HYDROTHENE™

A Family of Semi-aqueous Specialty Solvent Cleaners
Technical Data Sheet

Description & Application:

Hydrothene is the trade name for a family of high performance semi-aqueous precision cleaning solvents designed to replace environmentally unacceptable solvents for the cleaning of electronic components and circuit boards. Hydrothene solvents may also be successfully used for the cleaning of precision engineering parts.

The current range of family members consists of:

- Hydrothene: The original family member, and
- Hydrothene NM: Has better handling performance and is slightly more compatible with certain plastics.

Primary features attributable to the Hydrothene solvent family are:

- Compatible with all common electronic components, metals and plastics;
- High solvency power, excellent cleaning performance;
- Moderate drying rates:
- Leaves no residue;
- Low odour;
- No flash point;
- CFC and aromatic hydrocarbon free;
- Low toxicity and environmental impact, not carcinogenic or mutagenic.

Cost benefits of using Hydrothene solvents may be summarized as:

- Reduced product consumption;
- Reduced energy usage, solvent emissions and waste disposal costs;
- Parts cleaned more quickly (reduced cycle time);
- Health, safety and environmental benefits, non hazardous for transport.

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Applications

The Hydrothene family has been formulated to remove:

- Solder fluxes, both organic & inorganic;
- Polar and non-polar contaminants;
- Oils and greases; and
- Finger marks.

They are specifically formulated for use in ultrasonic and batch cleaning of electronic parts and circuit boards, particularly following solder application to remove flux residues.
Hydrothene solvents are safe and effective even with surface mount devices and sensitive electronics such as read-write heads.
General information on fluxes and the cleaning of electronic parts and assemblies post soldering, may be obtained by requesting Product Information Bulletin Sheet 00-004.

Compatibility

Hydrothene solvents may be safely used with modern electrical and electronic parts / components.
They can be safely applied to steel, aluminium, titanium, magnesium, zinc and other metal surfaces.
An indication on the compatibility of Hydrothene solvents with those plastics and rubbers normally encountered in electronic applications are presented in the table below.

Compatibility with Plastics	
Polymer	**Soak Test**
Polyurethane	Compatible
Acrylic	Compatible
Isoprene (Natural Rubber)	Compatible
PVC	Compatible
Polyethylene Teraphthalate	Compatible
Cellophane	Compatible
Polycarbonate	Compatible
Polystyrene	Compatible
Fibre Reinforced Epoxy Laminate	Compatible

Note: Due to wide variation in the material properties from different sources, it is always recommended that users confirm these guidance findings using materials encountered in parts from their specific constructions.

Health and Safety

Hydrothene solvents are blends of oxygenated solvents and surface-active chemicals and are not classified as a hazardous chemical, according to OSHA criteria.
The products are non-flammable and are neither a known or suspected carcinogen.
Users should however take common sense precautions in handling and using chemicals. Avoid eye contact, ingestion and skin contact and do not eat, drink or smoke when using the solvent.
See Material Safety Data Sheet for details.

Typical Properties

Data on the effectiveness of cleaning using Hydrothene solvents, including comparison with some other common solvents may be obtained by requesting Product Information Bulletin Sheet 98-002.

	Hydrothene	Hydrothene NM
Appearance	Colourless, Clear liquid	Colourless, Clear liquid
Density @ 20 °C	0.96	0.97
Boiling Point, °C (°F)	>150 (>302)	>150 (>302)
Freeze Point °C (°F)	-117 (-178)	< -100 (<-148)
Flash Point, (Tag Closed Cup, ASTM D56, °C)	> 90	> 90
Auto-ignition Temp °C (°F)	> 200 (>392)	> 200 (>392)
Volatile Organic Compound (VOC) content, g/L	> 800	> 800
Solubility in water, g/L	See note 1	See note 1
Vapour pressure, mbar at 20 °C (mm Hg at 20 °C)	0.11 (0.3)	0.11 (0.3)
Evaporation rate (Butyl Ac = 1)	0.1	0.1
Viscosity - (centipoises at 25 °C)	3.7	3.7
Specific heat (J/g/°C at 25 °C)	2.5	2.5
Heat of combustion (kJ/g @ 25°C)	27	27
Latent heat of vaporisation (J/g)	267	267

Note 1. Hydrothene is fully miscible in water up to about 250g/L thereafter turbidity is observed. Some separation may be seen above concentrations of about 500 g/L.

Storage life in original, unopened containers, at between 0 °C and 35 °C (32° to 95 °F), is not less than 5 years.

Test Compliance:

Hydrothene solvents will meet the residual ionic contamination requirements following cleaning of electronic items, as set out in Mil Standard 2000.

Processing

Application

The products must be used as supplied. DO NOT DILUTE, as segregation will occur and effectiveness of the cleaners will be impaired.

Immerse the circuit board or electronic component into a bath of Hydrothene heated to a temperature between 40 °C and 60 °C (104 °F and 140 °F) for between 1 and 2 minutes, preferably with ultrasonic agitation.

Remove the component and rinse with a small amount of de-mineralized or deionised water. (Alternatively parts may be rinsed using clean, fresh Hydrothene.)
Force dry the component using warm air at between 40 °C and 80 °C (104 °F and 176 °F) for between 2 and 10 minutes, dependant upon substrate type and required process speed

Notes:

1. Ensure that the Hydrothene cleaner is compatible with any plastic or paint surfaces that require to be retained, prior to application.
2. If static water rinse tanks are used for rinsing, then these should be discarded when turbidity of the solution is observed, which indicates build up of contaminants. To minimize these drag out losses, Amity recommends that rinsing be carried out in fresh Hydrothene, which can then be used to top up the primary cleaning solution.

Plant & Equipment

Ultrasonic immersion equipment:
Supplied by any reputable supplier and fitted with in-line filtration down to 1 μm.
Note
The recommended frequency for operation of ultrasonic agitators without effect on sensitive electronics is 132 kHz.

Recovery of Solvent

Used Hydrothene may be recycled using a simple oil-water separation filter, without losing any detergent activity. Distillation is not necessary.

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Packaging Details:

Hydrothene and Hydrothene NM are available in:

- 200 Litre drums;
- 25 Litre containers.

Note:
When applicable, the user must specify NM grade on the order otherwise standard Hydrothene will be supplied.