

# MSB

## 1. Description

MSB is an assortment of unfinished coloured base concentrates which allows producing spot and process colours for various applications, primarily using offset technology.

The role of the technology additives is to optimise the press performance. When adding additives or varnishes which are not part of the MSB package (described in chapter 4), no assurance on print performance is given.

When printing packaging for sensitive goods (e.g. food), the use of SunPak® FSP or SunPak LMQ base inks are the preferred products, see also chapter 8 of this document.

## 2. Product features

MSB base concentrates:

- are vegetable based and free of mineral oils
- consist out of a set of 34 highly concentrated bases and two whites
- allow to formulate inks which dry by penetration and/or oxidation
- have pure colour shades allowing to obtain very clean colours.
- unblended bases do not contain waxes, drying catalysts or any other reactive compounds
- are rheologically balanced
- MSB bases are not supposed to be blended with Cobalt compounds.

## 3. Product Suitability

### 3.1 Applications

MSB is intended for use in offset printing. Its unique concept allows to formulate inks for a wide variety of applications including:

- standard oil based sheetfed offset (ST)
- web offset heatset (H/S)
- web offset coldset (C/S)
- business form printing on narrow web presses (CT)
- wax free oil based offset for subsequent finishing (BL)
- hard drying for oil based offset (HR)
- for non absorbant substrates for oil based offset (FO)
- Sunlit Titan Eco quality (TNE)

Inks produced from the MSB system are not suitable for the following applications:

- Food packaging applications without functional barrier (see chapter 8)
- Waterless offset printing



### 3.2 Substrate

From MSB, inks can be formulated for the following substrates:

- any kind of matt/silk coated paper
- any kind of gloss coated paper
- any kind of uncoated paper ("offset paper")
- any kind of coated and uncoated cardboard
- suitable impervious substrates

NB: The paper quality will influence the drying performance and the gloss of the print.

### 3.3 Varnishability

Printed sheets with inks made from MSB can be finished either with an oil based overprint varnish or a water based overprint varnish.

When applying inline UV coatings a suitable primer is mandatory. When offline UV coating is applied, a water based primer is recommended or a waiting time of at least 48h is necessary. The impact of the ink resistances has to be taken into consideration as well.

### 3.4 Interaction with plastic films

In some cases printed material is wrapped with plastic films. Some polymer films (like Polyethylene or Polypropylene) tend to absorb liquid ink components resulting in a cloudy appearance of the film or a dimension change, often described as "swelling".

MSB has a significantly reduced potential of solvent migration, however a test under industrial condition is advised if film swelling could be an issue (especially when additives are used which are mineral oil based).

### 3.5 Hot Foil stamping

The adhesion between the different layers such as carton board, ink, varnish and lamination foil is essential for the final result. Therefore for hot foil stamping applications a waiting time of minimum 48 hours is requested. A suitable combination of water based coating and foil is mandatory.

### 3.6 Adhesion and drying on non-absorbent (impervious) substrates

The surface and the chemistry of the substrate have a strong impact on the drying performance/adhesion and should be tested under industrial conditions prior to a commercial print run.

Plasticisers used for example in PVC films can resoften the dried ink film and must therefore be avoided.

For some substrates a corona treatment might be required before printing.



## 4. Product Range

### 4.1 MSB Base Range

MSB bases are available as concentrates, not ready to print.

The following table sums up the light fastness (ISO 12040) and the resistances (ISO2836) of the bases:

Product Code	Base	Description	Light fastness ISO12040			Alcohol ISO 2836	Solvent mixture ISO 2836	Alkali ISO 2836
			100%	10%	2%			
Group 1: The Basic ones								
MSB12	YELLOW	Mid shade Yellow	6/7	5	4	+	-	+
MSB18	YELLOW	Mid shade Yellow	5	3	2	+	+	+
MSB21	ORANGE	Orange	5	4	3	+	+	+
MSB31	WARM RED	Warm Red***	3	2	1	-	-	-
MSB33	RED	Resistant Warm Red <sup>#</sup>	5	4	4	-	-	+
MSB36	RED	Resistant Magenta	6	5	4	+	+	+
MSB42	RUBINE	Red shade Magenta**	5	4	4	+	+	-
MSB54	RESISTANT PINK	Resistant Pink	7	7	6/7	+	+	+
MSB53	VIOLET	Resistant Violet	7	6	5	+	+	+
MSB91	REFLEX BLUE	Reflex Blue shade*	3	2	2	-	-	+
MSB17	BLUE	Cyan	8	7	6/7	+	+	+
MSB71	GREEN	Green	8	7	6/7	+	+	+
MSB50	BLACK	Untoned Black	8	8	7	+	+	+
MSB45	OPAQUE WHITE	Opaque White**						
MSB48	TRANSP. WHITE	Transparent White						
Group 2: The Optional Ones								
MSB11	YELLOW	Green shade Yellow**	7	6	5	-	-	+
MSB13	YELLOW	Green shade Yellow	5	4	4	+	+	+
MSB15	YELLOW	Green shade Yellow	5/6	4	3	+	+	+
MSB06	ORANGE	Opaque Orange	4	3	2	+	+	+
MSB23	WARM RED	Intense warm Red	3	2	1	-	-	-
MSB32	RED 032	Pantone 32 shade Red	6	5	5	+	-	+



Product Code	Base	Description	Light fastness ISO12040			Alcohol ISO 2836	Solvent mixture	Alkali ISO 2836
MSB34	RED	Blue shade Magenta	3	2	2	+	-	+
MSB40	RED	Resistant Warm Red***	4	3	2	+	+	+
MSB35	RUBINE	Blue shade Magenta	5	4	3	+	+	-
MSB55	RHODAMINE RED	Rhodamine Red*	4	3	2	-	-	-
MSB51	PURPLE#	Purple*	4	3	2	-	-	-
MSB52	VIOLET	Violet*	4	3	2	-	-	-
MSB60	BLUE	Blue*	4	3	2	-	-	-
MSB16	BLUE	Red shade Cyan	8	7	6/7	+	+	+
<i>Group 3: The Special Ones</i>								
MSB10	YELLOW	Green shade Yellow	7	7	6/7	+	+	+
MSB19	WARM YELLOW	Red shade Yellow	6	5/6	5	+	+	+
MSB07	ORANGE	Orange	6/7	6/7	6	+	+	+
MSB22	RED	Red	7	7	6/7	+	+	+
MSB37	CARMINE	Resistant blue shade Magenta	6/7	5	5	+	+	+

\* These inks are based on so-called Triarylcation pigments. This class of pigments do have limited resistances against solvents and alkali and tend to bleeding when overvarnished. A test under industrial conditions is mandatory to avoid customer complaints. Ink will not fade but darken.

\*\*Opaque or semi-opaque

\*\*\*Not recommended for toy packaging

# Please note that this base ink may tend to fade in particular in conjunction with elevated temperatures and when being used in small proportions.



## 4.2 MSB Technology additives

Code	Type	Description and recommendations for use
D110	Sheetfed varnish	Standard letdown varnish for optimum lithographic properties. Recommended for use in all recipes containing more than 50% of MSB bases, instead of Transparent White MSB48.
AD120	Heatset varnish	Letdown varnish for the formulation of inks adapted for heatset printing.
AD210	Sheetfed composite varnish	Composite varnish to be used at 16-18%; containing varnish, wax and anti-setoff. It gives standard intensity sheetfed inks with sufficient mechanical resistance for most applications and especially suitable for finishing processes such as off-line UV varnishing. Adapted rheology should minimise the necessity to use additional additives to adjust tack and viscosity.
AD230	Coldset composite varnish	Varnish compound for the formulation of inks with rheology, press stability and drying adapted for coldset printing.
AD240	Foils composite varnish	Varnish compound for the formulation of inks having fast drying properties for cast coated and impervious substrates (films and foils).
AD250	Foils paste	Paste to be added at 10-15% to improve drying of conventional inks for foils application.
AD260	Titan composite varnish	Vegetable based composite varnish based on the Titan technology and containing also varnish, wax and anti-set off which will provide a very quick drying on all absorbent papers without reducing the freshness of the ink. Designed for printers who want to increase their productivity by reducing their waiting times.
AD310	Perfecting additive	Additive for use in perfecting inks to prevent impression cylinder piling. Can also be used in coldset inks.
AD320	Anti set off additive	Additive giving a higher productivity profile through improved non-set off and fast work and turn properties, but with a higher risk of piling.
AD330	Anti-slip additive	Additive to be used (5 to 15%) in order to reduce slip of inks and overprint varnishes.
AD410	Linseed oil	Viscosity and tack reducer, also giving improved tack stability where using lower quality papers, perfecting, and in business form printing.
AD420	Tack off	Tack reducer which will retain ink setting properties.
AD510	PE wax paste	Standard polyethylene based wax additive for the mechanical resistance of the dried ink film.
AD520	PTFE wax paste	PTFE wax additive giving improved mechanical resistance. May be omitted for improved finishing properties, for example when off-line UV varnishing or laminating.
AD530	Paraffin wax	Wax additive for inks for heatset drying, using AD120 as letdown varnish



Code	Type	Description and recommendations for use
AD810	Anti-oxidant compound	Additive to avoid skin formation on the rollers or in the ink duct (fresh effect). Necessary for business forms applications and other specific requests
AD910	Standard drier	Standard drier, giving surface and through drying adapted for most applications.
AD940	High performance drier	High reactivity surface drier giving faster drying and improved mechanical resistance to the dried ink film, but with limited ink stability in the duct (reduced fresh effect).
AD950	Water active dryer	Special drying catalyst that develops its catalytical potential only when in contact with water (e.g. on a printing press). Helpful in case of very hard oxidative drying inks where standard driers might already start a reaction in the packaged ink

## 5. General Handling

### 5.1 Storage

MSB concentrates should be stored at ambient temperature between 5°C and 35°C.

Concentrates supplied in drums or pails should be used within 24 months after production. Drums and pails having exceeded 24 months may be fit for purpose but must be inspected before usage. Critical is the formation of skin where there is surface contact with air (oxygen). Minor appearance of skin shall be removed, provided that the ink underneath is skin-free. In either case, once the container is opened, the concentrate should be worked off in a timely manner.

### 5.2 Waste disposal

MSB waste can be handled as any other sheetfed ink waste. This should be carried out in accordance with good industrial practice, observing all the appropriate local, national and regional regulations and guidance.



## 6. Printing ink formulation

Code	Description	ST		CT		BL	HR		FO		TNE	H/S	C/S
		Option 1	Option 2	Option 1	Option 2		Option 1	Option 2	Option 1	Option 2			
<b>MSB base</b>	Pigmented concentrates	Max 95 Stand. 80	Stand. 80	Max 93 Stand. 80	Stand. 80	Max 99	Max 92	Stand. 78	Max75	Max 75	Max 80	Max 70	Max 75
<b>MSB48</b>	Transparent White	Balance	Balance	Balance	Balance	Minimum	Balance	Balance	Balance	Balance	Balance		
<b>AD210</b>	Sheetfed composite varnish		18		15			18			0 – 10		
<b>AD110</b>	Let down Varnish	0 - 30	0 - 30	0 - 30	0 - 30	Minimum	0-30	0 - 30		0 – 30	0 - 5		
<b>AD120</b>	Heatset additive											25 - 35	
<b>AD240</b>	Hard drying additive								20				
<b>AD250</b>	Foils paste									10 - 15			
<b>AD260</b>	Titan composite varnish										10 - 20		
<b>AD310</b>	Perfecting additive												0 - 5
<b>AD230</b>	Coldset additive												25 - 60
<b>AD510</b>	PE Wax additive	3		3			3			3			
<b>AD520</b>	PTFE Wax additive	(1)		(1)			2	1		2		1,6 – 2,2	
<b>AD530</b>	Paraffin wax											3,5 – 4,5	
<b>AD910</b>	Standard Drier	2	2	1	1	1	2	2	2	2	2		
<b>AD940</b>	High Performance Drier						1	1	3	3			
<b>AD950</b>	Water active dryer								(0,5 – 1)	(0,5 – 1)			
<b>AD810</b>	Anti-oxidant	(0.5)		1	1								
<b>AD410</b>	Linseed oil	(0 - 2)	(0 - 2)	3	3	(0 - 2)	(0 – 2)	(0 - 2)	(0 - 2)	(0 - 2)	(0 - 2)		
<b>AD420</b>	Tack off 7000	(0 - 3)	(0 - 3)			(0 - 3)							
<b>AD320</b>	Anti set off additive	(0 - 2)	(0 - 2)										
	<b>Total</b>	100 %	100 %	100 %	100 %	100 %	100%	100 %	100 %	100 %	100 %	100 %	100 %

Quantities in brackets ( ) indicate optional additives.

Notes: The balanced viscosities and tacks of AD210 and AD110 normally allow formulation of inks adapted for sheetfed printing on standard substrate grades without addition of reducing additive AD410.



## 7. Printing Conditions and press room consumables

### 7.1 Printing Plates

Inks made from MSB can be run with any type of aluminium based printing plates (CtP plates, conventional positive or negative plates).

### 7.2 Influence of IR drier

The use of IR drier is not recommended as it might lead to an increased tendency of set off in the delivery pile, unless a water-based coating is applied.

### 7.3 Press cleaning

After having printed with inks made from MSB the press can be easily cleaned using standard press washes.

## 8. End-use safety

All Sun Chemical Europe printing inks and related materials are formulated in accordance with the CEPE/EuPIA Exclusion Policy. This excludes from use all materials classified according to the CLP Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures as carcinogenic, mutagenic or toxic for reproduction in categories 1A or 1B with hazard statements H340, H350 or H360, in addition to toxic or highly toxic materials with hazard statements H300, H301, H310, H311, H330, H331, H370 or H372. None of the raw materials used in inks supplied intentionally contain the heavy metals Antimony, Arsenic, Cadmium, Chromium (VI), Lead, Mercury, Selenium. A copy of the document is available on the EuPIA website: <http://www.eupia.org>

Inks made from MSB allow packaging to be produced which meets the requirements of the Packaging and Packaging Waste Directive (94/62/EC) and the CONEG heavy metal limits.

Inks made from MSB (except MSB31 and MSB40) can be used to print packaging which meets the requirements of EN71-3 (toy standard).

Inks made from MSB may not be suitable to fulfil the legal demands and the customer expectations for food packaging. Although the packaging design plays an important role, food compliant (Low Odour / Low Migration) inks are the preferred solution. The relevant Sun Chemical Best Practice guide may advise in this subject.

## 9. Disclaimer

This list of applications, substrates and processes provided in this document is not exhaustive. Please contact your local Sun Chemical representative for full technical evaluation of your application or process.





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## Appendix

### SPOT COLOUR MANAGEMENT

For optimum colour consistency it is recommended to use precise proofing equipment and a colour computer. For MSB users Sun Chemical provide colour data bases for effective colour matching. They are available for various substrates as coated and uncoated papers and for cardboards.

Depending on their colour (whiteness) and on the oil-absorbency one and the same spot colour ink might look differently when being printed on various substrates. Further to this it must be noted that most colours change during the drying process of the ink. If the print is in-line varnished this effect is minimised. These effects must be respected if a precise colour specification is agreed.

Dark colours and those of high colour strength often show the so-called bronzing effect which is a colour impression varying with the observation angle. This is not a product failure and influenced by the surface of the substrate. In-line coating or foil lamination eliminates the bronzing effect.

If (proof) prints are not over coated, the level of gloss, which is substrate depending, will have an impact on the reading of spectrophotometers.

The human eye and spectrophotometers assess bronzing and gloss differently. The make of spectrophotometers, in particular the geometry and the software used, respect gloss and bronzing in the calculation of the colour data in a different way. Therefore, specifying colour data must always include the substrate, the conditions of proof printing, the use of an overprint coating (or not) and the time between printing and assessment.

### FASTNESS AND RESISTANCE REQUIREMENTS

During its lifetime, a print might change its colour. Light fastness and resistance parameters describe the ability of the print to maintain the colour under the conditions of its application. The product table (see page 4 of this document) contains the parameters evaluated using test methods agreed in international standards.

The parameters of the pure base inks are unlike to those of a blended spot colour. As a general rule, it is the base ink with the lowest resistance that defines the overall fastness/resistance value. Higher pigmented inks are usually more persistent, the resistance is reduced the more the strength of the shade is reduced. Resistance levels can also vary in practice caused by a number of factors as pigment compositions, substrate, colour strength, film weight used, the printed picture (solids, screened half-tones), storage conditions, exposure time etc.

### LIGHT FASTNESS

Light fastness is important where prints are exposed to sunlight.

The light fastness for inks for packaging varies with the intended use. Packaging which are supposed to be stored close to a window should have a light fastness of not lower than WS 5.

### CHEMICAL RESISTANCIES

Resistance properties play a role when the prints are processed (coating, foil-laminating) or the prints are exposed to chemicals, as detergents. Water-based overprint varnishes may contain solvents or high percentage of ammonia, which can require the resistance against alkaline and alcohol. A test under practice conditions is advised.

UV coatings contain monomers which might have an impact on the print. Often alkaline, alcohol and solvent resistance are demanded. Again, a test under practice conditions is recommended.



**LOW ODOUR / LOW MIGRATION PRINTING**

Sun Chemical offers 2 solutions: SunPak FSP and SunPak LMQ (Low Migration Quality). Both product lines have excellent Low odour/Low taint properties and minimise the transfer (migration) of any printing ink ingredients. Both series are offered as process colours and base inks.

