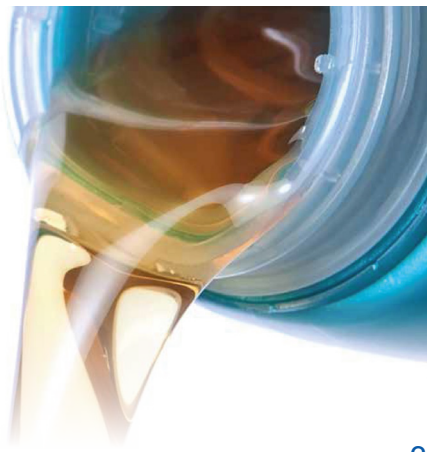
Resins
UPR & VE
EMEA

POLYNT GROUP

Global leader
for thermoset composites



Contents

Production Sites

Polynt Composites UK Ltd.

Stallingborough, Mitcham

Polynt Composites France S.A.

Polynt Composites Spain, S.L.U.

Polynt SpA
San Giovanni Valdarno; San Polo di Torrile.

Polynt Composites Poland Sp. z o.o.

Polynt Composites Norway AS

Polynt Group

After the merger with Reichhold on May 2017 the new Polynt 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 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 Group continue not only to deliver what the market wants and needs, but also when it is wanted and needed.

What are Resins?

Polynt 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 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, polymer 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 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 Group to develop products with the following chemistry and products lines.

POLYNT COMPOSITES EMEA UP resins' evolution of coding system

Each new UP resin reference developed in Europe will now only be named according to a new code format. For example, a special thixo preaccelerated ORTHO UP resin could now be identified as POLYNT 2500 TA. For existing products, there is no change: the UP resins remain the same and available under their historical names, based on commonly used UP resins product names described below (POLYLITE®, DISTITRON®, NORSODYNE®, ENYDYNE®, ENCORE® PRIME, etc.).
Polynt Group's portfolio includes a wide range of Unsaturated Polyester resins developed for general and more specific application sectors (see the chart).

UP Resins Family	*Resins Types*	*Applications*
DISTITRON®	Orthophthalic, Isophthalic, Maleic, DCPD (Dicyclopentadiene), VE	Building & Construction, Transportation, Electrical & Energy, Marine, Sport & Leisure
ENVIROLAM™	Low-Styrene Content (LSC)	Building & Construction, Transportation, Marine, Sport & Leisure
OPTIMOLD®	Tooling system	Building & Construction
ENVIROGUARD®	Bio-based resins	Building & Construction, Transportation, Marine, Sport & Leisure
FIREBLOCK™	Intumescent (Highly Resistant to Fire)	Building & Construction, Transportation
ENCORE® PRIME	Styrene-free	Transportation, CIPP
NORSOLOOK®	Low Profile Additives (LPA)	Transportation, SMC, Pultrusion
NORSODYNE®	Orthophthalic, Isophthalic, Maleic	Building & Construction, Transportation, Electrical & Energy, Marine, Sport & Leisure
ENYDYNE®	DCPD (low-styrene content)	Building & Construction, Transportation, Marine, Sport & Leisure
POLYLITE®	Orthophtalic, Isophtalic, Maleic, DCPD (Dicyclopentadiene)	Building & Construction, Transportation, Electrical & Energy, Marine, Sport & Leisure
ENVIROLITE™	Low Styrene Content (LSC), Bio-based, Recyclable input	Building & Construction, Transportation, Marine, Sport & Leisure
POLYLITE HS TM	Styrene-free, monomer-free	Building & Construction, CIPP, Transportation

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, preaccelerated, thixotropic, low-styrene content LSC, low-styrene emission LSE, etc.) to meet all composites industry's needs in case of reinforced or unreinforced applications.

Sustainable Product Portfolio

As one of the leaders in resins production, Polynt Group can offer the best technologies for specific high-performance markets. It is actively engaged with sustainable development and operates internal management systems that prioritize Safety, Quality and Efficiency which encompass a commitment to environmental, social and economic health, the ”triple bottom line”.
Polynt Group has all the knowledge, resources and capabilities to help customers to develop more sustainable products utilizing the below technologies:

- Lower emission
  - Low styrene content
  - Low styrene emission
  - Styrene-free solutions
  - UV curing
- Cobalt-free
- Use of bio-based raw materials
- Use of recyclable materials
- LCA (Life Cycle Analysis) capabilities
- Through GMP-compliant materials and plants.

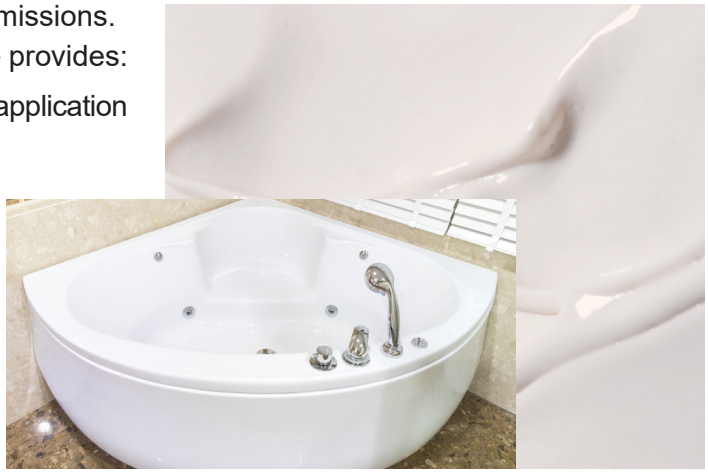
Polynt Group trademarks associated with above technologies are: EVIROLAM™, ENCORE™ PRIME, POLYLITE HS™, ENVIROGUARD™ and ENVIROLITE™.
Tailored-made, more sustainable products have been developed for large a variety of market applications (Wind Energy, Marine, Building & Construction, Transportation) and Composite manufacturing processes (Hand Lay Up, Spray up, Infusion, RTM/ Press Molding, Filament Winding, Centrifugal Casting, Pultrusion, Cured In Place Pipe, SMC).

LOW-STYRENE CONTENT

ENVIROLAM™ is a cost effective solution for lower emissions.
The very low-styrene content (from 15%) of this range provides:

- low-styrene emission (up to 50% reduction) during application and cure
- improved cosmetics
- low-exotherm allowing thicker laminates.

The ENVIROLAM™ product line gives solutions to help manufacturers comply with lower styrene emission limits required in several EMEA countries.



ENVIROLAM™ application: sanitary

Life Cycle Assessment (LCA)

Each raw material has its own eco-footprint. By optimizing the composition of the resin the overall environmental footprint (and thus Composites material) can be greatly improved. Life Cycle Assessment (LCA) is a methodology used to measure the environmental impact of a product (or a system) over a life cycle. It measures the environmental impacts from the extraction of raw materials, through processing, manufacture, refurbishment to eventual end of life and disposal.

A life-cycle

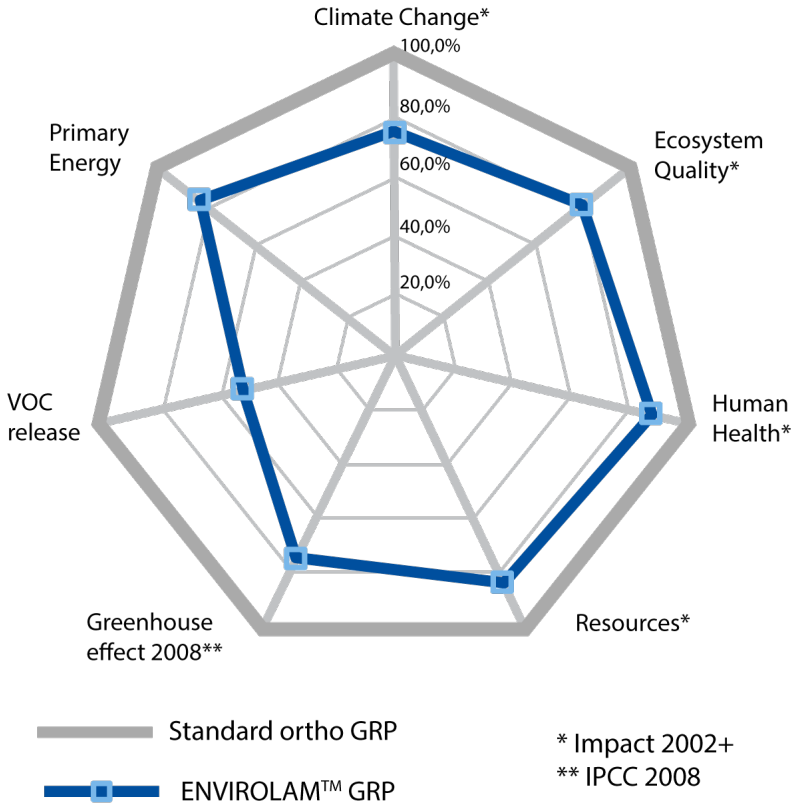
All products have an impact on the environment. This impact can occur at any time during the manufacture, use of the product or at end of life. These different stages are called collectively a life-cycle.

Cradle-to-gate LCA

Cradle-to-gate is an assessment of a partial product life cycle from resource extraction (cradle) to the factory gate (i.e., before it is transported to the consumer). Polynt Group actively collaborates with customers to carry-out cradle to end-life LCA assessments.

Cradle to grave LCA comparison - Standard ortho GRP vs ENVIROLAMTM GRP

A Cradle to Grave LCA concluded that ENVIROLAM™ GRP (Glass-reinforced plastic) reduces by 25% the Greenhouse Gases emissions and by 50% VOC (Volatile Organic Compounds) compared to a standard resin GRP.



* Impact 2002+
** IPCC 2008

ENVIROLAM™ market: transportation

STYRENE-FREE

Several styrene-free resins are already utilized in several applications and tailor-made solutions can be developed to meet specific needs.

ENCORE™ PRIME is an optimized product line which is also available in thickenable formulations suitable for SMC.

POLYLITE HS™ is a novel base resin technology. It allows for formulating resins and gelcoats (Norpol Ultimate) which can provide low viscosity resin systems with no/low monomer additions and which are styrene free. The scope of this technology also covers prepreg semi-solid resin systems.

ENCORE™ PRIME and POLYLITE HS™ can be used in several market segments including wind, automotive, industrial, construction and aerospace.

Typical benefits include very low odour/emissions, good weatherability, use of standard peroxide systems and carbon fibre compatibility.

An example of ENCORE™ PRIME market: transportation

POLYLITE HS

POLYLITE HS is a novel base resin technology. It allows for formulating resins and gelcoats (Norpol Ultimate) which can provide low viscosity resin systems with no or low monomer additions and which are styrene free. The scope of this technology also covers prepreg semi solid resin systems.
Market segments for use include wind, automotive, industrial, construction and aerospace where property benefits include:

- room temperature cure and storage
- very low odour / emissions
- fast cure
- carbon fibre compatibility
- good weatherability
- use of standard peroxide systems
- more environmentally friendly SDS.

BIOBASED RESINS

ENVIROGUARD™ and ENVIROLITE™ are the Polynt Group's brands which contain up to 50% of bio-sourced content. These product lines features are:

- similar properties to the conventional UP resins
- similar processability in most composite manufacturing process
- lower carbon foot-print.

Two examples of applications' markets: construction and marine.

FLAME RETARDANT

Fire protection is a challenging objective where composite materials play an important role.
Fire retardant products are designed to minimize the chance of fire occurring when the end product gets in touch with heat source and to slow down the combustion process, should a fire starts.

The final Fire Retardant performance of a part or a laminate depends on the construction design selected by the end-user who needs to get its own certification.

Polynt Group can provide a full range of products, halogenated or non-halogenated, clear or filled to be used to manufacture laminates meeting the different fire retardant requirements.

Example of FIREBLOCK™ market: railway industry

The most common Polynt group's brands for Fire Retardant resins fall under FIREBLOCK™ and DION™ FR brands.

In addition Polynt Group offers the intumescent system FIREBLOCK™.
Intumescent materials work by forming a char layer at the interface between 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
- lower toxicity and fumes opacity
- lower density compared to standard fire retardant products
- eco-efficiency: up to 13% CO_2 emission reduction vs. conventional system in railway application
- easy-to-use in all composites processes (mainly Hand lay-up, RTM and Pultrusion)
- compliance with EN 45545-2 at the highest levels (HL3) for railway rolling stock and HL2 level on each side of the laminate.

Polynt Group offers complementary Fire Retardant gelcoat based on intumescence technology under the POLYCOR™ 2335 and NORPOL™ SVX brands.

TOOLING SYSTEM

The OPTIMOLD® and POLYLITE® Low Profile tooling Systems 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 and infusion 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 and/or Norpool tooling gelcoat - high HDT and chemical resistance makes the gelcoat an ideal choice.

SWIFT motor caravan: the front and rear bumpers and roof of caravans and campervans are made of Optimold Tooling (and tooling gel coat).

LOW PROFILE ADDITIVES

NORSOLOOK® and NORPOL™ low shrink and low profile additives are designed for use in a variety of fiber-reinforced plastic fabrication processes: SMC/BMC, RTM, pultrusion, etc.

Depending on the grade, the main features and benefits of NORSOLOOK® and NORPOL™ additives are:

- Low profile or Class A automotive appearance with outstanding aesthetic properties
- Good to high gloss
- Good mechanical properties and pigmentation
- Good to excellent toughness
- Excellent shrinkage control
- Improved paintability of Class A SMC
- Can be thickened.

An example of UP Resin's application: composites' panel for transportation

Vinyl Ester (VE) resins

Vinyl Ester resins are produced by reaction of an epoxy resin with an unsaturated monocarboxylic acid. The polymer obtained is dissolved in a reactive monomer, such as styrene and/or an alternative monomer, generating a solution that can be applied and cured as conventional polyester resins.

Due to the chemical nature of the family, Vinyl ester resins are able to provide superior performance such as:

- 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 DION™, DISTITRON® 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, ducts and exhaust stacksand. Polynt Group's VE resins are also widely used by marine, swimming pools and automotive sectors.

Example of DISTITRON® VE 100 application.

VE Resins	VE resins references	Performance & Applications
Bisphenol A Epoxy Vinyl ester resin	DION 9100, DION 9102	Heat, corrosion and chemical resistance
Bisphenol A Epoxy Vinyl ester resin	DISTITRON VE100, EPOVIA KRF 1001, DION 9100, HYDREX 100	Mechanical performance, marine
Bisphenol A Epoxy Vinyl ester resin	DION 9100 PLUS	Mechanical performance, carbon fibre, pultrusion
Higher HDT Bisphenol A Epoxy Vinyl ester resin	DISTITRON VE102, DION IMPACT 9133, DION 9700	Improved thermal resistance
Novolac Epoxy Vinyl ester resin	DION 9400	High temperature performance, corrosion and chemical resistance, pultrusion, carbon fibre
Urethane modified vinyl ester resin	DION 9800	Heat, corrosion and chemical resistance, marine, pultrusion, carbon fiber
Brominated Vinyl ester resin	DION 9300	FR resin, corrosion & chemical resistance, heat
Elastomer modified vinyl ester resin	DION 9500	Flexibility, toughness, marine, carbon fiber, corrosion resistance
Urethane Epoxy Resin based vinyl ester in styrene	EPOVIA® OPTIMUM RF 5000	High performance, thickenable, transportation (SMC/BMC)
Bisphenol A Vinyl ester resin low-styrene content	DISTITRON VEef220, DION IMPACT 9160	Low styrene, high mechanical performance
Infusion grade Bisphenol A Vinyl ester resin	DISTITRON VE370, DION 9102, HYDREX 100 HF	Hydrolysis resistance, marine
Bisphenol-A Epoxy vinyl ester based resin	EPOVIA® OPTIMUM KRF 4031	Hydrolysis resistance, marine
Styrene-free bisphenol A Epoxy Vinyl ester resin	EPOVIA® OPTIMUM EP KRF 1101 TA, DION 9165, DISTITRON 220XZ1, DISTITRON 220XZ1	Styrene-free, CIPP, chemical anchors, mine bolts
Extra clear bisphenol A Epoxy Vinyl ester resin	POLYNT VE220 IQ	Excellent clear color, molding applications requiring good color or transparency

For further information please contact us

The photo on the right shows the ‘Soffio 31’ RIB (Rigid Inflatable Boat) photo by kind permission of Soffio 31 project.

This powerboat is composed of 3 basic components: deck, hull and engine covers. In order to save weight and increase performance, Polynt Group’s specially modified epoxy Vinyl Ester resin PCCR 138-40-40 was used for the hull of the boat. This particular resin gives excellent mechanical properties, adhesion to different fibres and the toughness and fatigue resistance required for race conditions, reducing problems of stress failure of any composite parts.

The Deck was constructed with temperature controlled infusion technology using unidirectional glass fibre and carbon fibre reinforcement, the resin used was Polynt Composites Vinyl Ester, DISTITRON VEef 220V4.

The Engine covers were, again constructed with temperature controlled infusion technology using different layers of carbon fiber fabric for the structure and Polynt Composites special urethane modified Vinyl Ester resin, DISTITRON VE104.

This process (with controlled optimised resin infusion) allows the use of medium high viscosity resin, a resin with less reactive solvent and excellent adhesion to reinforced fibres, less shrinkage during polymerization and enhanced toughness.

COMPANY ADDRESSES

EUROPE

FRANCE

Polynt Composites France S.A.
Route D'Arras CS 50019
62320 Drocourt
France
Phone: +33 3 21 74 84 00
Fax: +33 3 21 49 55 84
email: contact.FRComposites@polynt.com

ITALY

Polynt S.p.A.
Via del Pruneto, 40
52027 San Giovanni Valdarno (AR) - Italy
Phone: +39 055 91 281
Fax: +39 055 94 3936
email: contact.IT@polynt.com

Polynt S.p.A.
Via Romagnoli, 23
43056 San Polo di Torrile (PR) - Italy
Phone: +39 0521 812811
Fax: +39 0521 813445
email: contact@polynt.com

NORWAY

Polynt Composites Norway AS
Lilleborggata 4,
1630 Gamle Fredrikstad - Norway
Phone: +47 69357000
Fax: +47 69357001
email: contact.NO@polynt.com

POLAND

Polynt Composites Poland Sp. z o.o.
ul. Grabska 11d
32-005 Niepołomice
Poland
Phone: +48 12 281 42 00
Fax: +48 12 281 42 01
email: contact.PLcomposites@polynt.com

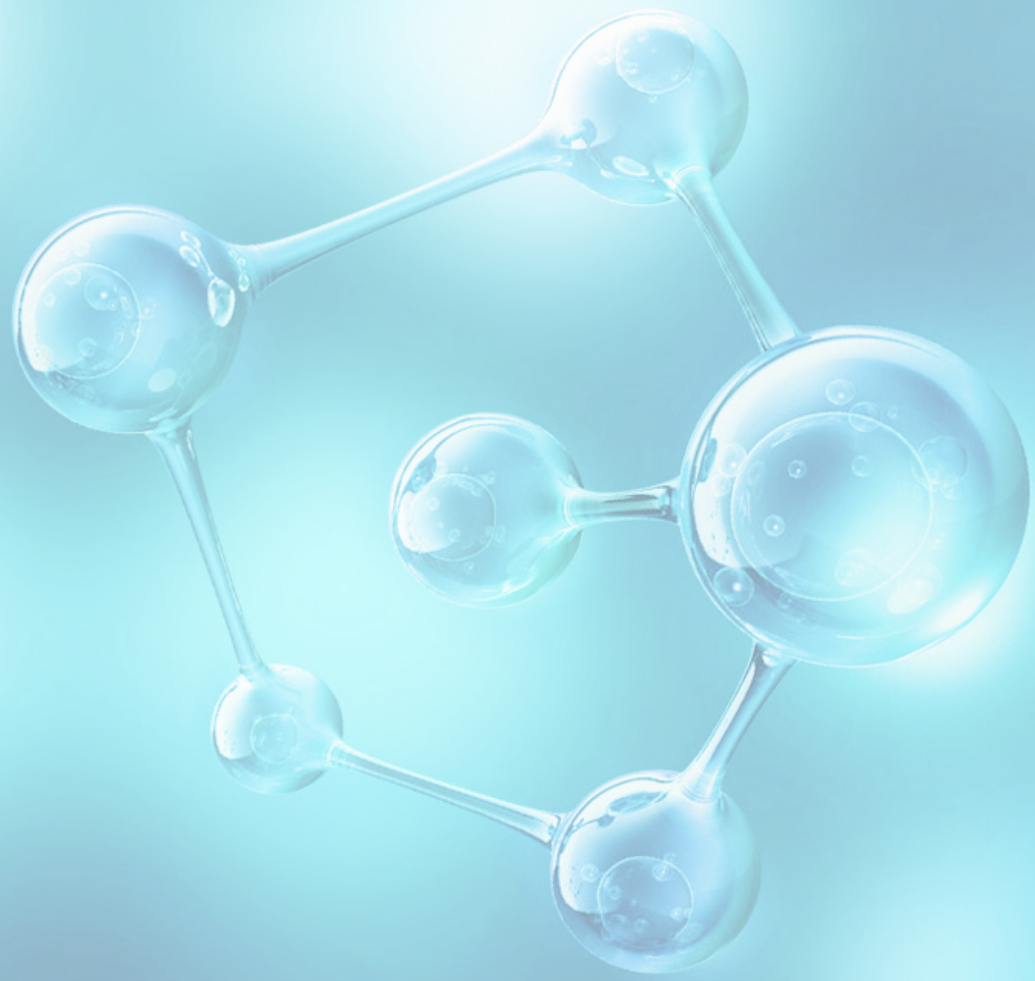
SPAIN

Polynt Composites Spain, S.L.U.
Avenida República Argentina, S/N
09200, Miranda de Ebro – Burgos
Spain
Phone: +34 947 333 348
email: contact.EScomposites@polynt.com

UK

Polynt Composites UK Ltd.
Laporte Road
Stallingborough - Near Grimsby
North East Lincolnshire DN41 8DR
United Kingdom
Phone: +44 1469 552570
Fax: +44 1469 552597
email: contact.UKComposites@polynt.com

Polynt Composites UK Ltd.
54 Willow Lane,
Mitcham
Surrey CR4 4NA - United Kingdom
Phone: +44 20 8648 4684
Fax: +44 20 8640 6432
United Kingdom
Phone: +44 1469 552570
Fax: +44 1469 552597
email: contact.UKComposites@polynt.com



Polynt Composites USA Inc.
99 East Cottage Avenue
Carpentersville, IL 60110
United States
Phone: +1 800 322 8103
email: contact.US@polynt.com
www.polynt.com

Polynt S.p.A.
Via Enrico Fermi, 51
24020 Scanzorosciate (BG)
Italy
Phone: +39 035 652 111
email: contact.IT@polynt.com
www.polynt.com