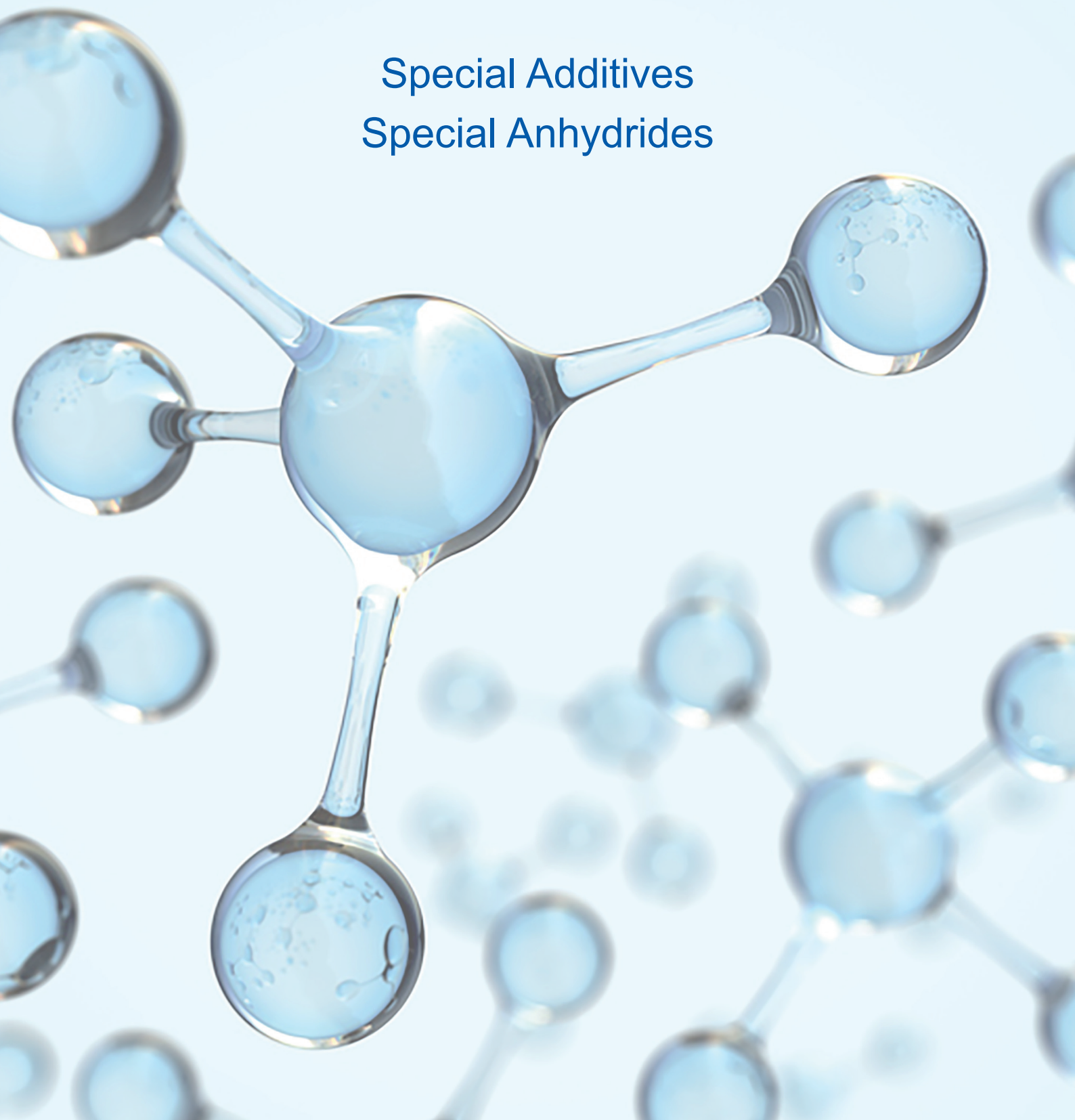




Special Additives
Special Anhydrides





POLYNT INTERMEDIATES & SPECIALTIES

Special Anhydrides and Special Esters

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Production Site



EMEA

Polynt S.p.A.

(Cavaglià, Ravenna, Scanzorosciate - Italy)

Polynt UK Ltd.



ASIA PACIFIC

Polynt Chemical (Changzhou) Co., Ltd.

Polynt Reichhold Group

After the merger on May 2017 the new Polynt-Reichhold Group is a global Company in the Intermediates, Coating and Composite Resins, Thermoset Compounds, Gel-coats and niche Specialties. This combination enhances the Group's leading position as a global vertically integrated specialty chemicals player, with significant global presence in Europe, North America and Asia, a strategy initiated by Polynt with the successful integration of PCCR and CCP in the last years and now further reinforced by Reichhold's global scale, extensive product portfolio and R&D competencies.

Polynt-Reichhold Group is known for its superior quality and impressive range of products and with its excellent distribution network it can provide first-class service to customers whatever their market. Customer Service and Technical Service teams are renowned for their customer focus, offering the best service even after products have left manufacturing.

The Group strives to keep customers satisfied, assisting them in producing premium quality products every time they use its products. Product innovation is important for the Group's business and it's the reason for which it constantly works with customers to find solutions to problems. Introducing new or improved products ensures that Polynt-Reichhold Group continue not only to deliver what the market wants and needs, but also when it is wanted and needed.

Special Additives

Special additives include special anhydrides and special esters. The company is one of the leading manufacturers of these products.

Special Anhydrides

Maleic derivatives manufactured starting from maleic anhydride and conjugated double bonds compounds (i.e. butadiene or isoprene). Some anhydrides grades can be further transformed by hydrogenation in order to impart them additional properties for example higher UV stability.

Thanks to its backwards integration in Maleic Anhydride Polynt Group has a worldwide strong and competitive position and it's the only European producer.

Our anhydrides are used in several industrial applications:

- As hardener for epoxy resin in the electronic and electrical markets, for the manufacturing of: LED and PCB (printed circuits boards), insulation of motors and generators, insulators, bushings and switchgears; electronic transformers and semi-conductors.
- As hardeners for epoxy resins in industrial sectors: high/medium pressure pipes for oil & gas and reverse osmosis, wind turbine blades and wind mill components, pultruded parts for electrical and composite applications.
- As raw material for manufacturing resins for paint and coatings, plasticizers and a intermediate for miscellaneous applications.

Special Esters

Special Esters represent a large family of products like [acetates](#), [glycerol derivatives](#), [low-molecular weight phthalates](#), [citrate](#)s, [maleate](#)s, [fumarate](#)s, [succinate](#)s and other organic esters used in special applications.

They find a wide range of applications such as:

- flavours and fragrances (solvents, fixatives, additives)
- cosmetics (emollients, solvents and plasticizers)
- food (additives, ingredients)
- pharmaceutical (excipients)
- polymers and plastics (plasticizers)
- paints and coatings (solvents and coalescent agents)
- adhesives (solvents, plasticizers)
- pigments and UV stabilizers (intermediate)
- inks (plasticizers, solvents)
- peroxides (extenders and solvents)
- foundries (binder agents for molds and hardeners)
- tobacco (plasticizers for cigarette filters)
- leather (finishing agents)
- lubricants (metalworking additives)
- textile (additives)



Special Anhydrides

Methyltetrahydrophthalic anhydride (MTHPA)

Methyltetrahydrophthalic anhydride is widely used in various transformation technologies such as casting, impregnation and lamination. The product remains liquid also at low temperatures allowing an easy handling and mixing with the epoxy resin and providing long 'pot life' mixtures.

Thanks to its excellent insulation properties, it finds application for the manufacturing of several different electrical components and articles such as capacitors, insulators, resistors, transformers, ignition coils and various similar components. In the field of reinforced plastics it is used for the production of composites throughout filament winding and pultrusion technologies (pipes for medium-high pressure, bars, poles and components for wind turbines).

It is available in different grades, the most important are:

- **MTHPA NG:** reference MTHPA grade, suitable for a wide range of applications, in particular for the electrical insulation and composites
- **MTHPA NT:** anhydride for multipurpose applications, particularly useful in the field of electrical insulation
- **MTHPA TT:** lower viscosity
- **MTHPA PI:** better resistance to UV and atmospheric agents, making it similar to hydrogenated anhydrides
- **MTHPA 604:** excellent performance/price ratio; it is recommended in the electrical and composites fields.

Methylendomethylentetrahydrophthalic anhydride (METH)

Methylendomethylentetrahydrophthalic anhydride or Methyladamic Anhydride (METH) is a high performance curing agent for epoxy resins, also known as Methyl-Himic Anhydride. Thanks to its low viscosity, it can be easily mixed with different liquid resins providing long pot life mixtures. Compared to other anhydride hardeners, epoxy materials obtained using METH show higher thermal and better electrical properties.

Thanks to its low exothermic behaviour it's recommended for casting and large impregnation.

It is available in different grades:

- **METH E:** Reference product recommended for applications in which higher thermal and electrical performances are required.
- **METH ES:** purer than METH E. When used with basic accelerators it forms less carbon dioxide and gives a better colour retention on finished products.



Special Anhydrides - Special Hydrogenated / Cycloaliphatic Anhydrides

Hexahydrophthalic anhydride (HHPA)

It is primarily used as intermediate for the production of alkyd resins and as hardener for epoxy resins. Due to its high resistance to yellowing, it is the most suitable solution, compared to other cycloaliphatic anhydrides, for applications that require resistance to outdoor conditions (weathering resistance).

The low viscosity at melting point and its high mixability with the epoxy resins make this anhydride particularly suitable for reinforced applications.

Methylhexahydrophthalic anhydride (MHHPA)

Thanks to its cycloaliphatic structure, it imparts an excellent resistance to UV radiations and weathering. As hardener for epoxy resins, it contributes to a very water-white coloration, excellent mechanical and electric properties to the finished product. For this reason it's particularly suitable for electrical applications or special electronic purposes such as high-performance LED.

It is available in different grades:

- **MHHPA:** it's the reference product suitable for general purpose applications suggested when excellent mechanical and chemical properties are requested in association with good colour retention. It is recommended for the production of transformers suitable for external use and "general purpose LED"
- **MHHPA WW:** it is a very pure material water-white in colour, with better colour retention even when heated for a long period at high temperatures. Suitable for "high performance LED" (O.E.M.)
- **MHHPA SW:** its use is recommended when excellent mechanical properties, electrical insulation and chemical resistance in combination with outstanding colour retention are required. Suitable for LED lighting applications.

Anhydride 70/30

Mainly used as hardener for epoxy resins and as component for special coatings. It is recommended when excellent mechanical, electrical and chemical properties, associated with a good colour retention, are required. It is suitable for the production of articles intended for outdoor applications.

Succinic anhydride

Mainly used for the manufacture of alkyd resins and copolymers, as crosslinking agent in acrylic films, special elastomers, pharmaceuticals, esters for several applications, as intermediate for the production of modifiers of starches and dyestuffs.



Special Anhydrides - Pre-accelerated and modified special anhydrides and others

MTHPA 700 PL / N

Modified and pre-accelerated methyltetrahydrophthalic anhydride is particularly suitable for filament winding technology to produce high pressure pipes intended for reverse osmosis in desalination plants.

MTHPA / NT K1

Pre-accelerated methyltetrahydrophthalic anhydride: it is suitable for the production of electrical components.

MTHPA 700 K3

Modified and pre-accelerated methyltetrahydrophthalic anhydride: it finds application in the production of medium-high-pressure pipes and vessels.

Other anhydrides are available on request and / or for special applications

Polynt Group is able to offer tailor-made solutions to better satisfy the various needs in terms of process and performance thanks to its know-how and experience combined with R&D capabilities. Do not hesitate to contact our Customer Service or Technical Assistance in case you require further support.

PRODUCT FAMILY NAME	APPLICATIONS
THPA (Tetrahydrophthalic acid anhydride)	Intermediate for UPR and alkyd resins
MTHPA (Methyltetrahydrophthalic Anhydride)	
METH (Methylnadic Anhydride)	
Special Hydrogenated Anhydrides/Cycloaliphatic: HHPA (Hexahydrophthalic Anhydride); MHHPA (Methylhexahydrophthalic Anhydride) Special Grades; Anhydride 70/30; Succinic Anhydride	
Pre-accelerated and Modified Special Anhydride: MTHPA (Methyltetrahydrophthalic Anhydride) Special Grades	
	Aerospace, automotive, building and construction, chemical industry, coatings, electric and electronic, intermediates for chemical synthesis, marine, polymers and plastics, renewable energy.

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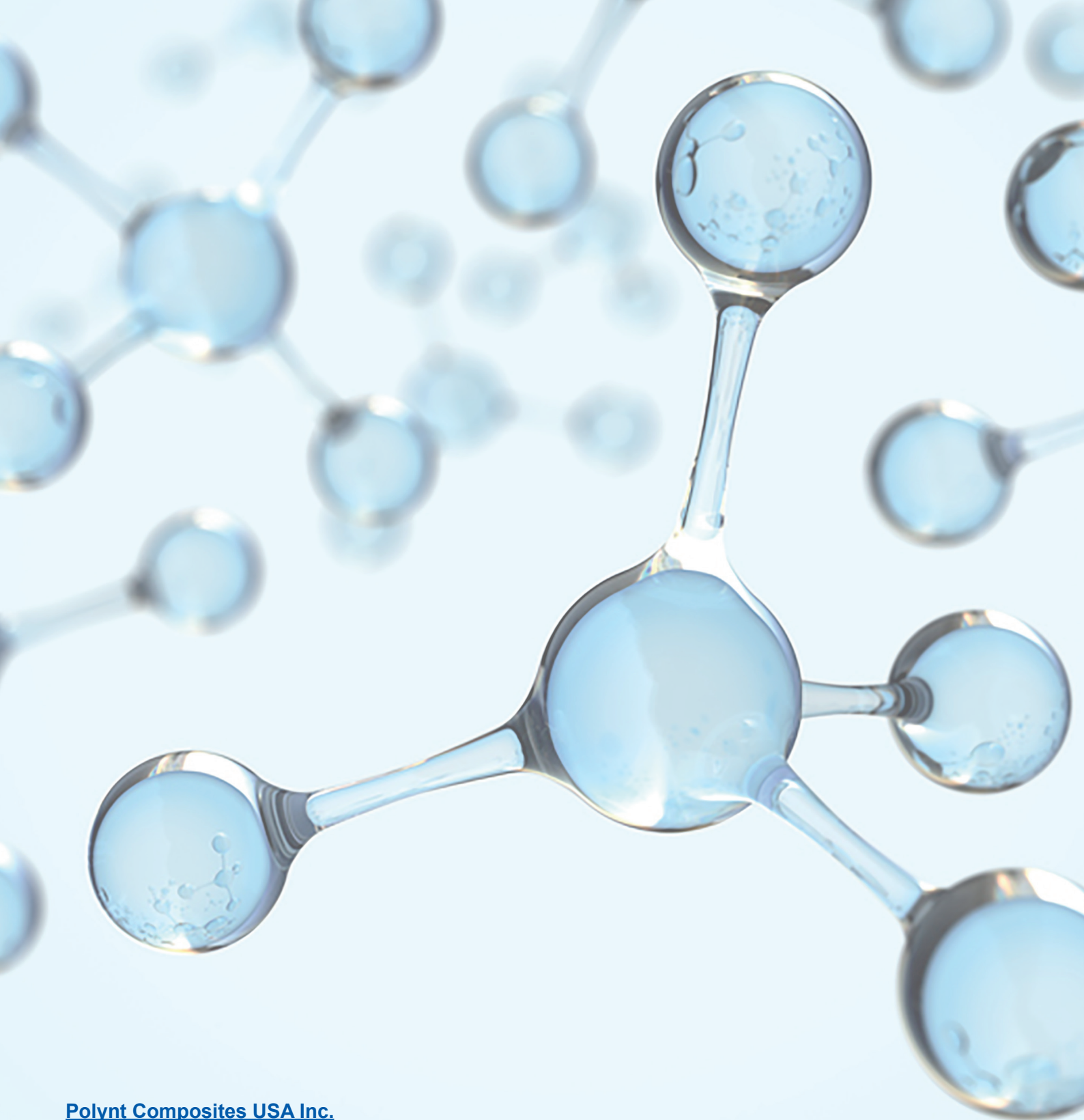
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This brochure is intended to provide a comprehensive list of the products and services available from all business sectors in which are active the companies and/or corporations controlled, directly or indirectly, by Specialty Chemicals International Ltd (hereinafter referred to as «Polynt Group»). The information, recommendations, answers and/or opinions contained herein (which must be intended only for explanatory purposes) are aimed to assist customers on the basis of our technical and scientific knowledge as of today, taking into account that our products are intended for sale to industrial and commercial customers. However we require customers to inspect and test our products before use and to satisfy themselves as to contents and suitability for their applications: nothing herein shall constitute or shall be deemed to be any other warranty or a representation, express or implied, including merchantability or fitness for a particular purpose or results to be obtained from the use of such information, nor shall be taken or construed as infringing of any existing patents. Product names in capital letters are registered trademarks of the relevant member of Polynt Reichhold Group. © Polynt S.p.A. - April 2019



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