

# 3MG.021

## Bismaleimid Film

### Summary

### Overview

#### OVERVIEW

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#### PRODUCT RANGE

**Bismaleimide film - article  
167-0306**

**Bismaleimide film - article  
167-0307**

Bismaleimide films produce easier and cleaner assemblies as they have an easily controllable consistency. They have been developed with the following objectives:

- Operating temperature: up to 240 °C
- High adhesive and thermal resistance
- Film thickness: ~ 100 µm
- Easy to use, clean and precise
- Solvent-free
- Difficult dissolution
- Moisture resistant
- Very high elasticity modulus
- Vitreous transition temperature: > 200 °C
- Heat curing: between 150 and 170 °C

The product is presented in the form of a dry adhesive layer on a polyester support film. It can be cut to the desired shape.

#### Manufacture

Bismaleimide powders are rarely used in their pure and solid form: in most applications, they are used with reactive monomers. The powder then becomes a viscous liquid and can be poured to form adhesive films.

However, the viscosity of such systems is often very high. Thinners need to be added to facilitate use.

#### Applications

- Assembly of metals (aluminium, stainless steel, steel etc.), glass, ceramics, PTFE and plastics

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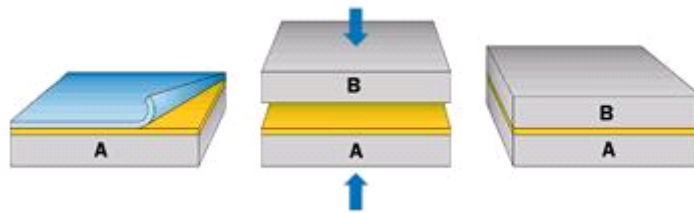
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## Implementation

### General instructions

- Cut the film to the desired shape.
- Place the film onto the substrate.
- Remove the polyester support film.
- Compress the adhesive film with the second substrate.
- Cure the product at 150 °C maintaining the pressure.



**Note:** during curing, the film softens slightly and smooths any irregularities on the bond surface. However, this change in viscosity is not as great as for conventional adhesive resins.

### Detailed instructions

- Clean the bond substrate: by mechanical abrasion and degreasing, or chemical etching.

**Note:** Follow the specific instructions for the surface pre-treatments of each material.

- Cut the film to the shape of the bond area
- Remove the transparent support film
- Place the yellow adhesive film onto one part
- Place the adhesive film on the second part
- Fix the assembly with mechanical clamps for curing
  - A low fixing pressure is sufficient
- Curing: minimum of 30 minutes between 150 and 200 °C

**Notes:** The curing time depends on how fast the adhesive can reach the required temperature (thermal conductivity and geometry of the parts).

- Post-curing: at 200 °C

**Notes:** For the first tests, a curing schedule of 2 hours at 150 °C followed by post-curing of 2 hours at 200 °C is recommended.

- Alternative:
  - Apply the film onto the first part
  - Heat the part to 120 °C so that the film adheres
  - Heat the second part
  - Place the second part on the adhesive
  - Fix the assembly for hardening
  - Cure and post-cure as before

**General Guidelines****Storage**

- Store in its original container between 4 and 35 °C.
- Do not freeze!
- Avoid direct sunlight.
- Shelf-life: 12 months.
- Expiry date is indicated on the label.

**Disposal**

Unused amounts of the adhesive should be cured and then disposed of according to local regulations.

**Safety**

- When using the adhesive, wear safety glasses and protective gloves.
- Please refer to the additional instructions in the safety data sheet.

**Table**

Property	Unit	306	307
Max. Operating Temperature	°C	220	240
Colour		Translucent yellow	Yellow
Film Thickness	µm	100	100
Viscosity at 23 °C		Rigid flexible film	Rigid flexible film
Density	g/cm <sup>2</sup>	1.18	1.18
Storage		6 months between 2 and 35 °C	
Cure		150 / 200 °C	150 / 200 °C

**Chemical resistance**

We have conducted numerous tests to validate the chemical resistance bismaleimide films 306 and 307. However, it is important to note that the surface preparation of the parts has a strong influence on the resistance of the overall assembly.

Water and other aqueous media are especially known to penetrate into the bond line and destroy the adhesion. Surface treatment with adhesion promoters (silanes) can often help in such cases.

Post-curing at 200 °C significantly improves the chemical resistance of products 306 and 307.

**Acid resistance tests:**

- sulphuric acid, phosphoric acid, at pH 1 up to temperatures of 60 °C
  - good results



## Bismaleimide Films

### Solvent resistance tests:

- acetone, methyl ethyl ketone, and N-methyl pyrrolidone
  - very high

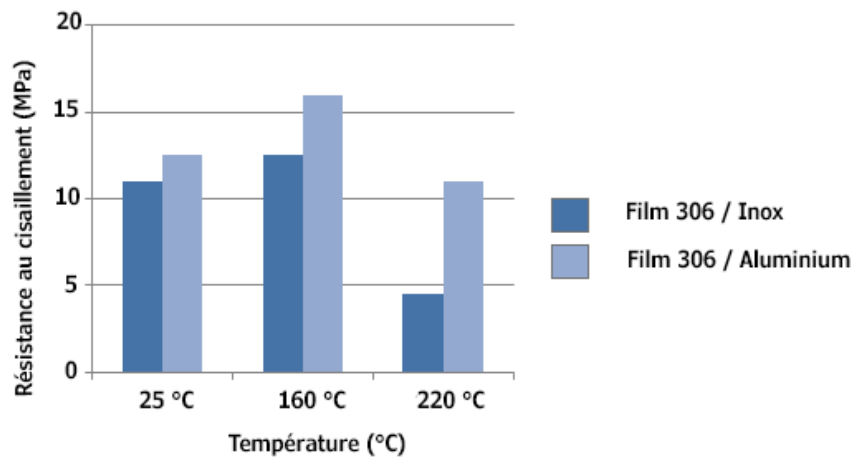
### Fuel resistance tests:

- biodiesel and regular diesel
  - excellent results

We do not have enough information on resistance in basic media (pH 10) to comment on the performances of bismaleimide films 306 and 307.

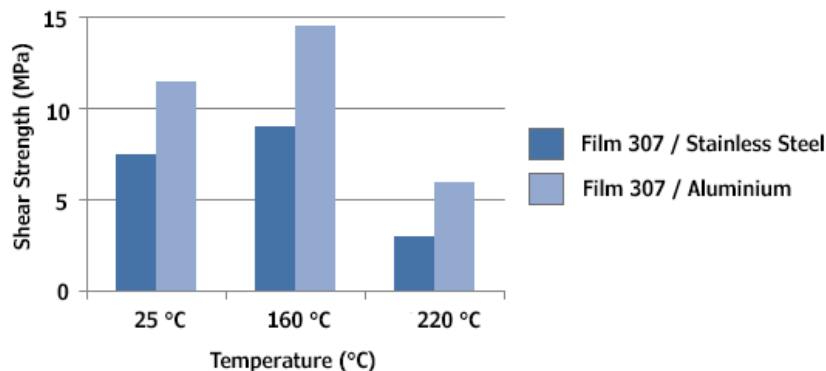
### Shear resistance in MPa according to the temperature

Bismaleimide film 306 on stainless steel and aluminium substrate (DIN EN 1465)



### Shear resistance in MPa according to the temperature

Bismaleimide film 307 on stainless steel and aluminium substrate (DIN EN 1465)



**Product Range**

Products 306 and 307 are solvent-free adhesive films with good high temperature and chemical resistance. Product 307 resists higher temperatures than 306. They are not tacky at room temperature and can be easily cut. Post-curing significantly improves their resistance to temperature and chemicals.

**Bismaleimide film - article 167-0306****Properties**

- One-component adhesive film
- Maximum operating temperature 220 °C
- Curing: 120 °C
- Very high bond strength at high temperatures
- Very resistant to various chemicals
- Good adhesion to aluminium, PTFE (Teflon®) and glass
- Easy and clean to use

**Applications**

- Bonding piezo ceramics onto metal surfaces for the manufacture of ultrasonic wave sensors where very low mechanical damping is required
- Structural bonding between metal parts, in particular aluminium and stainless steel

**Bismaleimide film – article 167-0307****Properties**

- One-component adhesive film
- Maximum operating temperature 240 °C
- Curing: 120 °C
- Very high bond strength at high temperatures
- Very resistant to various chemicals
- Good adhesion to aluminium, PTFE (Teflon) and glass
- Easy and clean to use

**Applications**

- Bonding piezo ceramics onto metal surfaces for the manufacture of ultrasonic wave sensors where very low mechanical damping is required
- Structural bonding of PTFE substrates onto aluminium

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