STYPOL®

040-4604
Isophthalic Filament Winding Resin – FDA Approvable

Copyright 2016-2017

Description

STYPOL® 040-4604 is a pre-promoted, unsaturated polyester laminating resin in monomer. It is especially formulated for filament winding parts for high heat resistance and/or corrosion resistant applications.

STYPOL® 040-4604 is formulated with FDA approved ingredients for indirect food contact per 21 CFR 177.2420. The fabricator is responsible for obtaining actual FDA approval for the finished part.

STYPOL® 040-4604 meets National Emissions Standards for Hazardous Air Pollutants: Reinforced Plastic Composite Production, corrosion resistant/high strength resins, filament, and manual application.

Features and Benefits

- Outstanding chemical resistance
- High impact resistance
- Good heat resistance

Typical Liquid Properties (at 77°F)

The liquid properties of STYPOL® 040-4604 are shown below. These values may or may not be manufacturing control criteria; they are listed as a reference guide only. Particular batches will not conform exactly to the numbers listed because storage conditions, temperature changes, age, and testing equipment (type and procedure) can each have a significant effect on the results. Products with properties outside of these readings can perform acceptably. Final suitability of this product is in the end use performance.

Test	STYPOL® 040-4604
Viscosity (1)	550 cps
Gel Time (2)	40 minutes
Peak Exotherm	375°F
Gel to Peak Time	13 minutes
Weight per Gallon	9.0 lbs.

(1) Brookfield LVF #3, @ 60 rpm

(2) Arkema Luperox® 1.5% Arkema Luperox® DDM-9

Physical Properties

The physical properties of STYPOL® 040-4604 are shown below. Properties are shown for a neat resin casting. These are typical values and are provided for reference only.

Note: The physical properties of thermoset resins evolve as the resin cures. The properties given below are for well cured castings. Resin and laminates at different stages of cure will have varying properties.

Test	Test Method [1]	Neat Resin Casting [2]
Tensile Strength	ASTM D638	9,300 psi
Tensile Modulus		930,000 psi
Tensile Elongation		1.9%
Flexural Strength	ASTM D790	17,500 psi
Flexural Modulus		650,000 psi
Barcol Hardness, Model #934	ASTM D2583	48
Heat Distortion Point at 264 psi	ASTM D648	
Cure at 70°C		189°F
Cure at 120°C		207°F

[1] All tests were run per internal Polynt test methods. These methods are similar to the ASTM methods listed above.

[2] Neat resin casting catalyzed with 1.5% Arkema Luperox® DDM-9.

Application

The cure rate of polyester resins depends on a number of factors including the product's age, temperature, catalyst type, catalyst level and ambient humidity. When used in a laminating application, the laminate cure rate also depends on reinforcement content and laminate thickness as well as other factors. For these reasons, we recommend that customers check the cure rate in their plant.

STYPOL® 040-4604 is quality control tested using Arkema Luperox® DDM-9 peroxide. United Initiators NOROX® MEKP-9, and Akzo Nobel CADOX® D-50a and CADOX® L-50a are expected to yield similar performances. Arkema Luperox® DHD-9, United Initiators NOROX® MEKP-925 and NOROX® MEKP-925H, and Pergan HP®-90 may also be used but gel and cure times will vary.

The catalyst level should not exceed 2.4% or fall below 0.9% for proper cure. A catalyst level of 1.5% at 77°F is considered ideal.

This product should not be used when temperature conditions are below 60°F, as curing may be adversely affected.

Caution

Do not add any material, other than the recommended methyl ethyl ketone peroxide, to this product without the advice of a representative of Polynt Composites.

Related Documents

MB-354 Food Contact Regulations for Composites

Storage Limitations

STYPOL® 040-4604 has a shelf life of 120 days from date of manufacture when stored at 73°F or below in a closed, factory sealed, opaque container, and out of direct sunlight. The shelf life is cut in half for every 20°F over 73°F.

SDS / Data Sheets

SDS and data sheets can be obtained by contacting your Polynt representative or Polynt Customer Service at 800-322-8103.

POLYNT SAFETY INFORMATION

All sales of products manufactured by Polynt Composites USA Inc. and described herein, are made solely on condition that Polynt Composites USA customers comply with applicable health and safety laws, regulations and orders relating to the handling of our products in the workplace. Before using, read the following information, and both the product label and Safety Data Sheet pertaining to each product.

Most products contain styrene. Styrene can cause eye, skin and respiratory tract irritation. Avoid contact with eyes, skin and clothing. Impermeable gloves, safety eyewear and protective clothing should be worn during use to avoid skin and eye contact. Wash thoroughly after use.

Styrene is a solvent and may be harmful if inhaled. Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Extended exposure to styrene at concentrations above the recommended exposure limits may cause central nervous system depression causing dizziness, headaches or nausea and, if overexposure is continued indefinitely, loss of consciousness, liver and kidney damage.

Do not ingest or breathe vapor, spray mists or dusts caused by applying, sanding, grinding and sawing products. Wear an appropriate NIOSH/MSHA approved and properly fitted respirator during application and use of these products until vapors, mists and dusts are exhausted, unless air monitoring demonstrates vapors, mists and dusts are below applicable exposure limits. Follow respirator manufacturer's directions for respirator use.

The 12th Report on Carcinogens issued by the National Toxicology Program lists styrene as a “reasonably anticipated” carcinogen, but the Report cautions that the NTP listing does not mean that styrene presents a risk to persons in their daily lives. The Styrene Information and Research Center does not agree with the classification as it did not include a review of all available data. SIRC states: “HHS included styrene in the 12th RoC despite the fact that European Union regulators have determined styrene does not represent a human cancer concern. E.U. scientists reviewed the full styrene database, weighing all of the available data in reaching their conclusion.”

The International Agency for Research on Cancer (IARC) reclassified styrene as Group 2B, "possibly carcinogenic to humans." This revised classification was not based on new health data relating to either humans or animals, but on a change in the IARC classification system. The Styrene Information and Research Center does not agree with the reclassification and published the following statement: Recently published studies tracing 50,000 workers exposed to high occupational levels of styrene over a period of 45 years showed no association between styrene and cancer, no increase in cancer among styrene workers (as opposed to the average among all workers), and no increase in mortality related to styrene.

Styrene is classified by OSHA and the Department of Transportation as a flammable liquid. Flammable products should be kept away from heat, sparks, and flame. Lighting and other electrical systems in the workplace should be vapor-proof and protected from breakage.

Vapors from styrene may cause flash fire. Styrene vapors are heavier than air and may concentrate in the lower levels of molds and the work area. General clean air dilution or local exhaust ventilation should be provided in volume and pattern to keep vapors well below the lower explosion limit and all air contaminants (vapor, mists and dusts) below the current permissible exposure limits in the mixing, application, curing and repair areas.

Some products may contain additional hazardous ingredients. To determine the hazardous ingredients present, their applicable exposure limits and other safety information, read the Safety Data Sheet for each product (identified by product number) before using. If unavailable, these can be obtained, free of charge, from your Polynt Composites representative or from: Polynt Composites USA Inc., 99 East Cottage Avenue, Carpentersville, IL 60110, 800-322-8103.

FIRST AID: In case of eye contact, flush immediately with plenty of water for at least 15 minutes and get medical attention; for skin, wash thoroughly with soap and water. If affected by inhalation of vapors or spray mist, remove to fresh air. If swallowed, get medical attention.

Those products have at least two components that must be mixed before use. Any mixture of components will have hazards of all components. Before opening the packages read all warning labels. Observe all precautions.

Keep containers closed when not in use. In case of spillage, absorb with inert material and dispose of in accordance with applicable regulations. Emptied containers may retain hazardous residue. Do not cut, puncture or weld on or near these containers. Follow container label warnings until containers are thoroughly cleaned or destroyed.

FOR INDUSTRIAL USE AND PROFESSIONAL APPLICATION ONLY. KEEP OUT OF REACH OF CHILDREN.

LIMITED WARRANTY AND LIMITATION OF LIABILITY

LIMITED WARRANTY.

Seller warrants that: (i) Buyer shall obtain good title to the product sold hereunder, (ii) at shipment such product shall conform to Seller's specifications for the product; and (iii) the sale or use of such product will not infringe the claims of any U.S. patent covering the product itself, but Seller does not warrant against infringement which might arise by the use of said product in any combination with other products or arising in the operation of any process. **SELLER MAKES NO OTHER WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE, EVEN IF THAT PURPOSE IS KNOWN TO SELLER. ANY ADDITIONAL REPRESENTATIONS OR SUGGESTIONS REGARDING THE PRODUCT OR ITS POSSIBLE USES ARE BASED UPON SELLER'S GOOD FAITH OPINION AND BELIEF, BUT ARE NOT TO BE CONSTRUED AS AFFIRMATIONS OF FACT, PROMISES, OR DESCRIPTIONS, AND SHALL IN NO WAY BE DEEMED PART OF THE SALE OF PRODUCT.** In particular, and without limiting the foregoing, because of environmental and use conditions beyond Seller's control, Seller offers no warranty and makes no promise concerning the results that may be obtained by the Buyer (or the Buyer's customer) with the product or the performance of the product. Each user should satisfy itself, by adequate testing, of the suitability of the product for its particular application.

LIMITATION OF LIABILITY.

(a) Seller's total liability for any claim arising out of or in connection with this contract, including for breach of contract, warranty, statutory duty, or for other tort, including seller's negligence, shall not exceed the purchase price of such product as to which such liability arises. Seller shall not be liable for any injury, loss or damage, resulting from the handling or use of the product shipped hereunder whether in the manufacturing process or otherwise. **IN NO EVENT SHALL SELLER BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION LOSS OF PROFITS, CAPITAL OR BUSINESS OPPORTUNITY, DOWNTIME COSTS, OR CLAIMS OF CUSTOMERS OR EMPLOYEES OF BUYER, WHETHER IN AN ACTION UNDER CONTRACT, NEGLIGENCE OR ANY OTHER THEORY, ARISING OUT OF OR IN CONNECTION WITH THIS CONTRACT, OR THE USE, INABILITY TO USE, OR PERFORMANCE OF THE PRODUCT.**

(b) If Seller furnishes technical or other advice to Buyer, whether or not at Buyer's request, with respect to processing, further manufacture, other use or resale of the products, Seller shall not be liable for, and Buyer assumes all risk of, such advice and the results thereof.

The information provided is believed to be accurate at the time of preparation, or prepared from sources believed to be reliable, but it is the responsibility of user to investigate and understand other pertinent sources of information, to comply with all laws and procedures applicable to the safe handling and use of the product and to determine the suitability of the product for its intended use.