

# Technical Datasheet

## Araldite<sup>®</sup> Impregnating Resin System

|                             |               |                    |            |            |
|-----------------------------|---------------|--------------------|------------|------------|
| <b>Araldite<sup>®</sup></b> | <b>MY 740</b> | <b>Resin</b>       | <b>100</b> | <b>pbw</b> |
| <b>Aradur<sup>®</sup></b>   | <b>HY 906</b> | <b>Hardener</b>    | <b>95</b>  | <b>pbw</b> |
| <b>Accelerator</b>          | <b>DY 070</b> | <b>Accelerator</b> | <b>1.2</b> | <b>pbw</b> |

**Hot-curing, low-viscosity impregnating resin system**

**Application**                      Manufacture of electrical laminates (tubes, rods, etc.)  
Impregnation of high voltage bushings, coils etc.

**Processing methods**              Filament winding  
Pultrusion  
Wet laminating  
Trickle impregnation

**Key Properties**                      Good mechanical and dielectric properties  
Good aging resistance

## Product Data (Guideline Values)

### Araldite® MY 740

Unmodified, medium-viscosity, solvent-free epoxy resin

|                         |         |           |                   |                 |
|-------------------------|---------|-----------|-------------------|-----------------|
| Viscosity               | at 25°C | ISO 12058 | mPa's             | 10'000 - 14'500 |
| Epoxy content           |         | ISO 3001  | equiv/kg          | 5.25 - 5.55     |
| Density                 | at 25°C | ISO 1675  | g/cm <sup>3</sup> | 1.15 - 1.20     |
| Flash point             |         | ISO 1523  | °C                | > 200           |
| Vapour pressure at 25°C |         | Knudsen   | Pa                | < 0.01          |
|                         | at 60°C |           | Pa                | < 0.5           |

### Aradur® HY 906

Liquid, dicarboxylic anhydride

|                         |         |           |                   |             |
|-------------------------|---------|-----------|-------------------|-------------|
| Viscosity               | at 25°C | ISO 12058 | mPa's             | 175 - 350   |
| Density                 | at 25°C | ISO 1675  | g/cm <sup>3</sup> | 1.20 - 1.25 |
| Flash point             |         | ISO 1523  | °C                | > 135       |
| Vapour pressure at 50°C |         | Knudsen   | Pa                | < 20        |

### Accelerator DY 070

Liquid, heterocyclic amine

|                         |         |          |                   |             |
|-------------------------|---------|----------|-------------------|-------------|
| Viscosity               | at 25°C | ISO 2555 | mPa's             | < 50        |
| Density                 | at 25°C | ISO 1675 | g/cm <sup>3</sup> | 0.95 - 1.05 |
| Flash point             |         | ISO 1523 | °C                | 92          |
| Vapour pressure at 20°C |         | Knudsen  | Pa                | 15          |

## Remarks and Storage Conditions

Provided that the products described above are stored in a dry place in their original, properly closed containers between 2 - 40°C. Under these conditions, the shelf life will correspond to the expiry date stated on the label. After this date, the product may be processed only on re-analysis. Partly emptied containers should be closed immediately after use.

Aradur HY 906 is sensitive to moisture, storage containers should be ventilated with dry air only.

For information on waste disposal and hazardous products of decomposition in the event of fire, refer to the Material Safety Data Sheets (MSDS) for these particular products.

## Processing (Guideline Values)

To get good fiber wetting and reproducible building parts a temperature of 35-45°C is recommended for the impregnation bath. The mandrel temperature shall be 60-120°C during winding. The gelling shall take place on the rotating mandrel at 90-120°C.

### Filament Winding

To guarantee a good wetting of the fibres, the viscosity shall not exceed 2000 mPa.s. The temperature of the impregnation bath, has to be adapted correspondingly. Under these circumstances a pot life of least 90 min is achievable. These can also be influenced or adapted by the amount of the accelerator.

### Pultrusion

The accelerator is always to be added to the hardener.

### Adding of accelerator

## Processing Data (Guideline Values)

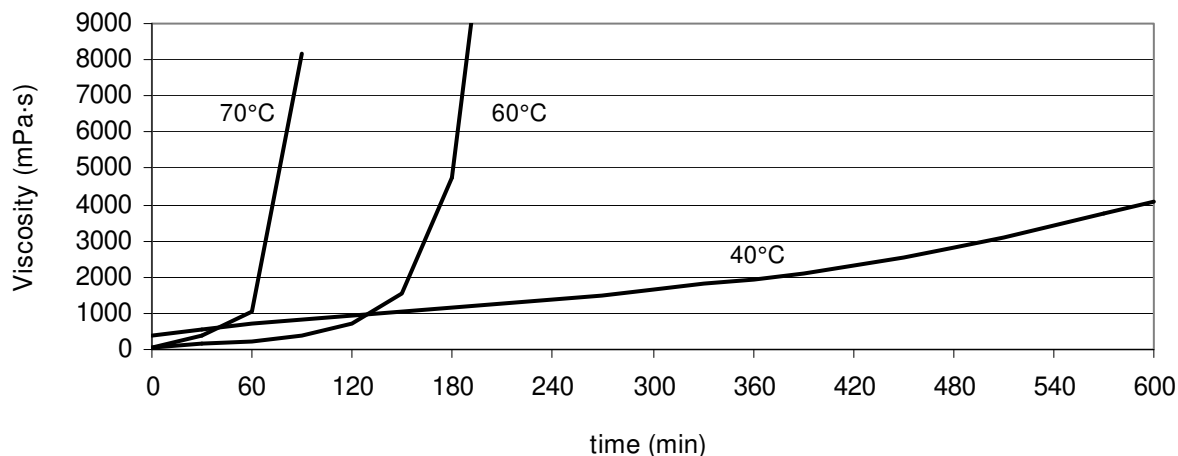


Figure 1: **Viscosity increase at 40, 60 and 70 °C**  
(measurements with Rheomat 115A, Shear rate  $D = 10 \text{ s}^{-1}$ )

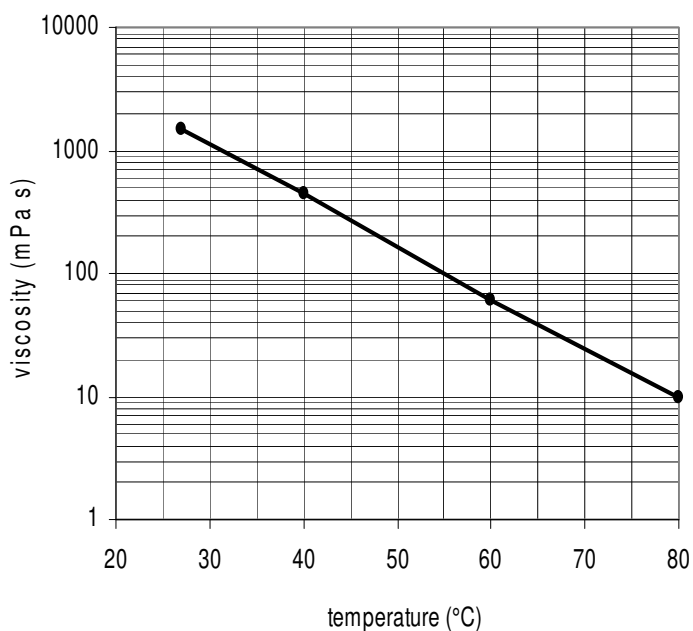


Figure 2: **Initial viscosity as a function of temperature**  
(measurements with Rheomat 115,  $D = 10 \text{ s}^{-1}$ )

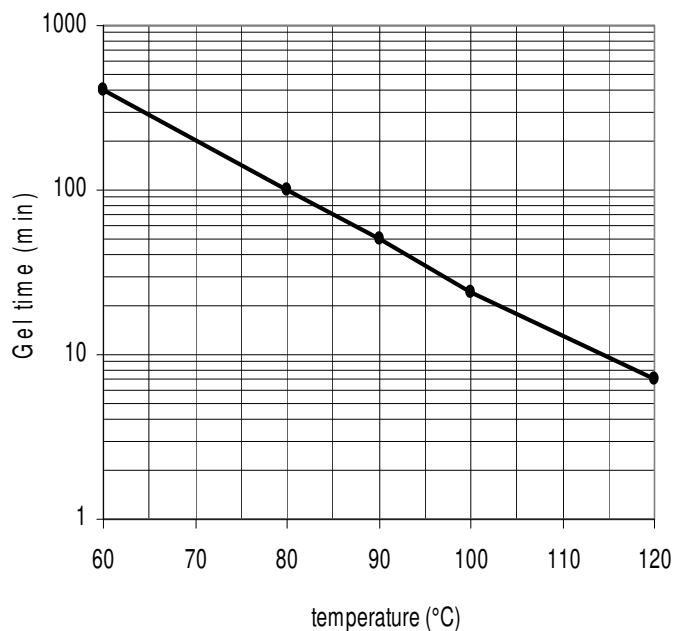


Figure 3: **Gel time as a function of temperature**  
(measured with Gelnorm Instrument, ISO 9396)

## Mechanical and Physical Properties (Guideline Values)

Determined on standard test specimens at 23°C. Cured for 30 min/110°C + 30 min/170°C + 30 min/200°C

|                                                             |             |                      |               |
|-------------------------------------------------------------|-------------|----------------------|---------------|
| Tensile strength                                            | ISO 527     | MPa                  | 75 - 85       |
| Elongation at break                                         | ISO 527     | %                    | 3.5 - 4.5     |
| E modulus from tensile test                                 | ISO 527     | MPa                  | 3'000 - 4'000 |
| Flexural strength at 23°C                                   | ISO 178     | MPa                  | 140 - 150     |
| Surface strain at 23°C                                      | ISO 178     | %                    | 5.5 - 6.5     |
| E modulus from flexural test                                | ISO 178     | MPa                  | 2'500 - 3'500 |
| Bend Notch Test                                             | CG 216-0/89 |                      |               |
| Critical stress intensity factor ( $K_{IC}$ )               |             | MPa·m <sup>1/2</sup> | 0.5 - 0.7     |
| Specific energy at break ( $G_{IC}$ )                       |             | J/m <sup>2</sup>     | 70 - 100      |
| Glass transition temperature (DSC)                          | ISO 11357-2 | °C                   | 165 - 175     |
| Coefficient of linear thermal expansion (< T <sub>g</sub> ) | ISO 11359-2 |                      |               |
| Mean value for temperature range: 20-60°C                   |             | 10 <sup>-6</sup> / K | 65 - 70       |
| Thermal conductivity similar to                             | ISO 8894-1  | W/mK                 | 0.15 - 0.20   |
| Water absorption (specimen: 50×50×4 mm)                     | ISO 62      |                      |               |
| 10 days at 23°C                                             |             | % by wt.             | 0.50 - 0.60   |
| 60 min at 100°C                                             |             | % by wt.             | 0.20 - 0.25   |
| Decomposition temperature<br>(heating rate: 10K/min)        | DTA         | °C                   | 350           |

## Electrical Properties (Guideline Values)

Determined on standard test specimens at 23°C. Cured for 30 min/110°C + 30 min/170°C + 30 min/200°C

|                      |             |       |            |
|----------------------|-------------|-------|------------|
| Breakdown strength   | IEC 60243-1 | kV/mm | 22 - 26    |
| HV arc resistance    | IEC 61621   | s     | 70 - 80    |
| Tracking resistance  | IEC 60112   |       |            |
| with test solution A |             | CTI   | > 600-0.0  |
| with test solution B |             | CTI   | > 600M-0.1 |

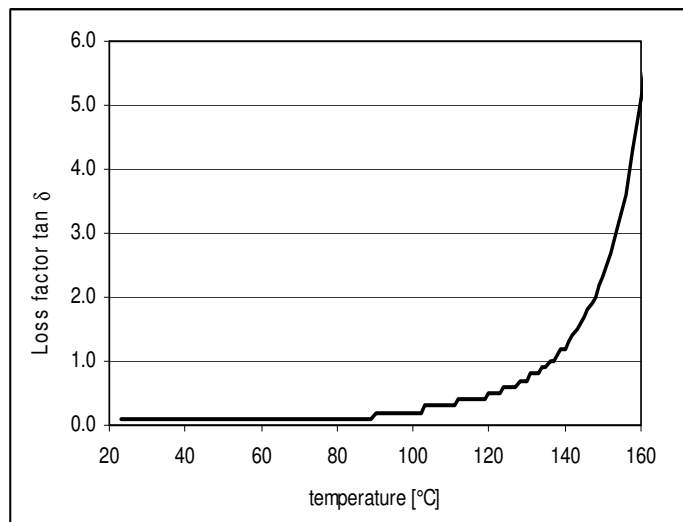


Figure 4: Loss factor (tan δ) at 50 Hz (IEC 60250)

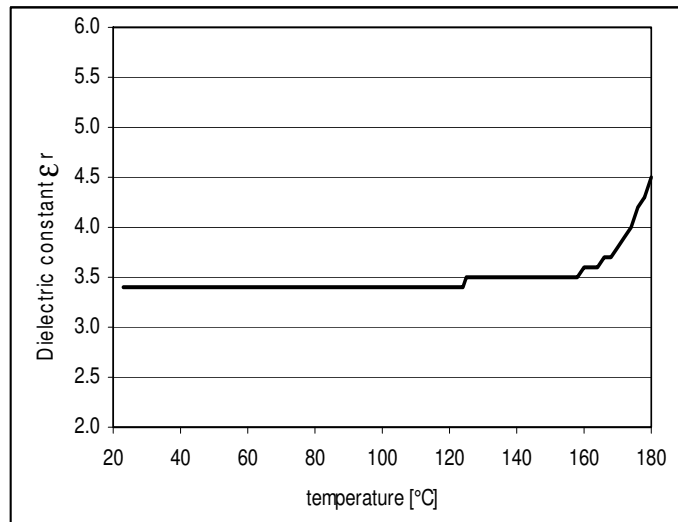


Figure 5: Rel. permittivity (ε<sub>r</sub>) at 50 Hz (IEC 60250)

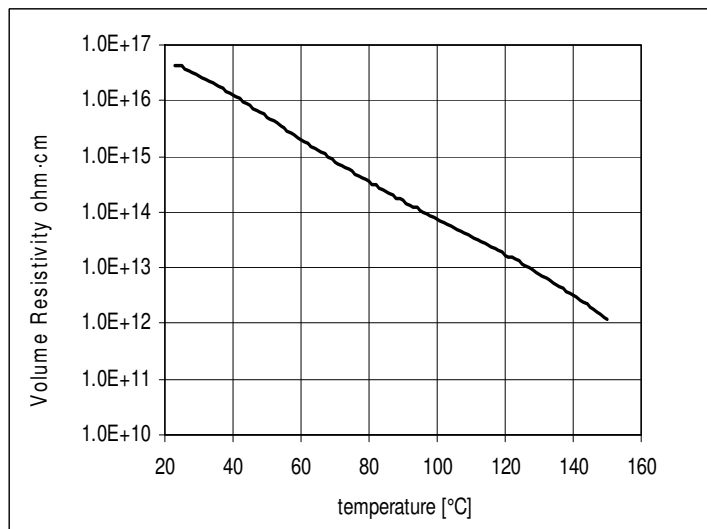


Figure 6: Volume resistivity at 50 Hz (IEC 60093)

## Industrial hygiene

Mandatory and recommended industrial hygiene procedures should be followed whenever our products are being handled and processed. For additional information please consult the corresponding Safety Data Sheets and the brochure "Hygienic precautions for handling plastics products".

### Handling Precautions

Safety precautions at workplace:

|                        |                                      |
|------------------------|--------------------------------------|
| protective clothing    | yes                                  |
| gloves                 | essential                            |
| arm protectors         | recommended when skin contact likely |
| goggles/safety glasses | yes                                  |
| respirator/dust mask   | recommended                          |

Skin protection

before starting work  
after washing

Apply barrier cream to exposed skin  
Apply barrier or nourishing cream

Cleaning of contaminated skin

Dab off with absorbent paper, wash with warm water and alkali-free soap, then dry with disposable towels. Do not use solvents

Clean shop requirements

Cover workbenches, etc. with light coloured paper. Use disposable beakers, etc.

Disposal of spillage

Soak up with sawdust or cotton waste and deposit in plastic-lined bin

Ventilation:

of workshop  
of workplace

Renew air 3 to 5 times an hour  
Exhaust fans. Operatives should avoid inhaling vapours.

### First Aid

Contamination of the **eyes** by resin, hardener or casting mix should be treated immediately by flushing with clean, running water for 10 to 15 minutes. A doctor should then be consulted.

Material smeared or splashed on the **skin** should be dabbed off, and the contaminated area then washed and treated with a cleansing cream (see above). A doctor should be consulted in the event of severe irritation or burns. Contaminated clothing should be changed immediately.

Anyone taken ill after **inhaling** vapours should be moved out of doors immediately. In all cases of doubt call for medical assistance.

### Note

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