



Oillio

**MEDIUM CHAIN
TRIGLYCERIDES**



IQL

Industrial Química Lasem, sau
A Nisshin Oillio Group Company

Quolior

Contents

THE COMPANY

QUOLIO

Product description

- Product benefits
- Product specifications
- Storage & Conditions
- Pack sizes

Applications

- Food, Feed & Beverage: Technological aid
 - Healthy Food: Nutritional complement
 - Pharmaceuticals & Veterinary: Base ingredient
 - Personal Care: Aesthetic enhancer
 - Agriculture: Protective agent
-

The Company

Industrial Química Lasem is a European Oleochemical producer. The company was founded in 1947, and since July 2011 we are part of The Nisshin OilliO Group, Ltd. With more than 50 years of experience we are one of the largest fatty esters manufacturers in the area. Our extensive portfolio contains more than 150 different esters covering all the range of applications.

IQL facilities are located, since 2003, in Castellgalí (Barcelona). We have a very flexible production site that operates with a reliable automated system, able to provide the highest-grade science-based products. The exigent quality standards of our molecules are continuously being improved by our experienced staff and in compliance with the most demanding international requirements. The whole production site is ISO 14001 (Environmental Management System) and ISO 9001 (Quality Management System) certified.

In 2013, following our commitment to continuous improvement, a new line was settled for the MCT oil production. The dedicated processing units, reactors, treatment vessels, tanks and deodorizers avoid any possible cross contamination.

We always strive to offer our customers the best possible service, that's why this installation was built up to meet the highest food quality standards, which warrants a total safety in the whole food supply chain.

Pursuing day by day the minimal environmental impact, we have a continuous optimization policy to manufacture under safe conditions and in a sustainable manner.

Quolio

Product description

QUOLIO is a Medium Chain Triglycerides (MCT) oil obtained by the esterification of vegetable glycerol, with a specific and selected blend of fatty acids, caprylic (C_{8:0}) and capric (C_{10:0}).

QUOLIO is free of additives, solvents and catalyst residues. It is manufactured in an exclusive line, completely food compliant with dedicated processing units. Due to the very strict manufacturing conditions and the selection of raw materials, QUOLIO is a clear and colourless liquid. It is neutral in odour and taste.

QUOLIO is presented with two different grades, QUOLIO 75 and QUOLIO 60, differing only in C_{8:0}/C_{10:0} ratios.

Typical Fatty Acid Distribution %	Quolio 75	Quolio 60
C _{8:0}	75	60
C _{10:0}	25	40

Its excellent properties and chemical structure, make QUOLIO a versatile ingredient perfect for a wide range of applications; it can be used for auxiliary and base substances for pharmaceutical, veterinary and cosmetic preparations. It meets exceptional sensorial properties; very useful for flavours and food applications, as technological aid or lubricant ingredient for the treatment of food equipments. It can be used as well as nutritional complement for healthy food products.

Quolio 75 & Quolio 60

Appearance	Oily, low viscous liquid
Colour	Clear, colourless to slightly yellowish liquid
Odour	Neutral, essentially odourless
Taste	Neutral and bland, free from any foreign or rancid taste

PRODUCT BENEFITS

▶ Improved manufacturing process

- Exclusive line to MCT oil production, avoiding any possible cross contamination with other products.
- Dedicated processing units, specially designed for food applications.
- Manufactured without catalyst, additives, solvents or heating mediums.
- Low iodine value.

▶ High performance profile

- Excellent resistance to polymerization.
- High oxidative stability.
- Good low temperature stability, low cloud point ($\leq -5^{\circ}\text{C}$).
- Liquid at 0°C .
- Lower viscosity than other natural triglyceride oils.
- Saturated and very unreactive molecule.

▶ Exceptional solubility

- High solubility of fatty substances.
- Good solubility in alcohol.
- Excellent carrier.

▶ Hydrophobic ability

- Low water solubility, it acts as a moisture barrier preventing water loss.
- Surface treating substance, it protects and isolates surfaces.

The fatty acids used for the production of QUOLIO comply with Code of Federal Regulations (CFR) Title 21 – Food and Drugs, Part 172 – Food Additives Permitted for Direct Addition to Food for Human Consumption, Sec. 172.860 Fatty Acids. Additionally, $\text{C}_{8,0}$ fatty acid meet the specifications of the “Food Chemical Codex” 7th Edition as Octanoic acid/ Caprylic acid and listed in Code of Federal Regulations Title 21, Part 184 – Direct Food Substances Affirmed as Generally Recognized as Safe (GRAS) – Sec. 184.1025 Caprylic Acid.

QUOLIO conforms to the requirements of the following monographs:

- *European Pharmacopoeia - Medium Chain Triglycerides*
- *Japanese Pharmaceutical Excipients - Medium Chain Fatty Acid Triglycerides*

PRODUCT SPECIFICATIONS

QUOLIO meets the highest specifications values, for a Medium Chain Triglycerides oil.

Parameter	Quolio 75	Quolio 60	Unit	Analytical method
	Margins	Margins		
C _{8:0}	71.00 – 79.00	55.00 – 65.00	%	AOCS Ce 2-66
Colour APHA	≤ 50	≤ 50	APHA	PHOTOMETER
Density 20°C	0.930 - 0.960	0.930 - 0.960	g/ml	PICNOMETER
Refractive Index 20°C	1.4400 - 1.4520	1.4400 - 1.4520		AOCS Cc 7-25
Iodine Value	≤ 0.50	≤ 0.50	g I ₂ /100g	AOCS Cd 1-25
Saponification Value	340.0 - 350.0	330.0 - 340.0	mg KOH/g	AOCS Cd 3-25
Acid Value	≤ 0.05	≤ 0.10	mg KOH/g	AOCS Cd 3d-63
Peroxide Value*	≤ 1.0	≤ 0.5	meq O ₂ /kg	AOCS Cd 8-53
Hydroxyl Value	≤ 3.0	≤ 5.0	mg KOH/g	AOCS Cd 13-60
Water	≤ 0.050	≤ 0.100	%	AOCS Ca 2e-84

*Peroxide Value can be only guaranteed from the production to the shipping of the goods, not cover whole shelf life.

STORAGE & CONDITIONS

- Keep closed in their original packaging away from sunlight, moisture and extreme temperatures. Recommended storage temperature 15-25°C.
- Avoid contact with PS (polystyrene), OPS (oriented polystyrene) and HIPS (high impact polystyrene) as a packaging materials, MCT dissolve this kind of plastics.

PACK SIZES

- Drums, 50 kg & 200 kg.
- IBC containers, 950 kg.
- Bulk, delivered by road tanker.

Quolio

Applications

FOOD, FEED & BEVERAGE: TECHNOLOGICAL AID

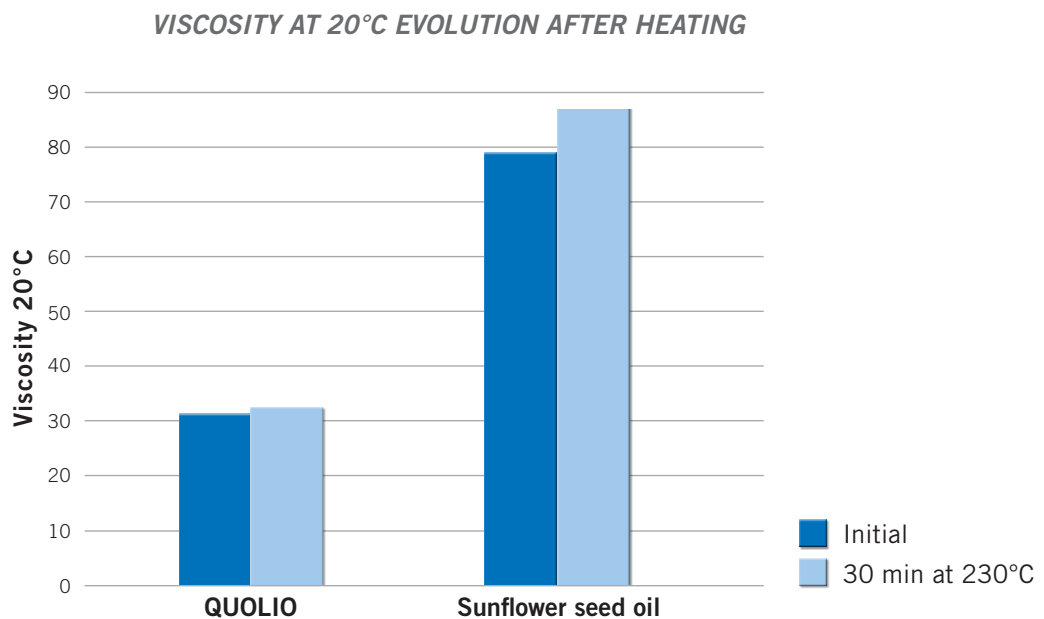
QUOLIO has been specially designed for food applications, without catalyst. It is manufactured in an exclusive line, that meets the highest food quality standards.

Comparing with other oils used in food applications, QUOLIO shows numerous benefits for manufacturing food products.



► Excellent resistance to polymerization

When baking products, ingredients and technological aids are exposed to high temperatures (180 - 230°C) for a prolonged time. Unsaturated fatty acids tend to polymerize under this conditions, but QUOLIO as saturated product, is much more stable.

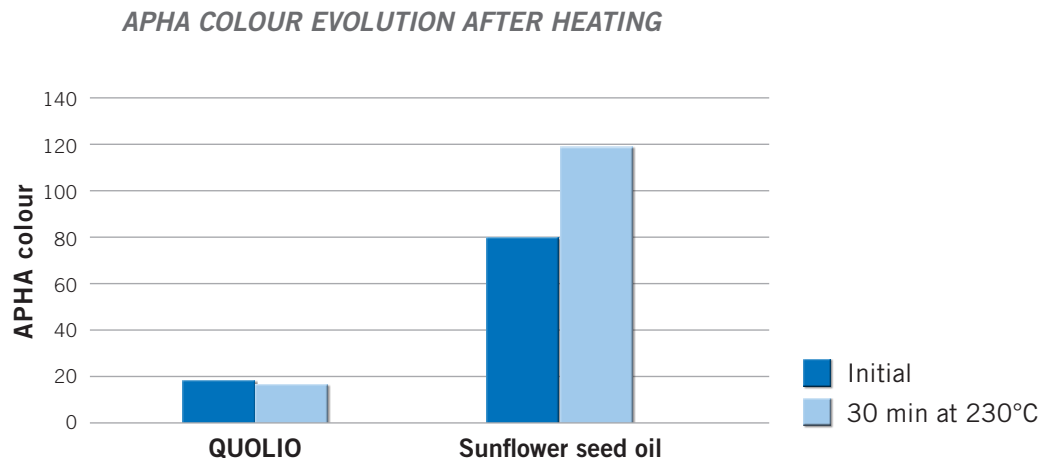


FOOD, FEED & BEVERAGE: TECHNOLOGICAL AID

► High oxidative stability

Unsaturated fats and oils have a natural tendency to oxidize or resinify at high temperatures. QUOLIO presents a high stability against oxidation. After 30 min at 230°C some aldehydes are clearly noticeable in the case of sunflower seed oil, but not in the case of QUOLIO¹.

¹ Analysed by head space GC/MS/MS



► Neutral in taste and smell

QUOLIO is processed under a high standard of food safety and perfectly refined. QUOLIO is not promoting any off-flavour or off-odour even under demanding conditions.

► Hydrophobic ability

QUOLIO exhibits very low water solubility thus it is able to make the surface of the mould, pan, machine or equipment water-repelling. QUOLIO also protects surfaces against corrosion due to the hydrophobic effect as well as the isolation from the external air.

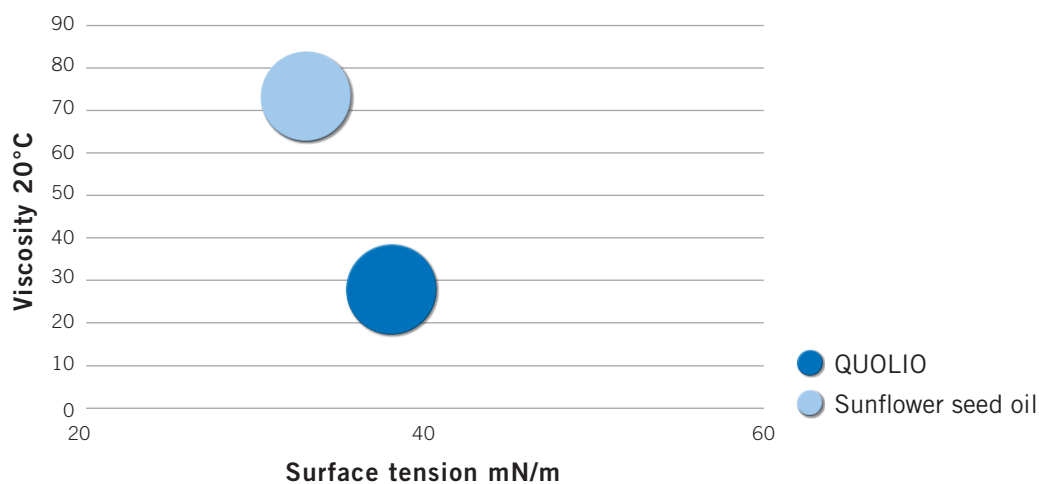


FOOD, FEED & BEVERAGE: TECHNOLOGICAL AID

► Film former properties

QUOLIO presents a perfect balance in surface tension, spreadability and viscosity; as a consequence it forms an interrupted film between the surfaces and the doughs. Additionally MCT can form a good adhering film on steep walls, creating a moisture barrier and preventing water loss.

THE AREA OF THE SPOT IS PROPORTIONAL TO THE SPREADABILITY



► High fatty substance solubilizer

QUOLIO is perfectly refined and presents a very few amount of particles, being rated as below 0.05 NTU, preventing clogging of the nozzles during application. QUOLIO presents good solubilizing properties being slightly more polar than standard vegetable oils, so it can act as a solvent for oil dispersible substances.

Solvent	Quolio	Sunflower oil
Acetic Acid	Soluble	Soluble
Diethyl Ether	Soluble	Soluble
Ethanol 96%	Soluble	Insoluble
Ethyl Acetate	Soluble	Soluble
Glyceryl Oleate Citrate	Soluble	Soluble
Hexane	Soluble	Soluble
Isopropanol	Soluble	Soluble
Isopropyl Myristate	Soluble	Soluble
Lecithin	Soluble	Soluble
Paraffinum Liquidum	Soluble	Soluble
PEG-400 Oleate	Soluble	Soluble
Polyglycerol Polyricinoleate	Soluble	Soluble
Rapeseed Oil	Soluble	Soluble
Soybean Oil	Soluble	Soluble
Toluene	Soluble	Soluble

Solubility 1:1

RECOMMENDED APPLICATIONS

QUOLIO is recommended for used as a technological aid for many food, feed and beverage applications.

Function	Advantages	Recommended applications
Solvent/ Carrier agent	<ul style="list-style-type: none"> • Solvent for oil dispersible materials. • Carries and transports fat soluble components. • Oxidative stable. • Neutral in taste and smell. 	Flavours, essences, vitamins and lipophilic ingredients.
Dispersing agent	<ul style="list-style-type: none"> • Improves the homogeneity of pigment dispersions. 	Colorants, powders, spices, condiment, herbs, etc.
Releasing agent	<ul style="list-style-type: none"> • Constituent of releasing preparations helps to prevent stickiness. 	Baked products in any kinds form molds.
Hydrophobic agent	<ul style="list-style-type: none"> • Good film former and protective capacity. • Low water solubility, it acts as a moisture barrier. 	Water repelling for confectionery molds, food processing machines and equipments.
Surface treating substance	<ul style="list-style-type: none"> • Protects and isolates surfaces against corrosion and external air. • Forms a good adhering film on steep walls. 	Confectionery molds, food processing machines and equipments.
Lubricant agent	<ul style="list-style-type: none"> • Forms a stable oil film. • Prevents nozzles clogging. 	Confectionery molds, extruders, food processing machines and equipments.
Coating agent	<ul style="list-style-type: none"> • Keeps the surface sheen. • Protects against drying out. • Protects against discolouration. • Helps to prevent stickiness. • Prevents water loss. 	Dried fruit, frozen foods, confectionery, hard candies and gummies.
Viscosity regulator	<ul style="list-style-type: none"> • Adjusts to lower viscosity. 	Highly viscous oils.
Clouding agent	<ul style="list-style-type: none"> • Produces uniform cloud. • Taste neutral. 	Beverages.

HEALTHY FOOD: NUTRITIONAL COMPLEMENT

The unique metabolic and functional properties of QUOLIO, a consequence of its chemical structure, make the product a perfect nutritional complement for healthy food products, adult & pediatric nutritionals, meal replacement, sport nutrition, balanced diets and reduced calorie foods.

Due to its small molecular size, QUOLIO is digested much more rapidly than other long chain triglycerides; upon absorption, it is taken directly by the bloodstream and transported to the liver. This metabolic pathway allows QUOLIO to serve as an instant energy source, rapidly available without accumulating as fat deposits in body tissues.



Values*	
Energy	900 kcal/ 3,800 kJ
Protein (g/100 g)	0 g
Carbohydrate (g/100 g)	0 g
- of which sugars	0 g
Fat (g/100 g)	100 g
- of which saturates	100 g
- of which monounsaturates	0 g
- of which polyunsaturates	0 g
Fibre (g/100 g)	0 g
Sodium (g/100 g)	0 g

*Approximate value for nutrition labeling per 100 g.

The nutritional benefits associated with the rapid metabolization of QUOLIO, enable it to find utility in meal replacement systems, as well as sports nutrition weight management products to increase exercise performance.

It is suitable for medical nutritional products, as an ingredient of therapeutic foods or food administered through a tube to gastrointestinal patients with fat malabsorption syndrome like, an energy source.

Function	Advantages	Recommended applications
Nutritional complement	<ul style="list-style-type: none"> • Concentrated source of readily metabolizing energy. • Goes straight to the liver without burdening the lymphatic system. • Low caloric value. • Helps with good digestibility. • Rapidly available, valuable energy without addition to depot fat. • Does not contain trans-fatty acids. • Slimming products with specific nutrient requirements. • Suitable for special diets. • Substitute of conventional oils. 	Healthy food products. Adult nutritional supplement. Sport nutritionals. Balanced diets and reduced calorie foods. Edible oils.

It also can be used in special purpose for infants, unable to metabolize long chain fats improving digestibility; in pediatric nutritionals as processing aid in preparations of fat-soluble nutrients.



Function	Advantages	Recommended applications
Processing aid	<ul style="list-style-type: none"> • Quick and simple source of energy. • Improves good digestibility. • Carries fat-soluble nutrients. • Oxidative stable. • Neutral in taste and smell. 	Pediatric nutritionals. Infant formula and follow-on formula.

PHARMACEUTICALS & VETERINARY: BASE INGREDIENT

QUOLIO is an almost neutral triglyceride, contains less than 300 ppm of free fatty acids, and because it is a saturated substance it is a very unreactive molecule. It doesn't react with the solubilized ingredients even when forming a film on the surface of a material. Those characteristics make QUOLIO an optimum aid for pharmaceutical and veterinary products manufacture.



It can be used as:

- Drug carrier in capsules filling, ointments, creams and dental products.
- Surface treatment and binder agent for tablets, pills, etc.
- Penetration enhancer for fatty actives.
- Lubricant for soft gelatin capsules.
- Dispersing aid for dermal applications such as veterinary pour-on preparations, topical creams and lotions.
- Solvent and release agent for medical actives.

Function	Advantages	Recommended applications
Solvent/ Carrier agent	<ul style="list-style-type: none"> • Solvent for oil dispersible materials. • Carries and transports fat soluble components. • Promotes dissolving of individual constituents. • Oxidative stable. • Neutral in taste and smell. 	Pharmaceutical excipients, fat soluble vitamins, cholesterol, etc.
Releasing agent	<ul style="list-style-type: none"> • Constituent of releasing preparations helps to prevent stickiness. 	Tablet molds, soft gelatin capsules, etc.
Surface treating substance	<ul style="list-style-type: none"> • Seals the surface and creates sheen. • Helps to prevent stickiness. 	Soft gelatin capsules, tablets and coated tablets.
Coating agent	<ul style="list-style-type: none"> • Keeps the surface sheen. • Protects against drying out. • Protects against discolouration. • Helps to prevent stickiness. 	Soft gelatin capsules, tablets and coated tablets.
Emollient & aesthetic enhancer	<ul style="list-style-type: none"> • Spreads very readily and evenly on the skin. • Does not leave a greasy residue, used in small doses. • Boosts the water holding capacity of the epidermis and creates a soft, smooth and hydrated feel. • Enhances penetration, the active constituent is absorbed through the skin. • Conveys medicines to deeper layers of the skin. • Forms a non-occlusive barrier on the skin and permits skin-respiration. • Provides a persistent long lasting protective barrier. • Forms part of the oil phase. 	Topical therapeutics products, transdermal applications (ointments, creams, plasters).
Lubricant agent	<ul style="list-style-type: none"> • Prevents nozzles clogging. • Forms a stable oil film. 	Pharmaceutical processing machines, extruders and rolling machines.
Dispersing agent	<ul style="list-style-type: none"> • Improves the homogeneity of pigment dispersions. 	Pharmaceutical excipients.
Viscosity regulator	<ul style="list-style-type: none"> • Adjusts to lower viscosity. • Inhibits crystallization. 	Highly viscous oils and suppositories.

PERSONAL CARE: AESTHETIC ENHANCER

QUOLIO has excellent emollient and skin conditioning properties. It is a rich emollient with a soft, non tacky skin feel and long lasting lubrication. It is perfect for use in skin care products as creams or lotions; in sun protection with high or low SPF values, colour cosmetics and hair care applications.



Used in emulsions it adds numerous benefits to the final formulation:

- Enhances penetration, provides an excellent emolliency and skin smoothing properties.
- Forms a non-occlusive barrier on the skin and permits skin-respiration.
- Provides persistent long lasting moisture in skin care formulations.
- Hydrates, nourishes and softens the skin around the nail, maintains cuticles soft and elastic.
- Penetrates the upper layer of the skin, leaving no greasy after-feel.

Function	Advantages	Recommended applications
Emollient & aesthetic enhancer	<ul style="list-style-type: none"> • Boosts the water holding capacity of the epidermis and creates a soft, smooth and hydrated feel. • Spreads very readily and evenly on the skin. • Does not leave a greasy residue, used in small doses. • Enhances penetration, the active constituent is absorbed through the skin. • Forms a non-occlusive barrier on the skin and permits skin-respiration. • Provides a persistent long lasting protective barrier. • Forms part of the oil phase. 	<p>Skin care products – facial care, body care and baby care.</p> <p>Hair care – conditioners, shampoos and styling.</p> <p>Sun care – after-sun.</p> <p>Toiletries – after-shaves and hair removals.</p>
Solvent / Carrier agent	<ul style="list-style-type: none"> • Carries and transports fat soluble components. • Solvent for oil dispersible materials. • Improves the solubility of the chemical UV filters, thereby increasing UV absorption, SPF and the formulation's stability. • Oxidative stable. 	<p>Sun care products, aerosols (sprays and perfumes).</p>
Dispersing agent	<ul style="list-style-type: none"> • Improves the homogeneity of pigment dispersions. 	<p>Colour cosmetics – Make-up, lipstick, lip gloss, etc.</p> <p>Sun care products.</p>
Viscosity regulator	<ul style="list-style-type: none"> • Adjusts to lower viscosity. • Inhibits crystallization. 	<p>Highly viscous oils, fluid and creamy products.</p>
Fixative agent	<ul style="list-style-type: none"> • Fixative agent for fragrances. 	<p>Perfumes.</p>

AGRICULTURE: PROTECTIVE AGENT

QUOLIO is a natural and vegetal derived oil. It can act as a protective agent for the agriculture industry. It can create a protective film on leaf plants, vegetables and fruits to protect them against insects, discolouration or drying out.



Function	Advantages	Recommended applications
Surface treating substance (during handling and presentation)	<ul style="list-style-type: none"> • Seals the surface and creates sheen. • Helps to prevent stickiness. 	Leaf plants, vegetables and fruits.
Coating agent/ Protective agent (during growth)	<ul style="list-style-type: none"> • Keeps the surface sheen. • Protects against drying out. • Protects against discolouration. • Protects against insects. 	Leaf plants, vegetables and fruits.
Lubricant agent	<ul style="list-style-type: none"> • Prevents nozzles clogging. • Forms a stable oil film. 	Processing machines, extruders and rolling machines.

Quilior

The data disclosed at this brochure it is given in good faith but the values or proposals does not guarantee the good operation. Industrial Química Lasem, S.A.U. expressly disclaims any responsibility for the suitability of the product for any specific or particular purposes intended by the user. Suggestions for the use and application of the product are given for information purpose only and without commitment. The specification is no warranty for the suitability for a special application on customer side. The customer is not released from testing the product for the intended processes and purposes. The users of the products are responsible of how they use the products. It is the responsibility of the user of the product to check the compliance with all laws, regulations and standards applying to the use of the product. Proposals for uses in applications are only suggestions. Industrial Química Lasem, S.A.U. reserves the right to make any changes according to technological progress or further developments in its sole discretion.

November 2013



IQL

Industrial Química Lasem, sau
A Nisshin Oillio Group Company

Pol. Ind. Pla del Camí, s/n · Av. de la Indústria, 7
08297 Castellgalí (Barcelona) SPAIN
Tel. + 34 938 758 840 · Fax + 34 938 758 841
info.iql@lasem.com · www.iqlasem.com