

# Makrolon® M820 GF

## Preliminary Datasheet /

polycarbonate; MVR (300 °C/1.2 kg) 3.5 cm³/10 min; high viscosity; 20 % glass fiber reinforced; biocompatible according to many ISO 10993-1 test requirements; injection molding; available in opaque colors only; suitable for medical devices

## ISO Shortname

PC-GF20

Property	Test Condition	Unit	Standard	typical Value
<b>Rheological properties</b>				
Melt volume-flow rate	300 °C/ 1.2 kg	cm³/10 min	ISO 1133	3.5
Melt viscosity	1000 s⁻¹ / 300 °C	Pa·s	b.o. ISO 11443-A	660
C Molding shrinkage, parallel	60x60x2 mm	%	ISO 294-4	0.3
C Molding shrinkage, normal	60x60x2 mm	%	ISO 294-4	0.55
<b>Mechanical properties (23 °C/50 % r. h.)</b>				
C Tensile modulus	1 mm/min	MPa	ISO 527-1,-2	5600
C Stress at break	5 mm/min	MPa	ISO 527-1,-2	100
C Strain at break	5 mm/min	%	ISO 527-1,-2	4.0
Flexural modulus	2 mm/min	MPa	ISO 178	5800
Flexural strength	2 mm/min	MPa	ISO 178	168
Izod notched impact strength	23 °C/ 3 mm	kJ/m²	ISO 21305/based on ISO 180/A	16
Izod notched impact strength	-30 °C/ 3 mm	kJ/m²	ISO 21305/based on ISO 180/A	14
<b>Thermal properties</b>				
C Temperature of deflection under load	1.80 MPa	°C	ISO 75-1,-2	140
C Temperature of deflection under load	0.45 MPa	°C	ISO 75-1,-2	146
Vicat softening temperature	50 N; 120 °C/h	°C	ISO 306	150
C Coefficient of linear thermal expansion, parallel	23 to 55 °C	10⁻⁴/K	ISO 11359-1,-2	0.3
C Coefficient of linear thermal expansion, normal	23 to 55 °C	10⁻⁴/K	ISO 11359-1,-2	0.4
<b>Other properties (23 °C)</b>				
C Water absorption (saturation value)	Water at 23 °C	%	ISO 62	0.28
C Water absorption (equilibrium value)	23 °C; 50 % r. h.	%	ISO 62	0.11
C Density		kg/m³	ISO 1183-1	1340
<b>Recommended processing and drying conditions</b>				
Standard Melt temperature		°C	-	310
Mold Temperatures		°C	-	100
Dry Air Drying Temperature		°C	-	120
Dry Air Drying Time		h	-	4

C These property characteristics are taken from the CAMPUS plastics data bank and are based on the international catalogue of basic data for plastics according to ISO 10350.

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

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## Disclaimer

### Disclaimer for Developmental products

This is a trial product. Further information, including amended or supplementary data on hazards associated with its use, may be compiled in the future. For this reason no assurances are given as to type conformity, processability, long-term performance characteristics or other production or application parameters. Therefore, the purchaser/user uses the product entirely at his own risk without having been given any warranty or guarantee and agrees that the supplier shall not be liable for any damage, of whatever nature, arising out of such use. Commercialisation and continued supply of this material are not assured. Its supply may be discontinued at any time.

### Information Impact properties

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

### Typical value

These values are typical values only. Unless explicitly agreed in written form, they do not constitute a binding material specification or warranted values. Values may be affected by the design of the mold/die, the processing conditions and coloring/pigmentation of the product. Unless specified to the contrary, the property values given have been established on standardized test specimens at room temperature.

### General

The manner in which you use and the purpose to which you put and utilize our products, technical assistance and information (whether verbal, written or by way of production evaluations), including any suggested formulations and recommendations are beyond our control. Therefore, it is imperative that you test our products, technical assistance, information and recommendations to determine to your own satisfaction whether our products, technical assistance and information are suitable for your intended uses and applications. This application-specific analysis must at least include testing to determine suitability from a technical as well as health, safety, and environmental standpoint. Such testing has not necessarily been done by Covestro. Unless we otherwise agree in writing, all products are sold strictly pursuant to the terms of our standard conditions of sale which are available upon request. All information and technical assistance is given without warranty or guarantee and is subject to change without notice. It is expressly understood and agreed that you assume and hereby expressly release us from all liability, in tort, contract or otherwise, incurred in connection with the use of our products, technical assistance, and information. Any statement or recommendation not contained herein is unauthorized and shall not bind us. Nothing herein shall be construed as a recommendation to use any product in conflict with any claim of any patent relative to any material or its use. No license is implied or in fact granted under the claims of any patent. With respect to health, safety and environment precautions, the relevant Material Safety Data Sheets (MSDS) and product labels must be observed prior to working with our products.

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The manner in which you use and the purpose to which you put and utilize our products, technical assistance and information (whether verbal, written or by way of production evaluations), including any suggested formulations and recommendations, are beyond our control. Therefore, it is imperative that you test our products, technical assistance and information to determine to your own satisfaction whether our products, technical assistance and information are suitable for your intended uses and applications. This application-specific analysis must at least include testing to determine suitability from a technical as well as health, safety, and environmental standpoint. Such testing has not necessarily been done by us. The biocompatibility testing referenced above cannot assure the biocompatibility of final or intermediate products made from Covestro products or the suitability of such products for their use in a Medical Application, i.e., the test data cannot be used to conclude that any medical devices manufactured from the Covestro products meet the necessary requirements of ISO Standard 10993-1. It is the sole responsibility of the manufacturer of final end-use product to conduct all necessary tests (including biocompatibility tests) and inspections and to evaluate the final product under actual end-use requirements. Unless we otherwise agree in writing, all products are sold strictly pursuant to the terms of our standard conditions of sale which are available upon request. All information and technical assistance is given without warranty or guarantee and is subject to change without notice. It is expressly understood and agreed that you assume and hereby expressly release us from all liability, in tort, contract or otherwise, incurred in connection with the use of our products, technical assistance, and information. Any statement or recommendation not contained herein is unauthorized and shall not bind us. Nothing herein shall be construed as a recommendation to use any product in conflict with any claim of any patent relative to any material or its use. No license is implied or in fact granted under the claims of any patent.

### Recommended Processing and Drying Conditions

Barrel temperatures are valid for a standard 3-zone barrel. Temperature set-up for different barrel types may change according to configuration. Values for hold pressure as percentage of injection pressure may vary depending on, amongst others, part geometry, injection molding machine and injection mold. Drying conditions are for dry air dryers only. Drying times and drying temperatures may differ depending on valid dryer type. Further information is provided by your local Covestro support as well as in the following brochures: Injection Molding of High Quality Molded Parts - Drying; Determining the Dryness of Makrolon by TVI Test; The fundamentals of shrinkage in thermoplastics; Shrinkage and deformation of glass fiber reinforced thermoplastics [...]. <https://www.plastics.covestro.com/Library/Overview.aspx>

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