

Advanced Materials

Araldite® MT 35710 FST Benzoxazine Resin

PRELIMINARY DATA SHEET

Key Properties

- **Low fire, smoke and toxicity (FST) properties**
- **Volatile/void free during curing**
- **High resin modulus and strength**
- **Good laminate properties**
- **Good processability with low viscosity and long pot-life**
- **Low temperature (350 °F) curing**
- **Long storage life**

Description:

Araldite® MT 35710 FST is a benzoxazine thermoset resin designed for transportation interior or other composite applications where low flammability is needed. This product is volatile-release free during curing and has improved mechanical performance and storage stability compared to traditional phenolic resin. It has good solubility in ketone or other solvents.

Processing

Resin Transfer Molding (RTM), Vacuum assisted RTM (VARTM), Film infusion, Pre-preg, etc

Applications

Aerospace and industrial composite with flammability requirement

Product Data

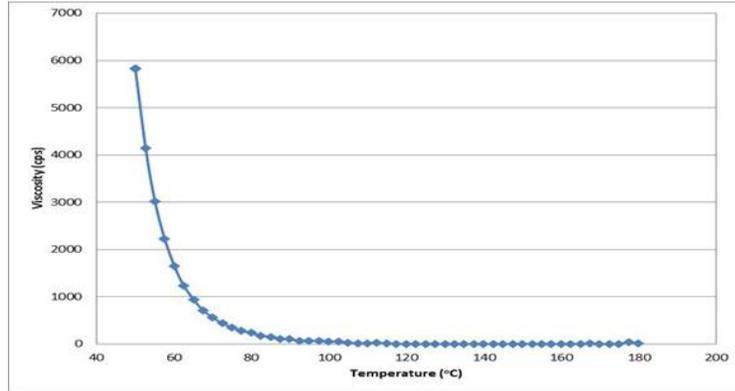
	Araldite® MT 35710 FST
Visual Appearance	Yellow viscous liquid
Solid content	>99%
Viscosity at 100 °C, cps	30-100
Gel time at 200 °C, sec.	300-450

* Product data are based on Huntsman testing methods, copies are available upon request

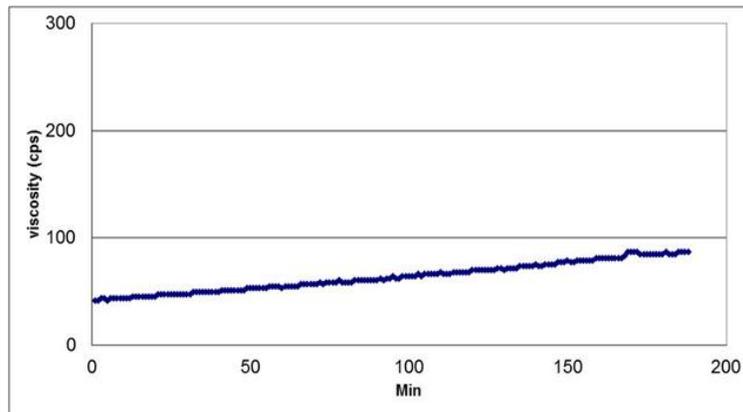
Processing Data

Unless otherwise stated, data was determined with typical production batches using standard testing methods. They are provided solely as technical information and do not constitute a product specification

Initial Viscosity vs temperature



Viscosity Build-Up at 100 °C



Formulation and Reactivity Data

Araldite[®] MT 35710 FST can be used by itself, or formulated with epoxy, novolac, cyanate ester, anhydride, catalysts, toughener agents and flame retardant additive to improve resin processability, reactivity, and performance. However, caution must be exercised during use as resin reactivity could change significantly when formulating with other components.

Formulation	Part by weight	
	Araldite [®] MT 35710 FST	100
Novolac SD-1702*	0	20

* : From Momentive Specialty Chemicals

Reactivity by DSC		
Onset temperature, °C	215	174
Peak temperature, °C	227	202
Cure schedule	150 °C/1h +177 °C/ 90min	160 °C/1h
Glass Transition by DSC, °C	137 / 142 (re-run)	127/143(re-run)

Casting and Curing Characteristics

Araldite® MT 35710 FST generates almost no volatiles or voids during curing. Therefore, minimum pre-degassing is needed. In case degassing is preferred, use procedure below as guidance:

Weigh benzoxazine material in an appropriate kettle equipped with heating capability, mechanical stirrer and temperature recording device. Heat to 80-100 °C until a clear homogeneous solution is obtained. Additional heating dictates the pot life of the resultant prepolymer. Degas the resultant mixture with 26+ inches of vacuum for 15 minutes. Hot degassed melt can be poured into preheated molds; and cured at the desired conditions.

Neat resin Casting without pre-degassing or pressure



Cured Neat Resin Properties

Cure schedule: 2h at 150 °C + 2h at 177 °C

Mechanical Properties

Flexural test (ISO 178)	
Flexural Modulus, MPa	5,205
Flexural Strength, MPa	121
Ultimate Elongation, %	2.3
Tensile test (ISO 527)	
Tensile Modulus, MPa	4,859
Tensile Strength, MPa	61
Ultimate Elongation, %	1.15
Toughness Test (Bend Notch test ISO 13586)	
K1c, MPa√m	0.92
G1c, J/m ²	200

Laminate Properties

Sample:
Araldite® MT 35710 FST/7781 glass laminate,
Cured condition: 2h at 150 °C + 2h at 177 °C

FST Properties

	Test Method	Specification	35710 FST laminate*
<u>Flammability – 60 second vertical burn</u> Extinguish time – Burn length – Drip extinguish time -	FAR 25.853(a)	< 15 seconds < 6 inches < 3 seconds	0.0 3.7 0.0
<u>Smoke density</u> Specific optical density -	FAR 25.853(d)	< 200 (Ds)	11
<u>Heat release</u> Total heat release – Peak heat release-	FAR 25.853(d)	< 65 kW·min /m ² < 65 kW/m ²	18 29
<u>Toxicity</u> HCN – CO – NOx – SO ₂ – HF – HCL –	BSS 7239	<150ppm Ref. <100ppm <100ppm <200ppm <500ppm	2 19 3 0 1 0

*: 2ply laminate with fiber volume (50%)

Mechanical properties

Properties	Method	35710 FST laminate*
Flexural modulus (warp), Gpa	ISO178	27
Flexural strength (warp), MPa		663
Tensile modulus (warp), GPa	ISO527	28
Tensile strength (warp), MPa		457
ILSS (warp), MPa	ISO14130	50
Compression modulus (warp), GPa	ISO14126	29
Compression strength (warp), MPa		555

*: 13ply laminate with fiber volume (50%)

Storage

Araldite® MT 35710 FST benzoxazine resin may be stored for up to 6 months from date of shipment at temperature around 77°F provided the product is stored in sealed container.

Handling precautions**Caution**

Do not use this product until the MSDSs have been read and understood. To protect against any potential health risks presented by our products, the use of proper personal protective equipment (PPE) is recommended. Eye and skin protection is normally advised. Respiratory protection may be needed if mechanical ventilation is not available or is insufficient to remove vapors. For detailed PPE recommendations and exposure control options consult the product MSDS or a Huntsman EHS representative.

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