

Technical Data Sheet: PARALOID B72 P422-9000

Product Description

Ethyl methacrylate co-polymer. Also known as **Acraloid B72**.

Properties

Non-crosslinking, medium to hard thermoplastic acrylic resin which is light proof and has good age resistance. Glass Transition Temperature is approximately 40°C (104°F). Ultimate hardness as expressed in Khn units: 10-11. Density: gms/ml: 1.15gm (i.e. 1ml volume of resin = 1.15 gms).

Uses (typical percentages shown in brackets)

Paraloid B72 (acrylic polymer) can be used in the consolidation of wall paintings (1-5%); ground and pigment layers on oil paintings (5-10% in either toluene or isopropanol); fragile wood in furniture, polychrome sculpture etc (5-20%); to consolidate worm holes in wooden artifacts (30%); to consolidate plaster on ceilings (ideally two coats at 15% solids or one coat of 25% solids); as a fixative for chalk, charcoal and pencil marks (2-4% in toluene or isopropanol); as an adhesive for glass and ceramics (in acetone); as a varnish to fix identity markings on historical artifacts (20% in acetone); and with microballoons as a filler.

Solubility of Paraloid/Acraloid B72

Soluble in Acetone, Amyl Acetate, n-Butanol, Cellosolve, Diacetone Alcohol, Dimethyl Formamide, Ethyl Alcohol, Ethylene Dichloride, Isopropanol, Methylene Chloride, Methyl Ethyl Ketone, Toluene, Trichloroethane (see now Leksol) and Xylene. B72 is insoluble in White Spirit.

Mix thoroughly using a glass rod and bowl, if using a stirrer ensure all parts are fully solvent vapour protected. For best results extract a small amount of the dissolved solution using a glass rod and spread onto a glass slide. Check that the resin has fully dissolved before application. If storing ensure the mixture is placed in an airtight container preferable made of glass or metal. If metal, periodically invert the sealed container to reduce dry zones inside and in doing so minimise any moisture penetration.

User tips on applications

Markings on museum objects – Paraloid/Acraloid B72 is commonly used as a varnish to seal identification markings onto furniture and artifacts on display with acetone being the commonly used solvent for this purpose. To apply ensure the area to be treated is clean. Using a fine brush apply 20% weight/volume of B72 dissolved in acetone (i.e. 20g of B72 to 100ml Acetone) and allow to dry up to 15 minutes. On particularly rough surfaces a second coat may be preferable to form an even surface on which to apply the marking.

Using an appropriate rotting isograph style pen (a typical nib size is 010 or 020) and drawing ink (water based ink: white, red or black) apply the reference marking and allow to dry. Apply a further top coat of B72 in Acetone as the sealant and allow to dry. Your reference marking is now sealed in place. If necessary Acetone (or the solvent used to dissolve B72) may be used to remove the varnish.

Sealing fine cracks by capillary action - Mixed to a non-viscous state and through capillary action (approximately 10% or less solids) Paraloid/Acraloid B72 can be used to seal cracks within tightly formed objects (vases etc). After application the solvent evaporates to leave sufficient solids to form an adhesive bond. A 15% solids concentration may be preferable when applying B72 as a consolidant on site.

For more manageable working/drying times both Xylene and Butyl Acetate may prove preferable to Acetone. Used as an adhesive (i.e. 50/50%) B72 once fully dried (up to 7 days) should not be effected by contact with water, condensation etc.

Consolidating wormholes in furniture – A 5 to 10% concentration in Acetone applied by syringe works well to penetrate and consolidate worm holes. Keeping the item in a sealed container after treatment greatly assists in penetration. Small holes can be filled using a combination of microballoons and B72. Larger holes can be filled using polyethylene foam shaped to fit recesses and then covered with a mixture of microballoons and B72 tinted with dry pigments if necessary.

N.B. More volatile solvents may create surface films trapping the solvent within the structure for longer than solvents that are slower/less volatile. We recommend the use of Paraloid/Acraloid B67 (30%) for the treatment of worm holes wherever practical. B67 is soluble in White Spirit, and has the advantage of being a slower evaporating solvent, much easier to work with on a health and safety front.

Plaster sealant – Paraloid B72 has been used as a pre treatment sealant on certain friable plaster covered walls prior to the re-application of original spirit based stumple glazes. Allow surface coating to dry fully before applying over-painting on surface.

Filling voids in bone – Paraloid B72 has been used very effectively to fill voids on bone. A 20% working solution in acetone should be used initially as an adhesive for the void filler,

follow with a 40% concentration in acetone (2:1 by volume) with glass microballoons to fill any voids. Ideally allow 4 days for the void fill to harden.

[Further reading: ‘The use of Paraloid B72 as an Adhesive; Its application for Archaeological Ceramics and other Materials’ by Stephen Koob, Studies in Conservation 31, 14/07/1986]

General Health & Safety Information (consult full MSDS sheet prior to use)

Mild acrylic odour, auto ignition temperature 393°C (close to 750°F), not hazardous according to EEC directives 67/548/EEC and 88/379/EEC. Burns vigorously with intense heat. Vapour from heated product can irritate the nose, throat and lungs, cause headache, drowsiness, dizziness and nausea, and may cause eye and skin irritation. Scoop or shovel material into suitable container for recovery or disposal.

When mixed with solvent **always** evoke appropriate health and safety guidelines. Always use adequate means of extraction and personal protection and **never** use electric mixers. We would recommend using a glass rod and bowl for mixing.

Disposal & Ecological Considerations

Incinerate at a facility that complies with local, state and federal regulations. No applicable data is available in respect of ecological considerations.

Transportation

Not regulated, not considered hazardous. Commodity code: 39069090

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT IDENTIFICATION

Paraloid® B-72 100% Acrylic resin

Paraloid® is a trademark of Rohm and Haas Company or one of its subsidiaries or affiliates.

See section 16, for European Emergency Contact Information

2. COMPOSITION/INFORMATION ON INGREDIENTS

| No. | | CAS REG NO. | WEIGHT(%) |
|-----|-------------------|---------------|-----------|
| 1. | Acrylic polymer | Not Hazardous | 98-100 |
| 2. | Residual monomers | Not Required | 0.15MAX |
| 3. | Toluene | 108-88-3 | 1.0MAX |

See section 8, Exposure Controls / Personal Protection

EEC Risk Classification

| No. | Classification and Hazard Labelling |
|-----|-------------------------------------|
| 3. | Toluene F, Xn R: 11-20 |

See section 15, Regulatory Information

This product is a preparation.

3. HAZARDOUS IDENTIFICATION

Primary Routes of Exposure

- Inhalation
- Eye Contact
- Skin Contact

Inhalation

Inhalation of monomer vapour from heated product can cause the following:

- Irritation of nose, throat, and lungs – nausea – headache – dizziness

Eye Contact

Monomer vapours from heated product can cause the following:

- Moderate irritation

Skin Contact

Prolonged or repeated skin contact can cause the following:

- Slight skin irritation

Delayed Effects

Repeated overexposure to the solvents in this product can cause the following:

- Enlarged liver – kidney effects – cardiac sensitization – irritation of the respiratory tract

4. FIRST AID MEASURES

Inhalation

Move subject to fresh air

Eye Contact

Flush eyes with a large amount of water for at least 15 minutes. Consult a physician if irritation persists.

Skin Contact

Wash affected skin areas thoroughly with soap and water. Consult a physician if irritation persists.

Ingestion

If swallowed, give 2 glasses of water to drink. Consult a physician.
Never give anything by mouth to an unconscious person.

5. FIRE FIGHTING MEASURES

| | |
|---------------------------|------------------------|
| Flash Point | Not Applicable |
| Auto-ignition Temperature | 393°C / 739°F Estimate |
| Lower Explosive Limit | No Data |
| Upper Explosive Limit | No Data |

Unusual Hazards

Material as sold is combustible; burns vigorously with intense heat.

Extinguishing Agents

Use the following extinguishing media when fighting fires involving this material:

- Carbon dioxide – dry chemical – water spray

Personal Protective Equipment

As in any fire, wear self-contained breathing apparatus (pressure-demand, MSHA/NIOSH approved or equivalent) and full protective gear.

Special Procedures

Do not smoke under any circumstances

6. ACCIDENTAL RELEASE MEASURES

Personal Protection

Appropriate protective equipment must be worn when handling a spill of this material. See section 8, Exposure Controls/Personal Protection, for recommendations. If exposed to material during clean-up operations, see section 4, First Aid Measures, for actions to follow.

Procedures

Keep spectators away. Floor may be slippery; use care to avoid falling. Eliminate all ignition sources. Use water spray to keep dusting to a minimum. Transfer spilled material to suitable containers for recovery or disposal.

Caution: Keep spills and cleaning runoff out of municipal sewers and open bodies of water.

7. HANDLING AND STORAGE

Storage Conditions

Material can burn; limit indoor storage to approved areas equipped with automatic sprinklers. Avoid all ignition sources. The minimum recommended storage temperature for this material is -18C/0F. The maximum recommended storage temperature for this material is 49C/120F.

Handling Procedures

Monomer vapours can be evolved when material is heated during processing operations. See section 8, Exposure Controls/Personal Protection, for types of ventilation required.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limit Information

| No. | CAS REG NO. | WEIGHT (%) |
|----------------------|---------------|------------|
| 1. Acrylic polymer | Not Hazardous | 98-100 |
| 2. Residual monomers | Not Required | 0.15 MAX |
| 3. Toluene | 108-88-3 | 1.0 MAX |

| Comp | ROHM AND HAAS | | ACGIH | | MAK(Germany) | | |
|------------|---------------|------------|-------------|------------|--------------|-------------|------------|
| <u>No.</u> | <u>Units</u> | <u>TWA</u> | <u>STEL</u> | <u>TWA</u> | <u>STEL</u> | <u>WERT</u> | <u>KAT</u> |
| 1 | | None | None | None | None | None | None |
| 2 | | a | a | a | a | a | a |
| 3 | ppm | 50 b | 75 b | 50 b | None | 50 | c |

a Not Required

b Risk of skin-absorption

c Maximum Limit: Category II,2

Respiratory Protection

A respiratory protection program meeting OSHA 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use. None required if airborne concentrations are maintained below the exposure limit in 'Exposure Limit Information'.

Up to 10 times the TWA/TLV: Wear a MSHA/NIOSH approved (or equivalent) half-mask, air purifying respirator.

Up to 1000ppm organic vapour: Wear a MSHA/NIOSH approved (or equivalent) full-facepiece, air-purifying respirator.

Above 1000ppm organic vapour or Unknown: Wear a MSHA/NIOSH approved (or equivalent) self-contained breathing apparatus in the positive pressure mode,

Or,

MSHA/NIOSH approved (or equivalent) full-facepiece airline respirator in the positive pressure mode with emergency escape provisions.

Air-purifying respirators should be equipped with MSHA/NIOSH approved (or equivalent) cartridges for protection against organic vapors.

Eye Protection

Use safety glasses (ANSI Z87.1 or approved equivalent).

Hand Protection

Cotton or canvas gloves.

Engineering Controls (Ventilation)

Use local exhaust ventilation with a minimum capture velocity of 100 ft/min. (0.5m/sec) at the point of vapour evolution. Refer to the current edition of Industrial Ventilation: A Manual of Recommend Practice published by the American Conference of Governmental Industrial Hygienists for information on the design, installation, use, and maintenance of exhaust systems.

Other Protective Equipment

Facilities storing or utilizing this material should be equipped with an eyewash facility.

9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|------------------------------|-----------------------|
| Appearance | Clear |
| State | Granular solid |
| Odour Characteristic | Acrylic odour |
| Viscosity | Not applicable |
| Specific Gravity (Water = 1) | 1.15g/cm ³ |
| Vapour Density (Air = 1) | Not applicable |
| Vapour Pressure | Not applicable |

| | |
|--------------------------|-----------------------|
| Melting Point | No data |
| Boiling Point | Not applicable |
| Solubility in Water | Practically insoluble |
| Percent Volatility | 1.15 maximum |
| Evaporation Rate (BAc=1) | Not applicable |

See section 5, Fire Fighting Measures

10. STABILITY AND REACTIVITY

Instability

This material is considered stable. However, avoid temperatures above 260C/500F, the onset of polymer decomposition. Thermal decomposition is dependant on time and temperature.

Hazardous Decomposition Products

There are no known hazardous decomposition products for this material.

Hazardous Polymerization

Product will not undergo polymerization.

Incompatibility

There are no known materials which are incompatible with this product.

11. TOXICOLOGICAL INFORMATION

Acute Data

Oral LD50 – rat: >5000mg/kg
Dermal LD50 – rabbit >3000 mg/kg
Eye Irritation – rabbit: moderate irritation
Skin Irritation – rabbit: slight irritation

Reproductive/Teratology Data

Toluene has been demonstrated to be embryofetotoxic and teratogenic in laboratory animals.

12. ECOLOGICAL INFORMATION

No applicable data

13. DISPOSAL CONSIDERATIONS

Procedure

For disposal, incinerate this material at a facility that complies with local, state and federal regulations.

Waste Key for the Product as Delivered (Germany)

571 29 waste of other hardened plastic materials

14. TRANSPORT INFORMATION

Label Not regulated

15. REGULATORY INFORMATION

United States

All components of this product are in compliance with the inventory listing requirements of the U.S Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

EEC

This product satisfies all the requirements of the European Inventory of Existing Chemical Substances (EINECS).

EINECS Information

| No. | CAS REG NO. | EINECS |
|----------------------|---------------|---------|
| 1. Acrylic polymer | Not Hazardous | |
| 2. Residual monomers | Not Required | |
| 3. Toluene | 108-88-3 | 2036259 |

Indication of Danger

This product is not hazardous according to EEC Directives 67/548/EEC and 88/379/EEC

16. OTHER INFORMATION

| <u>Rohm and Haas Hazard Rating</u> | | <u>Scale</u> |
|------------------------------------|---|-------------------|
| Toxicity | 1 | 4 = Extreme |
| Fire | 1 | 3 = High |
| Reactivity | 0 | 2 = Moderate |
| Special | - | 0 = Insignificant |

Ratings are based on Rohm and Haas guidelines, and are intended for internal use.

EMERGENCY TELEPHONE NUMBERS

| | |
|--------------------|---------------------|
| Italia | (39) (0) 2 95250555 |
| United Kingdom | (0) 191 4898181 |
| France | (16) 88 73 60 00 |
| Espana | (9) 48 822 700 |
| Belgique – Belgium | (0) 3 5410016 |
| Sverige | (0) 418 450490 |
| Vienna | (0222) 4064343 |

ABBREVIATIONS

| | |
|-------|---|
| ACGIH | = American Conference of Governmental Industrial Hygienists |
| MAK | = Maximum Workplace Concentrations |
| TLV | = Threshold Limit Value |
| PEL | = Permissible Exposure Limit |
| TWA | = Time Weighted Average |
| STEL | = Short-Term Exposure Limit |
| BAC | = Butyl acetate |

The information contained herein relates only to the specific material identified. Rohm and Haas Company believes that such information is accurate and reliable as of the date of this material safety data sheet, but no representation, guarantee or warranty, express or implied, is made as to the accuracy, reliability, or completeness of the information. Rohm and Haas Company urges persons receiving this information to make their own determination as to the information's suitability and completeness for their particular application.