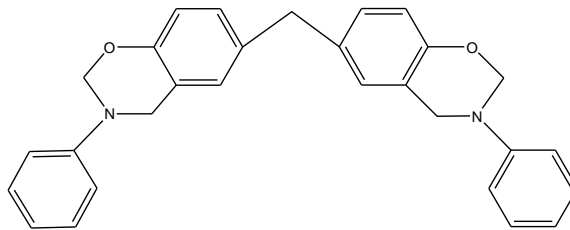


## Description

Lapox ARBZ-10 is bisphenol-F based, difunctional and halogen free, benzoxazine thermoset resin. This can be homopolymerised or co-cured with epoxy, phenol or suitable catalyst resulting in polymers with excellent thermal and mechanical properties. It is suitable for high performance applications due to very low water absorption and curing shrinkage along with high glass transition temperature.

## Chemical structure



## Advantages

- Excellent chemical and thermal resistant
- Excellent electrical properties
- Good flammability resistant UL94 V1
- Good moisture resistant
- High glass transition temperature
- Low coefficient of thermal expansion
- Low shrinkage
- Low smoke toxicity

## Applications

- Advanced composites
- High performance coatings
- High performance structural adhesives
- Moulded components for electronics
- PCB
- Prepregs

## Typical specifications

Properties	Unit	Test method	Values
Appearance	-	Visual	Yellowish solid
Viscosity at 100°C	m Pas	ASTM D4287	1,000 - 7,000
Gel time at 220°C	Seconds	DIN 16945	200 - 450
Softening point	°C	Atul	60 - 80
*Glass transition temperature (Tg)	°C	DSC	145 - 155

\*Cure schedule: 3 hours at 170°C + 2 hours at 180°C + 4 hours at 200°C

## Typical properties of cured system

### Sample preparation for casting

Heat the benzoxazine resin between 120°C and 130°C, transfer it to vacuum oven. Remove volatiles (if any) by maintaining temperature between 120°C and 140°C for 15 to 20 minutes under 650 to 700 mm Hg vacuum. Ensure that foaming has stopped and volatiles are removed. Hot degassed molten resin should be poured into preheated moulds and cured for 3 hours at 170°C + 2 hours at 180°C + 4 hours at 200°C.

Test description	Condition	Test standard	Unit	Typical values
Tensile strength	25°C	ISO 527	MPa	60 - 75
Tensile modulus	25°C	ISO 527	MPa	6,500 - 7,000
Flexural strength	25°C	ISO 178	MPa	120 - 135
Flexural modulus	25°C	ISO 178	MPa	5,400 - 5,600
Glass transition temperature (Tg) by DMA	-	-	°C	160 - 170
Glass transition temperature (Tg) by DSC	-	ISO 11357-2	°C	145 - 155
Weight Loss by TGA	at 300°C	-	%	2.69
	at 350°C	-	%	9.35
	at 400°C	-	%	17.5

### Catalysts for Benzoxazine Formulations

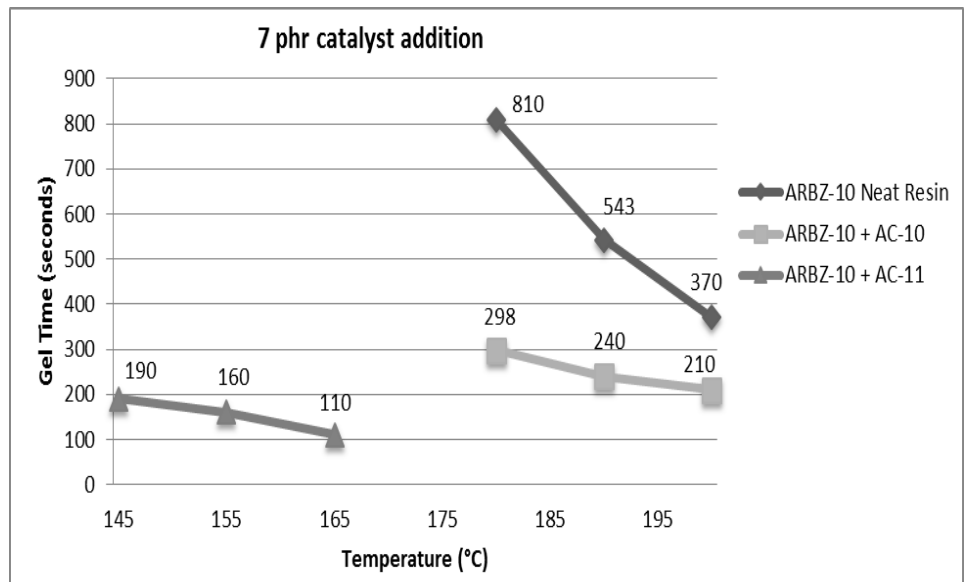
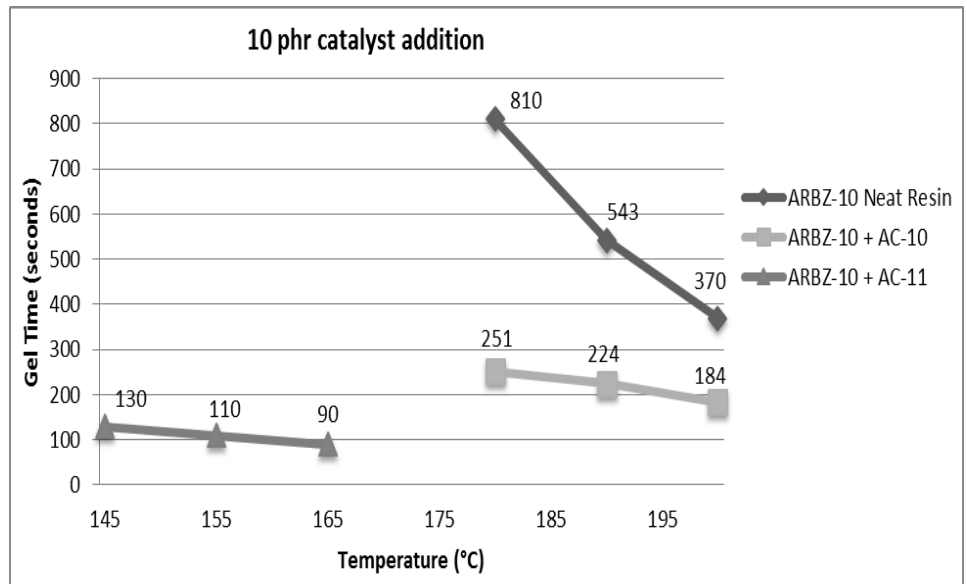
Reactivity of Benzoxazine resins can be enhanced by using various catalysts or accelerators. Usage of accelerator Lapox AC-10 and Lapox AC-11 helps in increase of reactivity and faster production. The selection of catalyst and its loading quantities are decided according to the requirements of cure temperature, cure time, and other additives being incorporated.

Lapox AC-10 and Lapox AC-11 has shelf life of 1 year from the date of manufacturing if stored between 25°C and 30°C in a sealed air tight container.

### Typical specifications of Lapox AC-10 and Lapox AC-11

Properties	Unit	Test method	Values (Lapox AC-10)	Values (Lapox AC-11)
Appearance	-	Visual	White crystal	White crystal
Melting point	°C	ASTM D2703	154 - 156	127 - 134
Assay	%	HPLC	Min 98	Min 98

The below graphs show the effect on reactivity of Lapox ARBZ-10 resin with the addition of 10 phr and 7 phr each of both the catalysts.



<b>Packaging</b>	Lapox ARBZ-10 is semi-solid and available in 25 kg MS drums. Other packing may be considered on request.
<b>Storage and handling</b>	Lapox ARBZ-10 must be stored between 2°C and 40°C in a sealed container. Storage at high temperature may adversely impact its properties. Keep away from direct sunlight, warm areas, particularly near heat sources. Shelf life of this product is 1 year from the date of manufacturing. Solid lumps of this resin can be dissolved in suitable solvent or resin can be heated in original container up to maximum 90°C to convert into liquid form for easy handling.
<b>Safety</b>	Wear personal protective equipment (PPE). Avoid contact with the eyes and skin. In case of direct contact and irritation, the resin should be washed off immediately with soap and warm water. Avoid breathing vapours, mist or gas. Please refer to the Safety Data Sheet (SDS) of Lapox ARBZ-10 for detailed safety instructions.
<b>Spills and disposal</b>	In case of spills, sweep up and shovel the spilled material. Keep spilled material in suitable, closed containers for disposal. Soak up with an absorbent such as clay, sand or other suitable material. Flush area with water to remove trace residue. Do not allow the product to reach the sewage system. Waste must be disposed of in accordance with federal, state or local regulations, as applicable.
<b>Contact</b>	E-mail: <a href="mailto:polymers@atul.co.in">polymers@atul.co.in</a> Website: <a href="http://www.atul.co.in">www.atul.co.in</a>
<b>Note</b>	Lapox <sup>®</sup> is a registered trademark of Atul Ltd.

## Manufacturing site

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