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Composites Group

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**Prepregs for Space Applications**

# Products for Space Applications . . . Cyanate Ester, Epoxy, BMI and Phenolic Prepregs

## Cyanate Ester Prepreg Systems:

### LTM<sup>®</sup>123 - Low Temperature Curing

#### Applications:

- Satellite structures
- Reflectors
- Radomes

#### Main Features:

- Low initial cure temperature (80°C)
- Low moisture pick-up (0.75% on cured neat resin)
- High Tg after post-cure (250°C)
- Exceeds NASA outgassing requirements
- Good dielectric properties

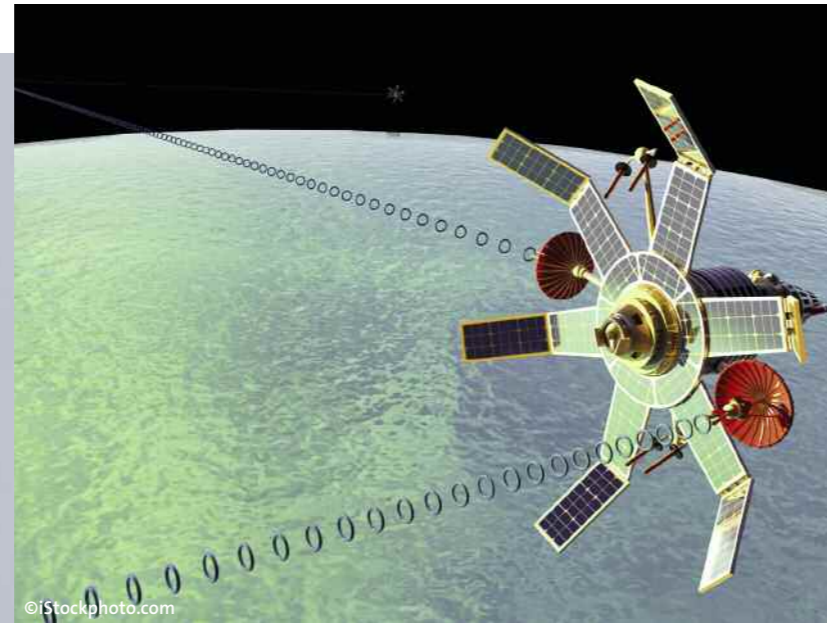
### HTM<sup>®</sup>143 - Very Low Moisture Pick-Up

#### Applications:

- High precision satellite structures
- Large and complex structures
- Reflectors
- Radomes

#### Main Features:

- Low moisture pick-up (0.55% on cured neat resin)
- Out life of 21 days
- Excellent tack and drape
- High Tg after post-cure (250°C)
- Exceeds NASA outgassing requirements
- Good dielectric properties



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## Bismaleimide Prepreg System:

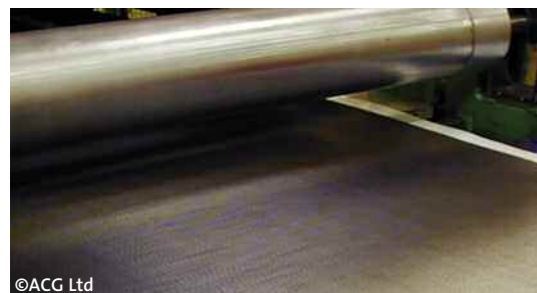
### HTM<sup>®</sup>556 - Toughened, Controlled Flow

#### Applications:

- High temperature structural parts

#### Main Features:

- Upper service temperature 250°C
- Out life of 30 days
- Excellent tack and drape with improved ambient temperature tack stability
- Initial cure temperature 190°C
- Free-standing post-cure 240°C



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## Epoxy Prepreg Systems:

### MTM<sup>®</sup>44-1 - Medium Temperature Curing

#### Applications:

- Launcher and satellite structural parts

#### Main Features:

- Processable using vacuum bag or autoclave
- Out life of 21 days
- Variable cure 130 to 180°C
- Full Tg after 180°C post-cure
- High damage tolerance
- Low density (3% weight saving on carbon structure)
- Exceeds NASA outgassing requirements

### MTM<sup>®</sup>46 - Medium Temperature Curing

#### Applications:

- Satellite structural parts

#### Main Features:

- Processable using vacuum bag or autoclave
- Out life of 60 days
- Variable cure 80 to 135°C
- Full Tg after 180°C post-cure
- Exceeds NASA outgassing requirements

## Phenolic Prepreg System:

### MTM<sup>®</sup>80S

#### Applications:

- Ablative parts
- High temperature insulation

#### Main Features:

- Processable using autoclave or vacuum bag
- Out life of 30 days
- Initial cure 160°C
- Post-cure to 315°C

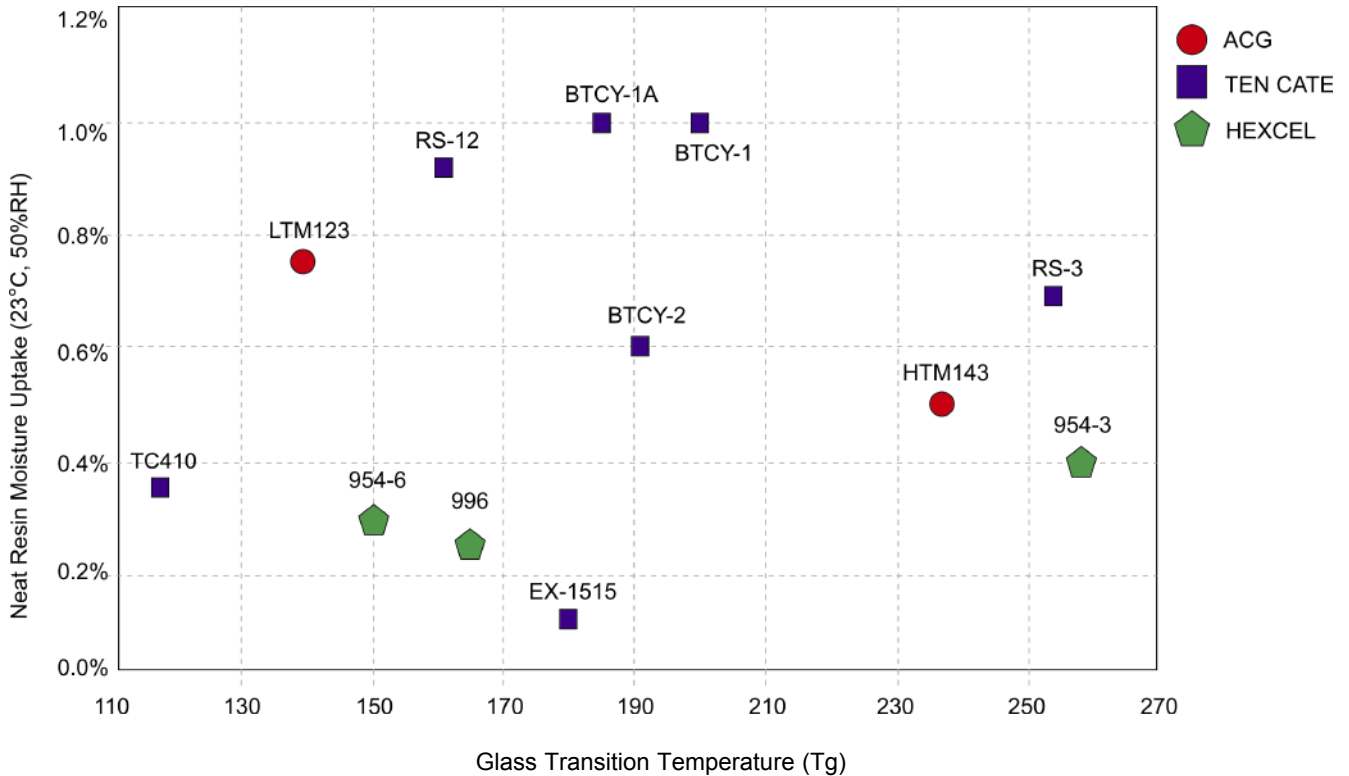


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## ACG Prepregs for Space Applications

	Processing								Properties		
	Typical Initial Cure Temperature °C	Typical Initial Cure Time (hours)	Typical Post-Cure Temperature °C	Out Life (days) at 21°C	Autoclave	Press Moulding	OoA/ Vacuum Bag	Flow	Maximum Tg °C	Outgassing	Toughness
<b>Cyanate Ester</b>											
LTM®123	80	16	240	2 to 3	Yes	No	Yes	High	250	Pass	Medium
HTM®143	180	2	230	21	Yes	No	No	High	250	Pass	Medium
<b>Bismaleimide</b>											
HTM®556	190	6	240	30	Yes	No	No	Medium	270	-	Medium
<b>Epoxy</b>											
MTM®44-1	130	2	180	21	Yes	Yes	Yes	Medium	190	Pass	High
MTM®46	135	1.5	180	60	Yes	Yes	Yes	Medium	180	Pass	Medium
<b>Phenolic</b>											
MTM®805	160	0.5	315	30	Yes	Yes	Yes	High	N/A	-	N/A

ACG cyanate ester versus commercial alternatives



Note: Hexcel and TenCate values taken from data sheets.

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