

SUNPAK™ LMQ

SunPak LMQ (Low Migration Quality) is a package of innovative products for food and tobacco packaging. SunPak LMQ enables the converter to produce food packaging (folding cartons, wrappers) with a minimum of migration* potential.

SunPak LMQ inks are vegetable based and mineral oil free and have a very low odour and taint. They dry by penetration only and are not supposed to undergo any reaction with oxygen. This results in very low Hexanal* levels (very low odour) but requires in-line overprinting with an aqueous overprint varnish. Therefore SunPak LMQ complies with the organoleptic demands for food or tobacco packaging printing.

SunPak LMQ inks and coatings shall be applied on the (outer) non-food side of the packaging only. The optimum application range of SunPak LMQ is low odour packaging for the food, cosmetic, pharmaceuticals or tobacco industry. Target areas are packaging printers for food or tobacco packaging. Preferred press configurations are straight 4+ colour presses of all makes and sizes with a unit for aqueous coatings.

*Further details on odour/taint, migration and Hexanal are given in the glossary below.

PROCESS COLOURS	PRODUCT CODE	LIGHT FASTNESS ISO 12040	ALCOHOL ISO 2836	SOLVENT MIXTURE ISO 2836	ALKALI ISO 2836
SUNPAK LMQ Process Black	LMP46	8	+	+	+
SUNPAK LMQ Process Cyan	LMP25	8	+	+	+
SUNPAK LMQ Process Magenta	LMP27	5	+	+	-
SUNPAK LMQ Process Yellow	LMP26	5	+	+	+

For SunPak LMQ Base inks and Metallic inks please see next pages.

SunPak LMQ is the industry leading product for safe offset food packaging.

working for you.



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BASE INKS	PRODUCT CODE		LIGHT FASTNESS ISO 12040	ALCOHOL ISO 2836	SOLVENT MIXTURE ISO 2836	ALKALI ISO 2836
SUNPAK LMQ Yellow G 63105	LMB11	Green shade yellow ^{##}	7	+	-	+
SUNPAK LMQ Yellow G 63110	LMB18	Mid shade yellow	5	+	+	+
SUNPAK LMQ DAF** Yellow G 63148	LMB08	Di-arylide free Yellow	6	+	+	+
SUNPAK LMQ Warm Yellow G 63145	LMB19	Warm shade Yellow	6	+	+	+
SUNPAK LMQ Orange O 63200	LMB21	Orange	5	+	+	+
SUNPAK LMQ Red R 63300	LMB33	Resistant warm red	5	+	-	+
SUNPAK LMQ Rubine P 63705	LMB35	Blue shade Magenta	5	+	+	-
SUNPAK LMQ Carmine P 63710	LMB37	Resistant blue shade Mag.	6	+	+	+
SUNPAK LMQ Rubine P 63700	LMB42	Red shade Magenta	5	+	+	-
SUNPAK LMQ Red R 63330	LMB36	Resistant Magenta	6	+	+	+
SUNPAK LMQ Resistant Pink P 63730	LMB54	Resistant Pink	7	+	+	+
SUNPAK LMQ Violet P 63780	LMB53	Resistant Violet	7	+	+	+
SUNPAK LMQ Reflex Blue B 63450	LMB65	Reflex Blue Shade [#]	4	-	-	+
SUNPAK LMQ Blue B 63420	LMB17	Cyan	8	+	+	+
SUNPAK LMQ Green V 63500	LMB71	Green	8	+	+	+
SUNPAK LMQ Black S 63900	LMB50	Untoned Black	8	+	+	+
SUNPAK LMQ Transparent White W 63020	LMB48	Transparent White				
SUNPAK LMQ Opaque White W 63040	LMB45	Opaque White				

[#]These inks are based on so-called Triarylcationium pigments. This class of pigments do have limited resistancies against solvents and alkali and tend to bleeding when overvarnished. A test under industrial conditions is mandatory to avoid customer complaints.

^{##} semi opaque

** DAF = Di-arylide free. See comment on oven or microwave applications in the glossary.



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METALLIC INKS	PRODUCT CODE
SUNPAK LMQ Pale Gold	MT521
SUNPAK LMQ Rich Pale Gold	MT522
SUNPAK LMQ Rich Gold	MT523
SUNPAK LMQ Premium Silver	MT511
SUNPAK LMQ Varnish untuned	MT591
SUNPAK LMQ Varnish toned	MT592

PREPARATION / ADDITIVES

SunPak LMQ Metallics are supplied as a 2 pack system. It is recommended to mix the two components directly before printing. The mixing ratios are:

Gold Bronze : Varnish = 1 : 1
 Depend on the substrate the ratio can be raised up to 6 : 4

Silver Bronze : Varnish = 3 : 7

The addition of any other additives is not advised. Please note that mixed ink will deteriorate by time concerning organoleptic properties. Therefore, the storage of (mixed) finished inks should be avoided.

GENERAL INFORMATION

SunPak LMQ Metallics are supplied as a set of 2 vacuum sealed tins.



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CHARACTERISTICS

Very low odour* and taint*
 Good lithographic stability at all press speeds
 High metallic lustre (Metallic inks)

Requires overprinting with a LMQ varnish
 Suitable for hot foil stamping

*Dependent on substrate

ENVIRONMENTAL

It is Sun Chemical's policy to reduce progressively ecological impacts and resource intensity throughout the life-cycle of their products. When selecting raw materials we follow strictly the EuPIA Raw Material Exclusion List (www.eupia.org) and respect the CONEG regulation on toxic heavy metals. SunPak LMQ inks do not contain chemical catalysts based on Cobalt (Co), Manganese (Mn) or other metal catalysts.

PRINT STANDARDISATION (ISO 12647:2, PSO)

Some offset printers commenced to realise print standardisation according to ISO 12647:2 in their press-rooms. The entire offset workflow is regulated comprising the incoming picture data, the dot size and shape on the printing plate and the reproduction of the picture on the print. Finally, the colour of the full-tone and the dot gain of the 4 colours are specified. By their choice of pigments and by their precise dot reproduction, SunPak LMQ supports the realisation of ISO 12647:2 in an offset pressroom. SunPak LMQ complies with industrial standards as ISO 2846:1 (Colour). Sun Chemical has gained a lot of expertise in print standardisation and is an official partner of FOGRA, which is one of the certifying institutes. Please consult Sun Chemical if assistance in this matter is needed.

LMQ FOUNTAIN SOLUTION

SunFount™ LMQ 6222 provides optimum lithography and does not contribute to migration. The plate protection is realised by a food additive.
 SunFount™ LMQ 6222 is suitable for 7-10% IPA in normal water qualities.

LMQ WATER-BASED COATINGS

SunCoat™ LMQ 6212 is suitable for all coating units. The low migration rate qualifies the product to be used in combination with our LMQ inks to achieve optimum results. Due to the minimised ammonia content SunCoat™ LMQ 6212 does not contribute to odour and taint of the print, further SunCoat™ LMQ 6212 ensures a reduced ammonia load in the print room atmosphere.

PRESS AUXILIARIES

SunPak™ LMQ Thinner LMC69 lowers the viscosity of the ink.
 SunPak™ LMQ Tack Reducer Gel LMC70 enables printing on difficult cardboards.

GENERAL ADVICE

SunPak LMQ inks are roller fresh and supplied ready for use. They must not be mixed with any other additives or auxiliaries except the listed ones. Before printing with SunPak LMQ inks, the press must be cleaned thoroughly to avoid contamination with oxidative drying inks or other press room chemicals.

A best practice guide on food packaging printing and a Material Safety Data Sheet (MSDS) is available from Sun Chemical upon request. We issue a "Statement of Composition" to allow quantitative risk assessments. Please contact our technical services.

The recommended institute ISEGA analysed prints with SunPak LMQ. The compliance with the current food packaging legislation is certified. The document is available for discussions with customers.



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TECHNICAL GLOSSARY

Aldehydes are a family of chemical compounds, as Pentanal, Hexanal, Heptanal and Octanal. They can easily be quantified by means of analytical chemistry as gas-chromatography (GC).

Hexanal is an odorous compound which is created by oxidative decomposition of vegetable oils, common in sheetfed offset inks. SunPak LMQ inks do not contain vegetable oils which undergo a chemical reaction with oxygen.

Aldehydes as Hexanal in prints can be determined by Gas-Chromatography (GC). GC separates mixtures of chemical compounds and indicates their concentration. Subsequent in-line analysis, e.g. mass spectrometry (MS), identifies every compound. There is no international standard for the determination of Aldehydes in prints. Laboratories who wish to compare their results with other partners have to agree on specific details of the test procedure.

Migration is the (unwanted) transfer of substances from the packaging or its components (printing ink, substrate, varnish etc) into the packaged product (e.g. foodstuff). Ink solvents of conventional offset inks (mineral or vegetable oils) are supposed to show a significant migration potential. Migration is assessed by appropriate test methods and can occur whilst the organoleptic properties maintain unaffected. SunPak LMQ is SunChemical's product for Low Migration printing.

A raw material exclusion list for printing inks and coatings is available from www.eupia.org.

Odour/taint can be assessed in organoleptic tests, as EN 1230-1 (odour) and EN 1230-2 (taint).

Oxidation is a chemical reaction with oxygen, often initiated by a drying catalyst. By-products of this chemical reaction are Aldehydes and other odorous compounds. Unlike conventional sheetfed offset inks, SunPak LMQ inks do neither contain oxidative drying materials nor a drying catalyst.

The use of printing inks and coatings for oven or microwave applications is critical for 3 reasons:

1. Printed packaging exposed to heat is supposed to release volatile compounds which are constitutional part of the substrate, the printing ink or the overprint varnish. SunPak LMQ is not based on volatile chemicals and represents the technically optimum solution regarding migration even under elevated temperature conditions.
2. Chemical compounds may decompose under the influence of heat. This is obvious when pigments of the substrate or the printing ink begin to discolour, which is standard under oven temperature. Further to this, decomposition may happen without being visually noticed. Thus, the following LMQ products shall never be used for these applications: metallics, LMP46, LMB50, LMP26, LMB11, LMB18, LMB21 and LMB33. For 4c process printing, Process Yellow LMP26 can be roughly be matched by a blend of 99.4% LMB08 plus 0.6% LMB54.
3. The surface of inks and coatings will soften at oven temperatures. This may result in set-off when being in contact with the user's hands. Although this is not harmful, it might be negatively recognised by the consumer of the ovenable packaging.

There is no standard Test Method to measure the migration of carton (or paper) packaging. However, the migration potential of SunPak LMQ is far below any expected legal limits. A package of SunPak LMQ inks and SunCoat™ LMQ was certified by accredited institutes to be compliant with the demands of primary food packaging.

Disclaimer

In all cases, Sun Chemical cannot assume any liability for the final packaging and recommends consulting a neutral competent institute in the phase of packaging design.

It is recommended to advise all suppliers of the consumables (including the cardboard and the glue) on the future application of the relevant print job.

SunChemical®

a member of the DIC group



Sun Chemical Europe
Wexham Springs
Framewood Road
Slough, SL3 6PJ
United Kingdom
Tel + 44 (0)203 139 0000
Fax + 44 (0)203 139 0001
www.sunchemical.com

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