

Advanced Materials

XU 35910 Benzoxazine Resin

PRELIMINARY DATA SHEET

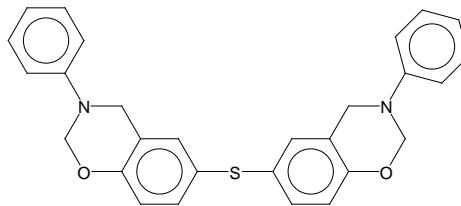
Key Properties

- High resin modulus
- High glass transition temperature
- Good laminate performance
- Good hot/wet performance
- Good processability with long pot life
- 350°F cure
- Long storage life / no refrigeration
- Good flammability resistance

Description

XU 35910 is thiodiphenol-based benzoxazine thermoset resin that is partially modified by epoxy. This product is readily used by itself or with further formulation. The resin has good processability, and shows good thermal and mechanical performances after cure.

Chemical Structure



Processing

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

Applications

Aerospace and industrial composites, high-temperature tooling, structural adhesives, high-performance coatings, molding compounds, laminates for printed wiring boards.

Product Data

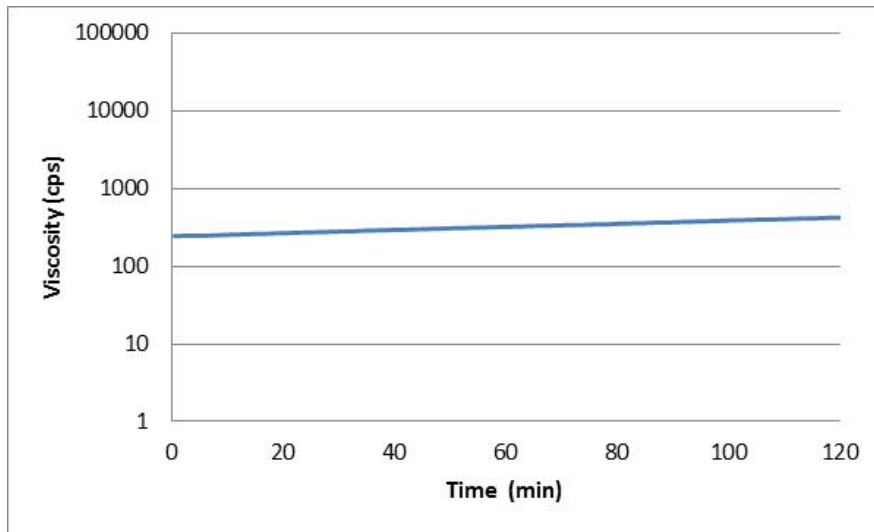
	XU 35910
Visual appearance	Amber semi-solid
Solid content	>99%
Viscosity at 110 °C, cps	100-500
Gel time at 200 °C, sec.	150-300

* 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

Viscosity build-up at 110 °C



Formulation and Neat Resin Properties

XU 35910 can be used by itself, or further formulated with epoxy, novolac, cyanate ester, anhydride, catalysts, and toughener agents 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 No	1	2
XU 35910	100	85
CY179 ¹		6
Hypro 1300X16 ATBN		9
Cure cycle: 2h at 160 °C + 2h at 180 °C		
Mechanical Properties		
Flexural test ²		
Flexural modulus, MPa	4,513	3,450
Flexural strength, MPa	105	117
Ultimate elongation, %	2.1	3.3
Tensile test ³		
Tensile modulus, MPa	4,477	3,364
Tensile strength, MPa	46	71
Ultimate elongation, %	1.0	2.6
Toughness test ⁴		
K1c, MPa√m	0.57	0.73
G1c, J/m ²	82	176

Thermal Properties			
Tg by DSC ⁵ , °C		206	208
Tg by DMA ⁶ , °C	E'	197	198
	E''	214	217
	Tan Delta	226	230
Water absorption 48 h in boiling water, %		1.16	1.28
Tg by DMA after 48 h in boiling water ⁶ , °C	E'	163	175
	E''	191	192
	Tan Delta	213	221
Further post cure at 200 °C for 2h			
Tg by DSC ⁵ , °C		224	223
Tg by DMA ⁶ , °C	E'	229	225
	E''	240	236
	Tan Delta	250	246
Water absorption 48 h in boiling water, %		1.3	1.6
Tg by DMA after 48 h in boiling water ⁶ , °C	E'	197	187
	E''	216	206
	Tan Delta	237	229

- Liquid cycloaliphatic epoxy resin (epoxy equivalent weight: 131-143)
- ISO 178/01
- ISO 527T2/93
- Bend Notch test ISO 13586/03
- DSC: TA Q2000 / ramp @ 10°C / 30°C - 300°C / nitrogen
- DMA: TA Q800 / ramp @ 5°C / 30°C - 300°C / nitrogen

Laminate Preparation and Properties

Laminate Preparation by RTM:

Carbon fabric: 6k 2x2 Twill, 360gsm

Resin injection temperature: 110 °C

Cured condition: 2h at 150 °C + 2h at 177 °C

Final fiber volume: 60%

Mechanical properties:

Properties	Method	XU 35910 laminate
Flexural modulus (warp), Gpa	ISO 14125/98	68
Flexural strength (warp), MPa		1042
Tensile modulus (warp), GPa	ISO527-4/97	74
Tensile strength (warp), MPa		761
ILSS (warp), MPa	ASTM 2344/00	69
Compression modulus (warp), GPa	ISO14126	176
Compression strength (warp), MPa		841

Storage

XU 35910 benzoxazine resin may be stored for up to 12 months from date of manufacture at a 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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