

1. Identification of the Product and Company

Product Name: IC80
Product Use: Adhesive/Bonding Compound
Product Type: Visible/Ultraviolet Adhesive
Address of Manufacturer: J and S Adhesives Ltd, Lancaster Court, Coldham Road Ind. Estate, Coningsby, Lincolnshire, LN4 4SE, England

2. Composition Information

Chemical name:	CAS Number	Proportion (%)
Polyurethane Methacrylate Resin		30 ~ 50
Hydroxyalkyl Methacrylate	868 - 77 - 9	10 ~ 50
High Boiling Methacrylate	7534 - 94 - 3	10 ~ 35
Acrylic Acid	79 - 10 - 7	1 ~ 5
1-Hydroxycyclohexyl Phenyl Ketone	947 - 19 - 3	1 ~ 5
2,4,6-Trimethylbenzoyl Diphenylphosphine Oxide	75980 - 60 - 8	1 ~ 5

3. Hazards Identification

Relevant Routes of Exposure: Eye, skin, inhalation, ingestion

Potential Health Effects:

- Inhalation:** May cause weakness, tiredness and headache. Sustained inhalation may cause loss of consciousness
- Skin Contact:** Moderate skin irritation. May cause allergic skin reaction.
- Eye Contact:** Contact with eyes will cause irritation, weeping eyes.
- Ingestion:** May be harmful if swallowed.

4. First Aid Measures

- Inhalation:** Remove to fresh air. If symptoms develop and persist, get medical attention.
- Skin Contact:** Wash with soap and water. Remove contaminated clothing and shoes. Wash clothing before re-using. Get medical attention if symptoms occur.
- Eye Contact:** Flush with copious amounts of water, preferably lukewarm water for at least 15 minutes, holding eyelids open all the time. Get medical attention.
- Ingestion:** Do not induce vomiting. Keep individual calm. Obtain medical attention.

5. Fire-Fighting Measures

Flash Point:	≥93°C
Auto-ignition Temperature:	Not available
Extinguishing Media:	Extinguish fire with dry chemical, foam or carbon dioxide.
Fire Fighting Procedures:	Wear self-contained breathing apparatus and full protective clothing, cooling the equipment with cold water.
Hazardous Combustion Products:	Oxides of carbon. Oxides of sulphur. Oxides of nitrogen. Irritating organic vapours.

6. Accidental Release Measures

Environmental Precautions:	Prevent product from entering into drains or open waters.
Clean-Up Methods:	Ventilate area of spill. Avoid fumes. Absorb with sand/earth and dispose to chemical waste bin. Dispose in accordance with pertinent local legislation.

7. Handling and Storage

Handling:	Avoid contact with eyes, skin and clothing. Avoid breathing vapour and mist. Wash thoroughly after handling.
Storage:	For safe storage, store at or below 38°C. Keep in a cool, well ventilated area, away from heat, sparks and open flame. Avoid direct sunlight. Keep container tightly closed until ready for use. Avoid contact with strong oxidisers, strong alkalis, and strong acid and other polymerisation initiators.

8. Exposure Controls and Personal Protection

Engineering Controls:	No specific ventilation requirements noted, but forced ventilation may still be required if concentrations exceed occupational exposure limits.
Respiratory Protection:	Usually do not need special protection, wear self-breathed filtrated gas mask if there is potential to exceed exposure limit(s).
Skin Protection:	Use impermeable gloves and protective clothing as necessary to prevent skin contact. Neoprene gloves. Butyl rubber gloves.
Eye/Face Protection:	Wear safety chemical goggles/glasses.
Body Protection:	Wear general safety clothes.
Hand Protection:	Wear chemical safety gloves.
Ventilation:	Good general or local exhaust ventilation are required.

9. Physical and Chemical Properties

Appearance and Properties: Clear liquid.
Specific Gravity: 1.05
Odour: Characteristic
Solubility: Solved in organic solvent. Solved in water slightly.
pH: Not available.
Boiling Point: $\geq 150^{\circ}\text{C}$
Melting Point: Not available
Flash Point: $\geq 93^{\circ}\text{C}$

10. Stability and Reactivity

Stability: Stable
Hazardous Polymerization: Will not occur
Conditions to Avoid: Exposure to sunlight. Heat, flames and sparks.
Incompatibility: Strong oxidisers. Strong alkalis. Strong acid, other polymerisation initiators. Reducing agents. Free radical initiators.
Hazardous Decomposition Products: Oxides of carbon. Oxides of sulphur. Oxides of nitrogen. Phenols.

11. Toxicological Information

Estimated oral LD50: Greater than 5000mg/kg (rat)
Estimated dermal LD50: Greater than 2000mg/kg (rabbit)

12. Ecological Information

Ecological Information: Not available

13. Waste Disposal

Recommended Method of Disposal: Dispose of according to local governmental and environment protection department regulations.

14. Transport Information

Proper Transportation Name: Unrestricted
Air Transportation Name: Unrestricted
Water Transportation Name: Unrestricted

15. Regulatory Information:

European information:

IRRITANT Symbol:	St Andrews Cross. Irritating to eyes and skin.
Symptoms of exposure:	May cause sensitisation to skin contact.
Risk Phrases:	36/38, 43
Safety Phrases:	26, 28, 36/37/39. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water. Wear suitable protective clothing, gloves and eye/face protection. Protect from heat and light. Ensure adequate ventilation during use.

16. Other Information

No liability is accepted for injury, loss, damage or cost arising directly or indirectly from the use of any information contained within this MSDS since the customers treatment of the product is necessarily out of our control. Section 14 of the Sale of Goods Act 1979 is excluded, as is liability for consequential losses. The information in this document has been compiled on the basis of the best available knowledge. It does not imply that the information is complete or accurate in all cases. It is the users responsibility to satisfy himself as to the application of the information and or the recommendations given for his own particular use.

Product Description

Chemical Type:	Methacrylate Ester
Appearance (uncured):	Colourless
Components:	One component
Viscosity:	Medium
Cure:	Visible/UV Curing

Typical Application

Nano470 IC80 is designed for bonding glass to glass, glass to metal.

Typical Properties of Uncured Material

Gravity @ 25°C:	1.06
Viscosity, 25°C, mPa•s (cp)	250 ~3000cp
Colour:	Clear
Flash Point:	>93°C
Fixture Time (100 mW/cm ² @ 365nm)	≤15LMS
Refractive Index:	1.48-1.51

Typical Properties of Cured Material

Temperature (°C)	-54+120
Hardness Shore D	65
Tensile Strength (Mpa)	≥12
Volumetric Shrinkage %	≤8.7
Coefficient of Thermal Conductivity W/(m•K)	0.10

Cure Properties

Nano470 IC80 can be cured by irradiation with UV/Visible light of sufficient intensity. The cure rate and ultimate depth of cure will depend on light intensity, the spectral distribution of the light source, the exposure time and the light transmittance of the substrates.

Usage

1. This product is light sensitive; exposure to daylight, UV light and artificial lighting should be kept to a minimum during storage and handling.
2. For best performance bond surfaces should be clean and free from grease.
3. Cure rate is dependent on lamp intensity, distance from lamp source, depth of cure needed or bond line gap and light transmittance of the substrate through which the radiation must pass.
4. Cooling should be provided for temperature sensitive substrates such as thermoplastics.
5. Excess uncured adhesive can be wiped away with organic solvent (e.g. Acetone).
6. Bonds should be allowed to cool before subjecting to any service loads.

Storage

It should be kept in an unopened container in a cool and dry location.

Optimal Storage:

8°C to 21°C . Storage below 8°C or greater than 21°C can adversely affect product properties.

Material removed from containers may be contaminated during use. Do not return product to the original container.

Keep away from children.

Note

It is the responsibility of the end user to test Nano470 IC40/80 for strength, bond-ability and observe any characteristics which appear when used with specific glass materials, and on particular projects.

It is essential that thorough testing occurs to satisfy the end user that Nano470 IC40/80 is indeed the correct bonding adhesive to be used for a particular application/project..

The information in this document has been compiled on the basis of the best available knowledge. It does not imply that the information is complete or accurate in all cases. It is the users responsibility to satisfy himself as to the application of the information and or the recommendations given for his own particular use.

Please refer to the website for instructions and MSDS sheets

The information provided by NANO470 or its agents as well as any technical information given either in writing or verbally or based on our tests are provided to the best of our knowledge. They are however non-binding recommendations and do not affect your responsibility to determine the correctness of given recommendations and suitability of our products for your particular applications. The application ,use or processing of our products as well as the production of products based on our technical advise or recommendations are beyond our control and therefore fall exclusively in the users area of responsibility. Sales of our products are subject to our latest sales and delivery conditions.

Instructions for Use For Glass Bonding with Nano470 IC40/80 Visible light & UV-curing Adhesive

1. Choosing Glass

The type of glass on which you wish to use Nano470IC40/80 will affect the type and strength of bonding success.

Transparent, UVA light permeable float glass. Clear float glass, mirror (on front) tempered glass and smooth, plane wired glass can be bonded without problems.

Nano470 IC40/80 is not designed to be used on glass with coloured or textured glass.

Glass, like patterned glass, wired glass, sand-blasted glass or stained glass can have difficulty in achieving a good bond and required strength.

One good rule of thumb to remember is that the smoother the bonding surfaces and the thinner the layer of adhesive used, the stronger the bond will be.

2. Surface Preparation

Cleaning:

All surfaces to be bonded must be completely clean, free of grease and dry.

Temperature.

Any condensation in the glass (weather visible or invisible) must be removed before bonding. This will allow for a durable and stable bond.

Adhesive should be at a minimum of room temperature.

3. Using Positioning Devices

To ensure optimal bonding it is essential not to let parts moving about during the curing time. It is therefore crucial to use appropriate positioning devices.

4. Adhesive Application

- Pre-check that all parts to be bonding fit correctly and are aligned using the appropriate positioning devices.
- Excessive amounts of adhesive applied to a joint can lead to inferior bonding strength.
- Apply the adhesive in a 'caterpillar' fashion **before** joining parts.
- Parts should be lowered slowly and evenly to avoid trapping any air within the joint and allow for an even spread of the adhesive.
- You may find it necessary to raise and lower the parts before final cure occurs. This will allow for maximum distribution of the adhesive over the whole area of the joint.

5. Curing

The procedure for curing off the adhesive is a two step process.

- First allow for a pre-cure (approximately 60-80% of the final cure). This allows for clean up of the excess adhesive around the joint area.
- After the remaining cure has taken place the bond is fully complete and able to withstand maximum loads. 10 minutes minimum

The lamp used should exceed the dimensions of the joint to be bonded. An overlap should occur between lamp and glass.

The lamp should be held as close as possible to the joint while curing is taking place.

The glass should not be moved during curing.

Ensure there is no vibration of the joint or lamp during the curing process.

6. Testing Your Work

These instructions for use are only to be used as a guideline for working. It is the responsibility of the end user to test Nano470 IC40/80 for strength, bond-ability and observe any characteristics which appear when used with specific glass materials, and on particular projects.

It is essential that thorough testing occurs to satisfy the end user that Nano470 IC40/80 is indeed the correct bonding adhesive to be used for a particular application/project.

WARRANTY: J&S Adhesives Ltd guarantees that products and materials supplied by us are of satisfactory quality. However the final quality of the bond achieved will depend upon many variables which are outside our control. We will therefore have to reject any liability over and above the replacement of faulty material. This refers especially to any indirect or consequential loss, damages or expenses.