

INNOVATIONS FOR LIVING"

COMPOSITE SOLUTIONS

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- What is LFT ? → Introduction to LFT
- Why LFT ? → Excellent mechanicals for structural applications
- LFT processing technologies
- LFT applications
- LFT future Trends Opportunities
- LFT Molding Guidelines

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Impact, Creep, Short- & Long-term Heat Resistance

COMPOSITE SOLUTIONS Why is LFRT growing quite rapidly?

- Advantages vs. short fiber
 - Significant lower warpage vs short glass fibers
 - Much lower CTEs and higher isotropy than short glass fibers
 - Improved impact performance (especially Low temp.)
 - Improved creep resistance (better than PASGF)
 - Improved long and short term heat resistance
- Advantages vs. metal
 - Lower weight
 - Parts consolidation
 leading to lower cost







Polypropylene / Glass Composites

INNOVATIONS FOR LIVING

Testing Items	Unit	Testing Standard	40%CS- PP	40%LFT- PP(Internal)	STAMAX 40YM240	Celstran PP-GF40-02	OCMAX 4010HU-BH
Density	g/cm3	ISO1183	1.22	1.22	1.22	1.21	1.21
Tensile							
strength	MPa	ISO527	100	105	121	117	119
Flexural							
strength	MPa	ISO178	161	142	184	180	196
Flexural							
modulus	MPa	ISO178	7830	7760	7850	8060	8160
Impact		ISO179/1e					
strentth	kJ/m2	А	14.6	16.3	22	23	24.5

Note: StaMax[™] is the trademark of Sabic Petrochemicals

Celstran[™] is the trademark of Ticona Engineering Polymers

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DMA - Bending for PP LFT/ 30% & 40% LGF





Creep at 80°C, 5 MPa



log Time (sec.)



LFT Processing Technologies

- Short Fiber Compounding
- Long Fiber Thermoplastics granulate (LFT-G)
 - Wire coating (StaMax[™], RheMax[™])
 - Long Fiber Pultrusion (Celstran[™])
- Direct Long Fiber Thermoplastics (D-LFT)
 - Extrusion Compression Molding (ECM)
 - Direct Injection Molding (DIM)

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Advantages: Fast and inexpensive Disadvantages: Sub-optimal quality composites

3~4mm pellet length 0.25 – 0.5 mm GF length



Direct Roving(T30)

Long Fiber Pellets (8~12mm)



- Large Parts
- Thin Walls
- Easy Insertion of Hybrid Materials

- Small, Medium, Large Size Parts
- High Part Complexity & Integration
- No Post-Processing

Advantages: High quality composites and lower cost Disadvantages: Capital investment and process complexity



D-LFTP Extrusion Compression Molding (ECM)





D-LFT Injection Molding

KraussMaffei Principle

PlastiComp Principle





Screw / standard or throughput optimised



COMPOSITE SOLUTIONS COMPOS





Torque converter bracket PP LGF 40 %



Door module PP LGF 45 %





LFTP Automotive Applications





COMPOSITE SOLUTIONS LFTP Tooling and Molding Guidelines

Tooling Considerations

- Full round runners with a diameter of 0.25 in (5.56 mm) are preferred.
- Runners should have no sharp corners.
- Minimum gate thickness of 0.080 in (2 mm).
- Sprue as short as possible, with initial diameter of 0.25 in (5.56 mm), tapered to 11/32 in (8.73 mm).
- Open channel type hot runner systems are acceptable.
- Use same materials for molds as for other reinforced materials

Processing Considerations

- Feed throat from hopper to machine must have sufficient opening to prevent bridging of long pellet composition.
- Reverse barrel profile to 'pre-soak' or 'soften fibers' .
- Minimum back pressure should be used, typically 0.17-0.34 MPa



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