Makrolon® FR6020 HF

Designation according to ISO 1043: PC-I FR(40)

Product description

Polycarbonate; impact modified; flame retardant; easy release; easy flow; V-0 at 1.5 mm (UL 94); good low-temperature impact strength; good heat resistance; UV stabilized; UL746C f1 rated; good hydrolysis resistance

Applications

Injection molding; Electrical/Electronic; Information technology; Cases for consumer electronics; Charging Stations; Housing parts; Network stations & devices; Telecommunications

Typical Values

Rheological properties

Property	Test Condition	Value	Unit	Standard
Melt Volume-flow Rate (MVR)	300 °C/1.2 kg	15	cm³/10 min	ISO 1133-1
Melt Viscosity	300 °C; 1,000 s^{-1}	160	Pa·s	b. o. ISO 11443-A
Molding Shrinkage, parallel/normal	60×60×2 mm; 500 bar	0.50 - 0.70	%	ISO 294-4

Mechanical properties (23 °C/50 % r. h.)

Property	Test Condition	Value	Unit	Standard
Tensile Modulus	1 mm/min	2,340	MPa	ISO 527-1,-2
Yield Stress	50 mm/min	58	MPa	ISO 527-1,-2
Yield Strain	50 mm/min	5.4	%	ISO 527-1,-2
Stress at Break	50 mm/min	63	MPa	ISO 527-1,-2
Strain at Break	50 mm/min	> 100	%	ISO 527-1,-2
Flexural Modulus	2 mm/min	2,350	MPa	ISO 178
Flexural Strength	2 mm/min	88	MPa	ISO 178
Flexural Stress at 3.5 % Flexural Strain	2 mm/min	70	MPa	ISO 178
Flexural Strain at Flexural Strength	2 mm/min	6.5	%	ISO 178
Izod Impact Strength	23 °C	N	kJ/m²	ISO 180/U
Izod Impact Strength	-30 °C	N	kJ/m²	ISO 180/U
Izod Notched Impact Strength	23 °C; 3 mm	58P	kJ/m²	ISO 21305/b. o. ISO 180/A
Izod Notched Impact Strength	-10 °C; 3 mm	45P	kJ/m²	ISO 21305/b. o. ISO 180/A
Izod Notched Impact Strength	-30 °C; 3 mm	25C	kJ/m²	ISO 21305/b. o. ISO 180/A

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Property	Test Condition	Value	Unit	Standard
Charpy Impact Strength	23 °C	N	kJ/m²	ISO 179-1/1eU
Charpy Impact Strength	-30 °C	N	kJ/m²	ISO 179-1/1eU

Impact properties: N = non-break, P = partial break, C = complete break

Thermal properties

Property	Test Condition	Value	Unit	Standard
Temperature of Deflection under Load (HDT)	1.80 MPa	112	°C	ISO 75-1,-2
Temperature of Deflection under Load (HDT)	0.45 MPa	127	°C	ISO 75-1,-2
Vicat Softening Temperature	50 N; 50 °C/h	134	°C	ISO 306
Vicat Softening Temperature	50 N; 120 °C/h	136	°C	ISO 306
Coefficient of Linear Thermal Expansion (CLTE), parallel	23 to 55 °C	0.72	10^{-4}/K	ISO 11359-1,-2
Coefficient of Linear Thermal Expansion (CLTE), normal	23 to 55 °C	0.77	10^{-4}/K	ISO 11359-1,-2
Burning Behavior	1.5 mm	V-0		UL 94
Burning Behavior	2 mm	5VB		UL 94
Burning Behavior	3 mm	5VA		UL 94
Relative Temperature Index (RTI, Tensile Impact Strength)	1.5 mm	115	°C	UL 746B
Relative Temperature Index (RTI, Tensile Strength)	1.5 mm	125	°C	UL 746B
Relative Temperature Index (RTI, Electric Strength)	1.5 mm	125	°C	UL 746B

Other properties (23 °C)

Property	Test Condition	Value	Unit	Standard
Density		1,200	kg/m³	ISO 1183-1

Recommended processing and drying conditions

Property	Test Condition	Value	Unit	Standard
Dry Air Drying Temperature		110	°C	
Dry Air Drying Time		3 - 4	h	
Standard Melt Temperature		300	°C	
Mold Temperatures		80	°C	

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Health and Safety Information

Before working with this product, you must read and become familiar with the available information regarding its risks, proper use, and safe handling. This information is provided in various formats, including the current Safety Data Sheet (SDS) and product label. SDS can be accessed via the following link:

Safety Data Sheets (SDS) for Covestro products | Covestro

For further questions, please use the contact information provided on this technical data sheet.

Please note that for products manufactured in different colors, safety data may vary depending on the color variant.

Disclaimer

Responsibility and Liability

The use of Covestro products, technical assistance, and information (regardless of how provided) is outside Covestro's control and is solely the responsibility of the customer. The customer must conduct adequate testing to determine the suitability of products for its intended use, including but not limited to technical, health, safety, and environmental aspects. Unless otherwise agreed in writing, all products are sold exclusively under Covestro's standard conditions of sale, which prevail in case of conflict and are available upon request.
The terms and conditions of sale and delivery are available via the following link:

https://order.covestro.com/covestrostorefront/saleConditions

All information is provided "as is" without warranties, express or implied, including merchantability or fitness for a particular purpose, and is subject to change without notice. To the maximum extent permitted by law, Covestro disclaims, and the customer assumes all liability for losses, damages, or claims arising out of use of Covestro products, technical assistance, or information. Any statement or recommendation not expressly contained in Covestro documentation is unauthorized and shall not bind Covestro. Nothing herein shall be construed as encouraging or recommending the use of any product in conflict with any claim of any patent. No license is implied or in fact granted under the claims of any patent.

Restrictions on Regulated Applications

This product is not intended for use in regulated applications such as agriculture, cosmetics, drinking water contact, food contact, medical products (e.g., medical devices), toys, or similar uses subject to specific regulatory requirements. Prior written approval from Covestro is required before this product may be used in any regulated application. The customer is solely responsible for ensuring compliance with all applicable laws and determining product suitability. Covestro disclaims all liability and warranties for unauthorized regulated uses.

Typical Value

These values are provided as typical data only and do not constitute binding specifications or warranted performance, unless explicitly agreed by Covestro in writing. Performance may vary depending on factors including, but not limited to, mold/die, processing conditions and coloring/pigmentation. Unless otherwise stated, values are based on standardized test specimens at room temperature.

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Sample

Samples provided by Covestro are intended solely for evaluation and testing purposes by the customer and may not be used in commercial applications, resold, transferred to third parties (except qualified testing service providers acting on behalf of the customer), reverse engineered, modified, or used in any manner not explicitly authorized in writing by Covestro. Samples are provided ‘as-is’ without any warranties, express or implied, including fitness for a particular purpose. Customers are solely responsible for ensuring safe handling, regulatory compliance, and suitability of the material for their intended evaluations. Covestro disclaims all liability for damages or losses arising from the use of samples.

Shrinkage

Shrinkage data is provided for reference only and is based on plaques molded under specific, controlled processing conditions. Actual shrinkage values in production parts may vary due to numerous factors, including but not limited to part design (e.g., size, thickness, geometry), mold design (e.g., gate type and location, runner design, mold materials, cooling system), and molding conditions (e.g., processing temperature, mold temperature, packing time and pressure, injection speed).
The determination and application of shrinkage values are the sole responsibility of the customer and must be based on their own testing and experience under actual production conditions. To the maximum extent permitted by law, Covestro shall not be liable for any damages, losses, or claims arising from the use of, or reliance on, the shrinkage data provided.

Recommended Processing and Drying Conditions

The recommended processing and drying conditions are provided for reference only and do not constitute binding specifications or warranted values. Barrel temperatures are based on a standard 3-zone barrel; other configurations may require different settings. Values for hold pressure as a percentage of injection pressure may vary depending on part geometry, injection molding machine, and injection mold. Drying conditions are specified for dry air dryers only; drying times and temperatures may differ depending on the dryer type.
Processors are solely responsible for validating and optimizing processing parameters for their specific equipment and applications. To the maximum extent permitted by law, Covestro disclaims all liability for performance outcomes or damages resulting from reliance on these recommended conditions.

Contact Information

Please use our contact form or contact us directly by sending an e-mail to technical-datasheets@cx.covestro.com .

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