



Additives Guide
SPECIALTY ADDITIVES

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This range represents specialty additives with unique chemistries and exceptional technical features.



MULTI-PURPOSE ADDITIVES (DELTA-S® 5225 & DELTA-S® 5220)

DELTA-S® 5225 is a multi-functional additive as it can be used as well as:

- Color acceptance improver
- Sole dispersion control additive for the manufacturing of universal colorants
- Dispersant of choice for transparent iron oxides
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DELTA-S® 5220 is a multi-functional additive as it can be used as well as:

- Color acceptance improver
- Dispersant of choice for transparent iron oxides
- Excellent dispersion control additive for inorganic pigments and extenders in water- and solvent-based systems
- Dispersant of choice the preparation of slurries and matting agent dispersions

Both DELTA-S® 5225 and DELTA-S® 5220 are 100% active, APE-free dispersion control additives. They based on unsaturated fatty acids having polar heads based on tertiary amines.

The hydrophobic chains have unsaturated character which allows the additive to be liquid at room temperature (easy handling). In addition, the 'unsaturation' provides drying properties by cross-linking in the presence of oxygen.

The hydrophilic heads (tertiary amines) allow the additive to be effective dispersion control additive by acting as excellent anchoring groups.

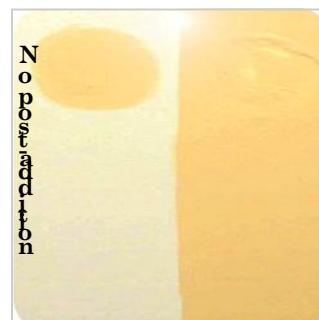
The anchoring groups used in DELTA-S® 5225 are similar to those of our high molecular weight dispersion control additives (DELTA-DC® 3000-series) and hence have strong affinity towards pigment surfaces (Inorganic, Organic and carbon black pigments).

DELTA-S® 5220 has special anchoring groups allowing the additive to drastically reduce the viscosity of inorganic pigments and extenders. Slurries and highly pigmented iron oxide or titanium dioxide pastes can be prepared by using one single dispersion control additive.

- Colour acceptance

It is possible to improve colour acceptance of base paints (solvent- and water-based paints) when using both DELTA-S® 5225 or DELTA-S® 5220 as post-additives by preventing the 'de-wetting' of surfactants (surfactant stripping) used for the formulation of universal colorants.

0.5-1.5 parts by weight of either DELTA-S® 5225 or DELTA-S® 5220 into the white base paint (alkyd or emulsion base) can make a world of difference.

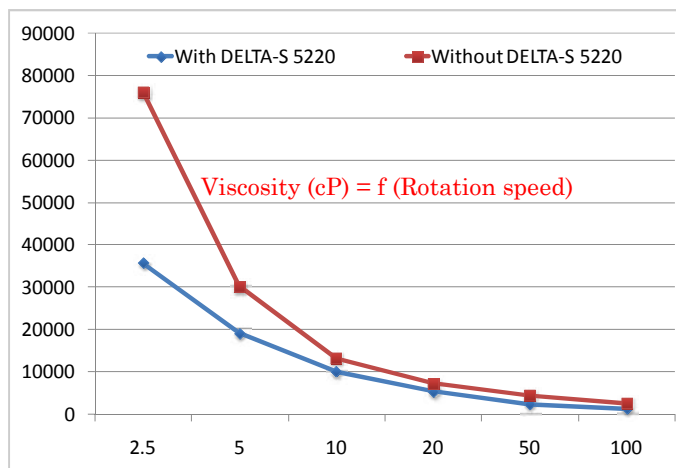


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- Dispersion of transparent iron oxides



Internal reference: Formulation 8/2009	Sicotrans Red L 2819XH (BASF)	
Aldehyde resin* (60% in Solvesso 100)	17.6	17.6
DELTA-S® 5220	--	5.0
Solvesso 100	25.9	23.5
Methoxypropylacetate (MPA)	26.0	23.4
Bentone 38 (Elementis)	0.5	0.5
Pigment	30.0	30.0
Total weight	100.0	100.0



The above pigment concentrates (with and without DELTA-S® 5220) were let-down in a nitrocellulose/short-oil alkyd vanish (Wood coatings).

Given the universality of the dispersing resin used and the excellent compatibility of DELTA-S® 5220 (absence of any solvent), pigment concentrates based on DELTA-S® 5220 can be used to tint most of the resin systems available in the market.

From the above graph, it is obvious that DELTA-S® 5220 provides excellent viscosity reduction in the pigment concentrate which is a direct indication of the excellent colour development (draw-down on the left).

DELTA-S® 5225 would give the same effect but slightly less pronounced than with DELTA-S® 5220.

- Slurries

Highly filled slurries (Calcium carbonate, talc, china clay or even titanium dioxide) can be manufactured using either DELTA-S® 5220 or/and DELTA-S® 5225. Guiding formulations are available upon request.

(*) e.g. Laropal A 81 (BASF)

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- Universal colorants for architectural paints

Production of colorants is essential for tinting of the architectural paints. Tinting systems require that the pre-dispersed colorants contain the same resin as the base (old system).

Ideally these tinting pastes would be compatible with water-based as well as solvent-based bases.

With DELTA-S® 5225, you can from now onward formulate your 16 colorants without any resin and with only one dispersion control additive. Making universal colorants has never been so easy!

Given its unique chemistry and the absence of any carrier, DELTA-S® 5225 will enable customers to:

- Meet the stringent VOC restrictions in place today
- Comply with the current and anticipated requirements in terms of APEs (Aryl phenyl ethoxylates) and environmental aspects



In view of the future environmental legislation and increased health and safety awareness, more and more paint manufacturers in the Middle East market will opt for APE-free products.

Due to many construction projects in the pipeline and the unusual and fast growth in the DIY (Do-It-Yourself) concept, demand for both interior and exterior paints from end-consumers in the Middle East will witness a steady increase in the coming years.

DELTA-S® 5225 will enable paint manufacturers to formulate environmentally friendly colorants, with no APE raw materials and lowered or no VOC content.

The following formulations, developed for in-plant-tinting have been tested in our technical service laboratory in various white base paints (water- and solvent-based) from different manufacturers in the Middle East.

Their compatibility and stability over time are just stunning.



Internal reference: Formulation 11/2009	PY 74	PB 15:3	PR 112	PG 7	PR 101	PY 42	PW 6	PBk 7
Monoethyleneglycol	18.0	16.0	11.0	16.0	15.3	18.0	15.5	18.0
DELTA-S® 5225	6.5	10.0	17.0	10.0	6.6	7.7	7.3	4.5
Demi-Water	33.8	32.8	38.7	32.8	12.0	17.2	14.1	57.7
NaOH (25% in water)	1.0	1.5	2.6	1.5	1.0	1.1	1.1	1.1
DELTA-FC® 1525	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Anti-settling	--	--	--	--	0.3	0.3	0.3	--
Preservative	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Pigment	40.0	39.0	30.0	39.0	64.0	55.0	61.0	18.0
Total weight	100.0	100.0	100.0	100.0	99.9	100.0	100.0	100.0
Pigment characteristics	BET=17	BET=57	BET=30	BET=44	OA=26	OA=34	OA=16	DBP=93

Please note that the above formulations were established using specific pigments with determined OA-,

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BET- and DBP-value (Please refer to CHOOSING A DISPERSION CONTROL ADDITIVE). In case you use pigments with different properties, it is obvious that your formulations would need some adjustments. Should you require tailored colorant formulations for your own system (s), our Technical Service technicians would be more than pleased to assist. We can indeed provide you with all the support you need to develop your own tinting system.

REPLACEMENT FOR COBALT DRIER

MORDRY® 410 is a highly efficient replacement for cobalt drier in urethane-modified alkyds and alkyds. It can be efficiently applied in clear and brightly pigmented urethane-modified alkyds and in conventional alkyds, which tend to discolor.

As compared to cobalt octoate, MORDRY® 410 can offer superior properties such as:

- The minimization of discoloration of clear urethane-modified alkyds in can
- The improvement of alkali resistance
- The increase in yellowing resistance of air-drying alkyd finishes especially those subjected to prolonged heat or alkaline fumes
- The prevention of 'loss of dry' on aging
- The relative lower level of toxicity compared to cobalt

To highlight its performance, MORDRY® 410 was tested in 2 different urethane-modified alkyds (see table below) in comparison to Cobalt octoate, considered to be the benchmark.

Internal reference: Formulation 6/2009	Formulation 1	Formulation 2	Formulation 3	Formulation 4
Uralac AR 202 W50 (DSM)	80.00 pbw	80.00 pbw	--	--
U-alkyd 20621 (60%) (Local)	--	-	80.00 pbw	80.00 pbw
White Spirit	18.96 pbw	18.96 pbw	18.46 pbw	18.46 pbw
MORDRY® 410	0.24 pbw	--	0.30 pbw	--
MORDRY® Cobalt 10%	--	0.24 pbw	--	0.30 pbw
MORDRY® Calcium 10%	0.48 pbw	0.48 pbw	0.48 pbw	0.48 pbw
MORDRY® Zirconium 18%	0.80 pbw	0.80 pbw	0.80 pbw	0.80 pbw
Color/Gardner	4 – 5	13 – 14	4 – 5	14
Drying time @25°C (min)	140 min	130 min	150 min	145 min



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MORDRY® 410 WD is the water-dispersible version of MORDRY® 410 suitable for water-reducible coatings.

ANTI-GEL ADDITIVE

DELTA-S® 5700 is an anti-gel agent and viscosity stabilizer for air-drying and stoving coating systems.

It delays/prevents thickening, which can occur as a result of oxidation or condensation of the binder. It also reduces the reaction of the pigments with the vehicle.

It is usually added prior to grinding, but already gelled materials can be restored to processing viscosity by the addition of DELTA-S® 5700.

SYNERGIST ADDITIVE

DELTA-S® 5745 is a polar pigment derivative (dyestuff), which is used in conjunction with a high molecular weight dispersion control additives (DELTA-DC® 3000-series) to enable efficient anchoring of the dispersant to the pigment.

It is primarily used with certain difficult non-polar organic pigments (Phtalo-cyanine blue and green pigments) and carbon black pigments, which do not enable good interaction with common dispersant anchoring groups.

Adding between 0.5% and 1.0% in the formulation along with one of DELTA-DC® 3000-series dispersion control additives will enable viscosity reduction in the mill-base and therefore improve the dispersion process.

METAL-FREE ACCELERATOR AND STABILIZER

MORDRY® AWD is a cost-effective metal-free accelerator and stabilizer for water-borne coatings.

Many waterborne coatings are prone to loss-of-dry upon extended storage. These compounds coordinate with the drying metals, specifically cobalt and manganese, and promote significantly faster dry.

This complexing action protects the active metals from hydrolysis over time and minimizes loss-of-dry in the customer's waterborne formula. This enhanced activity can also be seen in improved water resistance and higher gloss.

THIXOTROPIC ADDITIVE

DELTA-S® PN is a liquid thixotropic additive that builds its thixotropic structure through interaction of its molecules with the reactive groups distributed over the polymer of the latex emulsion or thickener.

This interaction occurs through hydrogen and covalent bonding with active sites of the polymer, thus creating a network structure.

The achieved thixotropic behavior of the coating results in:

- High viscosity at rest and during storage preventing settling or sedimentation
- Cessation of pigment separation (mostly in can) in formulations containing more than one type of pigments

Upon shear and during coating application, the network structure almost completely breaks enabling good flow and leveling of the coating. Right after shear removal, the network structure rebuilds again preventing sagging of the coating.

DELTA-S® PN doesn't thicken water by itself. It needs a binder containing system to give its effect.

The normal usage level for DELTA-S® PN is between 0.5% and 2.0% (as supplied) upon total formulation weight.

**Some think business opportunities,
we think business partnerships**

DELTA specialties

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