S	○	●	●	●	○	●	●	●	●	0.2–4
W'Disperse VP 8400W	●	●	●	●	◐	8–10	15–25	25–60	100–120	2–3
W'Disperse VP 8404W	●	●	●	●	○	10–12	20–30	30–75	130–150	2–3
W'Disperse VP 8405W	●	●	●	●	◐	8–10	15–25	25–60	100–120	2–3
W'Disperse VP 8406W	●	◐	●	●	◐	8–10	15–25	25–60	100–120	2–3
W'Disperse VP 8450W	◐	●	●	●	◐	10–12	20–30	30–75	130–150	2–3
W'Disperse VP 8460W	◐	●	●	●	◐	10–15	20–40	30–90	130–150	2–3
W'Disperse VP 8470W	●	○	○	○	●	○	○	15–30	50–60	

● recommended ◐ partially suitable ○ not recommended

02 Defoamers

Worlée defoamers for aqueous formulations

Overview of properties

Product	Chemical characteristic	Active substance %	Delivery form	Use level (on total formulation)
W'Add 6210	Silica containing PDMS solution	80	Solution	0.1–1.7
W'Add 6223	Silica containing PDMS	100	Compound	0.1–1.0
W'Add 6224	Silica containing PDMS	100	Compound	0.1–1.0
W'Add 6226	Silica containing PDMS	100	Compound	0.1–1.0
W'Add 628	Silica containing PDMS solution	66	Solution	0.1–1.0
W'Add 6410	Silica containing PDMS emulsion	30	Emulsion	0.3–1.0
W'Add 6420	Silica containing PDMS emulsion	26	Emulsion	0.1–1.0

Applications / Uses Overview

Product	Addition point			Use						Application			Curing method	
	Grind stage	Let down	Post add	Decorative	Industrial	Automotive	Wood/Furniture coatings	Adhesives	Printing inks	Brush/Roll	Spray	Dipping	Air	2-pack
W'Add 6210	○	●	○	○	○	○	○	○	●	●	○	○	●	●
W'Add 6223	○	●	○	●	●	●	●	●	●	●	●	●	●	◐
W'Add 6224	●	◐	○	●	●		●	●	○	●	●	●	●	◐
W'Add 6226	●	○	○	●	●	○	●	●	○	●	●	●	●	◐
W'Add 628	●	●	○	●	●	●	●	●	●	●	●	●	●	●
W'Add 6410	○	●	●	●	●	●	●	●	●	○	●	●	●	●
W'Add 6420	○	●	●	○	●	○	○	○	●	●	●	◐	●	○

● recommended ◐ partially suitable ○ not recommended

Worlée defoamers for non-aqueous formulations

Overview of properties

Product	Chemical characteristic	Highlighted application / Effect	Active substance %	Use level % (on total formulation)
W'Add 370	PDMS solution	Very effective even in low concentrations	10	0.03–0.5
W'Add 372	PDMS solution	For all kinds of solvent-borne paints and printing inks incl. high solids	5	0.05–0.80
W'Add 425	Silicone-free formulation of defoaming actives	Quick bubble-breaking without surface defects	80	0.2–1.5
W'Add 602	PDMS solution	Defoaming/de-airing agent especially for 2-pack PUR and EP systems	1.3	0.4–2.0
W'Add 603	Solution of acrylate-mod. PDMS	For all kinds of solvent-borne paints and printing inks incl. can coatings	13.5	0.2–1.5
W'Add 6235	Solution of polyacrylate-mod. PDMS	Especially for solvent-borne and solvent-free epoxy and thick-layer systems	8.5	0.5–1.0
W'Add 6236	PDMS solution	Especially for highly filled solvent-borne and solvent-free PUR and thick-layer systems	12	0.5–1.0

Applications / Overview of uses

Product	Solvent system			Use							Application			Curing method			
	Solvent-borne	Solvent-free	High solids	Decorative	Industrial	Flooring systems	Automotive	Wood/Furniture coatings	Coil coating	Printing inks	Brush/Roll	Spray	Dipping	Air	Oven	2-pack	UV
W'Add 370	●	◐	●	●	●	◐	●	●	○	●	●	●	●	●	○	●	○
W'Add 372	●	◐	●	●	●	◐	●	●	○	●	●	●	●	●	○	●	○
W'Add 425	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○
W'Add 602	●	●	◐	◐	◐	●	○	○	○	○	●	●	●	●	○	●	○
W'Add 603	●	◐	●	●	●	◐	●	●	○	●	●	●	●	●	○	●	●
W'Add 6235	●	●	●	●	●	●	◐	◐	○	○	●	◐	◐	●	○	●	○
W'Add 6236	●	●	●	●	●	●	◐	◐	○	○	●	◐	◐	●	○	●	○

● recommended ◐ partially suitable ○ not recommended

03 Substrate wetting agents

Worlée substrate wetting agents

Overview of properties

Product	Chemical characteristic	Highlighted application / Effect	Active substance %	Use level % (on total formulation)
W'Add 345	Formulation of silicone copolyether and dioctylsulphosuccinate	Improves the substrate wetting and penetration of aqueous formulations	71	0.3–1.5
W'Add 3410	Polyethermod. PDMS trisiloxane	For all kinds of aqueous air-drying industrial, automotive, wood and architectural coatings and 2-pack PUR systems; no influence on surface slip, no foam stabilisation	50	0.2–1.5
W'Add 3440	PDMS copolymer	For all kinds of aqueous air-drying industrial, automotive, wood and architectural coatings and 2-pack PUR systems; no influence on surface slip; better against craters than W'Add VP 3410	100	0.1–1.0

Applications / Overview of uses

Product	Use					Application			Curing method		Effects		
	Decorative	Industrial	Automotive	Wood/Furniture coatings	Printing inks	Brush/Roll	Spray	Dipping	Air	2-Pack	Substrate wetting	Flow and levelling	Surface defects
W'Add 345	●	●	○	●	●	●	●	●	●	○	●	◐	◐
W'Add 3410	●	●	●	●	○	●	●	●	●	●	●	●	◐
W'Add 3440	●	●	●	●	●	●	●	●	●	●	●	●	●

● recommended ◐ partially suitable ○ not recommended

04 Acrylic flow and levelling agents

Worlée flow and levelling agents

Overview of properties

Product	Chemical characteristic	Highlighted application / Effect	Active substance %	Use level % (on total formulation)	Coating system: Aqueous	Coating system: Solvent-borne	Coating system: Solvent-free
Resiflow FK 70	Amino-resin-modified acrylic copolymer	Especially developed for solvent-based, stoving systems	70	0.3–2.0	○	●	○
Resiflow FL 2	Polyacrylate	Especially for coil and can coatings, 2K-PUR and high solids; weatherproof, UV-resistant	100	0.2–2.0	○	●	●
Resiflow FL 2-50	Diluted polyacrylate	Easy to dose; especially for coil and can coatings, 2K-PUR and high solids; weatherproof, UV-resistant	50	0.4–4.0	○	●	●
Resiflow FL 9	Polyacrylate	Especially for coil coatings, 2K-PUR and high solids; weatherproof, UV- and hydrolysis-resistant	100	0.5–1.5	○	●	●
Resiflow FM 4	Acrylic compound	Especially for coil coatings, 2K-PUR, high solids and UV-curing systems; weatherproof, UV- and hydrolysis-resistant; improves impact resistance, flexibility and adhesion	100	0.2–2.0	○	●	●
Resiflow FM 4-50	Acrylic compound	Easy to dose; especially for coil coatings, 2K-PUR, high solids and UV-curing systems; weatherproof, UV- and hydrolysis-resistant; improves impact resistance, flexibility and adhesion	50	0.4–4.0	○	●	●
Resiflow L 66 F	High viscosity, carboxyl functional polyacrylate	Compatible with great variety of coating systems; provides exceptional clarity in clear-coat systems	100	0.2–1.5	○	●	●
Resiflow L 3075	Acrylic polymer	Exhibits excellent hydrolytic stability and outdoor durability and does not yellow or lose gloss when exposed to UV radiation	75	0.2–2.0	○	●	○
Resiflow LH 241	Carboxyl functional acrylic compound	Cross-linking in stoving systems; supports de-airing and reduces dirt pickup; excellent weather, UV and hydrolisis stability	100	0.2–2.0	○	●	●
Resiflow LH-240	Surface active oligomer, hydroxyl functional	Cross-linking in stoving systems; supports de-airing and reduces dirt pickup; excellent weather, UV and hydrolisis stability	100	0.2–2.0	○	●	●
Resiflow LW	Polyacrylate	Especially for 1K/2K high solids; excellent weather, UV and hydrolisis stability	100	0.2–2.0	○	●	●
Resiflow W 51	Carboxyl functional acrylic polymer; ethylacrylat	Especially for can and coil coatings; excellent weather and UV stability	50	0.5–2.0	●	●	●
Resiflow W 52	Carboxyl functional acrylic polymer; butylacrylat	Especially for coil coatings; excellent weather and UV stability	50	0.5–2.0	●	●	●
Resiflow W 5200	Modified polyacrylate, carboxyl functional	Excellent compatibility with various resins; no effect on transparency of clear coats	96	0.2–1.5	●	●	○
W'Add 100	Modified polyacrylate	Polymeric flow control agent to correct surface imperfections in coating and printing ink formulations	100	0.3–1.0	○	●	●
W'Add 101	Modified polyacrylate	Polymeric flow control agent to correct surface imperfections in coating and printing ink formulations	100	0.1–1.0	○	●	●

● recommended ◐ partially suitable ○ not recommended

Applications / Overview of uses

Product	Use								Application			Curing method				Effects							
	Decorative	Industrial	Automotive	Wood/Furniture coatings	High solids	Can coating	Coil coatings	Printing inks	Brush/Roll	Spray	Dipping	Air	Oven	2-pack	UV	De-aring	Flow and levelling	Surface defects	Flexibility/Impact resistance	Gloss	Dirt pickup	Pigment flooding	Adhesion to metals
Resiflow FK 70	○	●	●	○	○	○	●	○	○	●	●	○	●	○	○	●	●	●	○	○	○	●	○
Resiflow FL 2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	○	○	○	○
Resiflow FL 2-50	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	○	○	○	○
Resiflow FL 9	●	●	●	●	●	○	●	●	●	●	●	●	●	●	●	●	●	●	○	○	○	○	○
Resiflow FM 4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	○	○	●
Resiflow FM 4-50	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	○	○	●
Resiflow L 66 F	●	●	●	●	●	○	●	●	●	●	●	●	●	●	●	●	●	●	○	○	○	○	○
Resiflow L 3075	●	●	●	●	●	○	●	○	●	●	●	●	●	●	●	●	●	●	○	○	○	○	○
Resiflow LH 241	●	●	●	●	●	○	●	○	●	●	●	●	●	●	○	●	●	●	○	○	○	○	○
Resiflow LH-240	●	●	●	●	●	○	●	○	●	●	●	●	●	●	○	●	●	●	●	○	●	○	●
Resiflow LW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	○	○
Resiflow W 51	●	●	●	●	○	●	●	●	●	●	●	●	●		●	●	●	●	●	○	○	○	○
Resiflow W 52	●	●	●	●	○	○	●	●	●	●	●	●	●	●	●	●	●	●	●	○	○	○	○
Resiflow W 5200	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	○	○	○	○
W'Add 100	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	○	○	○	○
W'Add 101	●	●	●	●	●	○	●	●	●	●	●	●	●	●	●	●	●	●	○	○	○	○	○

● recommended ◐ partially suitable ○ not recommended

05 Silicone surface additives

Worlée silicone surface additives

Overview of properties

Product	Chemical characteristic	Highlighted application / Effect	Active sub-stance %	Use level % (on total formulation)	Coating system		
					Aqueous	Solvent-borne	Solvent-free
W'Add 311	Polyether-mod. PDMS	For solvent-borne air- and UV-drying systems; multifunctional additive to improve levelling and scratch resistance; prevents pigment floating	10 / 30	0.1–1.0 (10%) 0.03–0.3 (30%)	○	●	○
W'Add 312	Polyether-mod. PDMS	Especially for aroma-free decorative and DIY coatings	10	0,1–1,0	○	●	○
W'Add 315	Polyether-mod. PDMS	Silicone paint additive to improve surface slip, mar resistance, substrate wetting, flow and levelling and gloss; particularly for clear-coat formulations	10	0.1–1.0	○	●	○
W'Add 327	Polyether-mod. PDMS	For solvent-based, air-drying coatings; provides high mar resistance by increasing the surface slip	20	0,1–1,5	○	●	○
W'Add 328	Polyether-mod. PDMS	For 2K PUR and UV curing varnishes and printing inks; highly effective at low concentrations	100	0,2–1,0	○	●	○
W'Add 330	Mod. PDMS	For water-thinnable systems; improves the overspray absorption in wet-in-wet applications; reduces/avoids edge pulling	10	0.3–0.5	●	○	○
W'Add 373 N	Org. mod. PDMS	For alkyd-based decorative paints and DIY lacquers for brush and roll application; multifunctional	3	0.2–1.0	○	●	○
W'Add 429	Org. mod. PDMS	For solvent-borne matted systems; supports the rising and orientation of silica-based matting agents and improves matting	10	0.2–1.0	○	●	○
W'Add 3520	High molecular PDMS	For 2K PUR systems; improves scratch resistance of water-thinnable lacquers and printing inks as well as satin gloss to glossy systems; significantly reduces blocking	78	0.3–1.0	●	○	○
W'Add VP 3530	High molecular PDMS	For water-thinnable and alcohol-based paints, printing inks and overprint varnishes	70	0.1–1.0	●	◐	○
W'Add VP 3540	Org. mod. PDMS	For solvent-based paints and coatings incl. curtain coatings; stable up to 200 °C	30	0.2–1.0	○	●	○
W'Add VP 3585	Polyether-mod. PDMS	For solvent- and water-based paints and lacquers, printing inks, overprint varnishes and UV-hardening systems; improves levelling and scratch resistance; prevents pigment floating and surface defects	100	0.01–0.5	●	●	○

● recommended ◐ partially suitable ○ not recommended

Applications / Overview of uses

		Product	W'Add 311	W'Add 312	W'Add 315	W'Add 327	W'Add 328	W'Add 330	W'Add 373 N	W'Add 429	W'Add 3520	W'Add VP 3530	W'Add VP 3540	W'Add VP 3585
Use		Decorative	●	●	●	●	●	○	●	●	●	●	●	●
		Industrial	●	○	●	●	●	●	○	○	●	●	●	●
		Automotive	●	○	●	●	●	○	○	○	●	●	●	●
		Wood/Furniture coatings	●	○	●	●	●	○	●	●	●	●	●	●
		High solids	●	●	●	●	●	○	●	●	○	○	●	●
		Printing inks	○	○	○	○	○	○	●	○	○	○	●	●
	Application	Brush/Roll	●	●	●	●	●	○	●	●	●	●	●	●
		Spray	●	●	●	●	●	●	●	○	●	●	●	●
		Dipping	●	○	○	●	○	○	○	○	●	●	●	●
		Air	●	●	●	●	●	○	●	●	●	●	●	●
	Curing method	Oven	○	●	○	○	○	○	●	○	○	○	○	○
		2-pack	●	●	●	●	●	○	○	○	●	●	●	●
		UV	●	●	○	○	○	○	○	○	○	○	○	○
Effects		Defoaming	○	○	○	○	○	●	●	○	○	○	○	○
		De-aring	○	●	○	○	○	●	●	○	○	○	○	○
		Substrate wetting	●	●	○	○	●	●	●	●	●	●	●	●
		Flow and levelling	●	●	◐	●	●	●	●	●	●	●	●	●
		Mar resistance	●	●	●	●	●	●	○	●	●	●	●	●
		Surface slip	●	●	●	●	●	●	○	●	●	●	●	●
		Surface defects	●	●	●	○	○	●	●	●	●	●	●	●
		Gloss	●	○	○	○	○	○	●	●	●	○	●	●
		Pigment flooding	●	●	○	○	○	●	○	○	●	●	●	●
		Orientation of matting agents	○	○	○	○	●	○	○	○	○	○	○	○
		Anti-blocking	●	●	●	●	○	○	○	○	○	○	○	○

● recommended ◐ partially suitable ○ not recommended

06 Adhesion promoters and special primers

Worlée adhesion promoters

Overview of properties

Product	Chemical characteristic	Highlighted application / Effect	Active substance %	Use level % (on total formulation)
W'Add 480 N	Specially mod. epoxy ester	Aqueous baking enamels and polyurethane systems	70	1.0–5.0
W'Add 484	Specially mod. polyester	Solvent-borne baking enamels and polyurethane systems; NMP-free	77	1.0–3.0
W'Add 486	Special polyester	Solvent-borne air-drying and stoving polyurethane systems; stable up to 180 °C	75	1.0–3.0
W'Add 487	Special polyester	Solvent-borne air-drying and stoving polyurethane systems; stable up to 180 °C; NMP-free	75–80	1.0–3.0
W'Add 4820	Isocyanate functional polymer	Solvent-borne and solvent-free polyurethane systems	80	2.5–5.0

Applications / Overview of uses

Product	Reactive	Coating system				Use						Curing method				Effects			
		Aqueous	Solvent-borne	Solvent-free	Aroma-free	Decorative	Industrial	Wood/Furniture coatings	Can coating	Coil coatings	Printing inks	Air	Oven	2-pack	UV	Flexibility/Impact resistance	Adhesion to metals	Adhesion to glass/ Ceramic	Adhesion to melamin coated chipboard
W'Add 480 N	○	●	○	○	○	○	●	○	○	○	○	●	●	●	○	○	●	●	○
W'Add 484	○	◐	●	○	○	●	●	●	●	●	○	○	●	●	○	●	●	○	●
W'Add 486	○	○	●	○	○	●	●	●	○	●	○	●	●	●	○	●	●	○	●
W'Add 487	○	○	●	○	○	●	●	●	○	●	○	●	●	●	○	●	●	○	●
W'Add 4820	●	○	●	●	○	●	●	○	○	○	○	●	○	●	○	○	●	●	○

● recommended ◐ partially suitable ○ not recommended

Worlée special primers

Overview of properties

Product	Properties	Appearance / Use	Non-volatiles %	solvent	Flash point °C approx.
Special-Primer AP 1010	Adhesion promoter for flexible substrates; for immediate or subsequent painting, printing, gluing and labelling	White pigmented solution; ready for use	4	Xylene	25
Special-Primer AP 1030	Adhesion promoter for flexible substrates; for immediate or subsequent painting, printing, gluing and labelling	White pigmented solution; ready for use	4	Xylene	25
Special-Primer PE 6800	Adhesion promoter for untreated polyethylene for subsequent coating or printing	Yellowish to brown, low-viscosity liquid; dilute down to 2.5 % solids	5	Xylene	25
Special-Primer PP 3200 W	Aqueous adhesion promoter based on specially modified, low-chlorinated polypropylene	Low-viscosity, brownish and turbid liquid; dilute down to 10 % solids or incorporate in adhesives, inks and paints;	30	Water	n.a.
Special-Primer PP 5130	Adhesion promoter especially for polypropylene; use on other substrates may be possible (testing)	Yellowish, low-viscosity liquid; ready to use (2.5 %); dilute down to 2.5 %	2.5 or 5	Xylene	25
Special-Primer PP 7550	Like Special-Primer PP 5130 but for 2-pack EP or PUR systems with improved adhesion promotion on different PP substrates and aluminium	Colourless to yellowish, clear liquid; dilute down to 2.5 %	5	Xylene	25
Special-Primer PP 7560	Like Special-Primer PP 5130 with improved adhesion promotion on different PP substrates	Yellowish, low-viscosity liquid; dilute down to 2.5 %	10	Xylene	25
Special-Primer PP 7580	Adhesion promoter for untreated polypropylene for subsequent painting, printing, gluing; best adhesion properties	Colourless to yellowish, clear liquid; ready for use	2.5	Xylene	25

Applications / Overview of uses

Product	Aerosol-compatible	Application method					Substrates									
		Spraying (airless, air)	Aerosol can	Dipping	Floating	Printing	Rigid	Flexible	Foil	Thermoplastic rubber	Thermoplastic PUR	Polyethylene	Polypropylene	Polyolefine blends	EPDM	Aluminium
Special-Primer AP 1010	○	●	●	●	●	●	○	●	●	●	●	●	●	●	●	○
Special-Primer AP 1030	○	●	○	●	●	●	○	●	●	●	●	●	●	●	●	○
Special-Primer PE 6800	○	●	○	●	○	●	●	●	○	○	○	●	○	○	○	○
Special-Primer PP 3200 W	○	●	○	●	◐	●	●	●	◐	○	○	◐	●	●	○	○
Special-Primer PP 5130	○	●	○	●	○	●	●	●	●	◐	◐	◐	●	◐	◐	○
Special-Primer PP 7550	○	●	○	●	○	●	●	●	●	○	○	○	●	○	○	●
Special-Primer PP 7560	○	●	○	●	○	●	●	●	●	○	○	○	●	○	○	●
Special-Primer PP 7580	○	●	○	●	○	●	●	●	●	◐	◐	◐	●	◐	◐	○

● recommended ◐ partially suitable ○ not recommended

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