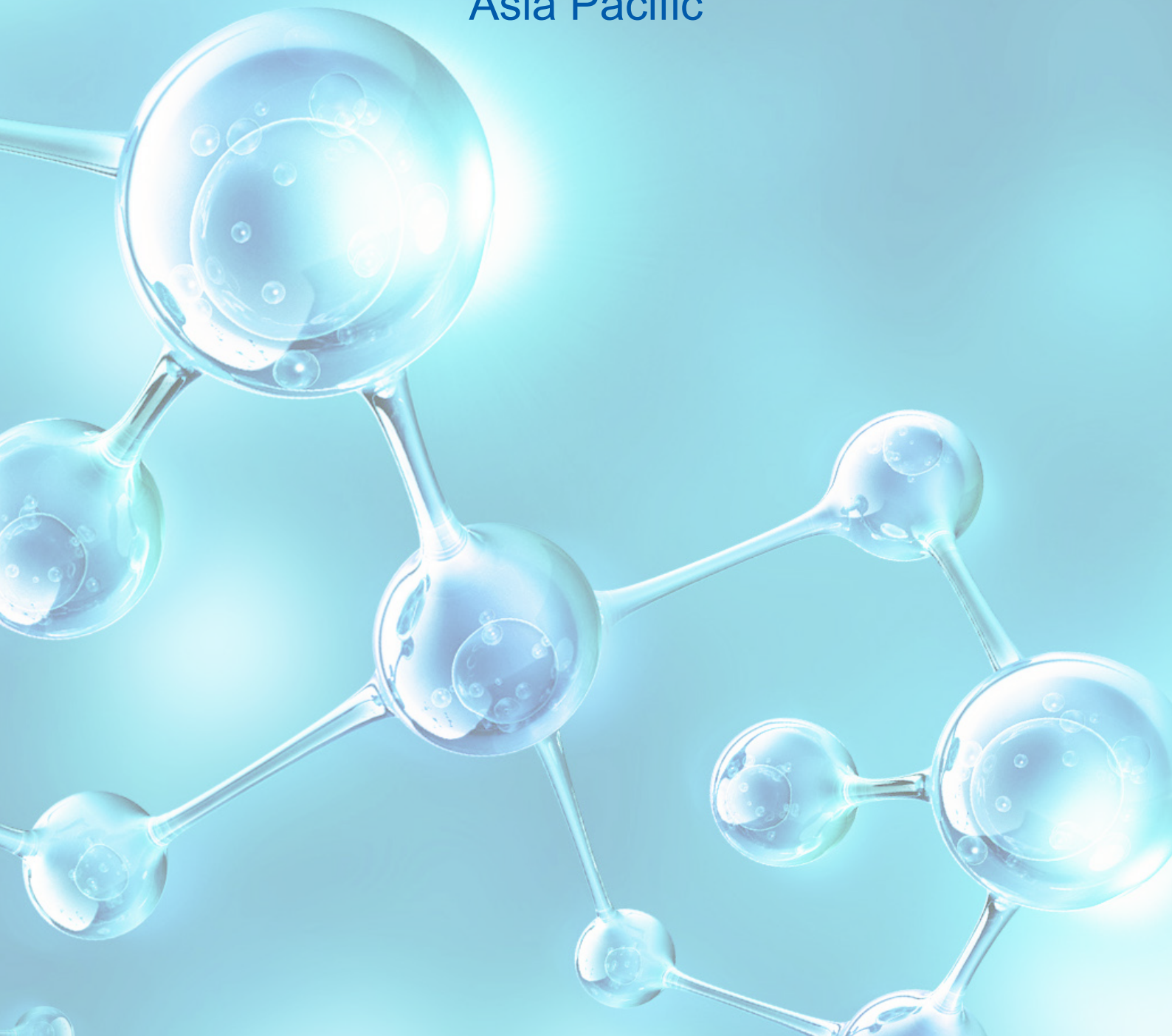


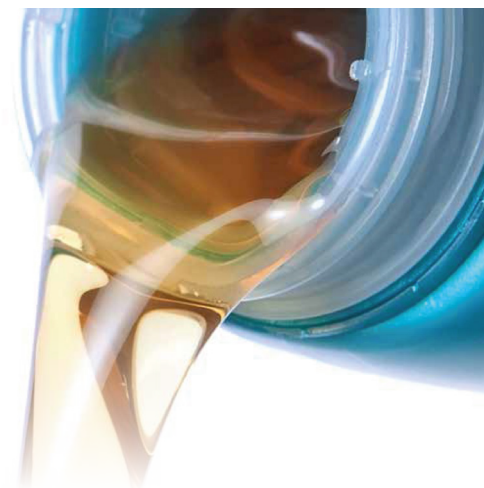


Resins
UPR & VE
Asia Pacific



POLYNT REICHHOLD GROUP

Global leader
for thermoset composites



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Production Sites



ASIA PACIFIC

Polynt Composites Korea Co., Ltd.

Polynt Composites Malaysia Sdn. Bhd. (936604-P)

Reichhold Polymers (Tianjin) Ltd.

Reichhold India Pvt. 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.

What are Resins?

Polynt Reichhold Group is one of the leading European companies in the production and sale of [Unsaturated Polyester \(UP\) and Vinyl ester \(VE\) resins](#). Due to the continuous innovation of composite materials, filled and reinforced, more specific and better performing products are required. UP and VE thermosetting resins are available in a wide range of grades (neutral, pre-accelerated, thixotropic, low-styrene content LSC, low-styrene emission LSE, etc.) suitable to meet all the needs of the composite industry and its high diversification.

Polynt Reichhold Group products find application in major industrial sectors such as:

- [Transportation](#) (automotive, railway, truck, vans, recreational vehicles, sandwich panels for refrigerated lorries, etc)
- [Building & Construction](#) (marble agglomerates and engineered stone, flat and corrugated sheets, pipes, tanks, CIPP (Cured-In-Place-Pipe), profiles, sanitary, polymere concrete, putties, mastics, abrasives...)
- [Electrical & Energy](#) (Windmill blades, nacelles, Electrical components, Insulators...)
- [Marine](#) (yachts, ferries, motor and sail boats, catamarans, canoas...)
- [Sport & Leisure](#) (swimming pools, helmets, surfboards, buttons, sport equipment...)

The portfolio also includes a series of UP resins for 'food contact applications' that fulfil the relevant [EC Regulations](#), including N° 10/2011 on plastic materials and articles intended to come in contact with food (*Plastics Implementing Measure – PIM*).

UP and VE resins have been optimized to be processed using various [application technologies](#) such as hand lay-up, spray-up, casting, pultrusion, filament winding, SMC/BMC, infusion, injection, RTM, etc.

The broad polymer chemistry knowledge of our R&D and Technical Service departments enables us to develop [tailor-made products](#) to meet the specific needs of each individual user.

Whatever your composite needs, we have the resin system and expertise to meet your application requirements.

Unsaturated Polyester (UP) Resins

Unsaturated polyester resins are thermosetting produced by the reaction of polyesterification between dicarboxylic acids (saturated and unsaturated) and glycols.

The final mixture is obtained by dissolving the resulting resin (a solid polymer at room temperature) in an unsaturated and reactive solvent, styrene and/or in an alternative monomer for Low-styrene / Styrene-free resins.

The crosslinking reaction is obtained by the addition of organic peroxide which acts as an initiator, leading to the formation of a complex three-dimensional network generating a solid irreversible state.

Polynt Reichhold Group produces several anhydrides (phthalic and maleic anhydride) and dicarboxylic acids (fumaric acid) used for the synthesis of polyester resins: these raw materials along with the strong formulation know-how gained over the years allowed Polynt Composites to develop products with the following chemistry and products lines.

Polynt Reichhold Group's portfolio includes a wide range of Unsaturated Polyester resins developed for general and more specific application sectors (see the chart).



Example of UP Resin's application

<i>UP Resins Family</i>	<i>Resins Types</i>	<i>Applications</i>
STYPOL®	Isophthalic	Bathwell
OPTIMOLD®	Tooling system	Industry
FIREBLOCK™	Intumescent (Highly Resistant to Fire)	Transportation, construction
ENCORE® PRIME	Styrene-free	Transportation, CIPP
NORSODYNE®, REICHHOLD®	Orthophthalic, Isophthalic, Maleic	Industry, construction, marine, swimming pools
ENYDYNE®	DCPD (low-styrene content)	Industry, marine, construction

For further information please contact us

Product line also includes resins synthesized using special anhydrides: these anhydrides are able to provide technical and application characteristics unique in the world of UP resins, such as the excellent surface curing and high resistance to UV rays. Resins are available in a wide range of versions (neutral, pre-accelerated, thixotropic, low-styrene content LSC, low-styrene emission LSE, etc.) to meet all composites industry's needs in case of reinforced or unreinforced applications.

ASIA-PACIFIC Specialty Products Portfolio

STYRENE-FREE

ENCORE® PRIME is the styrene-free products range. ENCORE® PRIME is an optimized product line in terms of odor and VOC (Volatile Organic Compounds) and offers these resins offer the following benefits:

- low-odor
- limitation of styrene exposure during part processing
- unchanged mechanical properties compared to standard UP and VE resins.

FLAME RETARDANT

Fire protection is a challenging application where composite materials play an important role. Polynt Composites can provide a full range of products halogenated, filled with ATH (Alumina trihydrate) and the intumescent system **FIREBLOCK™**. Intumescent materials work by forming a char layer at the interface of the fire source and the composite laminate, thus cutting off the oxygen accelerant from the organic fuel source. FIREBLOCK™ can offer the following benefits:

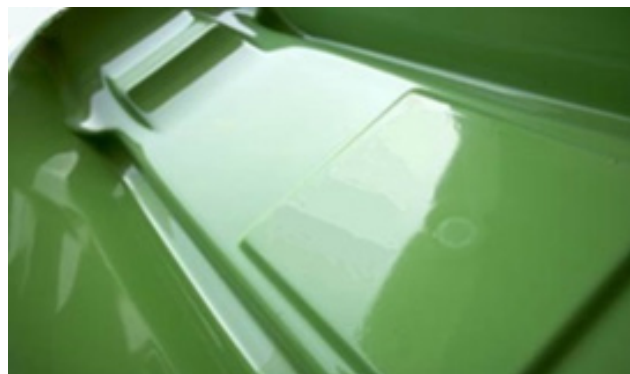
- Halogen-Free
- Lowering the toxicity and the opacity of the fumes
- Lower density compared to standard fire retardant products
- Eco-efficient: up to 13% reduction in CO2 emissions compared to conventional system in railway application
- Easy to use in all composites processes (mainly Hand Lay-up, RTM and pultrusion)
- Compliant with EN 45545-2 at highest level (HL3) for Railway Rolling Stock and reaches HL2 level on each side of the laminate.



TOOLING SYSTEM

The **OPTIMOLD®** solution offers the best solution for mould construction providing to user the following benefits:

- Easy to use - low viscosity for hand lay-up or spray-up applications
- One component - requires only the addition of standard MEKP (Methyl ethyl ketone peroxide) catalyst
- 24-hour turnaround - fast build-up of the mould thickness is an advantage
- Superior dimensional stability - high heat distortion temperature (HDT) allows better rigidity and tool life
- Improved stability - more stable filler suspension and gel time
- Reduced fiber print - low shrink system replicates the master mould surface more accurately
- Use with Polycor tooling gelcoat - high HDT and chemical resistance makes the gelcoat an ideal choice.



TERE RESIN FOR UST

Terephthalic resin was proved to be the best resin for oil resistance which revolutionized the industry 20 years ago, and has been used globally. Polynt Terephthalic resin has the following features:

- High cross-link density
- Good toughness, HDT 127°C
- No esterification catalyst
- Pre-promoted, thixotropic
- Excellent fiberglass wetting, spray-up, hand lay-up and filament winding or UV cure
- Excellent cure, low exotherm in thick laminates

We have both version approved by UL 1316 and UL1746.

WIND ENERGY

Polynt UP resins has been used in blade infusion for 30+ years. It has the following features:

- Low viscosity, good wetting out
- Long gel time and controlled gel time drift
- Low peak, but quick cure both at thick and thin parts
- Approved by GL -wind mill blades
- Wide product series, GT 100 to GT175



CIPP (Cured-In-Place Pipe)

As municipalities have come to recognize the overall economy of employing cured-in-place pipe solutions rather than «digging & replacing» crumbling infrastructure, Polynt Reichhold's DION® resins have gained popularity as a cost-effective method for replacement of conventional materials.



VINYL ESTER RESINS

Vinyl ester resins are produced by the reaction of an epoxy resin with an unsaturated monocarboxylic acid. The polymer obtained is dissolved in a reactive monomer, such as styrene, generating a solution that can be applied and cured as conventional polyester resins. Due to the chemical nature of the family of Vinyl ester resin EPOVIA® VE, they are able to provide superior performance thanks to their:

- High mechanical properties and high toughness
- High chemical and hydrolysis resistance
- High heat resistance at elevated operating temperatures
- Excellent adhesion to reinforcing fibers.

The range of Vinyl ester resins is designed to meet the high requirements of various application areas and is based on EPOVIA® and EPOVIA® OPTIMUM products line, as described in the chart. This VE resins product line finds its main use in a variety of industrial applications such as absorption towers, process vessels, storage tanks, pipes, hoods, scrubbers and ducts.

Polynt Reichhold Group's VE resins are also widely used by marine, swimming pools and automotive sectors.

<i>UP Resins Family</i>	<i>Resins Types</i>	<i>Applications</i>
Bisphenol A Epoxy Vinyl ester resin	EPOVIA® OPTIMUM KRF 1001MV, EPOVIA® RF 1001MV	Heat, corrosion & chemical resistance
Tooling gel coat base Bisphenol A Epoxy Vinyl ester resin	EPOVIA® RF 6000	High thermal and styrene resistance
Elastomer modified vinyl ester resin	EPOVIA® OPTIMUM KRF 3200	High elongation
Novolac Epoxy Vinyl ester resin	EPOVIA® OPTIMUM KRF 1051, EPOVIA® RF 1051	Heat, corrosion & chemical resistance
Bisphenol A Vinyl ester resin urethane hybrid	EPOVIA® OPTIMUM RF 5000	High performance, transportation (SMC/BMC)
Pultrusion grade Bisphenol A Vinyl ester resin	EPOVIA® OPTIMUM KRF 3100	High mechanical properties, optical fiber core
Infusion grade Bisphenol A Vinyl ester resin	EPOVIA® OPTIMUM KRF 1031, ARMORSTAR VXSH200	Hydrolysis resistance, marine
Brominated Vinyl ester resin	EPOVIA® OPTIMUM KRF 2000SE, EPOVIA® RF 2000 SEM	Heat, corrosion & chemical resistance
Bisphenol A Vinyl ester / DCPD blend	ARMORSTAR VXSH2200	Hydrolysis resistance, marine

For further information please contact us

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