

# Features

## High Melting Point Biomass Polyamide VYLOAMIDE™

- VYLOAMIDE™ has one of the lowest water absorption rates among polyamides.
- VYLOAMIDE™ has a high melting point of 315°C and excellent short-term heat resistance.
- VYLOAMIDE™ boasts high chemical resistance against acids, alkalis, oils, and more.
- VYLOAMIDE™ has excellent fluidity, allowing for the molding of thin-walled parts.
- VYLOAMIDE™ has a biomass content of about 30% in unreinforced grades.



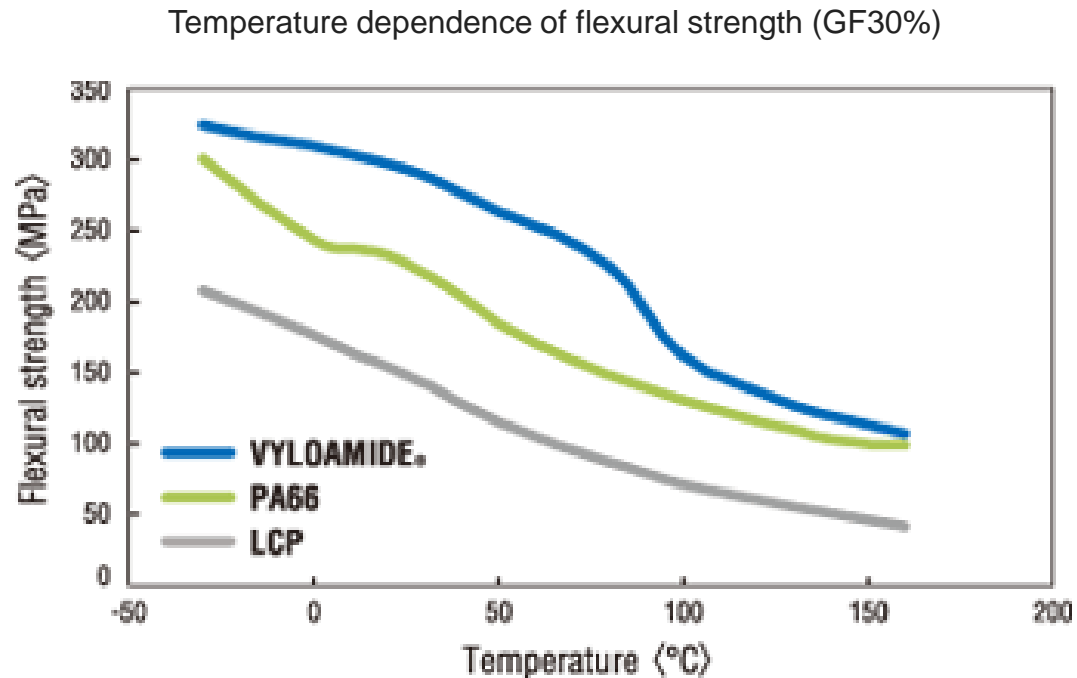
## VYLOAMIDE™ Main Grades

The physical properties can be found in the **Product search** on the top page of VYLOAMIDE™.

Type	Property	Grade	Feature
Non-Flame-Resistant	Unreinforced	MJ-300	Unreinforced
	GF reinforced	MJ-365GT	GF35%
	GF reinforced	MJ-360JA	GF35%, Good Appearance, Low Warp
	GF reinforced	MJ-365GC-U	GF35%, Impact Resistant
	GF reinforced	MJ-385JT	GF45%, Low Warp
	GF reinforced	MJ-390GNZ	GF50%, High Stiffness
	GF reinforced	MJ-330C	CF20%, Low Friction, High Stiffness
Flame Retardant	GF reinforced	MJ-350GCV	GF30%, High Toughness, Flame Retardant(V-0 Equivalent Rating/1.6mm)
	GF reinforced	MJ-365GHV	GF35%, Flame Retardant(V-0 Equivalent Rating/0.8mm)

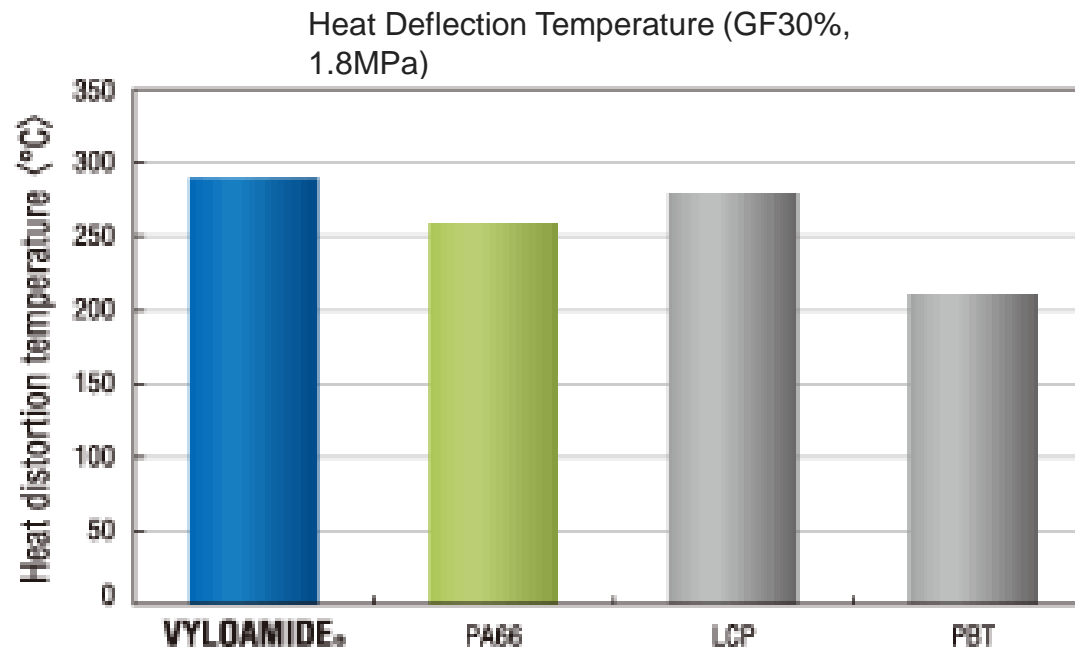
## High Strength

VYLOAMIDE™ maintains high strength across a wide temperature range. The graph shows temperature dependence of flexural strength. VYLOAMIDE™ is superior to PA66 and LCP at several temperatures.



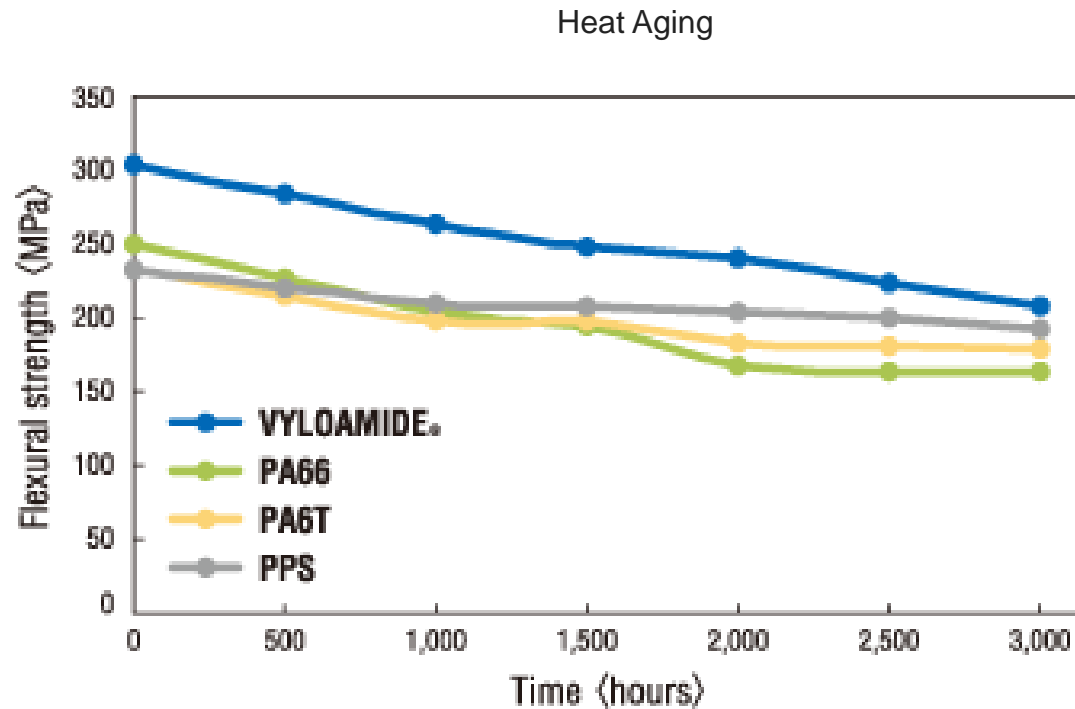
## Short-Term Heat Resistance

VYLOAMIDE™ has a high melting temperature of 315°C and a high HDT (Heat Deflection Temperature) of 290°C at 1.8MPa. The graph shows HDT of each material. VYLOAMIDE™ has a higher HDT than PA66 or PBT, so it is suitable for SMT processes.



## Long-Term Heat Resistance

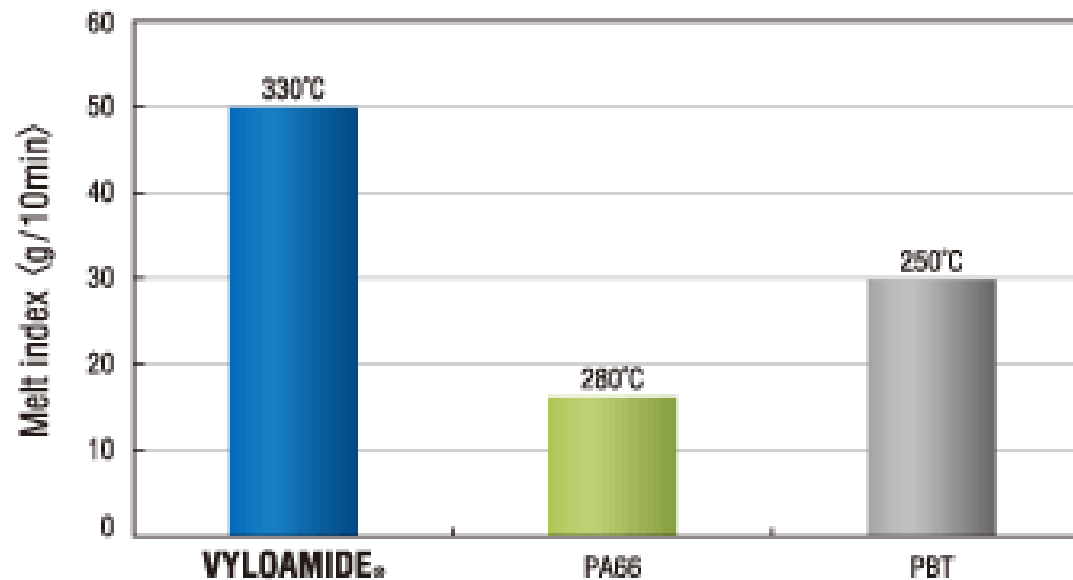
VYLOAMIDE™ maintains its mechanical properties under long-term high-temperature conditions. The graph shows heat aging results at 160°C and shows VYLOAMIDE™ to be superior in performance to PA66 and PPS.



## High Flow

VYLOAMIDE™ has excellent in mold flow. The graph compares the Melt Flow Index (MFI) of VYLOAMIDE™ (2,160 g/10min) to that of several other polymers. VYLOAMIDE™ has a higher MFI than PA66 or PBT, which allows for its use in molded parts with complex geometries or fine textures.

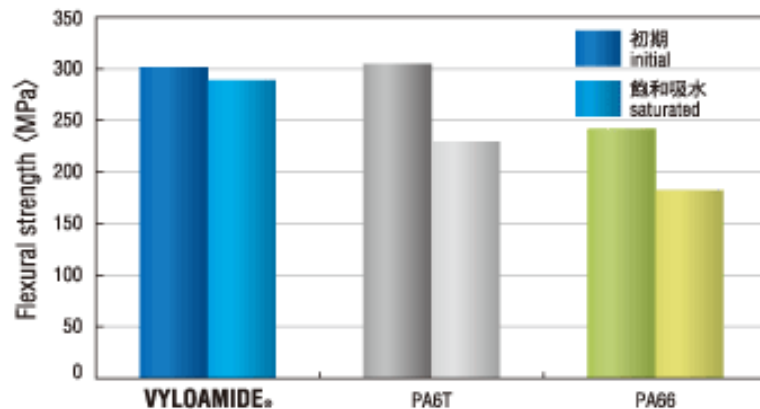
Melt index of VYLOAMIDE™ and several polymers



## Low Water Absorption

When selecting a polyamide for use in automotive parts and electronics parts, it is important to consider mechanical properties. Popular polyamides (for example PA6T, PA66) decrease in strength with water absorption. VYLOAMIDE™ has one of the lowest water absorption rates of all the polyamides due to its polymer structure which includes long-chain components. The graph shows flexural strength at 95%RH. VYLOAMIDE™ maintains its properties after water absorption better than PA66. Moreover, VYLOAMIDE™ prevents the generation of blisters due to its inherent low water absorption. The picture shows a comparison of VYLOAMIDE™ and a standard PA after the reflow process. VYLOAMIDE™ has no blisters.

Flexural strength at 95% RH



Appearance after reflow process



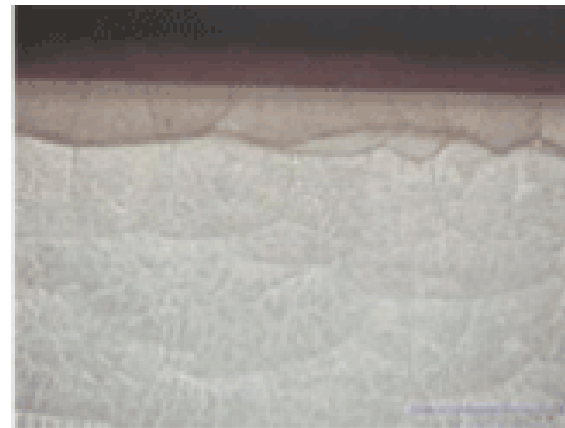
## Chemicals Resistance

VYLOAMIDE™ has good chemical resistance to acids, alkalis, oils and other chemicals. The graph shows the surface condition of VYLOAMIDE™ and PA66 after a CaCl<sub>2</sub> test. VYLOAMIDE™ has no cracks, while there are multiple cracks in PA66.

Surface Strength of VYLOAMIDE™ and PA66 after CaCl<sub>2</sub> Test



**VYLOAMIDE.**



**PA66**



## Biomass

VYLOAMIDE™ is made from inedible plant material so it is environmentally friendly. The biomass ratio of the unreinforced grade is about 30%.

Castor Oil Plant



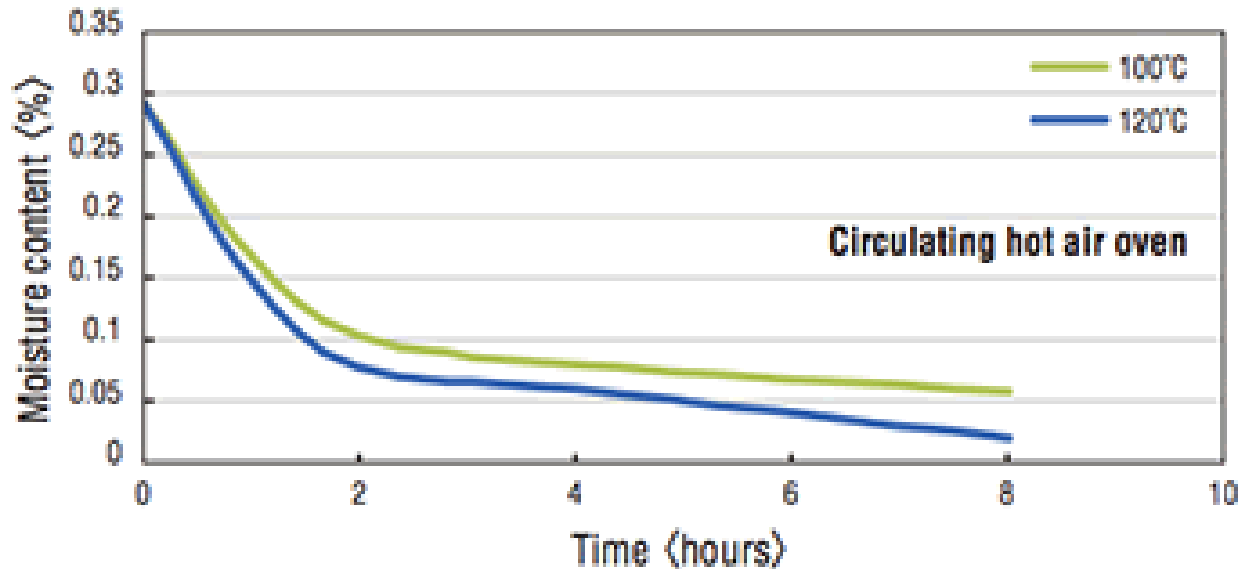
# Processing

## Molding Condition

### Drying Conditions

Drying is not necessary for VYLOAMIDE™ used directly from a new, sealed bag. When using VYLOAMIDE™ from an open bag, dry at 120°C for 5-8 hours at least if the opened once is used. Avoid overdrying as VYLOAMIDE™ this may cause discoloration.

Moisture content of VYLOAMIDE™ under 100°C and 120°C condition.



# Processing

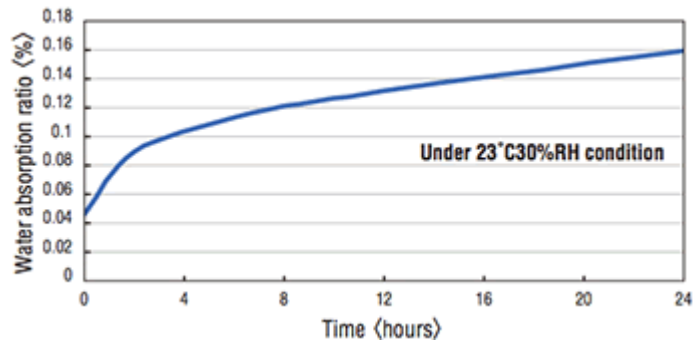
## Typical injection molding condition

	Unreinforced	Reinforced
Example of applicable grades	MJ-300	MJ-365GT
C1	315~320°C	315~320°C
C2	320~330°C	320~330°C
C3	320~330°C	320~330°C
NZ	320~330°C	320~330°C
Mold Temperature	120~150°C	120~150°C

## Storage condition

VYLOAMIDE™ has low water absorption rate but may absorb water a little under room condition for long time. Water absorption causes foaming, poor appearance, low mechanical properties and drooling. Seal aluminum package after using to prevent water absorption.

Water absorption rate of VYLOAMIDE™ (23°C30%RH)



# Processing

## Injection Molding Troubleshooting

Trouble	Cause		Countermeasure
Sink marks	Condition	<ol style="list-style-type: none"> <li>1. High resin temperature</li> <li>2. High/low mold temperature</li> <li>3. Low holding pressure</li> <li>4. Insufficient holding pressure time</li> <li>5. Insufficient cooling time</li> <li>6. No cushion</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce the cylinder temperature</li> <li>2. Set the mold temperature accordingly</li> <li>3. Increase the holding pressure</li> <li>4. Increase the holding pressure time</li> <li>5. Increase the cooling time</li> <li>6. Make cushion 5-10mm</li> </ol>
	Design	<ol style="list-style-type: none"> <li>1. Small runner/ gate</li> <li>2. Unsuitable gate location</li> </ol>	<ol style="list-style-type: none"> <li>1. Enlarge the runner/gate size</li> <li>2. Relocate the gate to a thicker area</li> </ol>
	Machine	<ol style="list-style-type: none"> <li>1. Back-flow during injection</li> </ol>	<ol style="list-style-type: none"> <li>1. Inspect or exchange the backflow valve</li> </ol>
Warping, Deformation	Condition	<ol style="list-style-type: none"> <li>1. Unsuitable injection conditions</li> <li>2. Insufficient holding pressure time</li> <li>3. Insufficient Cooling time</li> <li>4. Temperature difference between cavity and core</li> </ol>	<ol style="list-style-type: none"> <li>1. Increase the injection pressure/speed</li> <li>2. Increase the holding pressure</li> <li>3. Increase the cooling time</li> <li>4. Control the temperature of cavity and core separately</li> </ol>
	Mold	<ol style="list-style-type: none"> <li>1. Unsuitable ejector pin placement</li> <li>2. Insufficient ejector pin size</li> </ol>	<ol style="list-style-type: none"> <li>1. Balance ejector pin placement</li> <li>2. Enlarge ejector pin size</li> <li>3. Increase the draft angle</li> </ol>
	Design	<ol style="list-style-type: none"> <li>1. Unsuitable gate location</li> <li>2. Extreme change in part thickness</li> <li>3. Not enough gates for the part size</li> </ol>	<ol style="list-style-type: none"> <li>1. Change gate location</li> <li>2. Even out the part thickness</li> <li>3. Increase the number of gates</li> </ol>
Flash	Condition	<ol style="list-style-type: none"> <li>1. High resin temperature</li> <li>2. High injection speed</li> <li>3. High holding pressure</li> <li>4. Low mold clamping force</li> <li>5. Filling resin Volume is too high</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce the resin temperature</li> <li>2. Reduce the injection speed</li> <li>3. Reduce the holding pressure</li> <li>4. Increase the mold clamping force</li> <li>5. Set the cushion about 5mm</li> </ol>
	Mold	<ol style="list-style-type: none"> <li>1. Mold surface doesn't mate properly</li> </ol>	<ol style="list-style-type: none"> <li>1. Modify the mold</li> </ol>
Burn marks	Condition	<ol style="list-style-type: none"> <li>1. High resin temperature</li> <li>2. Air entrapment</li> <li>3. High injection speed</li> <li>4. Filling resin volume is too high</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce the resin temperature</li> <li>2. Reduce the screw rotation</li> <li>3. Reduce the injection speed</li> <li>4. Decrease the residence time</li> </ol>
	Mold	<ol style="list-style-type: none"> <li>1. Inadequate venting</li> </ol>	<ol style="list-style-type: none"> <li>1. Increase gas ventilation</li> </ol>
	Design	<ol style="list-style-type: none"> <li>1. Unsuitable gate location</li> <li>2. Small gate size</li> </ol>	<ol style="list-style-type: none"> <li>1. Change the gate location to make the welding line on the PL</li> <li>2. Enlarge the gate size</li> </ol>
Welding line	Condition	<ol style="list-style-type: none"> <li>1. Low resin temperature</li> <li>2. Low mold temperature</li> <li>3. Low injection speed</li> </ol>	<ol style="list-style-type: none"> <li>1. Increase the cylinder temperature</li> <li>2. Increase the mold temperature</li> <li>3. Increase the injection speed</li> </ol>
	Mold	<ol style="list-style-type: none"> <li>1. Inadequate holding pressure</li> </ol>	<ol style="list-style-type: none"> <li>1. Increase gas venting and/or change gate location to move the weld line onto the parting line.</li> </ol>
Poor surface appearance	Condition	<ol style="list-style-type: none"> <li>1. Low resin temperature</li> <li>2. Low mold temperature</li> <li>3. Low injection speed</li> <li>4. Inadequate holding pressure</li> <li>5. Insufficient amount of resin for fill</li> </ol>	<ol style="list-style-type: none"> <li>1. Increase the cylinder temperature</li> <li>2. Increase the mold temperature</li> <li>3. Increase the injection speed</li> <li>4. Increase the holding pressure/time</li> <li>5. Make cushion 5-10mm</li> </ol>
	Mold	<ol style="list-style-type: none"> <li>1. Inadequate holding pressure</li> <li>2. Unclean mold</li> </ol>	<ol style="list-style-type: none"> <li>1. Increase the holding pressure/time</li> <li>2. Clean the mold</li> </ol>

# Processing

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## Safety

### Molding Operation

- When purged resin contains a large quantity of gas or steam, the resin may have been insufficiently dried. We recommend re-drying the resin.
- Resin held in the cylinder for an extended period of time may lose viscosity or experience other impacts on quality. Please resume molding only after thoroughly replacing the resin that has been held too long in the cylinder with new resin.
- When switching from VYLOAMIDE™ to another polymer, replace the VYLOAMIDE™ with polyethylene or polypropylene to purge. Local and general ventilation are recommended.
- Keep hands and face away from the nozzle during molding to prevent burn injury.
- Please ensure proper ventilation, as a small amount of gas and fine dust may be produced during molding.

### Protective equipment

- Wear appropriate protective equipment such as protective clothing, safety glasses, and gloves to protect eyes and skin from the molten resin.

### Emergency Response

- Should molten resin adhere to the skin, cool the area immediately with cold water or an ice pack and then seek medical attention. Do not attempt to peel the resin off of the skin.

### Other

- Do not let molten resin touch electric wires or hoses.
- Molten resin reaches high temperatures and can catch fire if it forms large clumps when purging. Break up large clumps and allow to cool before disposal.
- Spilled pellets can be a slipping hazard, so be sure to clean them off the floor immediately.

# Notes

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## 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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