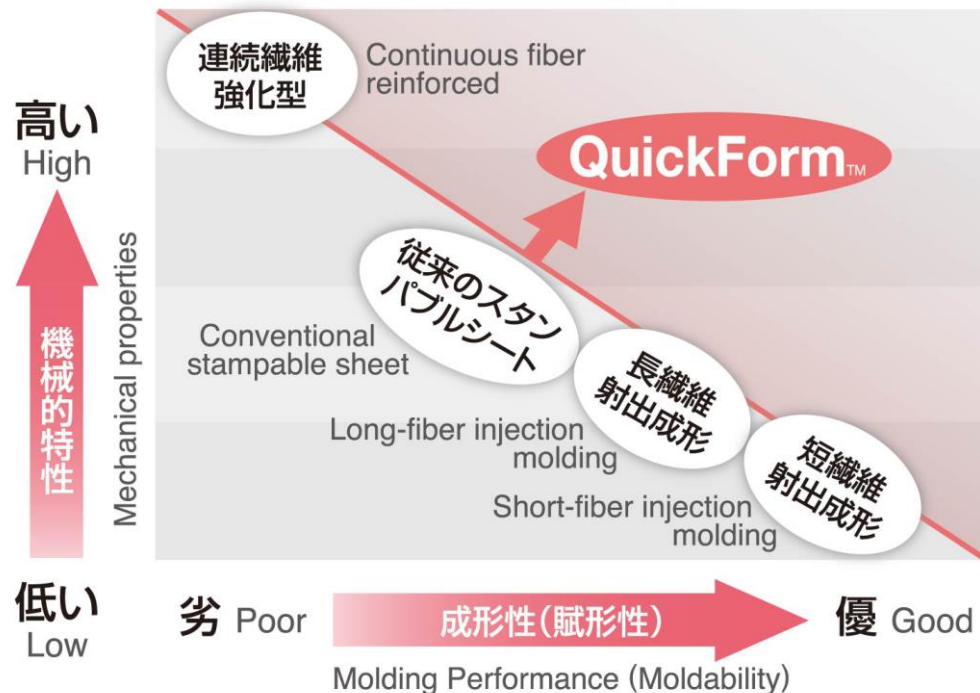


Features

High Performance Stampable Sheet for the 21st Century

- Excellent quasi-isotropic nature
- Markedly high content of reinforcing fiber
- Excellent resin impregnating ability, strength, and impact strength
- Excellent flowability and shape flexibility
- Random sheet with PP/GF content of 72wt%

Positioning of QuickForm™



Features

What is QuickForm™

Toyobo MC's proprietary impregnation technology is used to create press sheets made from glass fiber and thermoplastic resin (PP).

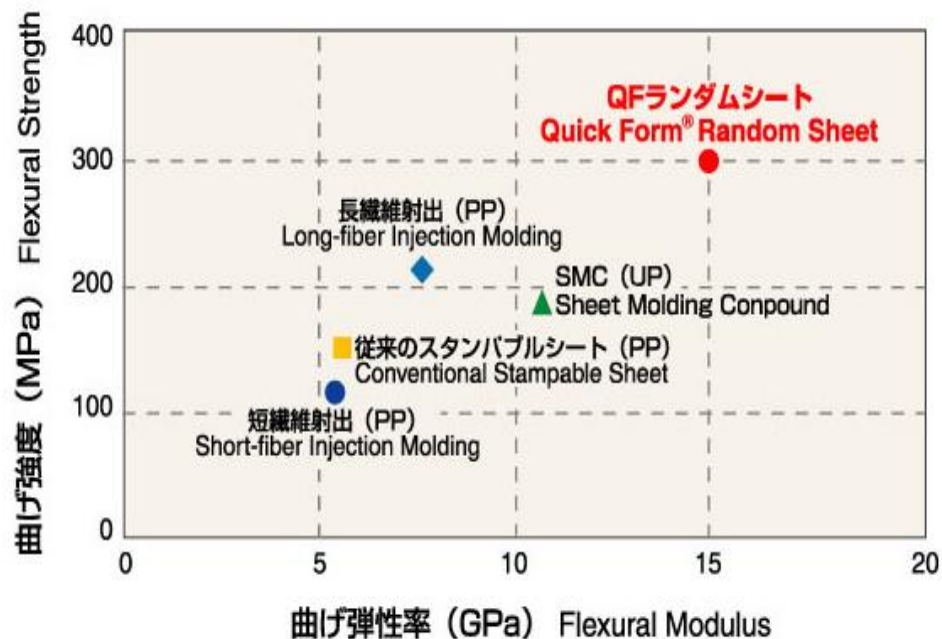


Positioning of QuickForm™

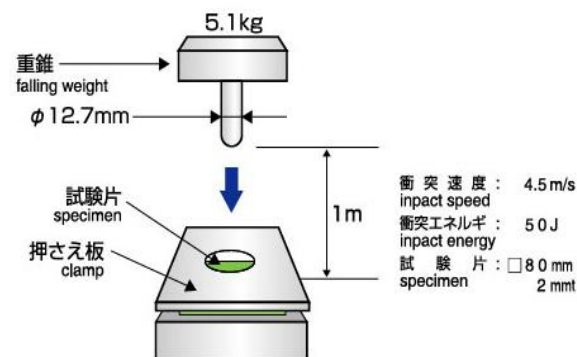
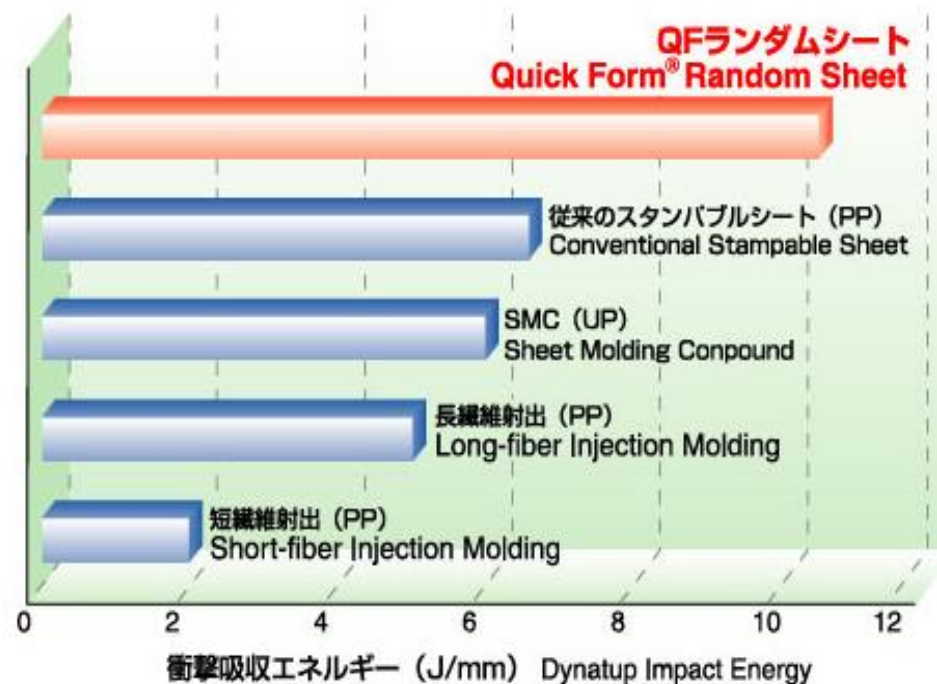
- **Strength/Impact resistance**
Achieved the highest level of reinforcing fiber content in sheets for press molding: GF content 72wt%
- **High flow**
The glass fiber and the thermoplastic resin do not separate, and there is a degree of freedom in shape.
- **Pseudo-isotropic**
The glass fibers are randomly arranged, making the surface pseudo-isotropic and the physical properties stable.



High Strength



Impact Resistance



計装化落錘衝撃試験 (ASTM D 3763)
 Instrumented Falling Weight Impact Test

Basic Physical Properties

Item	Unit	QF-001
Reinforcement Material	GF	
Matrix Resin	PP	
Fiber Content	vol%	48
	wt%	72
Specific Gravity	-	1.69
Tensile Modulus	GPa	15
Tensile Strength	MPa	180
Compressive Modulus	GPa	17
Compressive Strength	MPa	210
Three-Point Bending Modulus	GPa	15
Three-Point Bending Strength	MPa	300

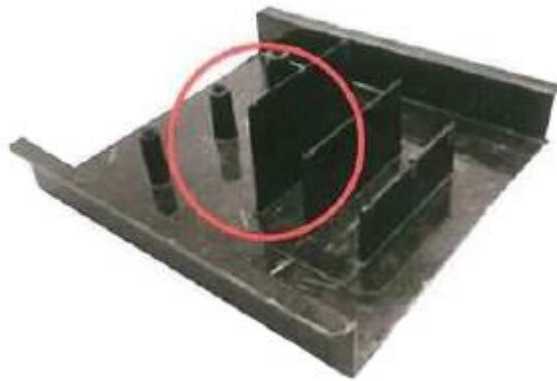
Comparison with Other Materials

	Injection Molding	QuickForm™	SMC	Continuous Fiber
Resin Type	Thermoplastic resin (PP, PA, etc.)	Thermoplastic resin (PP, PA, etc.)	Thermosetting resin (Unsaturated polyester, etc.)	Thermosetting resin (epoxy, etc.)
Base Material Condition	Pellet	Sheet form	Sheet form	Prepreg tape
Molding Method	Melt, inject and solidify resin	Melted by external heating press the sheet	After inserting the sheet into the mold Hardened by pressing	After laminating the tape Cure in mold
Storage of Base Materials	No limit	No limit	Limited (Store under non-reactive conditions)	Limited (Store under non-reactive conditions)
Substrate Heating Temperature	Expensive (Requires heating above melting point)	Expensive (Requires heating above melting point)	Low (Reaction at room temperature to 120°C)	Low (Reaction at room temperature to 130°C)
Molding Pressure	≥30MPa (Mold clamping force)	30~35MPa	5~10MPa	0.5~1MPa
Molding Time	Short (~30 seconds)	Short (1~5 minutes)	Short (1~5 minutes)	Long (2 hours~)
Bending Strength	△ (260MPa@PA6/GF30)	○ (300~400MPa)	△ (150~200MPa)	◎ (1100MPa: fiber direction)
Impact Resistance	△	◎	×	○
Remolding	Possible	Possible	Impossible	Impossible

Specifications and Performance

Excellent Molding Flowability

The glass fiber and thermoplastic resin (PP) do not separate, and the fiber content throughout, from the base to the tip of ribs



Processing

About Stamping Molding

① Blanking

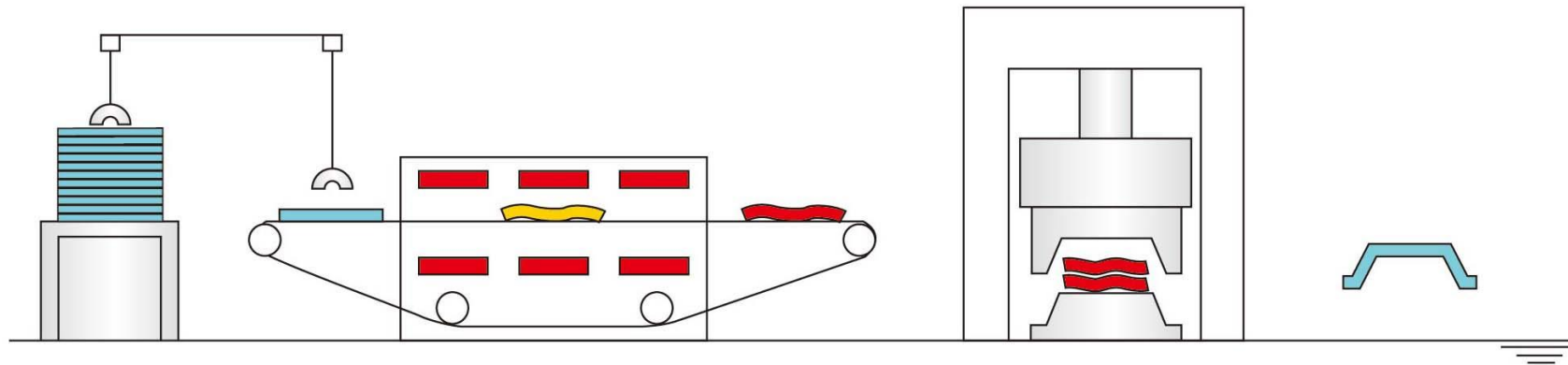
Cut out of QuickForm™ QF-Sheet blanks with specified weight and dimensions in accordance with the shape and volume of product.

② Heating

Heat the blanks with an infrared over to a temperature between 200 and 230°C until the matrix resin melts.

③ Pressing

Promptly load the heated blank in the mold and form it into the desired shape.



Stamping molding is similar to thermosetting SMC.

Processing

Basic Molding Conditions for QuickForm™

Item	PP/GF	Remarks
Pre-Drying Time	Unnecessary	
Substrate Heating Temperature	200~230°C	
Mold Temperature	80~130°C	
Molding Pressure	10MPa~	Depends on part shape
Draft angle	1°	
Type of Heater	Far infrared heater*	
Molding Cycle	0.5~5 minutes	Depends on molded product thickness and shape

*The substrate heating time can be shortened by using a near-infrared heater, but it is necessary to reduce the thickness of the substrate to be used.

Processing

Details of Compression Process and Tool Design



The loaded blank must have the same volume and weight as the product to be molded.

The pressured material flows along the cavity, then begins to cool.

The formed material is sealed by the shear edge and kept pressurized until it is solidified enough to be taken out. This completes the molding process.

Application Proposal

Example of application development

Safety shoe toe cap

- Weight saving
- Free design

62g→38g Weight reduction rate 39%



Notes

Disclaimer

- All of the property data is based on natural color or general black. Data may vary depending on color.
- All information in this technical data sheet is based on the experiences of TOYOBO MC Corporation.
- These information may vary depending on mold condition and application.
- There may also be laws and regulations depending on intended use. Please be careful of this things when using this product.
- If this material is to be used for medical, military, or food contact applications, or if it is to be used in a product where a defect in the product is likely to result in death, bodily harm, or substantial property damage, please contact us separately beforehand.
- Export of our materials and products using our materials must comply with the Foreign Exchange and Foreign Trade Law and other relevant laws and regulations.
- Chemical substances used in this material may be regulated by laws and regulations related to chemical substances in each country, and separate applications may be required or import/export may not be allowed. If you are an importer or exporter of this material, please inquire about compliance with regulations in the relevant country.
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