

Torayca® prepreg

Torayca® prepreg is a sheet made by aligning many high-performance carbon fiber Torayca® yarns horizontally.

It is a sheet-shaped material, or formed material made by impregnating thermosetting resin (matrix resin: primarily epoxy) containing curing agent in Torayca® textile, with the former called "Torayca® unidirectional prepreg (UD prepreg)" and the latter, "Torayca® textile prepreg."

The product type can be selected based on the conditions below, depending on the characteristics, formability, etc., required of the formed product:



- Type of Torayca® yarn used, and fiber weight per unit area
- Type of matrix resin used, and content of resin to prepreg
- Product shape of prepreg, etc.

In addition to Torayca® prepreg, Toray also offers aramid fiber "kevlar" and glass fiber prepreg products, as well as hybrid prepreg products combining different fibers.

1. Features/applications of matrix resins

Resin No.	Resin	Curing temperature (°C)	Features/applications
#2500	Epoxy	130	General purpose, general industry, sporting equipment
#2580-14	Epoxy	130	Self-adhesive, flame retardant
#2510	Epoxy	135	OoA*
#2511	Epoxy	135	OoA* low void content
#2573	Epoxy	130	Impact resistant, general industry, sporting equipment
#2574	Epoxy	130	High compression, general industry, sporting equipment
#2592	Epoxy	130	General purpose, heat-resistant tough resin
#3631-2	Epoxy	180	Heat resistant, aircraft
#3633	Epoxy	180	Heat resistant, quasi impact resistant, aircraft
#3900-2B	Epoxy	180	Heat resistant, impact resistant, aircraft

*OoA: Out-of-autoclave

2. Physical property table of Torayca® prepreg

Product type	Resin	Yarn weight per area	Carbon fiber Content Wf(%)	Resin content RC(%)	prepreg weight per area PPAW(g)	Thickness (mm)	Pre-ply	Carbon fiber used
P3051S-5	2500	55	63	37	87	0.06	H5	T700SC Tensile strength : 500kgf / mm ² Modulus of elongation : 23.5tf / mm ² Density : 1.80
P3051S-7	2500	75	63	37	119	0.08	H7	
P3252S-10	2592	100	67	33	149	0.10		
P3252S-12	2592	125	67	33	187	0.12		
P3252S-15	2592	150	67	33	224	0.14		
P3252S-17	2592	175	67	33	261	0.17		
P3252S-20	2592	200	67	33	299	0.19		
P3252S-25	2592	250	67	33	373	0.24		
P3255S-10	2592	100	76	24	132	0.08		
P3255S-12	2592	125	76	24	164	0.10		
P3255S-15	2592	150	76	24	197	0.12		
P3255S-17	2592	175	76	24	230	0.14		
P3255S-20	2592	200	76	24	263	0.16		
P3255S-25	2592	250	76	24	329	0.20		
P8051S-5	2500	55	63	37	87	0.06	M5	M30SC Tensile strength : 560kgf / mm ² Modulus of elongation : 30tf / mm ² Density : 1.73
P8051S-7	2500	75	63	37	119	0.08	M7	
P8253S-5	2592	55	70	30	79	0.05		
P8253S-7	2592	75	70	30	107	0.07		
P2255S-10	2592	100	76	24	132	0.08		T800SC Tensile strength : 600kgf / mm ² Modulus of elongation : 30tf / mm ² Density : 1.80
P2255S-12	2592	125	76	24	164	0.10		
P2255S-15	2592	150	76	24	197	0.12		
P2255S-17	2592	175	76	24	230	0.14		
P2255S-20	2592	200	76	24	263	0.16		
P2255S-25	2592	250	76	24	329	0.20		
P2205S-10	2573	100	76	24	132	0.08		
P17043G-10	2574	100	70	30	143	0.09		T1100GC Tensile strength : 675kgf / mm ² Modulus of elongation : 33tf / mm ² Density : 1.80
P17045G-10	2574	100	76	24	132	0.08		
P17045G-12	2574	125	76	24	164	0.10		
P10255F-10	2500	100	76	24	132	0.08		M35JB Tensile strength : 480kgf / mm ² Modulus of elongation : 35tf / mm ² Density : 1.75
P10255F-12	2500	125	76	24	164	0.10		
P10255F-15	2500	150	76	24	197	0.12		
P9052F-7	2500	69	67	33	103	0.07		M40JB Tensile strength : 450kgf / mm ² Modulus of elongation : 38.5tf / mm ² Density : 1.77
P9052F-10	2500	92	67	33	137	0.09		
P9052F-12	2500	116	67	33	173	0.11		
P9052F-15	2500	139	67	33	207	0.13		
P9052F-17	2500	161	67	33	240	0.16		
P9255F-11	2592	100	76	24	132	0.08		
P9255F-12	2592	116	76	24	153	0.10		
P9255F-13	2592	125	76	24	164	0.10		
P9255F-16	2592	150	76	24	197	0.12		
P6055F-11	2500	100	76	24	132	0.08		M46JB Tensile strength : 430kgf / mm ² Modulus of elongation : 44.5tf / mm ² Density : 1.84
P6055F-13	2500	125	76	24	164	0.10		
P6055F-16	2500	150	76	24	197	0.12		
P11255F-11	2592	100	76	24	132	0.08		M50JB Tensile strength : 420kgf / mm ² Modulus of elongation : 48.5tf / mm ² Density : 1.88
P11056F-11	2500	100	80	20	125	0.07		
P11056F-13	2500	125	80	20	156	0.09		
P11056F-16	2500	150	80	20	188	0.11		
P12056F-13	2500	125	80	20	156	0.09		M55JB Tensile strength : 410kgf / mm ² Modulus of elongation : 55tf / mm ² Density : 1.91
P12056F-16	2500	150	80	20	188	0.11		
P13056F-13	2500	125	80	20	156	0.09		M60JB Tensile strength : 390kgf / mm ² Modulus of elongation : 60tf / mm ² Density : 1.93
P13056F-16	2500	150	80	20	188	0.11		
F6142-05K	2500	119	60	40		0.13		T300 Tensile strength : 360kgf / mm ² Modulus of elongation : 23.5tf / mm ² Density : 1.76
F6343B-05P	2500	198	56	44		0.24		
F6347B-05P	2500	198	56	44		0.24		

* The "thickness" values are provided for reference.

* Consult us on other specifications.

* These are representative values and not guaranteed.

3. Specifications of Torayca® prepreg products

Standard length	● Unidirectional prepreg: 100 m ● Woven prepreg: 50 or 100 m		
Packing form	The prepreg is rolled around a paper tube together with a silicon-coated separation paper, and the roll is packed in a sealed polyethylene bag to prevent moisture absorption. ● Diameter of paper tube for unidirectional prepreg: 300 mm in inner diameter ● Diameter of paper tube for woven prepreg: 76 or 300 mm in inner diameter		
Storage life	Storage temperature	130°C curing type	180°C curing type
	– 18°C or less	6 months	6 months
	5°C or less	3 months	2 months
	20°C or less	1.5 months	14 days
Product shipment	The 180°C curing type is shipped refrigerated (–18°C or less). The 130°C curing type is shipped on regular trucks unless otherwise requested.		
Handling precautions	1. Store the received prepreg in a freezer or refrigerator without delay. 2. Torayca® prepreg has been adjusted to have the best tackiness at room temperature (24 ± 3°C). 3. Mixing-in of impurities into the prepreg may cause curing problems or defective product. 4. Implement safety measures when handling the prepreg. ● Epoxy resin may cause inflammation to some people. ● Ventilate the work room well to prevent resin volatile matter from staying indoors. ● Torayca® is a good conductor. Give consideration to electrical apparatuses. ● Do not incinerate waste carbon fiber materials and carbon fiber induced products, but dispose of them correctly as industrial waste.		

4. Handling precautions for carbon fiber

- Carbon fiber is conductive. Implement dust-proof measures to prevent electrical equipment from shorting, malfunctioning, etc., due to fibers scattering and flying around in the work area.
- No cases of health problems due to carbon fiber have been reported, but short fibers may attach to the skin or viscous membrane to cause itchiness or inflammation. When handling carbon fiber, wear a mask, gloves and other protective equipment to prevent carbon fiber from being inhaled or attaching to the skin.
- Incinerating waste material of carbon fiber or carbon fiber composite material may cause fibers to scatter and fly around and cause electrical failures. It is appropriate to bury such material as industrial waste.

Cautions

1. This product documentation does not guarantee the result or product safety/compliance achieved by applying the information provided herein. When using the product, confirm its safety/compliance according to the purpose of use.
 2. Our carbon fiber Torayca® products or technologies relating to the design, manufacturing or use thereof may be classified as the goods specified in 1 to 15 of Appended Table 1 of the Export Trade Control Order, or as the technologies specified in 1 to 15 of Appended Table 1 of the Foreign Exchange Order, or as other goods/technologies that may be specified by the government as being subject to export control for national security reasons. When exporting or providing to a non-resident any such Torayca® product or any such technology relating to the design, manufacture or use of Torayca® product, an export permission or service transaction permission must be obtained from the Minister of Economy, Trade and Industry or other necessary procedure must be taken according to the Foreign Exchange and Foreign Trade Act or other relevant law, notice, etc.
- Torayca® is a registered trademark of Toray's high-performance carbon fiber.

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