Product Datasheet

SP&S
Specialty Polymers and Services

Arathane® 5753A/B(LV-AOX)

Flexible, Resilient Urethane Adhesive, Coating, & Encapsulant

Arathane® 5753A/B(LV-AOX) is a variant of the popular Arathane® 5753A/B(LV) polymer system produced by Huntsman Advanced Materials. Arathane® 5753A/B(LV-AOX) is produced from Arathane 5753A/B(LV) and is designed to yield the same cured properties as the Arathane 5753A/B(LV) with the added benefit of increased resistance to thermal oxidation due to long term exposure to elevated temperatures.

Arathane® 5753A/B(LV-AOX) when cured produces a tough, flexible, repairable, urethane polymer useful as an adhesive, encapsulant or coating. The cured polymer provides excellent electrical insulation properties, extremely low outgassing and tough flexible bonds to many different materials. The polymer has a very low modulus and is often used with stress-sensitive components especially in cryogenic application or where impact or vibration may occur. In addition, the cured polymer is highly resistant to moisture and many chemicals and is extremely resistant to hydrolytic reversion even when subject to extended cycling in an autoclave.

In addition to the standard, Arathane® 5753A/B(LV-AOX), we offer many other custom variants of the standard Arathane® 5753A/B(LV) including thickened versions, custom colored versions, and faster setting/curing versions. 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. (Meets NASA and ESA requirements)
- Repairable

HANDLING PROPERTIES	VALUE	TEST METHOD
Visual Appearance, Part A	Clear, yellow to orange liquid	
Density, Part A	1.20 g/cm³	ASTM E-201
Viscosity, Part A, @ 25ºC	50 cps	ASTM D-2393
Visual Appearance, Part B	Clear to milky liquid	
Density, Part B	0.95 g/cm³	ASTM E-201
Viscosity, Part B, @ 25ºC	8000 cps	ASTM D-2393
Density Mixed, g/cm³	1.00 g/cm³	ASTM E-201
Viscosity Mixed, 780A/B @ 25ºC	6000 cps	ASTM D-2393
Mix Ratios by weight (by volume)	20A:100B (16.5A:100B)	

Processing Temp.	Gel time	Tack Free time	Full Cure time
25ºC	60 – 90 minutes	16 – 24 hours	3 - 7 days
65ºC	10 – 20 minutes	2 – 3 hours	8 - 16 hours
95ºC	5 –10 minutes	1 – 2 hours	4 - 8 hours

PHYSICAL PROPERTIES

	VALUE	TEST METHOD
Color	Translucent, light yellow to amber	Visual
Shore A Hardness - initial	45 – 60	ASTM D-2240
After 300 hours @ 125 ºC	Unchanged	
After 300 hours @ 150 ºC	≤ 5 point change in hardness	
Tensile Strength, psi	350 psi	ASTM D-638
Tensile Elongation at break	>150%	ASTM D-638
Glass Transition Temp. (Tg)	<-70ºC	ASTM D-648
Coefficient of Thermal Expansion (CTE):		ASTM E-831
Below Tg / Above Tg	100 ppm/ºC / 180 ppm/ºC	
Maximum Suggested Continuous Use Temperature:	130ºC	
Fungus Resistance	Non-Nutrient	Mil-I-46058C
Outgassing:		ASTM E-595
Total Mass Loss (TML) %	0.41%	
CVCM %	0.03%	
WVR %	0.01%	
Dielectric Strength @ 3 mil	>1500 V/mil	Mil-I-46058C
Insulation Resistance, ohms	>1.0 x 10^{15} ohms	Mil-I-46058C
Dielectric Constant @ 25C		ASTM D-150
@ 1 k Hz / 100 KHz	2.5 / 3.0	
Dielectric Constant @ 100C		ASTM D-150
@ 1 k Hz / 100 KHz	3.6 / 3.2	
Loss tangent @ 25C		ASTM D-150
@ 1 k Hz / 100 KHz	0.022 / 0.025	
Loss tangent @ 100C		ASTM D-150
@ 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:

Uncured or partially cured Arathane® 5753A/B(LV-AOX) can be removed with acetone, MEK, Ultralane Thinner, or other solvents. Fully cured Arathane® 5753A/B(LV-AOX) may be removed using mechanical or chemical methods as described below:

Mechanical Removal: Due to the soft, flexible nature of cured Arathane® 5753A/B(LV-AOX), 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 remove, lightly sand down rough edges of intact polymer, and wipe repair area clean with isopropyl alcohol. Allow to dry 15 minutes at 80ºC or 1 or more hours at room temperature. Then mix fresh Arathane® 5753A/B(LV-AOX) per the processing guidelines above and apply to repair area with a clean, dry, acid brush, spatula or equivalent. Cure, following one of the recommended cure schedule 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 for selective or total removal of cured compound. **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.

Localized Chemical Removal: Prepare parts by masking off area to remain intact using suitable chemical resistant masking tapes. Using an acid brush, apply generous amounts of Ultralane Stripper A/B over components in repair area. Do not allow to dry. Keep applying stripper until polymer starts to swell and flake off (approximately 5–10 minutes). While keeping repair area saturated, periodically brush or cut away loosened material. After 20 minutes exposure to stripper, wipe up or drain off all remain stripper, wash with isopropyl alcohol and allow to dry. Scrape or cut away any loose polymer. If further removal is necessary, apply fresh stripper and repeat process for up to an additional 20 minutes. When done, be sure to flush out all stripper with clean isopropyl alcohol and allow to dry. Then remove masking/damning materials, perform any component replacement or repairs and clean again with isopropyl alcohol. Dry board 2 hours at 80ºC. Apply fresh Arathane® 5753A/B(LV-AOX) and follow recommended cure schedules.

Total Removal: Place parts into a container of Ultralane Stripper A/B. Agitation will increase stripper efficiency. For safety reasons, using Ultralane Stripper A/B at room temperature is preferable, but with proper ventilation and fire/explosion proof equipment heating the stripper up to as much as 50ºC is possible and will reduce the time required to remove the coating. At room temperature, leave the part in the stripper for 15 minutes. The polymer will swell and start to separate from embedded components. Periodically, brush parts with stiff brush to help remove loosened material. After 15 minutes, remove parts from stripper and examine. Brush or cut away any loosened material. Repeat the process until majority of material is removed then apply stripper by brush to any localized areas where the polymer remains.

Note: The effectiveness of Ultralane Stripper A/B will decrease over several weeks and may decrease with use on multiple board or components. See separate Ultralane Stripper 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 5753B(LV-AOX) 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® 5753B(LV-AOX) - **Caution!** 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 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 supercedes 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

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