Bayblend®

Product range

Typical values

Bayblend®

Bayblend® is the trade name used by Covestro AG for its product line of amorphous, thermoplastic polymer blends based on polycarbonate (PC) and acrylonitrile butadiene styrene copolymer (ABS) as well as the rubber-modified polycarbonate (PC) and styrene-acrylonitrile copolymer (SAN) blends. Bayblend® is produced in the economic regions of Asia-Pacific (APAC), Europe, Middle East, Africa and Latin America (EMEA/LA) as well as North America and Mexico (NAFTA).

Characterization

The balanced combination of high heat resistance, toughness and rigidity is the outstanding feature of Bayblend®.

Characteristic features:

- High impact and notched impact strength
- High stiffness
- Heat resistant to 142 °C as per Vicat VST/B 120
- High dimensional accuracy and dimensional stability
- Low warpage and water absorption
- Low total shrinkage
- Good light stability
- Good processing properties
- No juicing/plate-out with FR grades
- FR grades fulfill the glow wire test requirements according to IEC 60331-1 (domestic appliances [GWFI min. 850 °C, GWIT min. 775 °C from 1.5 mm])

Bayblend® is available in:

- Standard grades
  - Nonreinforced
  - Glass fiber-reinforced
  - Mineral-filled
- Flame-retardant grades
  - Nonreinforced
  - Glass fiber-reinforced
  - Mineral-filled

Applications

- Automotive
- Data and information technology industries
- Electrical/electronic
- Household, leisure, sports

Delivery Form

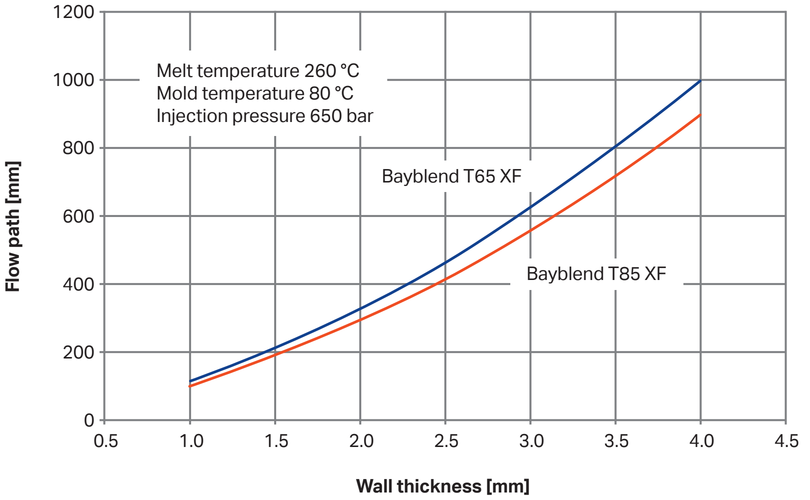
The products are supplied in the form of oval, spherical or cylindrical granules in 25-kg polyethylene sacks, in large cartons with a PE liner, in big bags or by silo truck.
The Bayblend® grades are available in natural color or opaque with a wide range of shades.
The production plants for Bayblend® in Europe, Asia and in the United States have been certified to ISO 9001: 2008 by the DQS (German Association for the Certification of Quality Systems, Berlin).
The certificate can be found on the Internet at www.plastics.covestro.com.

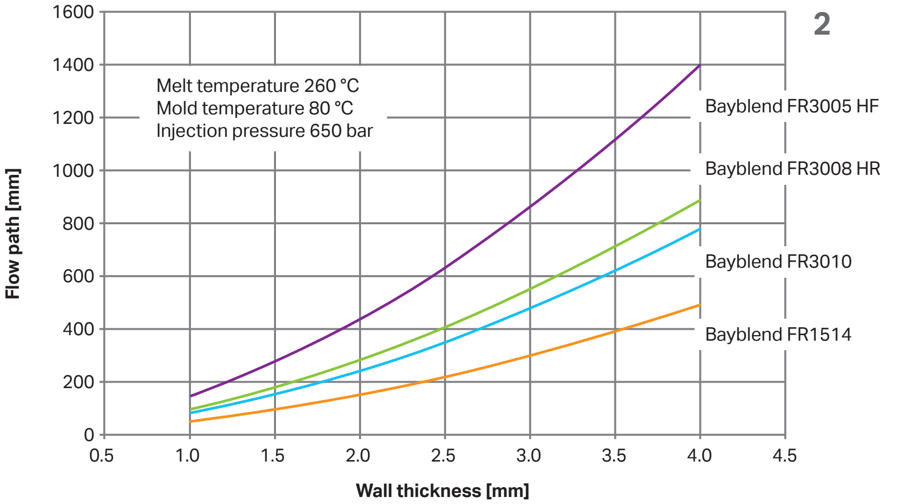
Rheological properties

The flowability of Bayblend® grades is dependent on the proportion of polycarbonate and its molecular weight and the type and content of rubber. Flowability and heat resistance are generally inversely proportional. Filling and reinforcing materials generally lead to a reduction in flowability. However, as a result of product optimization, there are filled/reinforced Bayblend® grades available with excellent flow properties, which are even suitable for thin-wall applications.
Figs. 1 to 3 illustrate the flow path/wall thickness diagrams for a few general purpose, GF and FR grades. The calculation was based on a maximum injection pressure in the mold of 650 bar, and a typical melt temperature (260 °C). From the diagrams it can be seen that with Bayblend® even complicated, thin-wall moldings with long flow paths can be realized by suitable gate and tool design.

The Bayblend® grades suitable for extrusion, T65 HI and FR3030, are distinguished by a particularly high pseudoplasticity. The consequence is that with low shear rates, such as in extrusion or extrusion blow molding, there is a very high melt stability, whereas with higher shear rates, such as in injection molding, the viscosity is comparatively low.
Due to the different, very distinctive pseudoplasticity of the Bayblend® grades, the melt volume flow rate (MVR) cannot be utilized directly for a comparative evaluation of the flowability of different Bayblend® grades. The MVR measurement takes place in a shear rate zone that has no practical relevance for the injection molding process.

Flow behavior – theoretical calculated values





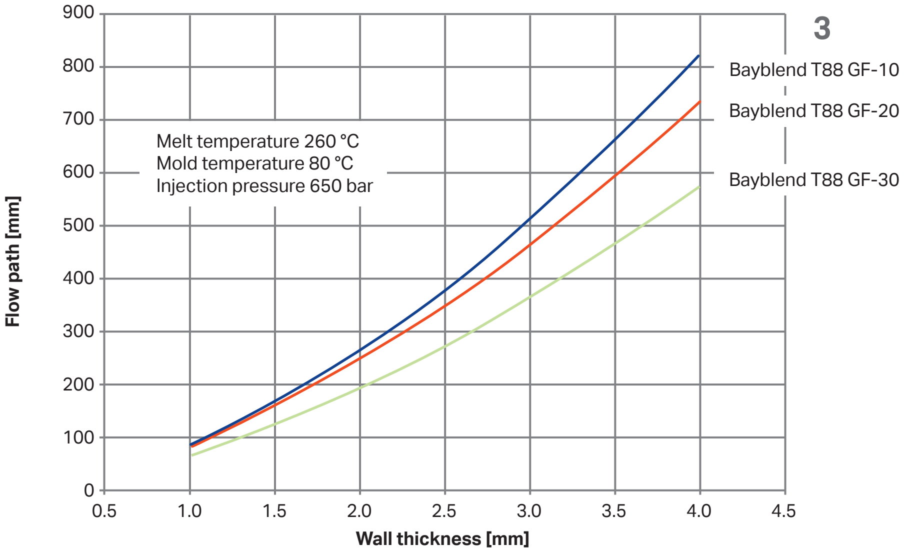


Fig. 1 to 3: Flow path/wall thickness diagrams
Bayblend® general purpose grades: T65 XF and T85 XF
Bayblend® FR-Typen: FR3005 HF, FR3008 HR, FR3010 and FR1514
Bayblend® GF-Typen: T88 GF-10, T88 GF-20 and T88 GF-30

Mechanical properties

Bayblend® displays a high impact and notched impact strength over a wide temperature range. With increasing polycarbonate content, the energy absorption in the dart penetration test increases. Due to the good low-temperature impact strength for multi axial loads, ductile fracture behavior is reached at –30 °C, particularly with the nonreinforced Bayblend® T grades.
It should be noted that at low temperatures the notched impact strength is higher than with pure ABS and pure polycarbonates. At the so-called critical temperature, Bayblend® exhibits a rapid change in the value of its notched impact strength. In this temperature range, there is a change in the fracture pattern. One advantage is the fact that the ductile to brittle transition of Bayblend® is at a much lower temperature than that of pure polycarbonate.

A few characteristic mechanical properties obtained from accelerated tests are listed in the guide value table.
As for all plastic materials, the mechanical properties change not only with temperature, but also with the period of loading. The isochronous stress-strain diagram provides a measure of the stress-strain behavior in relation to the period of loading. The longer the period of loading, the flatter the characteristic curve becomes.
Bayblend® can be reinforced with glass fibers in order to improve stiffness and stability. Grades are available with 10, 20 and 30 % glass fiber content. A 10 % increase in glass fiber content results in an increase of at least 2000 MPa in the tensile modulus.

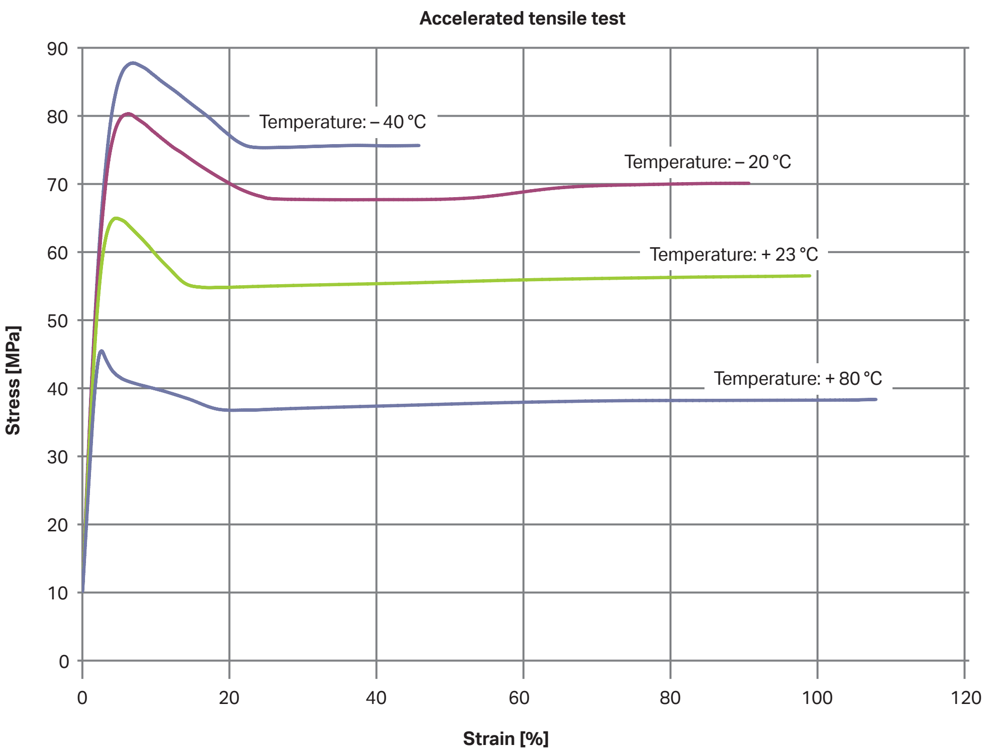
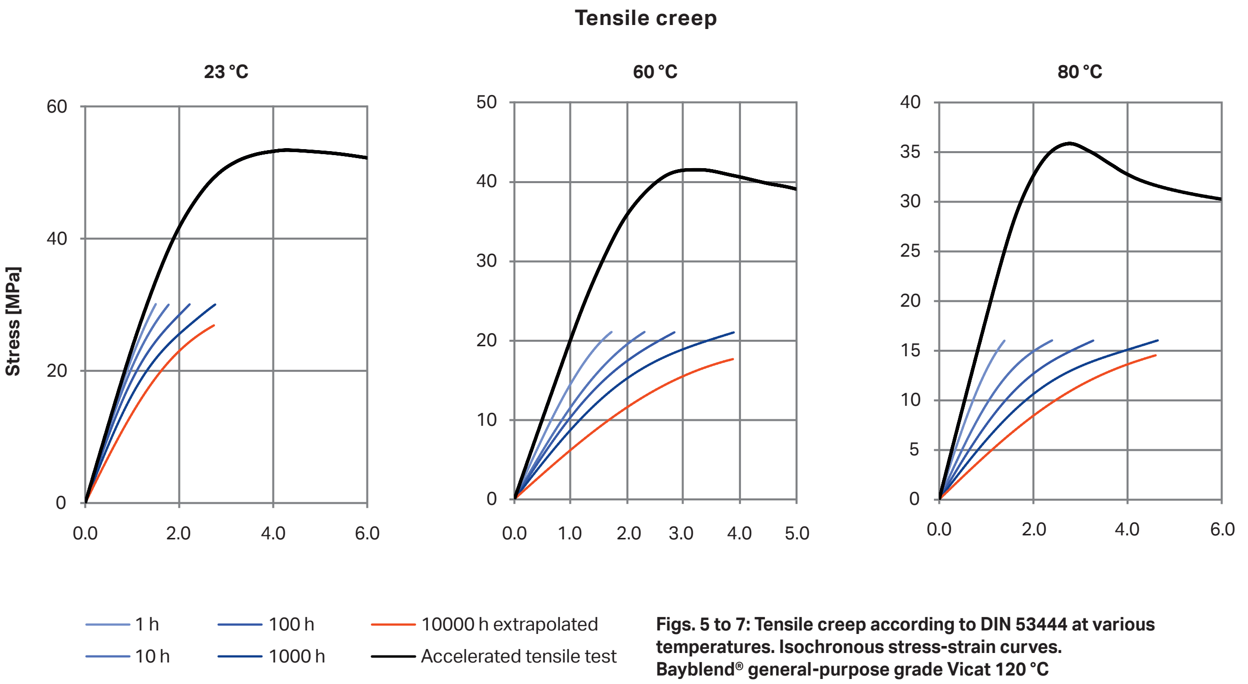


Fig. 4: Temperature-dependent stress-strain diagram for Bayblend T65 XF according to ISO 527-1, -2



Figs. 5 to 7: Tensile creep according to DIN 53444 at various temperatures. Isochronous stress-strain curves. Bayblend® general-purpose grade Vicat 120 °C

Furthermore, Bayblend® grades are available with up to 20 % mineral filling, which, in addition to increased stiffness, are distinguished in particular by low, isotropic, linear thermal coefficients of expansion and molding shrinkage.
For applications with dynamic loading, pilot tests on components are recommended.
The property values illustrated here were determined using ideal test specimens. Due to various influences (e. g. geometry of the molding, processing conditions, contact with media) and depending on the application, appropriate reduction factors must be taken into account and the relevant practical loading must be tested on actual molded parts.

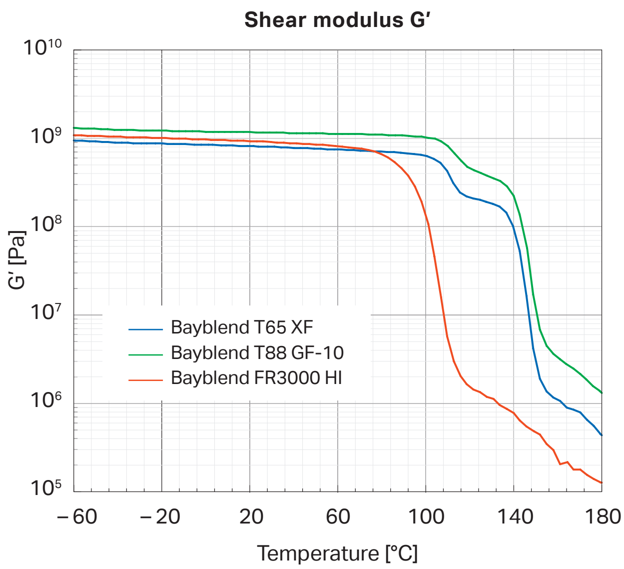


Fig. 8: Shear modulus G' from Bayblend® T65 XF, T88 GF-10 and FR3000 HI

Thermal properties

Depending on the type of application, thermal loading such as solar radiation, engine heat, etc. occurs, which makes high heat resistance a prerequisite. Bayblend® spans practically the whole range of heat resistance between ABS and polycarbonate. Thus the Bayblend® general purpose grades exhibit heat resistance to Vicat B 120 of between 112 and 142 °C, and FR grade products are available between 95 und 136 °C Vicat. In practice, the heat resistance of Bayblend® is higher than that of ABS for the same Vicat temperature, so that, influenced by the molding design, the practical requirements and the processing conditions, the short-term thermal loading can often be higher than the Vicat temperature, without any appreciable dimensional changes to the molding. The reason for this is the residual modulus at temperatures above the Vicat temperature caused by the glass transition temperature of the polycarbonate of approx. 150 °C. In the electrical sector, the housings must not warp excessively under thermal loading. Normal Bayblend® grades have a heat resistance range between 85 and 125 °C (ball indentation temperature (IEC 60335)). This makes them suitable for use as insulating housings. A few high heat resistance grades even reach values ≥ 125 °C and can therefore be used with live components. The linear thermal coefficient of expansion is in the range of ABS and is somewhat higher than that of pure polycarbonate. Nonreinforced and mineral-filled grades exhibit a small dependency on the direction of molding. With glass fiber-reinforced grades, the values are strongly dependent on the orientation of the glass fibers. The mineral-filled grades are distinguished by a considerably reduced linear thermal coefficient of expansion and by their anisotropy.

Electrical properties

The most crucial requirements for live parts are protection against contact and safe and permanent insulation. With a specific volume resistance > 1016 Ω, Bayblend® fulfills the insulation resistance requirements in the low-voltage range up to 4000 V, as proved by practical tests on actual molded parts. The surface resistivity is greater than 1014 Ω. Due to the very low water absorption, the dependence of this value on ambient humidity is negligible. A creep resistance of at least 175 V (according to CTI) is demanded for housing components in the electrical, electronic and IT industries. As a rule Bayblend® grades comfortably exceed this value. For applications in the electrical sector, the relative permittivity of the material used should be as independent of the frequency and temperature ranges as possible. Bayblend® exhibits largely constant values across a wide range of temperatures and frequencies.

Burning behavior

The most important flammability classification in the world for the IT, electrical and electronic industries is the UL 94 rating according to Underwriters Laboratories Inc., USA. The qualitatively highest rating is "V-0" and is satisfied by Bayblend® FR for the smallest possible wall thickness (from a minimum of 0.75 mm up to, as a rule, 1.5 mm) depending on grade.

Non-flame-retardant Bayblend® is classified HB according to the UL 94 test standard.

Materials used for vehicle interiors may not exceed a certain burn rate according to US-FMVSS 302. All Bayblend® grades are well below the permitted maximum value of 101.6 mm/min for wall thicknesses from 1 mm.

Furthermore, the Bayblend® FR grades in the wall thickness range of 1.0 to 3.0 mm will usually comply comfortably with the glow wire test

IEC 60695-2 according to the requirements of the domestic appliance standards of IEC 60335-1 for the required 850 °C glow wire flammability index of IEC 60695-2-12 (GWFI) and the required 775 °C glow wire ignitability temperature of IEC 60695-2-13 (GWIT).

Flame-retardant additives

The flame-retardant system used in the latest Bayblend® FR3000 generation is based on an advanced combination of oligomer phosphate with PTFE. From a technical, ecological and economic perspective, this enables a future-oriented technology to enter the market for flame-retardant blends (PC + ABS).

The advantages of using a flame-retardant system based on phosphate/PTFE:

- Maximum flame retardance in accordance with UL 94
- The typical range of properties of Bayblend® (PC + ABS) is retained
- The flame-retardant system used is toxicologically harmless

Bayblend® FR grades fulfill the requirements of materials used in the manufacture of products which are awarded an environmental symbol (ecolabel) such as "Blue Angel" (RAL Certificate), "EU Flower" and "TCO" as well as the EU Directives for WEEE (Waste Electrical and Electronic Equipment) and RoHS (Restriction of the Use of Hazardous Substances in Electrical and Electronic Equipment).

Chemical resistance

The resistance of Bayblend® to chemicals is dependent, among other things, on temperature, duration of exposure and the stress condition (internal and external stresses) of the molding. For this reason, when testing the chemical resistance, it is recommended to use the test which most closely corresponds to the practical service conditions of the molding.

The resistance of Bayblend® moldings to water and neutral liquid media is favorable up to 40 °C. At higher water temperatures, chemical decomposition occurs (hydrolysis), the rate of which is dependent on temperature and time. Bayblend® moldings are therefore not suitable for use where there is permanent contact with hot water. On request, special hydrolysis-stabilized grades such as FR3008 HR can be recommended for specific applications.

At room temperature, Bayblend® parts have a similar resistance to mineral acids (including higher concentrations), numerous organic acids and liquid salt solutions as they have to water. In relation to bases, Bayblend® moldings are largely nonresistant and can degrade relatively quickly, particularly at higher temperatures. Bayblend® parts are subject to surface swelling or dissolving by aromatics, ketones, esters and chlorinated hydrocarbons. In particular, the resistance of Bayblend® to these last-named media depends on the number of functional groups in the molecule and, in some cases, on the length of the aliphatic radicals. This list can only provide an initial indication of the reaction of Bayblend® to these chemicals. Whether Bayblend® is a suitable or unsuitable material for a molded part depends on the specific conditions of the part and its intended use. Such tests are therefore normally use-specific to finished components and are carried out as the responsibility of the manufacturer or supplier of the part.

Resistance to stress cracking

When molded parts under specific levels of tensile stress come into contact with chemicals, stress cracks can form. The assessment of chemical resistance under load will normally be made with the help of the bent strip method according to EN ISO 22088-3. In this method, test specimens (80 x 10 x 4 mm rectangular bars) are stretched over metal templates with defined outer fiber strain (up to 2.4 %) and stored in the relevant medium for a given exposure time, preferably at the application temperature. Afterwards, the test specimens are examined for fractures and for visually recognizable surface changes. The results provide valuable information on the behavior of Bayblend® moldings in practice. High outer fiber strain (> 5 %) and increased temperatures should be avoided, as they promote the formation of stress cracks. The contact of low-molecular plasticizer (e.g. from PVC film) with Bayblend® moldings that are under stress, can lead to stress cracks, particularly at higher temperatures. Within the permitted outer fiber strain levels (up to 0.4 %), the Bayblend® rectangular bars generally have a noncritical response to contact with a laminated plasticized PVC film. Polymeric plasticizers have proved to be largely harmless. Brief contact with hydrocarbons (e.g. gasoline) at room temperature is relatively uncritical for Bayblend® moldings. In this case, at most, it can lead to the formation of stains on the surface of the molded parts due to swelling. Longer exposure combined with externally applied stress can result in crack formation and the degradation of mechanical properties. Experience has also shown that Bayblend® parts respond uncritically to contact with paraffin oil (aliphatic) – even over a long period. More critical are fats and oils based on fatty acid esters. Short-term contact (max. 10 min) with chlorofluorohydrocarbons does not cause a reduction in the impact strength of Bayblend® test specimens.

Experience has also shown that for low-stress molded parts no stress cracks appear. For longer periods of contact, or higher outer fiber strain (> 0.5 %), material damage can be expected.

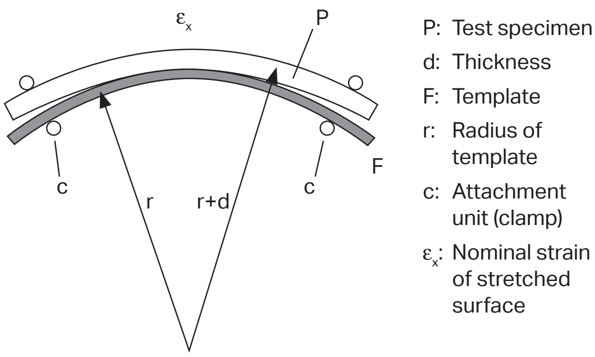


Fig. 9: Bent strip test according to ISO 22088-3 to assess stress crack resistance

Weatherability and light resistance

The weathering of Bayblend®, as with most thermoplastics, leads to color changes and a degradation of the mechanical properties. However, the degradation in the properties remains within limits which ensure that they meet the release status, e. g. in the automotive industry. The globally recognized illumination standard for interior use according to OEM requirements (housings for use in the fields of IT/DT and E & E, e. g. for monitors, printers) in accordance with ASTM D 4459 – the so-called IBM Test – with a permissible color change range for delta E of 1.5, is generally easily achieved by Bayblend® FR. The lightfastness of Bayblend® is determined by the proportion of ABS component. Sunlight may cause a change of color. Special grades are available for higher weatherability requirements or, as an alternative, the molding can be painted.

Light stability of Bayblend® W85 XF according to VDA 75202

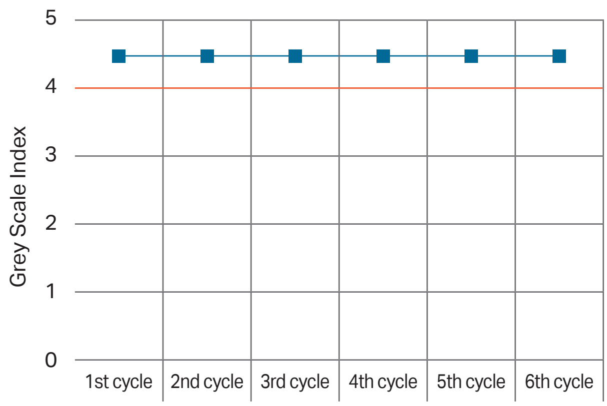


Fig. 10: Result of change of grey scale according to DIN EN 20105-A02

Light stability of Bayblend® W85 XF according to VDA 75202

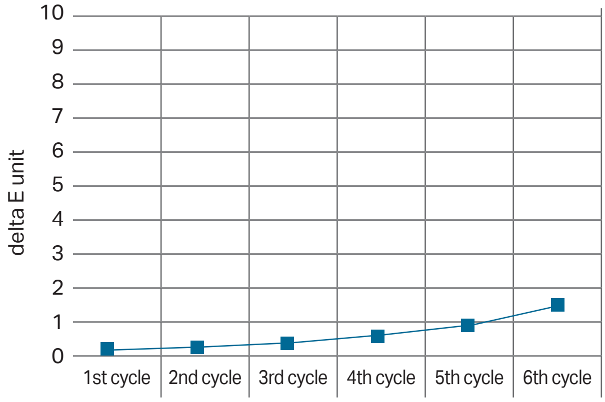


Fig. 11: Determination of change of color as delta E unit

Optical properties

Due to its rubber content Bayblend® is opaque. Therefore, only opaque colors (in a large range of shades) are available. Using nonreinforced Bayblend® for smooth moldings will generally produce uniform, high-gloss surfaces. Surfaces with reduced gloss can be obtained by appropriate mold surface treatment.

Emission characteristics

All Bayblend® grades designed for the interior of automobiles are low in emissions, i. e. the emission requirements of the European automotive industry for vehicle interior components can generally be fulfilled by these products (the majority of the Bayblend® T grades). Since the automotive industry demands an emission quantification, it should be noted that the emission characteristics are significantly influenced by the injection molding process and the molding design (particularly the gating system). Our design and process recommendations should be followed in order to achieve the optimum emission values.

Secondary finishing

Complete and semifinished molded parts made from Bayblend.

Machining

Bayblend® is easy to saw, drill, turn, file and mill. In order to guarantee a long tool life, the use of tungsten carbide-tipped tools is recommended. This is particularly relevant when machining glass fiber-reinforced products. During the machining process, care must be taken to ensure that the temperature at the point of machining does not exceed the softening temperature of that particular product, as the material may smear or decompose. Adequate cooling with water or air must be ensured. The cutting parameters must be selected to provide small feed rates at high cutting speeds.

Painting

Bayblend® moldings are well-suited for painting. To ensure a good paint finish, the surfaces must be clean, i.e. free of dust or grease. Particularly good adhesion is achieved using polyurethane-based coating systems. Unsuitable combinations of solvents in the paint system can attack (PC + ABS) blends and, depending on the stress condition of the molding, may initiate stress cracking. It is therefore recommended to contact the paint manufacturers who can supply suitable paint systems especially for (PC + ABS) blends. In order to maintain the good toughness of Bayblend®, care should be taken to use the paint system which has the best elasticity properties.

Printing

Printing on Bayblend® is possible with commonly used printing processes such as tampon printing and screen printing, as well as transfer printing and the thermal diffusion process. Hot foil stamping process is also possible with Bayblend®. Special inks suitable for laser printing have been developed.

Metallizing

Bayblend® can be metallized by deposition of a metallic layer in a high vacuum or by electroplating. In the metal deposition process, the best adhesion is achieved with aluminum, tin and copper. As protection for the very thin layer of metal, a coating of paint on the molding is recommended. In the case of electroplating, Bayblend® grades with a high rubber content (T45 PG, T65 PG, T65 HI) are particularly suitable, since these offer the best adhesion. Moldings which are to be electroplated should be produced with the lowest possible stress. The etching temperature and time must be adapted to the particular molding.

Bonding

Bayblend® moldings can be bonded not only to one another, but also to other materials. This is possible using suitable adhesive glues or diffusion adhesive. Before gluing, greases and other foreign materials must be removed from the surfaces to be glued. Dry-cleaning fluid or similar cleaning agents, which do not damage the material, can be used to remove grease. Roughening and subsequently cleaning the surfaces improves glue adhesion. In the case of adhesive glues, two-component adhesives based on epoxy and silicone resins and polyurethanes have proved excellent. Also suitable are hot-melt adhesives and adhesives based on cyanoacrylate. For diffusion gluing with pure solvent, 1.3-dioxolane can be used. Solvent-based adhesives can also be used. For this purpose, an 8 % (approximate) solution of polycarbonate in 1.3-dioxolane is made. After bonding, ensure adequate flash-off of the solvent from the molded part. In designing the gluelines, care is required to ensure that there are no peel forces in the event of loading. Shear forces (tensile or compressive) are much less critical. The names of manufacturers of adhesive systems suitable for use with Bayblend® are available on request.

Welding

Bayblend® moldings can be joined together by ultrasonic, vibration, friction, hot plate or laser welding. In order to achieve the best possible component quality when using ultrasonic welding, it is important to ensure a correctly formed weld seam.

Recycling

Part labeling is in accordance with DIN EN ISO 11469. After use, single-sort, noncontaminated moldings made from Bayblend® can be recycled. Contaminated moldings can be recycled chemically or thermally.

Standard grades

Nonreinforced

T45 PG	(ABS+PC) blend; unreinforced; general purpose injection molding grade; Vicat/B 120 = 112 °C; for electroplating applications.	**T65 HI**	(PC+ABS) blend; unreinforced; grade with improved low-temperature impact strength and chemical resistance for automotive parts; also suitable for extrusion/extrusion blow molding and electroplating applications; Vicat/B 120 = 120 °C.
T65 PG	(PC+ABS) blend; unreinforced; injection molding grade; Vicat/B 120 = 120 °C; easy flow; for electroplating applications.	**T80 XG**	(PC+ABS) blend; unreinforced; injection molding grade; Vicat/B 120 = 130 °C; excellent flow; optimized surface quality for metallization (steam treatment).
T50 XF	(PC+ABS) blend; unreinforced; injection molding grade; Vicat/B 120 = 115 °C; excellent flow; good low temperature impact strength.	**T90 HT**	(PC+ABS) blend; unreinforced; injection molding grade; high heat resistance; Vicat/B 120 = 135 °C; ball indentation temperature ≥ 125 °C; easy flow; suitable as supporting material for energized parts.
T65 XF	(PC+ABS) blend; unreinforced; general purpose injection molding grade; Vicat/B 120 = 120 °C; improved flowability compared to T65.	**W85 XF**	(PC+ASA) blend; unreinforced; injection molding grade with improved weather resistance; optimized heat ageing stability; easy flow; high heat resistance; Vicat/B 120 = 132 °C.
T85 XF	(PC+ABS) blend; unreinforced; injection molding grade; Vicat/B 120 = 130 °C; better flow than T85.	**W85 HI**	(PC+ASA) blend; unreinforced; injection molding grade with improved weather resistance; optimized heat ageing stability; excellent low temperature ductility; high heat resistance; Vicat/B 120 = 134 °C.

Glass fiber-reinforced

T88 GF-10	Rubber modified (PC+SAN) blend; 10 % glass fiber filled; injection molding grade; optimized heat ageing- and UV-stability; very good flow; tensile modulus = 4800 MPa; high heat resistance; Vicat/B 120 = 134 °C.	**T88 GF-30**	Rubber modified (PC+SAN) blend; 31 % glass fiber filled; injection molding grade; optimized heat ageing- and UV-stability; very good flow; tensile modulus = 10000 MPa; high heat resistance; Vicat/B 120 = 134 °C.
T88 GF-20	Rubber modified (PC+SAN) blend; 20 % glass fiber filled; injection molding grade; optimized heat ageing- and UV-stability; very good flow; tensile modulus = 7200 MPa; high heat resistance; Vicat/B 120 = 130 °C.		

Bayblend®

Standard grades

Mineral-filled

T95 MF	(PC+ABS) blend; 9 % mineral filled; injection molding grade; very high heat resistance; Vicat/B 120 = 142 °C; reduced coefficient of linear thermal expansion; tensile modulus = 3350 MPa.	**T90 MF-20**	Rubber modified (PC+SAN) blend; 20 % mineral filled; injection molding grade; very good flow; reduced coefficient of thermal expansion; tensile modulus = 4900 MPa; high heat resistance; Vicat/B 120 = 130 °C.

Flame-retardant grades

Nonreinforced

FR3000	(PC+ABS) blend; flame-retardant; easy-flow grade; Vicat/B 120 = 97 °C; UL recognition 94 V-0 (1.5 mm); glow wire test (GWFI): 960 °C (2.0 mm); no juicing; good light stability.	**FR3008 HR**	(PC+ABS) blend; unreinforced; flame-retardant; injection molding grade; improved chemical and very good hydrolysis resistance; HDT/A ≥ 85 °C; Vicat/B 120 = 103 °C; UL recognition 94 V-0 (1.5 mm); glow wire test (GWFI): 960 °C (2.0 mm); good light stability.
FR3000 HI	(PC+ABS) blend; unreinforced; flame-retardant; injection molding grade; general purpose; compared to FR3000 improved chemical resistance and stress cracking behavior; Vicat/B 120 = 97 °C; UL recognition 94 V-0 at 1.5 mm.	**FR3010**	(PC+ABS) blend; unreinforced; flame-retardant; injection molding grade; increased heat resistance; Vicat/B 120 = 110 °C; UL recognition 94 V-0 (1.5 mm); glow wire test (GWFI): 960 °C (2.0 mm); improved chemical resistance and stress cracking behavior.
FR3005 HF	(PC+ABS) blend; unreinforced; flame-retardant; injection molding grade; very easy-flow grade; Vicat/B 120 = 96 °C; UL recognition 94 V-0 (1.5 mm).	**FR3010 IF**	(PC+ABS) blend; unreinforced; flame-retardant; injection molding grade; increased heat resistance; Vicat/B 120 = 108 °C; improved flammability; UL recognition 94 5VB (1.5 mm); glow wire test (GWFI): 960 °C (2.0 mm); improved flow compared to FR3010.

Bayblend®

Flame-retardant grades

Nonreinforced

FR3010 HF	Previous name Bayblend FR2010; (PC+ABS) blend; unreinforced; flame-retardant; injection molding grade; easy-flow grade; Vicat/B 120 = 108 °C; UL recognition 94 V-0 (1.5 mm); glow wire test (GWFI): 960 °C (2.0 mm); optimized processability; good light stability.	**FR3110 TV**	(PC+ABS) blend; unreinforced; flame-retardant; injection molding grade; high heat resistance; Vicat/B 120 = 110 °C; easy flow; UL recognition 94 V-0 at 1.5 mm.
FR3011	(PC+ABS) blend; unreinforced; flame-retardant; injection molding grade; good flow; high heat resistance; Vicat/B 120 = 118 °C; UL recognition 94 V-0 (1.5 mm); glow wire test (GWFI): 960 °C (2.0 mm); good light stability.	**FR3200 TV**	(PC+ABS) blend; unreinforced; flame-retardant; injection molding grade; for high gloss applications, RHCM process etc.; Vicat/B 120 = 96 °C; easy flow; UL recognition 94 V-0 at 1.2 mm.
FR3030	(PC+ABS) blend; unreinforced; flame-retardant; extrusion grade; Vicat/B 120 = 115 °C; good extrusion and vacuum-forming behaviour; UL recognition 94 V-0 (1.5 mm); halogen-free according to DIN VDE 0472,815; glow wire temperature (GWFI): 960 °C at 1.0 mm.	**FR3210 TV**	(PC+ABS) blend; unreinforced; flame-retardant; injection molding grade; easy flow; improved surface quality; Vicat/B 120 = 93 °C; UL recognition 94 V-0 (1.2 mm).
FR3040	(PC+ABS) blend; unreinforced; flame-retardant; for thin-wall applications; injection molding grade; Vicat/B 120 = 108 °C; HDT/A ≥ 85 °C; very good burning behavior in small wallthicknesses (UL recognition 94 V-0 at 0.75 mm and above and V-1 at 0.6 mm).	**FR1514**	(PC+ABS) blend; flame retardant; high heat resistance; Vicat/B 120 = 136 °C; ball indentation temperature ≥ 125 °C; UL recognition 94 V-0 at 1.5 mm; suitable as supporting material for energized parts.
		FR1514 BB073	(PC+ABS) blend; flame retardant; high heat resistance; Vicat/B 120 = 136 °C; ball indentation temperature ≥ 125 °C; improved chemical resistance and stress cracking behavior compared to FR1514; UL recognition 94 V-0 at 1.5 mm; suitable as supporting material for energized parts.

Bayblend®

Flame-retardant grades

Glass fiber-reinforced

FR3305 TV (PC+ABS) blend; 10 % glass fibre reinforced; flame-retardant; injection molding grade; Vicat/B 120 = 103 °C; UL recognition 94 V-0 at 1.2 mm and V-1 at 1.0 mm.

FR3310 TV (PC+ABS) blend; 15 % glass fibre reinforced; flame-retardant; injection molding grade; Vicat/B 120 = 100 °C; UL recognition 94 V-1 at 1.2 mm and V-0 at 1.5 mm.

Mineral-filled

ET3032 FR Rubber modified PC blend; 10 % mineral filled; flame-retardant; extrusion grade; Vicat/B 120 = 108 °C; good extrusion and vacuum-forming behaviour; UL 94 V-0 (0.75 mm); glow wire temperature (GWFI): 960 °C at 2.0 mm.

FR3021 (PC+ABS) blend; 15 % mineral filled; flame retardant; injection molding grade; increased stiffness; tensile modulus = 4800 MPa; Vicat/B 120 = 98 °C; UL recognition 94 V-0 (1.5 mm); glow wire test (GWFI): 960 °C (2.0 mm).

FR3020 (PC+ABS) blend; 5 % mineral filled; flame retardant; for thin-wall applications; injection molding; Vicat/B 120 = 103 °C; HDT/A ≥ 85 °C; very good UL recognition in small wall thicknesses (V-0 at 0.75 mm).

FR410 MT Rubber modified PC blend; 10 % mineral filled; flame-retardant; Vicat/B 120 = 108 °C; very good UL recognition in small wallthickness (V-0 at 0.75 mm); for railway interiors. Due to the special formulation of this grade, the final parts may require coating.

Bayblend® – typical values

Properties	Test conditions	Units	Standards	Standard grades Non reinforced T45 PG	T65 PG	T50 XF	T65 XF	T85 XF
Rheological properties								
C Melt volume-flow rate (MVR)	240 °C; 5 kg	cm³/(10 min)	ISO 1133	–	–	–	–	–
C Melt volume-flow rate (MVR)	260 °C; 5 kg	cm³/(10 min)	ISO 1133	12	18	19	18	19
Melt viscosity	260 °C; 1000 s⁻¹	Pa · s	b. o. ISO 11443-A	200	200	190	200	250
Molding shrinkage, parallel	150 x 105 x 3 mm; 240 °C / mold 80 °C	%	b. o. ISO 2577	–	–	–	–	–
Molding shrinkage, parallel	150 x 105 x 3 mm; 260 °C / mold 80 °C	%	b. o. ISO 2577	0.55 – 0.75	0.5 – 0.7	0.55 – 0.75	0.5 – 0.7	0.5 – 0.7
Molding shrinkage, normal	150 x 105 x 3 mm; 240 °C / mold 80 °C	%	b. o. ISO 2577	–	–	–	–	–
Molding shrinkage, normal	150 x 105 x 3 mm; 260 °C / mold 80 °C	%	b. o. ISO 2577	0.55 – 0.75	0.5 – 0.7	0.55 – 0.75	0.5 – 0.7	0.5 – 0.7
Mechanical properties (23 °C / 50 % r. h.)								
C Tensile modulus	1 mm/min	MPa	ISO 527-1, -2	2100	2400	2100	2400	2300
C Tensile yield stress	50 mm/min	MPa	ISO 527-1, -2	49	54	50	54	54
C Tensile yield strain	50 mm/min	%	ISO 527-1, -2	3.7	4.4	4.5	4.4	4.7
Tensile stress at break	50 mm/min	MPa	ISO 527-1, -2	40	47	46	47	50
Tensile strain at break	50 mm/min	%	i. A. ISO 527-1, -2	> 50	> 50	> 50	> 50	> 50
Tensile yield stress	5 mm/min	MPa	ISO 527-1, -2	–	–	–	–	–
Tensile yield strain	5 mm/min	%	ISO 527-1, -2	–	–	–	–	–
C Tensile stress at break	5 mm/min	MPa	ISO 527-1, -2	–	–	–	–	–
C Tensile strain at break	5 mm/min	%	ISO 527-1, -2	–	–	–	–	–
Izod impact strength	23 °C	kJ/m²	ISO 180-U	N	N	N	N	N
Izod impact strength	–30 °C	kJ/m²	ISO 180-U	N	N	N	N	N
Izod notched impact strength	23 °C	kJ/m²	ISO 180-A	40	45	45	45	48
Izod notched impact strength	–30 °C	kJ/m²	ISO 180-A	36	35	38	35	35
Thermal properties								
C Temperature of deflection under load	1,80 MPa	°C	ISO 75-1, -2	95	102	99	102	109
C Temperature of deflection under load	0,45 MPa	°C	ISO 75-1, -2	112	122	120	122	127
C Vicat softening temperature	50 N; 50 °C/h	°C	ISO 306	110	118	113	118	128
C Vicat softening temperature	50 N; 120 °C/h	°C	ISO 306	112	120	115	120	130
C Coefficient of linear thermal expansion, parallel	23 to 55 °C	10⁻⁴/K	ISO 11359-1, -2	0.85	0.8	0.85	0.8	0.75
C Coefficient of linear thermal expansion, normal	23 to 55 °C	10⁻⁴/K	ISO 11359-1, -2	0.9	0.85	0.85	0.85	0.8
C Burning behavior UL 94 (UL)		Class	UL 94	–	HB (0.85 mm)*	–	–	–
C Burning behavior UL 94 (UL registration)		Class	UL 94	HB (0.85 mm)	–	HB (0.85 mm)	HB (0.85 mm)	HB (0.85 mm)
C Burning behavior UL 94-5V (UL registration)		Class	UL 94	–	–	–	–	–
C Burning behavior UL 94-5V (UL registration)		Class	UL 94	–	–	–	–	–
Electrical properties (23 °C / 50 % r. h.)								
C Relative permittivity	100 Hz	–	IEC 60250	3.1	3.1	3.1	3.1	3.1
C Relative permittivity	1 MHz	–	IEC 60250	3.0	3.0	3.0	3.0	3.0
C Dissipation factor	100 Hz	10⁻⁴	IEC 60250	35	30	25	30	20
C Dissipation factor	1 MHz	10⁻⁴	IEC 60250	85	85	90	85	85
C Volume resistivity	–	Ohm · m	IEC 60093	1E14	1E14	1E14	1E14	1E14
C Surface resistivity	–	Ohm	IEC 60093	1E16	1E16	1E16	1E16	1E16
C Electrical strength	1 mm	kV/mm	IEC 60243-1	35	35	35	35	35
C Comparative tracking index CTI	Solution A	Rating	IEC 60112	275	250	250	250	225
Other properties (23 °C)								
C Water absorption (saturation value)	Water at 23 °C	%	ISO 62	0.7	0.7	0.7	0.7	0.7
C Water absorption (equilibrium value)	23 °C; 50 % r. h.	%	ISO 62	0.2	0.2	0.2	0.2	0.2
C Density	–	kg/m³	ISO 1183-1	1100	1130	1110	1130	1140
Glass fiber content	Method A	%	i. A. ISO 3451-1	–	–	–	–	–
Processing conditions for test specimens								
C Injection molding: melt temperature	–	°C	ISO 294	260	260	260	260	260
C Injection molding: mold temperature	–	°C	ISO 294	80	80	80	80	80
C Injection molding: injection velocity	–	mm/s	ISO 294	240	240	240	240	240

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

* (Covestro Test)

Bayblend® – typical values

Properties	Test conditions	Units	Standards	Standard grades – Non reinforced T65 HI	T80 XG	T90 HT	W85 XF	W85 HI
Rheological properties								
C Melt volume-flow rate (MVR)	240 °C; 5 kg	cm³/(10 min)	ISO 1133	–	–	–	–	–
C Melt volume-flow rate (MVR)	260 °C; 5 kg	cm³/(10 min)	ISO 1133	5.0	27	26	27	17
Melt viscosity	260 °C; 1000 s^{-1}	Pa · s	b. o. ISO 11443-A	300	190	250	225	275
Molding shrinkage, parallel	150 x 105 x 3 mm; 240 °C / mold 80 °C	%	b. o. ISO 2577	–	–	–	–	–
Molding shrinkage, parallel	150 x 105 x 3 mm; 260 °C / mold 80 °C	%	b. o. ISO 2577	0.65 – 0.85	0.55 – 0.75	0.6 – 0.8	0.55 – 0.75	–
Molding shrinkage, normal	150 x 105 x 3 mm; 240 °C / mold 80 °C	%	b. o. ISO 2577	–	–	–	–	–
Molding shrinkage, normal	150 x 105 x 3 mm; 260 °C / mold 80 °C	%	b. o. ISO 2577	0.65 – 0.85	0.55 – 0.75	0.6 – 0.8	0.55 – 0.75	–
Mechanical properties (23 °C / 50 % r. h.)								
C Tensile modulus	1 mm/min	MPa	ISO 527-1, -2	2000	2500	2400	2450	2300
C Tensile yield stress	50 mm/min	MPa	ISO 527-1, -2	48	62	56	63	56
C Streckdehnung	50 mm/min	%	ISO 527-1, -2	4.5	4.7	5.0	5.0	5.0
Tensile stress at break	50 mm/min	MPa	ISO 527-1, -2	46	50	48	62	58
Tensile stress at break	50 mm/min	%	i. A. ISO 527-1, -2	> 50	> 50	> 50	> 50	> 50
Tensile yield stress	5 mm/min	MPa	ISO 527-1, -2	–	–	–	–	–
Tensile yield strain	5 mm/min	%	ISO 527-1, -2	–	–	–	–	–
C Tensile stress at break	5 mm/min	MPa	ISO 527-1, -2	–	–	–	–	–
C Tensile strain at break	5 mm/min	%	ISO 527-1, -2	–	–	–	–	–
Izod impact strength	23 °C	kJ/m²	ISO 180-U	N	N	N	N	–
Izod impact strength	–30 °C	kJ/m²	ISO 180-U	N	N	N	N	–
Izod notched impact strength	23 °C	kJ/m²	ISO 180-A	48	42	44	45	48
Izod notched impact strength	–30 °C	kJ/m²	ISO 180-A	38	14	21	–	38
Thermal properties								
C Temperature of deflection under load	1,80 MPa	°C	ISO 75-1, -2	99	108	110	109	–
C Temperature of deflection under load	0,45 MPa	°C	ISO 75-1, -2	120	127	129	127	–
C Vicat softening temperature	50 N; 50 °C/h	°C	ISO 306	118	128	133	130	–
C Vicat-Erweichungstemperatur	50 N; 120 °C/h	°C	ISO 306	120	130	135	132	134
C Coefficient of linear thermal expansion, parallel	23 to 55 °C	10^{-4}/K	ISO 11359-1, -2	0.9	0.72	–	0.7	–
C Coefficient of linear thermal expansion, senkrecht	23 to 55 °C	10^{-4}/K	ISO 11359-1, -2	0.95	0.72	–	0.7	–
C Burning behavior UL 94 (UL)		Class	UL 94	HB (0.85 mm)*	HB (0.85 mm)*	–	HB (0.85 mm)*	–
C Burning behavior UL 94 (UL registration)		Class	UL 94	–	–	–	–	–
C Burning behavior UL 94-5V (UL registration)		Class	UL 94	–	–	–	–	–
C Burning behavior UL 94-5V (UL registration)		Class	UL 94	–	–	–	–	–
Electrical properties (23 °C / 50 % r. h.)								
C Relative permittivity	100 Hz	–	IEC 60250	3.0	–	3.1	3.1	–
C Relative permittivity	1 MHz	–	IEC 60250	2.9	–	2.9	2.8	–
C Dissipation factor	100 Hz	10^{-4}	IEC 60250	25	–	15	25	–
C Dissipation factor	1 MHz	10^{-4}	IEC 60250	85	–	90	105	–
C Volume resistivity	–	Ohm · m	IEC 60093	1E14	1E14	1E14	1E14	–
C Surface resistivity	–	Ohm	IEC 60093	1E16	1E17	1E17	1E16	–
C Electrical strength	1 mm	kV/mm	IEC 60243-1	35	45	35	35	–
C Comparative tracking index CTI	Solution A	Rating	IEC 60112	275	175	–	225	–
Other properties (23 °C)								
C Water absorption (saturation value)	Water at 23 °C	%	ISO 62	0.7	0.7	0.7	0.5	–
C Water absorption (equilibrium value)	23 °C; 50 % r. h.	%	ISO 62	0.2	0.2	0.2	0.2	–
C Density	–	kg/m³	ISO 1183-1	1110	1160	1140	1160	–
Glass fiber content	Method A	%	i. A. ISO 3451-1	–	–	–	–	–
Processing conditions for test specimens								
C Injection molding: melt temperature	–	°C	ISO 294	260	260	260	260	260
C Injection molding: mold temperature	–	°C	ISO 294	80	80	80	80	80
C Injection molding: injection velocity	–	mm/s	ISO 294	240	240	240	240	240

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

* (Covestro Test)

Bayblend® – typical values

Properties	Test conditions	Units	Standards	Standard grades Glass fiber-reinforced T88 GF-10	T88 GF-20	T88 GF-30
Rheological properties						
C Melt volume-flow rate (MVR)	240 °C; 5 kg	cm³/(10 min)	ISO 1133	–	–	–
C Melt volume-flow rate (MVR)	260 °C; 5 kg	cm³/(10 min)	ISO 1133	–	–	–
Melt viscosity	260 °C; 1000 s⁻¹	Pa · s	b. o. ISO 11443-A	205	205	250
Molding shrinkage, parallel	150 x 105 x 3 mm; 240 °C / mold 80 °C	%	b. o. ISO 2577	–	–	–
Molding shrinkage, parallel	150 x 105 x 3 mm; 260 °C / mold 80 °C	%	b. o. ISO 2577	0.25 – 0.45	0.2 – 0.4	0.15 – 0.35
Molding shrinkage, normal	150 x 105 x 3 mm; 240 °C / mold 80 °C	%	b. o. ISO 2577	–	–	–
Molding shrinkage, normal	150 x 105 x 3 mm; 260 °C / mold 80 °C	%	b. o. ISO 2577	0.35 – 0.55	0.3 – 0.5	0.3 – 0.5
Mechanical properties (23 °C / 50 % r. h.)						
C Tensile modulus	1 mm/min	MPa	ISO 527-1, -2	4800	7200	10000
C Tensile yield stress	50 mm/min	MPa	ISO 527-1, -2	–	–	–
C Streckdehnung	50 mm/min	%	ISO 527-1, -2	–	–	–
Tensile stress at break	50 mm/min	MPa	ISO 527-1, -2	–	–	–
Tensile stress at break	50 mm/min	%	i. A. ISO 527-1, -2	–	–	–
Tensile yield stress	5 mm/min	MPa	ISO 527-1, -2	100	120	–
Tensile yield strain	5 mm/min	%	ISO 527-1, -2	3.2	2.4	–
C Tensile stress at break	5 mm/min	MPa	ISO 527-1, -2	95	120	135
C Tensile strain at break	5 mm/min	%	ISO 527-1, -2	3.7	2.4	2.0
Izod impact strength	23 °C	kJ/m²	ISO 180-U	35	38	40
Izod impact strength	–30 °C	kJ/m²	ISO 180-U	35	38	40
Izod notched impact strength	23 °C	kJ/m²	ISO 180-A	8.0	8.0	12
Izod notched impact strength	–30 °C	kJ/m²	ISO 180-A	6.0	8.0	11
Thermal properties						
C Temperature of deflection under load	1,80 MPa	°C	ISO 75-1, -2	121	119	126
C Temperature of deflection under load	0,45 MPa	°C	ISO 75-1, -2	133	129	134
C Vicat softening temperature	50 N; 50 °C/h	°C	ISO 306	132	128	132
C Vicat-Erweichungstemperatur	50 N; 120 °C/h	°C	ISO 306	134	130	134
C Coefficient of linear thermal expansion, parallel	23 to 55 °C	10⁻⁴/K	ISO 11359-1, -2	0.4	0.3	0.25
C Coefficient of linear thermal expansion, senkrecht	23 to 55 °C	10⁻⁴/K	ISO 11359-1, -2	0.67	0.65	0.6
C Burning behavior UL 94 (UL)		Class	UL 94	–	–	–
C Burning behavior UL 94 (UL registration)		Class	UL 94	HB (0.85 mm)	HB (0.85 mm)	HB (0.85 mm)
C Burning behavior UL 94-5V (UL registration)		Class	UL 94	–	–	–
C Burning behavior UL 94-5V (UL registration)		Class	UL 94	–	–	–
Electrical properties (23 °C / 50 % r. h.)						
C Relative permittivity	100 Hz	–	IEC 60250	3.2	3.3	3.6
C Relative permittivity	1 MHz	–	IEC 60250	3.0	3.2	3.4
C Dissipation factor	100 Hz	10⁻⁴	IEC 60250	25	25	30
C Dissipation factor	1 MHz	10⁻⁴	IEC 60250	90	85	85
C Volume resistivity	–	Ohm · m	IEC 60093	1E14	1E14	1E14
C Surface resistivity	–	Ohm	IEC 60093	1E16	1E17	1E17
C Electrical strength	1 mm	kV/mm	IEC 60243-1	35	35	35
C Comparative tracking index CTI	Solution A	Rating	IEC 60112	200	150	175
Other properties (23 °C)						
C Water absorption (saturation value)	Water at 23 °C	%	ISO 62	0.4	0.4	0.4
C Water absorption (equilibrium value)	23 °C; 50 % r. h.	%	ISO 62	0.2	0.2	0.1
C Density	–	kg/m³	ISO 1183-1	1220	1290	1375
Glass fiber content	Method A	%	i. A. ISO 3451-1	10	20	31
Processing conditions for test specimens						
C Injection molding: melt temperature	–	°C	ISO 294	260	260	260
C Injection molding: mold temperature	–	°C	ISO 294	80	80	80
C Injection molding: injection velocity	–	mm/s	ISO 294	540	540	540

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

* (Covestro Test)

Bayblend® – typical values

Properties	Test conditions	Units	Standards	Standard grades – Mineral-filled T95 MF	Standard grades – Mineral-filled T90 MF-20
Rheological properties					
C Melt volume-flow rate (MVR)	240 °C; 5 kg	cm³/(10 min)	ISO 1133	–	–
C Melt volume-flow rate (MVR)	260 °C; 5 kg	cm³/(10 min)	ISO 1133	18	12
Melt viscosity	260 °C; 1000 s⁻¹	Pa · s	b. o. ISO 11443-A	400	240
Molding shrinkage, parallel	150 x 105 x 3 mm; 240 °C / mold 80 °C	%	b. o. ISO 2577	–	–
Molding shrinkage, parallel	150 x 105 x 3 mm; 260 °C / mold 80 °C	%	b. o. ISO 2577	0.5 – 0.7	0.3 – 0.5
Molding shrinkage, normal	150 x 105 x 3 mm; 240 °C / mold 80 °C	%	b. o. ISO 2577	–	–
Molding shrinkage, normal	150 x 105 x 3 mm; 260 °C / mold 80 °C	%	b. o. ISO 2577	0.5 – 0.7	0.25 – 0.45
Mechanical properties (23 °C / 50 % r. h.)					
C Tensile modulus	1 mm/min	MPa	ISO 527-1, -2	3350	4900
C Tensile yield stress	50 mm/min	MPa	ISO 527-1, -2	66	60
C Streckdehnung	50 mm/min	%	ISO 527-1, -2	4.6	3.2
Tensile stress at break	50 mm/min	MPa	ISO 527-1, -2	52	50
Tensile stress at break	50 mm/min	%	i. A. ISO 527-1, -2	≥ 50	9.0
Tensile yield stress	5 mm/min	MPa	ISO 527-1, -2	–	–
Tensile yield strain	5 mm/min	%	ISO 527-1, -2	–	–
C Tensile stress at break	5 mm/min	MPa	ISO 527-1, -2	–	–
C Tensile strain at break	5 mm/min	%	ISO 527-1, -2	–	–
Izod impact strength	23 °C	kJ/m²	ISO 180-U	≥ 150	100
Izod impact strength	–30 °C	kJ/m²	ISO 180-U	–	50
Izod notched impact strength	23 °C	kJ/m²	ISO 180-A	9.0	20
Izod notched impact strength	–30 °C	kJ/m²	ISO 180-A	9.0	6.0
Thermal properties					
C Temperature of deflection under load	1,80 MPa	°C	ISO 75-1, -2	124	111
C Temperature of deflection under load	0,45 MPa	°C	ISO 75-1, -2	136	127
C Vicat softening temperature	50 N; 50 °C/h	°C	ISO 306	140	128
C Vicat-Erweichungstemperatur	50 N; 120 °C/h	°C	ISO 306	142	130
C Coefficient of linear thermal expansion, parallel	23 to 55 °C	10^{-4}/K	ISO 11359-1, -2	0.55	0.4
C Coefficient of linear thermal expansion, senkrecht	23 to 55 °C	10^{-4}/K	ISO 11359-1, -2	0.65	0.56
C Burning behavior UL 94 (UL)		Class	UL 94	HB (0.85 mm)*	HB (0.85 mm)*
C Burning behavior UL 94 (UL registration)		Class	UL 94	–	–
C Burning behavior UL 94-5V (UL registration)		Class	UL 94	–	–
C Burning behavior UL 94-5V (UL registration)		Class	UL 94	–	–
Electrical properties (23 °C / 50 % r. h.)					
C Relative permittivity	100 Hz	–	IEC 60250	3.2	3.3
C Relative permittivity	1 MHz	–	IEC 60250	3.0	3.2
C Dissipation factor	100 Hz	10^{-4}	IEC 60250	15	15
C Dissipation factor	1 MHz	10^{-4}	IEC 60250	90	32
C Volume resistivity	–	Ohm · m	IEC 60093	1E14	1E14
C Surface resistivity	–	Ohm	IEC 60093	1E16	1E16
C Electrical strength	1 mm	kV/mm	IEC 60243-1	35	35
C Comparative tracking index CTI	Solution A	Rating	IEC 60112	200	225
Other properties (23 °C)					
C Water absorption (saturation value)	Water at 23 °C	%	ISO 62	0.6	0.5
C Water absorption (equilibrium value)	23 °C; 50 % r. h.	%	ISO 62	0.2	0.2
C Density	–	kg/m³	ISO 1183-1	1240	1290
Glass fiber content	Method A	%	i. A. ISO 3451-1	–	–
Processing conditions for test specimens					
C Injection molding: melt temperature	–	°C	ISO 294	260	260
C Injection molding: mold temperature	–	°C	ISO 294	80	80
C Injection molding: injection velocity	–	mm/s	ISO 294	240	240

C Diese Eigenschaftsmerkmale sind Bestandteil der Kunststoffdatenbank CAMPUS® und basieren auf dem international festgelegten Katalog von Grunddaten für Kunststoffe ISO 10350.

Schlageigenschaften:
N = Nicht-Bruch
P = Teilbruch
C = Vollständiger Bruch

* (Covestro Test)

Bayblend® – typical values

Properties	Test conditions	Units	Standards	Flame-retardant grades			
				Nonreinforced			
				FR3000	FR3000 HI	FR3005 HF	FR3008 HR
Rheological properties							
C Melt volume-flow rate (MVR)	240 °C; 5 kg	cm^3/(10 min)	ISO 1133	24	20	40	13
C Melt volume-flow rate (MVR)	260 °C; 5 kg	cm^3/(10 min)	ISO 1133	–	–	–	–
Melt viscosity	260 °C; 1000 s^{-1}	Pa · s	b. o. ISO 11443-A	160	185	105	195
Molding shrinkage, parallel	150 x 105 x 3 mm; 240 °C / mold 80 °C	%	b. o. ISO 2577	0.5 – 0.7	0.5 – 0.7	0.5 – 0.7	0.5 – 0.7
Molding shrinkage, parallel	150 x 105 x 3 mm; 260 °C / mold 80 °C	%	b. o. ISO 2577	–	–	–	–
Molding shrinkage, normal	150 x 105 x 3 mm; 240 °C / mold 80 °C	%	b. o. ISO 2577	0.5 – 0.7	0.5 – 0.7	0.5 – 0.7	0.5 – 0.7
Molding shrinkage, normal	150 x 105 x 3 mm; 260 °C / mold 80 °C	%	b. o. ISO 2577	–	–	–	–
Mechanical properties (23 °C / 50 % r. h.)							
C Tensile modulus	1 mm/min	MPa	ISO 527-1, -2	2700	2700	2700	2700
C Tensile yield stress	50 mm/min	MPa	ISO 527-1, -2	60	60	60	60
C Streckdehnung	50 mm/min	%	ISO 527-1, -2	3.5	4.0	3.5	4.0
Tensile stress at break	50 mm/min	MPa	ISO 527-1, -2	45	45	45	50
Tensile stress at break	50 mm/min	%	i. A. ISO 527-1, -2	> 40	> 50	> 40	> 50
Tensile yield stress	5 mm/min	MPa	ISO 527-1, -2	–	–	–	–
Tensile yield strain	5 mm/min	%	ISO 527-1, -2	–	–	–	–
C Tensile stress at break	5 mm/min	MPa	ISO 527-1, -2	–	–	–	–
C Tensile strain at break	5 mm/min	%	ISO 527-1, -2	–	–	–	–
Izod impact strength	23 °C	kJ/m^2	ISO 180-U	N	N	N	N
Izod impact strength	–30 °C	kJ/m^2	ISO 180-U	–	–	–	–
Izod notched impact strength	23 °C	kJ/m^2	ISO 180-A	35	35	13	30
Izod notched impact strength	–30 °C	kJ/m^2	ISO 180-A	10	10	8	10
Thermal properties							
C Temperature of deflection under load	1,80 MPa	°C	ISO 75-1, -2	82	82	81	85
C Temperature of deflection under load	0,45 MPa	°C	ISO 75-1, -2	92	92	90	95
C Vicat softening temperature	50 N; 50 °C/h	°C	ISO 306	95	95	94	101
C Vicat-Erweichungstemperatur	50 N; 120 °C/h	°C	ISO 306	97	97	96	103
C Coefficient of linear thermal expansion, parallel	23 to 55 °C	10^{-4}/K	ISO 11359-1, -2	0.76	0.76	0.76	0.76
C Coefficient of linear thermal expansion, senkrecht	23 to 55 °C	10^{-4}/K	ISO 11359-1, -2	0.8	0.8	0,8	0.8
C Burning behavior UL 94 (UL registration)		Class	UL 94	V-0 (1.5 mm)	V-0 (1.5 mm)	V-0 (1.5 mm)	V-1 (1.2 mm)
C Burning behavior UL 94 (UL registration)		Class	UL 94	–	–	–	V-0 (1.5 mm)
C Burning behavior UL 94-5V (UL registration)		Class	UL 94	5VB (2.0 mm)	5VB (2.0 mm)	5VB (1.8 mm)	5VB (2.0 mm)
C Burning behavior UL 94-5V (UL registration)		Class	UL 94	5VA (3.0 mm)	5VA (3.0 mm)	5VA (3.0 mm)	5VA (3.0 mm)
Electrical properties (23 °C / 50 % r. h.)							
C Relative permittivity	100 Hz	–	IEC 60250	3.2	3.2	3.2	3.2
C Relative permittivity	1 MHz	–	IEC 60250	3.1	3.1	3.1	3.1
C Dissipation factor	100 Hz	10^{-4}	IEC 60250	50	50	50	50
C Dissipation factor	1 MHz	10^{-4}	IEC 60250	60	60	65	70
C Volume resistivity	–	Ohm · m	IEC 60093	1E14	1E14	1E14	1E14
C Surface resistivity	–	Ohm	IEC 60093	1E16	1E16	1E16	1E16
C Electrical strength	1 mm	kV/mm	IEC 60243-1	35	35	35	30
C Comparative tracking index CTI	Solution A	Rating	IEC 60112	350	350	350	300
Other properties (23 °C)							
C Water absorption (saturation value)	Water at 23 °C	%	ISO 62	0.5	0.5	0.5	0.5
C Water absorption (equilibrium value)	23 °C; 50 % r. h.	%	ISO 62	0.2	0.2	0.2	0.2
C Density	–	kg/m^3	ISO 1183-1	1180	1180	1180	1200
Glass fiber content	Method A	%	i. A. ISO 3451-1	–	–	–	–
Processing conditions for test specimens							
C Injection molding: melt temperature	–	°C	ISO 294	240	240	240	260
C Injection molding: mold temperature	–	°C	ISO 294	80	80	80	80
C Injection molding: injection velocity	–	mm/s	ISO 294	240	240	240	240

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

Bayblend® – typical values

				Flame-retardant grades			
				Nonreinforced			
Properties	**Test conditions**	**Units**	**Standards**	**FR3010**	**FR3010 IF**	**FR3010 HF**	**FR3011**
Rheological properties							
C Melt volume-flow rate (MVR)	240 °C; 5 kg	cm^3/(10 min)	ISO 1133	15	17	25	17
C Melt volume-flow rate (MVR)	260 °C; 5 kg	cm^3/(10 min)	ISO 1133	–	–	–	–
Melt viscosity	260 °C; 1000 s^{-1}	Pa · s	b. o. ISO 11443-A	245	210	–	240
Molding shrinkage, parallel	150 x 105 x 3 mm; 240 °C / mold 80 °C	%	b. o. ISO 2577	0.5 – 0.7	0.5 – 0.7	0.5 – 0.7	0.5 – 0.7
Molding shrinkage, parallel	150 x 105 x 3 mm; 260 °C / mold 80 °C	%	b. o. ISO 2577	–	–	–	–
Molding shrinkage, normal	150 x 105 x 3 mm; 240 °C / mold 80 °C	%	b. o. ISO 2577	0.5 – 0.7	0.5 – 0.7	0.5 – 0.7	0.5 – 0.7
Molding shrinkage, normal	150 x 105 x 3 mm; 260 °C / mold 80 °C	%	b. o. ISO 2577	–	–	–	–
Mechanical properties (23 °C / 50 % r. h.)							
C Tensile modulus	1 mm/min	MPa	ISO 527-1, -2	2700	2700	2700	2600
C Tensile yield stress	50 mm/min	MPa	ISO 527-1, -2	60	60	60	65
C Streckdehnung	50 mm/min	%	ISO 527-1, -2	4.0	4.0	4.0	4.0
Tensile stress at break	50 mm/min	MPa	ISO 527-1, -2	50	50	50	50
Tensile stress at break	50 mm/min	%	i. A. ISO 527-1, -2	> 50	> 50	> 50	> 50
Tensile yield stress	5 mm/min	MPa	ISO 527-1, -2	–	–	–	–
Tensile yield strain	5 mm/min	%	ISO 527-1, -2	–	–	–	–
C Tensile stress at break	5 mm/min	MPa	ISO 527-1, -2	–	–	–	–
C Tensile strain at break	5 mm/min	%	ISO 527-1, -2	–	–	–	–
Izod impact strength	23 °C	kJ/m^2	ISO 180-U	N	N	N	N
Izod impact strength	–30 °C	kJ/m^2	ISO 180-U	–	–	–	–
Izod notched impact strength	23 °C	kJ/m^2	ISO 180-A	35	25	35	12
Izod notched impact strength	–30 °C	kJ/m^2	ISO 180-A	10	–	10	10
Thermal properties							
C Temperature of deflection under load	1,80 MPa	°C	ISO 75-1, -2	90	88	90	98
C Temperature of deflection under load	0,45 MPa	°C	ISO 75-1, -2	100	98	100	108
C Vicat softening temperature	50 N; 50 °C/h	°C	ISO 306	108	106	106	116
C Vicat-Erweichungstemperatur	50 N; 120 °C/h	°C	ISO 306	110	108	108	118
C Coefficient of linear thermal expansion, parallel	23 to 55 °C	10^{-4}/K	ISO 11359-1, -2	0.76	0.76	0.76	0.7
C Coefficient of linear thermal expansion, senkrecht	23 to 55 °C	10^{-4}/K	ISO 11359-1, -2	0.8	0.8	0.8	0.7
C Burning behavior UL 94 (UL registration)		Class	UL 94	V-1 (1.2 mm)	V-1 (1.2 mm)	V-0 (1.5 mm)	V-1 (1.2 mm)
C Burning behavior UL 94 (UL registration)		Class	UL 94	V-0 (1.5 mm)	V-0 (1.5 mm)	–	V-0 (1.5 mm)
C Burning behavior UL 94-5V (UL registration)		Class	UL 94	5VB (2.0 mm)	5VB (1.5 mm)	5VB (2.2 mm)	5VB (2.0 mm)
C Burning behavior UL 94-5V (UL registration)		Class	UL 94	5VA (3.0 mm)	5VA (3.0 mm)	5VA (3.0 mm)	5VA (3.0 mm)
Electrical properties (23 °C / 50 % r. h.)							
C Relative permittivity	100 Hz	–	IEC 60250	3.2	–	3.2	3.2
C Relative permittivity	1 MHz	–	IEC 60250	3.1	–	3.1	3.1
C Dissipation factor	100 Hz	10^{-4}	IEC 60250	50	–	40	40
C Dissipation factor	1 MHz	10^{-4}	IEC 60250	70	–	70	75
C Volume resistivity	–	Ohm · m	IEC 60093	1E14	–	1E14	1E15
C Surface resistivity	–	Ohm	IEC 60093	1E16	–	1E16	1E17
C Electrical strength	1 mm	kV/mm	IEC 60243-1	35	–	35	35
C Comparative tracking index CTI	Solution A	Rating	IEC 60112	350	–	350	250
Other properties (23 °C)							
C Water absorption (saturation value)	Water at 23 °C	%	ISO 62	0.5	0.5	0.5	0.5
C Water absorption (equilibrium value)	23 °C; 50 % r. h.	%	ISO 62	0.2	0.2	0.2	0.2
C Density	–	kg/m^3	ISO 1183-1	1180	1180	1180	1190
Glass fiber content	Method A	%	i. A. ISO 3451-1	–	–	–	–
Processing conditions for test specimens							
C Injection molding: melt temperature	–	°C	ISO 294	240	240	240	240
C Injection molding: mold temperature	–	°C	ISO 294	80	80	80	80
C Injection molding: injection velocity	–	mm/s	ISO 294	240	240	240	240

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

Bayblend® – typical values

				Flame-retardant grades			
				Nonreinforced			
Properties	**Test conditions**	**Units**	**Standards**	**FR3030**	**FR3040**	**FR3110 TV**	**FR3200 TV**
Rheological properties							
C Melt volume-flow rate (MVR)	240 °C; 5 kg	cm³/(10 min)	ISO 1133	–	17	29	31
C Melt volume-flow rate (MVR)	260 °C; 5 kg	cm³/(10 min)	ISO 1133	11	–	–	–
Melt viscosity	260 °C; 1000 s⁻¹	Pa · s	b. o. ISO 11443-A	410	240	140	–
Molding shrinkage, parallel	150 x 105 x 3 mm; 240 °C / mold 80 °C	%	b. o. ISO 2577	–	0.5 – 0.7	0.5 – 0.7	–
Molding shrinkage, parallel	150 x 105 x 3 mm; 260 °C / mold 80 °C	%	b. o. ISO 2577	0.5 – 0.7	–	–	–
Molding shrinkage, normal	150 x 105 x 3 mm; 240 °C / mold 80 °C	%	b. o. ISO 2577	–	0.5 – 0.7	0.5 – 0.7	–
Molding shrinkage, normal	150 x 105 x 3 mm; 260 °C / mold 80 °C	%	b. o. ISO 2577	0.5 – 0.7	–	–	–
Mechanical properties (23 °C / 50 % r. h.)							
C Tensile modulus	1 mm/min	MPa	ISO 527-1, -2	2650	2700	2700	2600
C Tensile yield stress	50 mm/min	MPa	ISO 527-1, -2	69	65	60	60
C Streckdehnung	50 mm/min	%	ISO 527-1, -2	5.0	4.0	4.0	3.7
Tensile stress at break	50 mm/min	MPa	ISO 527-1, -2	53	50	50	46
Tensile stress at break	50 mm/min	%	i. A. ISO 527-1, -2	> 50	> 50	> 50	> 50
Tensile yield stress	5 mm/min	MPa	ISO 527-1, -2	–	–	–	–
Tensile yield strain	5 mm/min	%	ISO 527-1, -2	–	–	–	–
C Tensile stress at break	5 mm/min	MPa	ISO 527-1, -2	–	–	–	–
C Tensile strain at break	5 mm/min	%	ISO 527-1, -2	–	–	–	–
Izod impact strength	23 °C	kJ/m²	ISO 180-U	N	N	N	N
Izod impact strength	–30 °C	kJ/m²	ISO 180-U	–	–	–	–
Izod notched impact strength	23 °C	kJ/m²	ISO 180-A	40	30	12	25
Izod notched impact strength	–30 °C	kJ/m²	ISO 180-A	10	–	–	–
Thermal properties							
C Temperature of deflection under load	1,80 MPa	°C	ISO 75-1, -2	98	91	91	80
C Temperature of deflection under load	0,45 MPa	°C	ISO 75-1, -2	106	100	101	–
C Vicat softening temperature	50 N; 50 °C/h	°C	ISO 306	113	106	108	–
C Vicat-Erweichungstemperatur	50 N; 120 °C/h	°C	ISO 306	115	108	110	96
C Coefficient of linear thermal expansion, parallel	23 to 55 °C	10⁻⁴/K	ISO 11359-1, -2	0.68	0.76	0.68	–
C Coefficient of linear thermal expansion, senkrecht	23 to 55 °C	10⁻⁴/K	ISO 11359-1, -2	0.72	0.8	0.68	–
C Burning behavior UL 94 (UL registration)		Class	UL 94	V-2 (0.75 mm)	V-1 (0.6 mm)	V-1 (1.2 mm)	V-0 (1.2 mm)
C Burning behavior UL 94 (UL registration)		Class	UL 94	V-0 (1.5 mm)	V-0 (0.75 mm)	V-0 (1.5 mm)	–
C Burning behavior UL 94-5V (UL registration)		Class	UL 94	5VB (2.0 mm)	5VB (1.5 mm)	–	5VB (1.5 mm)
C Burning behavior UL 94-5V (UL registration)		Class	UL 94	5VA (3.0 mm)	5VA (3.0 mm)	–	–
Electrical properties (23 °C / 50 % r. h.)							
C Relative permittivity	100 Hz	–	IEC 60250	3.2	3.2	3.2	–
C Relative permittivity	1 MHz	–	IEC 60250	3.1	3.1	3.1	–
C Dissipation factor	100 Hz	10⁻⁴	IEC 60250	37	50	50	–
C Dissipation factor	1 MHz	10⁻⁴	IEC 60250	75	75	70	–
C Volume resistivity	–	Ohm · m	IEC 60093	1E15	1E15	1E14	–
C Surface resistivity	–	Ohm	IEC 60093	1E17	1E17	1E16	–
C Electrical strength	1 mm	kV/mm	IEC 60243-1	35	35	30	–
C Comparative tracking index CTI	Solution A	Rating	IEC 60112	350	325	350	–
Other properties (23 °C)							
C Water absorption (saturation value)	Water at 23 °C	%	ISO 62	0.5	0.5	0.5	–
C Water absorption (equilibrium value)	23 °C; 50 % r. h.	%	ISO 62	0.2	0.2	0.2	–
C Density	–	kg/m³	ISO 1183-1	1190	1190	1180	1195
Glass fiber content	Method A	%	i. A. ISO 3451-1	–	–	–	–
Processing conditions for test specimens							
C Injection molding: melt temperature	–	°C	ISO 294	260	240	240	240
C Injection molding: mold temperature	–	°C	ISO 294	80	80	80	80
C Injection molding: injection velocity	–	mm/s	ISO 294	240	240	240	240

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

Bayblend® – typical values

Properties	Test conditions	Units	Standards	Flame-retardant grades		
				Nonreinforced		
				FR3210 TV	FR1514	FR1514 BBS073
Rheological properties						
C Melt volume-flow rate (MVR)	240 °C; 5 kg	cm³/(10 min)	ISO 1133	38	–	–
C Melt volume-flow rate (MVR)	260 °C; 5 kg	cm³/(10 min)	ISO 1133	–	19	16
Melt viscosity	260 °C; 1000 s⁻¹	Pa · s	b. o. ISO 11443-A	135	450	520
Molding shrinkage, parallel	150 x 105 x 3 mm; 240 °C / mold 80 °C	%	b. o. ISO 2577	0.5 – 0.7	–	–
Molding shrinkage, parallel	150 x 105 x 3 mm; 260 °C / mold 80 °C	%	b. o. ISO 2577	–	0.5 – 0.7	0.5 – 0.7
Molding shrinkage, normal	150 x 105 x 3 mm; 240 °C / mold 80 °C	%	b. o. ISO 2577	0.5 – 0.7	–	–
Molding shrinkage, normal	150 x 105 x 3 mm; 260 °C / mold 80 °C	%	b. o. ISO 2577	–	0.5 – 0.7	0.5 – 0.7
Mechanical properties (23 °C / 50 % r. h.)						
C Tensile modulus	1 mm/min	MPa	ISO 527-1, -2	2700	2400	2400
C Tensile yield stress	50 mm/min	MPa	ISO 527-1, -2	60	63	63
C Streckdehnung	50 mm/min	%	ISO 527-1, -2	3.5	5	5
Tensile stress at break	50 mm/min	MPa	ISO 527-1, -2	45	57	59
Tensile stress at break	50 mm/min	%	i. A. ISO 527-1, -2	> 30	> 50	> 50
Tensile yield stress	5 mm/min	MPa	ISO 527-1, -2	–	–	–
Tensile yield strain	5 mm/min	%	ISO 527-1, -2	–	–	–
C Tensile stress at break	5 mm/min	MPa	ISO 527-1, -2	–	–	–
C Tensile strain at break	5 mm/min	%	ISO 527-1, -2	–	–	–
Izod impact strength	23 °C	kJ/m²	ISO 180-U	N	N	N
Izod impact strength	–30 °C	kJ/m²	ISO 180-U	–	–	–
Izod notched impact strength	23 °C	kJ/m²	ISO 180-A	30	45	50
Izod notched impact strength	–30 °C	kJ/m²	ISO 180-A	–	15	15
Thermal properties						
C Temperature of deflection under load	1,80 MPa	°C	ISO 75-1, -2	76	114	114
C Temperature of deflection under load	0,45 MPa	°C	ISO 75-1, -2	85	126	126
C Vicat softening temperature	50 N; 50 °C/h	°C	ISO 306	91	134	134
C Vicat-Erweichungstemperatur	50 N; 120 °C/h	°C	ISO 306	93	136	136
C Coefficient of linear thermal expansion, parallel	23 to 55 °C	10⁻⁴/K	ISO 11359-1, -2	0.75	0.68	0.72
C Coefficient of linear thermal expansion, senkrecht	23 to 55 °C	10⁻⁴/K	ISO 11359-1, -2	0.75	0.68	0.72
C Burning behavior UL 94 (UL)		Class	UL 94	–	–	–
C Burning behavior UL 94 (UL registration)		Class	UL 94	V-0 (1.2 mm)	V-0 (1.5 mm)	V-0 (1.5 mm)
C Burning behavior UL 94-5V (UL registration)		Class	UL 94	5VB (1.5 mm)	5VB (2.0 mm)	5VB (2.0 mm)
C Burning behavior UL 94-5V (UL registration)		Class	UL 94	–	5VA (3.0 mm)	5VA (3.0 mm)
Electrical properties (23 °C / 50 % r. h.)						
C Relative permittivity	100 Hz	–	IEC 60250	–	3.2	3.2
C Relative permittivity	1 MHz	–	IEC 60250	–	3.1	3.1
C Dissipation factor	100 Hz	10⁻⁴	IEC 60250	–	20	20
C Dissipation factor	1 MHz	10⁻⁴	IEC 60250	–	85	85
C Volume resistivity	–	Ohm · m	IEC 60093	–	1E15	1E15
C Surface resistivity	–	Ohm	IEC 60093	–	1E17	1E17
C Electrical strength	1 mm	kV/mm	IEC 60243-1	–	35	35
C Comparative tracking index CTI	Solution A	Rating	IEC 60112	–	350	350
Other properties (23 °C)						
C Water absorption (saturation value)	Water at 23 °C	%	ISO 62	0.5	0.5	0.5
C Water absorption (equilibrium value)	23 °C; 50 % r. h.	%	ISO 62	0.2	0.2	0.2
C Density	–	kg/m³	ISO 1183-1	1180	1190	1190
Glass fiber content	Method A	%	i. A. ISO 3451-1	–	–	–
Processing conditions for test specimens						
C Injection molding: melt temperature	–	°C	ISO 294	240	260	260
C Injection molding: mold temperature	–	°C	ISO 294	80	80	80
C Injection molding: injection velocity	–	mm/s	ISO 294	240	240	240

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

Bayblend® – typical values

Properties	Test conditions	Units	Standards	Flame-retardant grades Glass fiber-reinforced FR3305 TV	 FR3310 TV
Rheological properties					
C Melt volume-flow rate (MVR)	240 °C; 5 kg	cm³/(10 min)	ISO 1133	16	–
C Melt volume-flow rate (MVR)	260 °C; 5 kg	cm³/(10 min)	ISO 1133	–	23
Melt viscosity	260 °C; 1000 s⁻¹	Pa · s	b. o. ISO 11443-A	185	185
Molding shrinkage, parallel	150 x 105 x 3 mm; 240 °C / mold 80 °C	%	b. o. ISO 2577	–	0.2 – 0.4
Molding shrinkage, parallel	150 x 105 x 3 mm; 260 °C / mold 80 °C	%	b. o. ISO 2577	0.3 – 0.5	–
Molding shrinkage, normal	150 x 105 x 3 mm; 240 °C / mold 80 °C	%	b. o. ISO 2577	–	0.3 – 0.5
Molding shrinkage, normal	150 x 105 x 3 mm; 260 °C / mold 80 °C	%	b. o. ISO 2577	0.3 – 0.5	–
Mechanical properties (23 °C / 50 % r. h.)					
C Tensile modulus	1 mm/min	MPa	ISO 527-1, -2	4350	5300
C Tensile yield stress	50 mm/min	MPa	ISO 527-1, -2	–	–
C Streckdehnung	50 mm/min	%	ISO 527-1, -2	–	–
Tensile stress at break	50 mm/min	MPa	ISO 527-1, -2	–	–
Tensile stress at break	50 mm/min	%	i. A. ISO 527-1, -2	–	–
Tensile yield stress	5 mm/min	MPa	ISO 527-1, -2	75	–
Tensile yield strain	5 mm/min	%	ISO 527-1, -2	3	–
C Tensile stress at break	5 mm/min	MPa	ISO 527-1, -2	75	95
C Tensile strain at break	5 mm/min	%	ISO 527-1, -2	4	3
Izod impact strength	23 °C	kJ/m²	ISO 180-U	35	30
Izod impact strength	–30 °C	kJ/m²	ISO 180-U	–	–
Izod notched impact strength	23 °C	kJ/m²	ISO 180-A	7	8
Izod notched impact strength	–30 °C	kJ/m²	ISO 180-A	–	–
Thermal properties					
C Temperature of deflection under load	1,80 MPa	°C	ISO 75-1, -2	92	92
C Temperature of deflection under load	0,45 MPa	°C	ISO 75-1, -2	98	98
C Vicat softening temperature	50 N; 50 °C/h	°C	ISO 306	101	98
C Vicat-Erweichungstemperatur	50 N; 120 °C/h	°C	ISO 306	103	100
C Coefficient of linear thermal expansion, parallel	23 to 55 °C	10⁻⁴/K	ISO 11359-1, -2	0.5	0.4
C Coefficient of linear thermal expansion, senkrecht	23 to 55 °C	10⁻⁴/K	ISO 11359-1, -2	0.7	0.7
C Burning behavior UL 94 (UL registration)		Class	UL 94	V-1 (1.0 mm)	V-1 (1.2 mm)
C Burning behavior UL 94 (UL registration)		Class	UL 94	V-0 (1.2 mm)	V-0 (1.5 mm)
C Burning behavior UL 94-5V (UL registration)		Class	UL 94	–	–
C Burning behavior UL 94-5V (UL registration)		Class	UL 94	–	–
Electrical properties (23 °C / 50 % r. h.)					
C Relative permittivity	100 Hz	–	IEC 60250	3.3	3.2
C Relative permittivity	1 MHz	–	IEC 60250	3.2	3.1
C Dissipation factor	100 Hz	10⁻⁴	IEC 60250	50	50
C Dissipation factor	1 MHz	10⁻⁴	IEC 60250	70	70
C Volume resistivity	–	Ohm · m	IEC 60093	1E14	1E14
C Surface resistivity	–	Ohm	IEC 60093	1E16	1E16
C Electrical strength	1 mm	kV/mm	IEC 60243-1	35	35
C Comparative tracking index CTI	Solution A	Rating	IEC 60112	175	175
Other properties (23 °C)					
C Water absorption (saturation value)	Water at 23 °C	%	ISO 62	0.4	0.4
C Water absorption (equilibrium value)	23 °C; 50 % r. h.	%	ISO 62	0.1	0.1
C Density	–	kg/m³	ISO 1183-1	1280	1280
Glass fiber content	Method A	%	i. A. ISO 3451-1	10	15
Processing conditions for test specimens					
C Injection molding: melt temperature	–	°C	ISO 294	260	260
C Injection molding: mold temperature	–	°C	ISO 294	80	80
C Injection molding: injection velocity	–	mm/s	ISO 294	40	40

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

Bayblend® – typical values

Properties	Test conditions	Units	Standards	Flame-retardant grades – Mineral-filled ET3032 FR	FR3020	FR3021	FR410 MT
Rheological properties							
C Melt volume-flow rate (MVR)	240 °C; 5 kg	cm³/(10 min)	ISO 1133	–	20	13	–
C Melt volume-flow rate (MVR)	260 °C; 5 kg	cm³/(10 min)	ISO 1133	10	–	–	10
Melt viscosity	260 °C; 1000 s⁻¹	Pa · s	b. o. ISO 11443-A	380	200	165	360
Molding shrinkage, parallel	150 x 105 x 3 mm; 240 °C / mold 80 °C	%	b. o. ISO 2577	–	0.4 – 0.6	0.3 – 0.5	–
Molding shrinkage, parallel	150 x 105 x 3 mm; 260 °C / mold 80 °C	%	b. o. ISO 2577	0.4 – 0.5	–	–	0.4 – 0.5
Molding shrinkage, normal	150 x 105 x 3 mm; 240 °C / mold 80 °C	%	b. o. ISO 2577	–	0.4 – 0.6	0.3 – 0.5	–
Molding shrinkage, normal	150 x 105 x 3 mm; 260 °C / mold 80 °C	%	b. o. ISO 2577	0.4 – 0.5	–	–	0.4 – 0.5
Mechanical properties (23 °C / 50 % r. h.)							
C Tensile modulus	1 mm/min	MPa	ISO 527-1, -2	3950	3200	4800	3950
C Tensile yield stress	50 mm/min	MPa	ISO 527-1, -2	63	65	65	63
C Streckdehnung	50 mm/min	%	ISO 527-1, -2	4.0	4.0	3.0	4.0
Tensile stress at break	50 mm/min	MPa	ISO 527-1, -2	50	50	40	50
Tensile stress at break	50 mm/min	%	i. A. ISO 527-1, -2	15	> 30	10	19
Tensile yield stress	5 mm/min	MPa	ISO 527-1, -2	–	–	–	–
Tensile yield strain	5 mm/min	%	ISO 527-1, -2	–	–	–	–
C Tensile stress at break	5 mm/min	MPa	ISO 527-1, -2	–	–	–	–
C Tensile strain at break	5 mm/min	%	ISO 527-1, -2	–	–	–	–
Izod impact strength	23 °C	kJ/m²	ISO 180-U	–	–	–	–
Izod impact strength	–30 °C	kJ/m²	ISO 180-U	–	–	–	–
Izod notched impact strength	23 °C	kJ/m²	ISO 180-A	9	11	6	9
Izod notched impact strength	–30 °C	kJ/m²	ISO 180-A	7	–	–	7
Thermal properties							
C Temperature of deflection under load	1.80 MPa	°C	ISO 75-1, -2	94	85	85	94
C Temperature of deflection under load	0.45 MPa	°C	ISO 75-1, -2	–	95	92	–
C Vicat softening temperature	50 N; 50 °C/h	°C	ISO 306	106	101	96	106
C Vicat-Erweichungstemperatur	50 N; 120 °C/h	°C	ISO 306	108	103	98	108
C Coefficient of linear thermal expansion, parallel	23 to 55 °C	10⁻⁴/K	ISO 11359-1, -2	0.48	0.7	0.46	0.48
C Coefficient of linear thermal expansion, senkrecht	23 to 55 °C	10⁻⁴/K	ISO 11359-1, -2	0.59	0.7	0.63	0.59
C Burning behavior UL 94 (UL)		Class	UL 94	–	–	–	–
C Burning behavior UL 94 (UL registration)		Class	UL 94	V-0 (0.75 mm)	V-0 (0.75 mm)	V-0 (1.5 mm)	V-0 (0.75 mm)
C Burning behavior UL 94-5V (UL registration)		Class	UL 94	5VB (2.0 mm)*	5VB (2.0 mm)	–	5VB (2.0 mm)
C Burning behavior UL 94-5V (UL registration)		Class	UL 94	5VB (3.0 mm)*	5VA (3.0 mm)	–	5VA (3.0 mm)
Electrical properties (23 °C / 50 % r. h.)							
C Relative permittivity	100 Hz	–	IEC 60250	–	3.1	3.1	–
C Relative permittivity	1 MHz	–	IEC 60250	–	3.0	3.0	–
C Dissipation factor	100 Hz	10⁻⁴	IEC 60250	–	50	50	–
C Dissipation factor	1 MHz	10⁻⁴	IEC 60250	–	70	70	–
C Volume resistivity	–	Ohm · m	IEC 60093	–	1E14	1E14	–
C Surface resistivity	–	Ohm	IEC 60093	–	1E16	1E16	–
C Electrical strength	1 mm	kV/mm	IEC 60243-1	–	35	35	–
C Comparative tracking index CTI	Solution A	Rating	IEC 60112	–	275	275	–
Other properties (23 °C)							
C Water absorption (saturation value)	Water at 23 °C	%	ISO 62	0.5	0.5	0.5	0.5
C Water absorption (equilibrium value)	23 °C; 50 % r. h.	%	ISO 62	0.2	0.2	0.2	0.2
C Density	–	kg/m³	ISO 1183-1	1300	1200	1280	1300
Glass fiber content	Method A	%	i. A. ISO 3451-1	–	–	–	–
Processing conditions for test specimens							
C Injection molding: melt temperature	–	°C	ISO 294	260	240	240	260
C Injection molding: mold temperature	–	°C	ISO 294	80	80	80	80
C Injection molding: injection velocity	–	mm/s	ISO 294	240	240	240	240

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

* (Covestro Test)

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.

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.
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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.

These products are not designated for the manufacture of a medical device or of intermediate products for medical devices[1]. These products are also not designated for food contact[2], including drinking water, or cosmetic applications. If the intended use of the products is for the manufacture of a medical device or of intermediate products for medical devices, for food contact products or cosmetic applications, Covestro must be contacted in advance to provide its agreement to sell such products for such purpose. Nonetheless, any determination as to whether a product is appropriate for use in a medical device or intermediate products for medical devices, for food contact products or cosmetic applications must be made solely by the purchaser of the product without relying upon any representations by Covestro.

1) Please see the "Guidance on Use of Covestro Products in a Medical Application" document.
2) As defined in Commission Regulation (EU) 1935/2004.

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