Product Datasheet

SP&S Specialty Polymers and Services

Arathane® 5753A/HVB

Tough, Resilient Urethane Adhesive, Encapsulant, & Sealant

Arathane® 5753A/HVB is a variant of the popular Arathane® 5753A/B(LV) polymer system produced by Huntsman Advanced Materials. Arathane® 5753A/HVB is a formulation developed by Sandia national labs to provide improved dielectric properties and allow the modified Arathane 5753A/B(LV) formulation to match or exceed the performance of legacy TDI based system polyurethane potting and casting systems.

Arathane® 5753A/HVB is a tough, low viscosity, unfilled polyurethane systems that cures into a polymer exhibiting exceptional electrical insulating properties, excellent performance in cryogenic and high humidity environments, and low outgassing properties suitable for space applications. The cured system has a relatively low modulus and is excellent for use with stress sensitive electronics. The cured polymer forms a tough rubber and is suitable for casting rubber parts and components that are resistant to low temperature embrittlement and to moisture exposure.

This system is available in a natural off-white to light yellow color that is easily pigmented. It is also available in a standard black version or in custom colors by request. The standard system is supplied uncatalyzed and has a medium work-life. Faster setting and curing versions are available by request. Please contact us to discuss your application if you think such a variant would be helpful for your application.

APPLICATIONS & BENEFITS:

- Potting & impregnation of low voltage electronic devices, such as coils, potentiometers, modules, and hydrophones
- Low modulus reduces stress on stress-sensitive and cryogenic components
- Low outgassing for use in optical, space and other high vacuum environments.
- RoHS and REACH Compliant
- Highly resistant to reversion even with high heat and humidity exposure

HANDLING PROPERTIES		VALUE	TEST METHOD
Visual Appearance, Part 5753A		Clear, yellow to orange liquid	
Density, Part A		1.21 g/cm³	ASTM E-201
Viscosity, Part A, at 25ºC		50 cps	ASTM D-2393
Visual Appearance, Part 5753HVB		translucent liquid or Black	
Density, Part B		0.93 g/cm³	ASTM E-201
Viscosity, Part B, at 25ºC		4800 cps	ASTM D-2393
Density Mixed, g/cm³		1.00 g/cm³	ASTM E-201
Viscosity Mixed, at 25ºC		2600 cps	ASTM D-2393
Mix Ratios:		By Weight	By Volume
		51A:100	40A:100B
Processing Temp.	Gel time	Tack Free time	Full Cure time
25ºC	30 - 45 minutes	16 -24 hours	7 days
65ºC	15 – 25 minutes	2 – 3 hours	8 - 16 hours
95ºC	5 –10 minutes	1 – 2 hours	4 - 8 hours

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PHYSICAL PROPERTIES	VALUE	TEST METHOD
Color	light yellow or Black	Visual
Shore Hardness	90A ± 10 or 34D ± 7	ASTM D-2240
Tensile Strength, psi	1750 psi	ASTM D-638
Tensile Elongation at break	>150%	ASTM D-638
Tear Strength	>200%	
Glass Transition Temp. (Tg)	-61ºC	ASTM D-648
Coefficient of Thermal Expansion (CTE):		ASTM E-831
Below Tg / Above Tg	60 ppm/ºC / 174 ppm/ºC	
Maximum Suggested Continuous Use Temperature:	130ºC	
Fungus Resistance	Non-Nutrient	Mil-I-46058C
Water Absorption 30-day immersion	0.35%	
Outgassing:		ASTM E-595
Total Mass Loss (TML) %	0.66%	
CVCM %	<0.01%	
WVR %	0.01%	
Dielectric Strength at 3 mil	>1500 V/mil	Mil-I-46058C
Dielectric Strength at 1/8"	700 V/mil	Mil-I-46058C
Insulation Resistance, ohms	>1.0 x 10^{15} ohms	Mil-I-46058C
Dielectric Constant at 25C		ASTM D-150
at 1 k Hz / 100 KHz	3.5 / 2.9	
Dielectric Constant at 100C		ASTM D-150
at 1 k Hz / 100 KHz	3.8 / 3.2	
Loss tangent at 25C		ASTM D-150
at 1 k Hz / 100 KHz	0.014 / 0.015	
Loss tangent at 100C		ASTM D-150
at 1 k Hz / 100 KHz	0.024 / 0.027	
Thermal Conductivity	0.22 W/mK	

NOTE : Values are based on laboratory or average production results – not for specification purposes.

SUGGESTED PROCESSING GUIDELINES:

To use, weigh Part A and Part B in the recommended ratio as accurately as possible into a clean mixing container. Mixing containers should preferably be made of polyethylene, glass, or non-corroding metal. (Stainless steel, aluminum, etc.). Always use weighing equipment having accuracy that is ±1% or less of the smallest quantity that you will be weighing. Blend Part A & B thoroughly using a spatula or stirring stick for at least 2-3 minutes using a kneading motion. Scrape the bottom and sides of the mixing container carefully and frequently to produce a uniform mixture. Vacuum de-gassing after mixing is helpful to remove air. Vacuum degassed material will produce the strongest possible bonds and provide the best insulation values. Apply the mixed material to clean, dry surfaces. Suitable application methods include by brush, by spatula, from a syringe, etc.

Stripping / Removal:

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Uncured or partially cured Arathane® 5753A/HVB can be removed with acetone, MEK, Ultralane Thinner #1 or #25, or other solvents. Fully cured Arathane® 5753A/HB may be removed using mechanical or chemical methods as described below:

Mechanical Removal: Due to the flexible nature of cured Arathane® 5753A/HVB, it may be fairly easily cut with a sharp knife and then scraped or peeled from the surface. If repairing the area where the material was removed, lightly sand down rough edges of intact polymer, and wipe repair area clean with isopropyl alcohol or acetone. Allow to dry 15 minutes at 80ºC or 1 or more hours at room temperature. Then mix fresh Arathane® 5753A/HVB per the processing instructions above and apply to repair area with a clean, dry brush, spatula or equivalent. Cure following one of the recommended cure schedules and perform any necessary quality control of performance testing on the board, component, or repair area to ensure a satisfactory performance.

Chemical Removal Use Ultralane Stripper A/B or Ultralane Stripper A/B Gel for selective or total removal of cured compound. See technical datasheet for the Ultralane Stripper A/B for more information. **Important:** Laboratory tests indicate that if suggested procedures are followed, there will be little or no adverse effects to printed circuit board and most components from using the Ultralane Stripper, but please test first on scrap components or boards prior to trying on parts you want to rework. The most likely materials to be affected by the Ultralane Stripper are other inks, adhesive, encapsulants and coatings.

Note: The effectiveness of Ultralane Stripper A/B will decrease over several weeks after mixing and may decrease with use on multiple board or components. See separate Ultralane Stripper A/B technical datasheet & MSDS for additional usage and handling instructions. Use only explosion-proof equipment. Keep away from flame and sparks.

STORAGE GUIDELINES:

Store this material in a clean, cool, and dry environment in its tightly closed original container. Protect the Arathane® 5753A from extended exposure to temperature below 20ºC (68ºF). Crystallization may occur if the 5753A is exposed to cold for extend periods. If this occurs, heat the entire container of 5753A for 4 hours at 65ºC to re-liquefy the crystals. Allow to cool to ambient temperature prior to using. Also protect the 5753HVB from extended exposure to moisture or high humidity. Tightly re-seal containers after use and blanket with dry nitrogen or another dry inert gas if available. If the recommended storage conditions are observed the products will have a minimum shelf-life of 6 months from the date of shipment.

HANDLING PRECAUTIONS:

Mandatory and recommended industrial hygiene procedures should be followed whenever these products are being handled and processed. For additional information please consult the corresponding material safety data sheets.

PERSONAL HYGIENE:

Arathane® 5753A - **WARNING! Contains organic isocyanate.** May cause severe eye & skin irritation. Prolonged or repeated skin contact, or inhalation of vapors may cause allergic skin or respiratory reactions. Harmful if inhaled or swallowed. Avoid contact with eyes, skin, or clothing. Wear eye protection and impervious gloves when handling. Wash thoroughly after handling. Avoid breathing vapor or mist. Keep containers closed when not in use. Use only with adequate ventilation. Do not take internally.

Arathane® 5753HVB - WARNING**!** May cause eye & skin irritation. Prolonged or repeated skin contact may cause allergic skin reactions. Harmful if inhaled or swallowed. Avoid contact with eyes, skin, or clothing. Wear eye protection and impervious gloves

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when handling. Wash thoroughly after handling. Avoid breathing vapor or mist. Keep containers closed when not in use. Use with adequate ventilation. Do not take internally.

FIRST AID

In case of contact: **Skin** – Immediately wash skin thoroughly with mild soap and water. Remove contaminated clothing and wash before reuse. Destroy contaminated shoes and other articles made of leather. **Eyes** – Immediately flush eyes with plenty of water for 15 minutes and get prompt medical attention. **Inhalation** - Remove person to fresh air. Administer oxygen or artificial respiration if necessary. Call a physician. **Ingestion** - Do not induce vomiting. Dilute with plenty of water and contact physician immediately. Never give anything by mouth to an unconscious person.

DISCLAIMER:

IMPORTANT: The following supersedes Buyer's documents. **SELLER / MANUFACTURER MAKES NO REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, INCLUDING OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE**. No statements herein are to be construed as inducements to infringe any relevant patent. Under no circumstances shall Seller / Manufacturer be liable for incidental, consequential or indirect damages for alleged negligence, breach of warranty, strict liability, tort, or contract arising in connection with the product(s). Buyer's sole remedy and Seller's sole liability for any claims shall be Buyer's purchase price. Data and results presented are based on controlled or laboratory work and must be confirmed by Buyer by testing for its intended conditions of use. The product(s) has not been tested for, and is therefore not recommended for, uses for which prolonged contact with mucous membranes, abraded skin, or blood is intended; or for uses for which implantation within the human body is intended

Specialty Polymers & Services, Inc. (SP&S)
27822 Fremont Court **Tel: 661-294-1790**
Valencia, CA 91355 **Fax: 661-294-0640**
www.spolymers.com **info@spolymers.com**

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