

Protectors Made from Biomass Polyamide 56

Under development

Protectors used for automotive W/Hs in engine compartments, made from biomass-derived polyamide 56 as an alternative to conventional petroleum-based polyamide 66

Background or Assignment





As part of social responsibility, companies are required to reduce greenhouse gas emissions according to the purpose of the Paris Agreement. Activities to achieve carbon neutrality by 2050 are essential.

Solutions to Challenges

Greenhouse gas emissions are reduced by replacing petroleum-derived polyamide materials with biomass-derived polyamide materials used for protectors

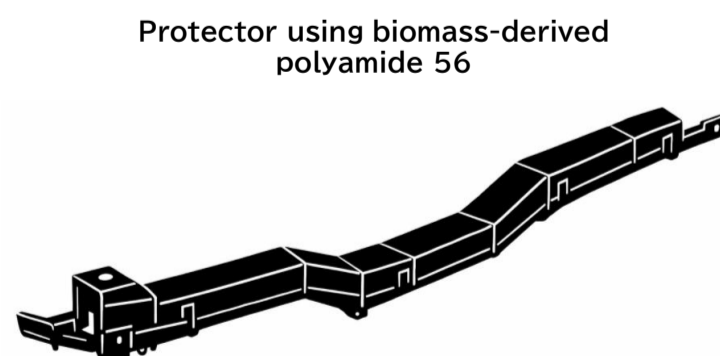
Main performance, specifications, and structure

① Chemical structure and raw material differences between petroleum polyamide 66 and biomass polyamide 56

Resin type	Petroleum-derived polyamide 66	Biomass-derived polyamide 56
Chemical structure	$\begin{array}{c} -N-(CH_2)_6-N-C-(CH_2)_4-C- \\ \quad \quad \quad \quad \quad \\ H \quad \quad H \quad O \quad \quad O \end{array}$	$\begin{array}{c} -N-(CH_2)_5-N-C-(CH_2)_4-C- \\ \quad \quad \quad \quad \quad \\ H \quad \quad H \quad O \quad \quad O \end{array}$
Raw materials	<p>Diamine Hexamethylenediamine $H_2N-(CH_2)_6-NH_2$</p>  <p>Petroleum-derived</p> <p>Dicarboxylic acid Adipic acid $HOOC-(CH_2)_4-COOH$</p>  <p>Petroleum-derived</p>	<p>Diamine Pentamethylenediamin $H_2N-(CH_2)_5-NH_2$</p>  <p>(e.g. corn, etc.) Biomass-derived</p> <p>Dicarboxylic acid Adipic acid $HOOC-(CH_2)_4-COOH$</p>  <p>Petroleum-derived</p>

② Performance comparison of petroleum polyamide 66 and biomass polyamide 56
Representative values

	Petroleum-derived polyamide 66	Biomass-derived polyamide 56	
Degree of biomass	0%	47%	
Greenhouse gas reduction rate (Compared to petroleum PA66)	-	51% reduced	
Physical properties	Melting point	261°C	
	Equilibrium water absorption (23°C, 50%)	2.7%	
	Bending characteristics	Strength	130MPa
		Elastic modulus	2,973MPa
IZOD impact strength	49J/m	50J/m	



Can be molded in the same way as petroleum-derived polyamide 66