



# Ultrafuse<sup>®</sup> ABS

Strong | impact resistant | rigid

## Extended TDS

Complete Technical Documentation and  
Testing Summary

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# Technical Data Sheet

## Product description (one sentence).

Filament Properties		
Filament Diameter	1.75 mm	2.85 mm
Diameter Tolerance	±0.050 mm	±0.1 mm
Average ovality	<0.050 mm	<0.050 mm
Available Spool size	750 g	750 g
Available colors	natural white, black, blue, red	

Spool Properties				
Spool size	750 g	2.0 kg	4.0 kg	8.0 kg
Outer diameter	200 mm	300 mm	350 mm	355 mm
Inner diameter	50.5 mm	51.5 mm	51.7 mm	36 mm
Width	55 mm	103 mm	103 mm	167 mm

Recommended 3D-Print processing parameters	Used for test specimens	
Printer	FFF printer	Ultimaker 3
Nozzle Temperature <sup>1)</sup>	240 – 260 °C / 464 – 500 °F	260 °C / 500 °F
Build Chamber Temperature	-	Closed chamber, passively heated
Bed Temperature	90 – 110 °C / 194 – 230 °F	100 °C / 212 °F
Bed Material	Tape, spray, glue	Glass+3DLac
Nozzle Diameter	≥ 0.4 mm	0.4 mm
Print Speed	40 - 80 mm/s	40 mm/s
Max Volumetric Speed <sup>2)</sup>	22 mm <sup>3</sup> /s	//

Please check your standard and/or high speed print profile availability for an easy start at [www.forward-am.com](http://www.forward-am.com).

<sup>1</sup> Fast printing might require an additional increase of the nozzle temperature; the stated printing speed is based on current validations. As equipment and technology continues to evolve, it is possible that even higher printing speeds may be attainable in the future.

<sup>2</sup> Based on Bambu Lab X1C with a nozzle diameter of 0.4 mm

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Please contact us for further product information, like for example REACH, RoHS, FCS.

The safety data given in this publication is for informational purposes only and does not constitute a legally binding MSDS. The relevant MSDS can be obtained upon request from your supplier or you may contact Forward AM Technologies GmbH directly at [sales@forward-am.com](mailto:sales@forward-am.com).

Process materials in a well-ventilated room, or use professional extraction systems.

**Further Recommendations**

Drying recommendations to ensure printability and best mechanical properties<sup>3)</sup> 60 °C in a hot air dryer or vacuum oven for 4 to 16 hours

Support material compatibility Single material breakaway

**General Properties**

**Standard**

**Average Values**

Filament Density<sup>4)</sup> ISO 1183-1 1037 kg/m<sup>3</sup>

**Tensile Properties<sup>5)</sup>**

**Standard**

**Average Values**

**XY-Direction**

**XZ-Direction**

**ZX-Direction**

Tensile strength<sup>6)</sup> ISO 527 36.3 MPa - 21.3 MPa

Elongation at Break<sup>6)</sup> ISO 527 7.4 % - 1.8 %

Young's Modulus<sup>7)</sup> ISO 527 1958 MPa - 1608 MPa

**Flexural Properties<sup>6) 8)</sup>**

**Standard**

**Average Values**

**XY-Direction**

**XZ-Direction**

**ZX-Direction**

Flexural Strength ISO 178 56.6 MPa 58.3 MPa 38.6 MPa

Flexural Modulus ISO 178 1833 MPa 1767 MPa 1586 MPa

Flexural Elongation at Break ISO 178 5.3 % 5.0 % 3.1 %

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<sup>3</sup> Please note: To ensure constant material properties the material should always be kept dry.

<sup>4</sup> measured on filament

<sup>5</sup> Samples were conditioned in standard climate (23°C, 50% RH 72h)

<sup>6</sup> Testing speed: 5 / 200 mm/min

<sup>7</sup> Testing speed: 1 mm/min

<sup>8</sup> Testing speed: 2 mm/min

Measured on milled specimens

Impact Properties <sup>6)</sup>	Standard	Average Values		
		XY-Direction	XZ-Direction	ZX-Direction
Impact Strength Charpy (notched)	ISO 179-2	16 kJ/m <sup>2</sup>	17.4 kJ/m <sup>2</sup>	2.8 kJ/m <sup>2</sup>
Impact Strength Charpy (unnotched)	ISO 179-2	36.4 kJ/m <sup>2</sup>	42.2 kJ/m <sup>2</sup>	6.8 kJ/m <sup>2</sup>
Impact Strength Izod (notched)	ISO 180	18.8 kJ/m <sup>2</sup>	18.9 kJ/m <sup>2</sup>	3.5 kJ/m <sup>2</sup>
Impact Strength Izod (unnotched)	ISO 180	40 kJ/m <sup>2</sup>	35.7 kJ/m <sup>2</sup>	7.2 kJ/m <sup>2</sup>

For the diagrams on mechanical properties see Chapter: [Mechanical Properties Diagrams](#)

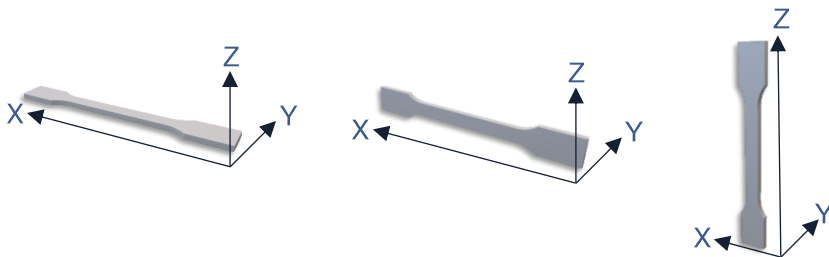
Thermal Properties <sup>6)</sup>	Standard	Average Values
HDT A at 1.8 MPa	ISO 75-2	90 °C
HDT B at 0.45 MPa	ISO 75-2	96 °C
Vicat softening point at 50 N	ISO 306	94 °C
Vicat softening point at 10 N	ISO 306	102 °C
Glass Transition Temperature	ISO 11357-2	104 °C
Melt Volume-Flow Rate (MVR)	ISO 1133	24 cm <sup>3</sup> /10 min (260 °C, 5 kg)

For the diagrams on thermal properties see Chapter: [Thermal Properties Diagrams](#).

Hardness and Abrasion	Standard	Typical Values
Shore Hardness D (15s)	DIN ISO 7619-1	71

**Print direction explanation**

The orientation of the 3D printed part in the printer is always aligned with the longest axis first. The print direction is consistently along the Z-axis.



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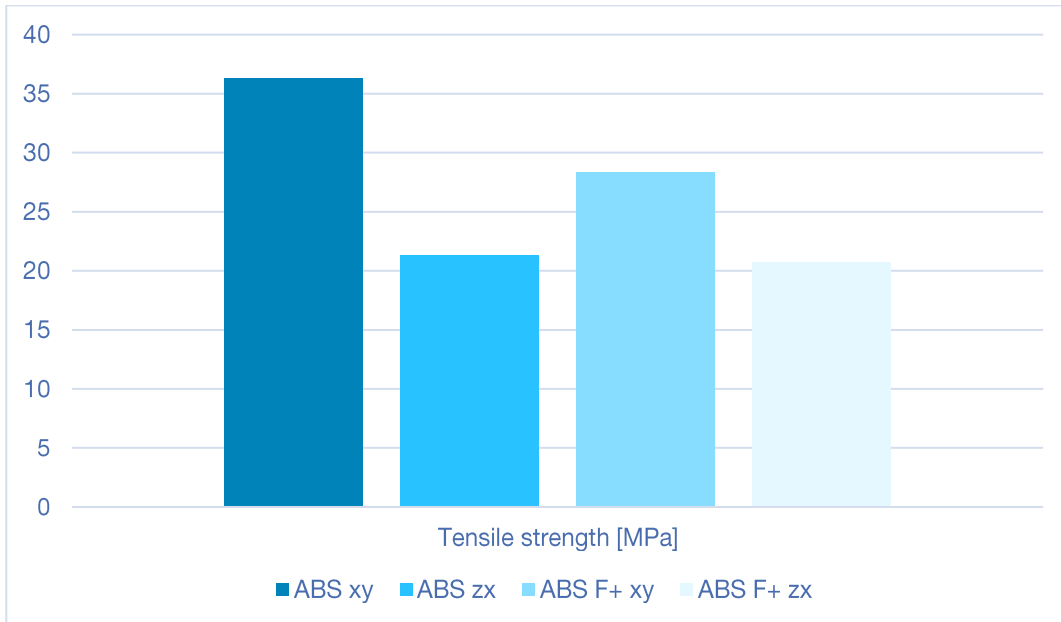
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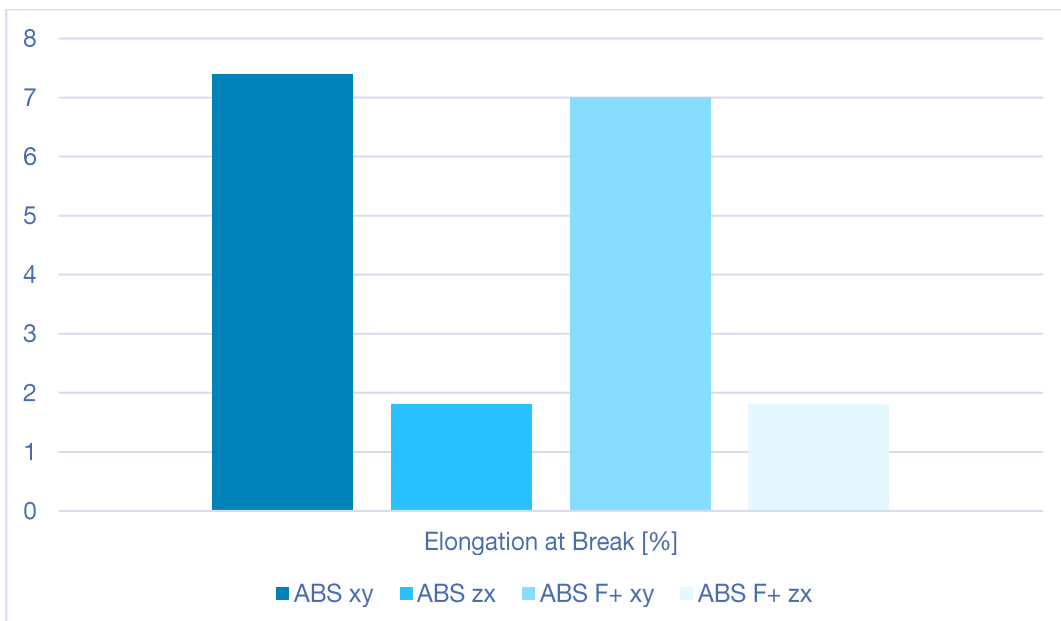
Process materials in a well-ventilated room, or use professional extraction systems.

# Mechanical Propertie Diagrams

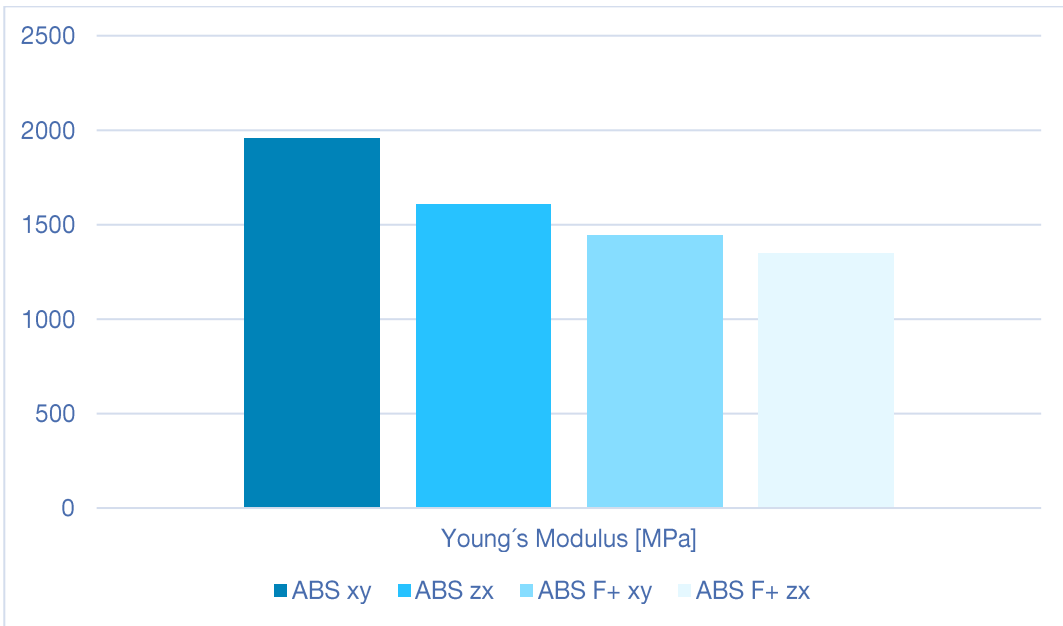
## Comparison Ultrafuse® ABS and Ultrafuse® ABS Fusion+



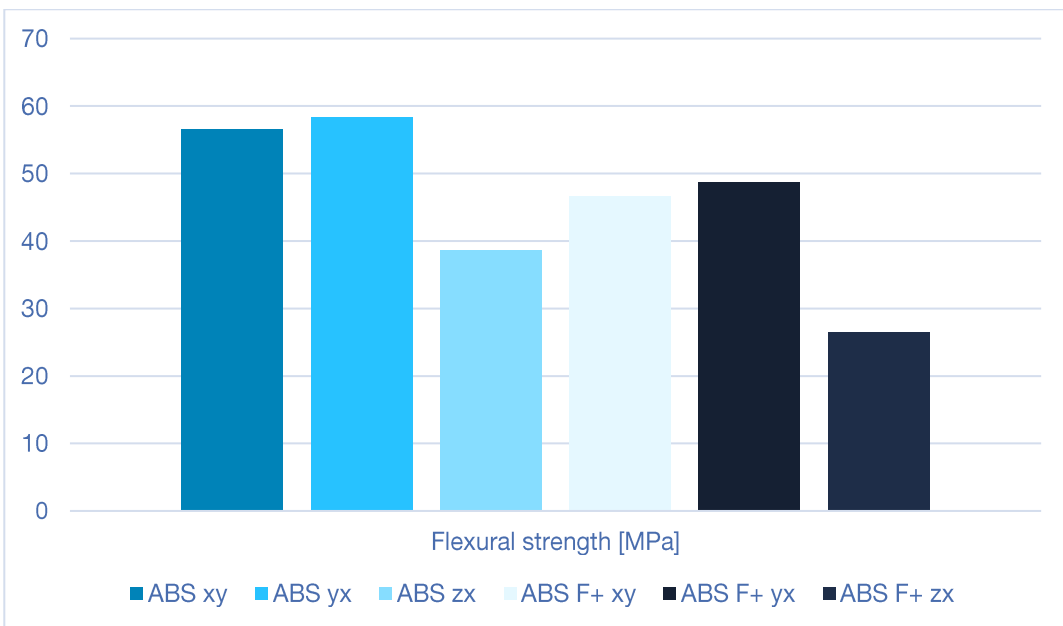
*Tensile strength comparison Ultrafuse® ABS and Ultrafuse® ABS F+*



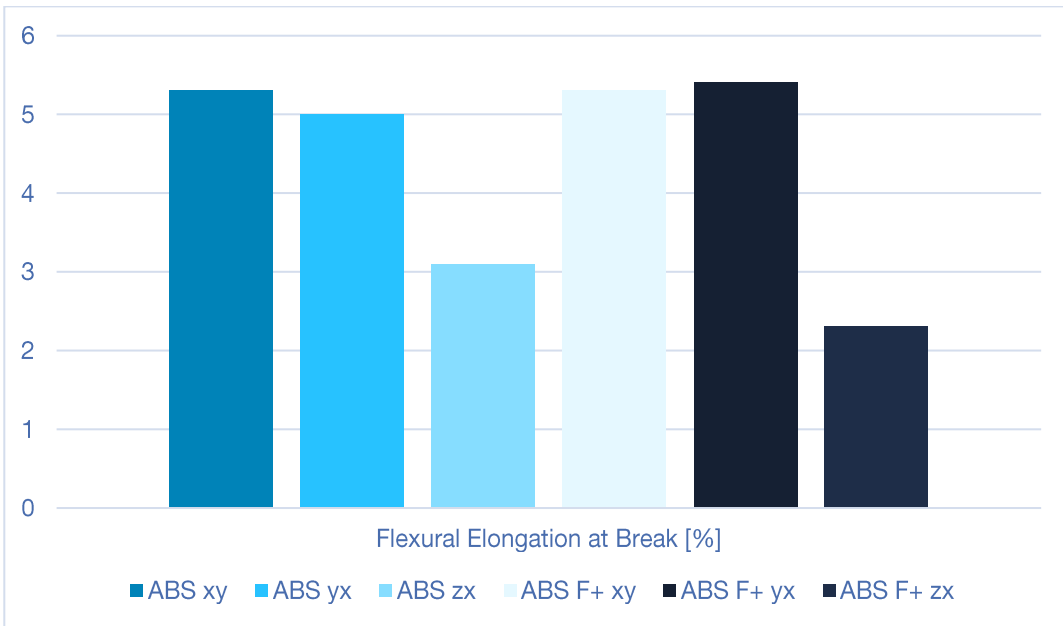
*Elongation at Break comparison Ultrafuse® ABS and Ultrafuse® ABS F+*



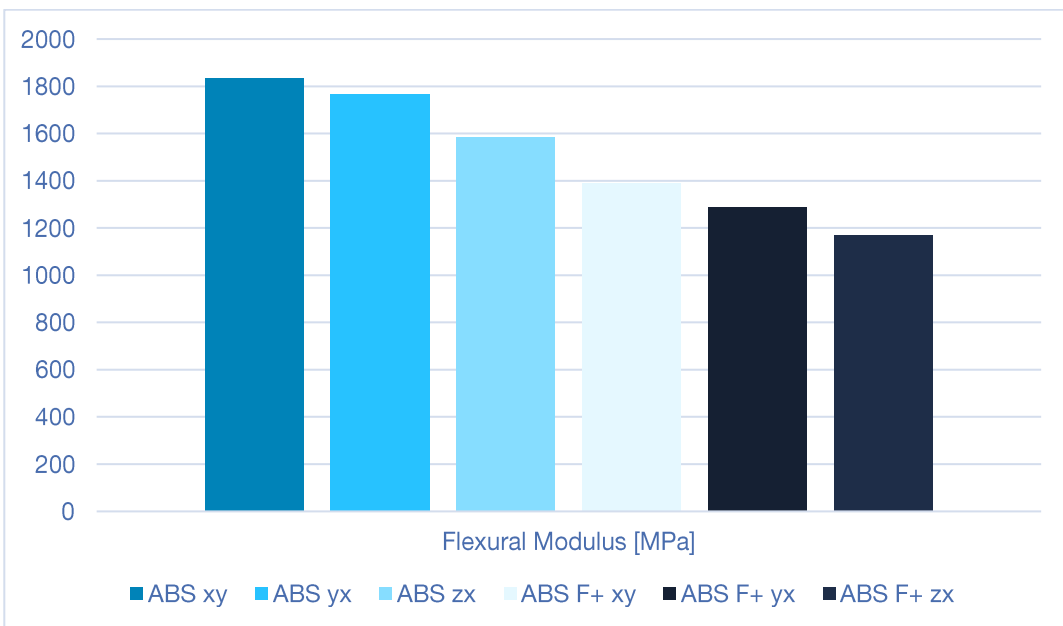
*Young's modulus comparison Ultrafuse® ABS and Ultrafuse® ABS F+*



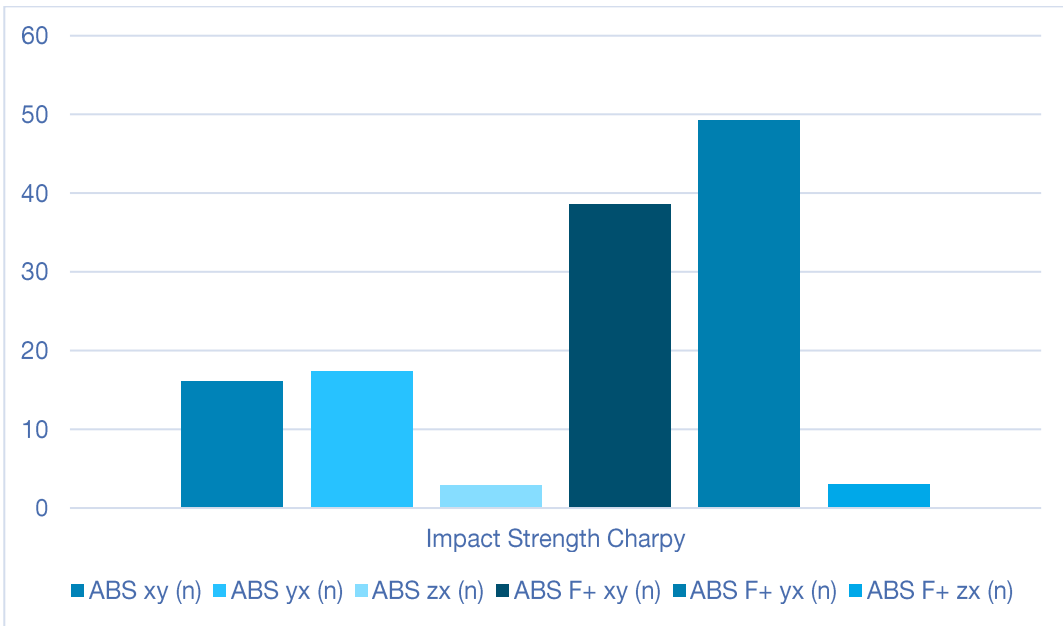
*Flexural strength comparison Ultrafuse® ABS and Ultrafuse® ABS F+*



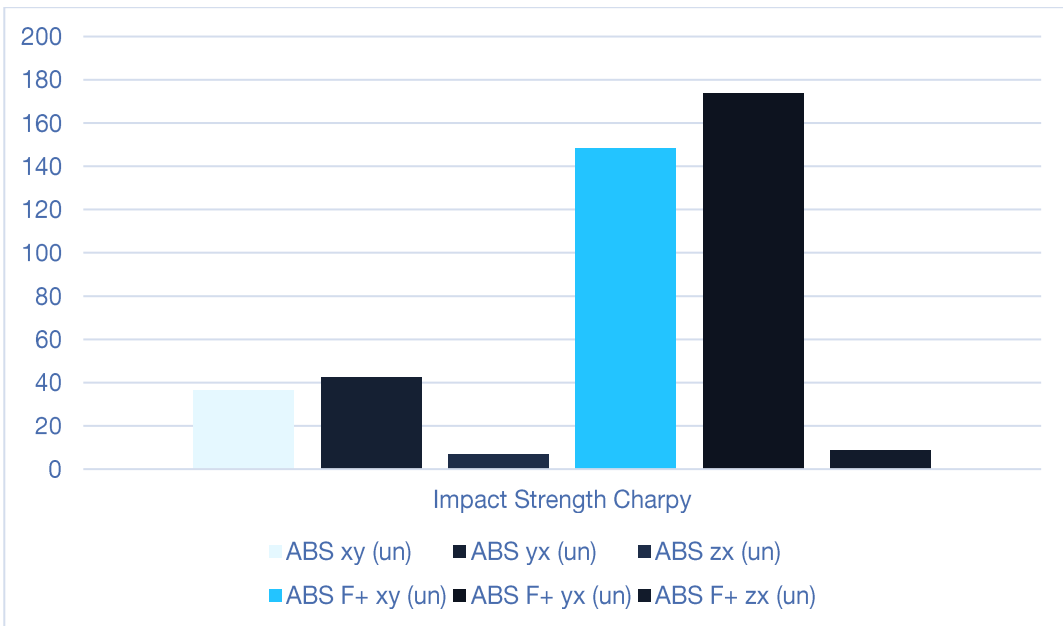
*Flexural Elongation at Break comparison Ultrafuse® ABS and Ultrafuse® ABS F+*



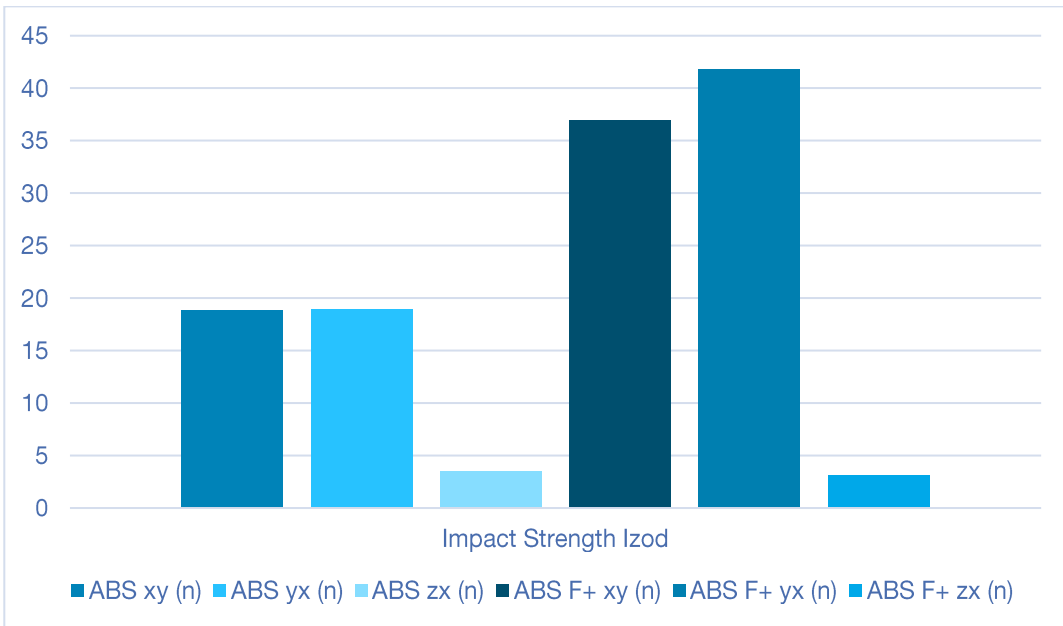
*Flexural Modulus comparison Ultrafuse® ABS and Ultrafuse® ABS F+*



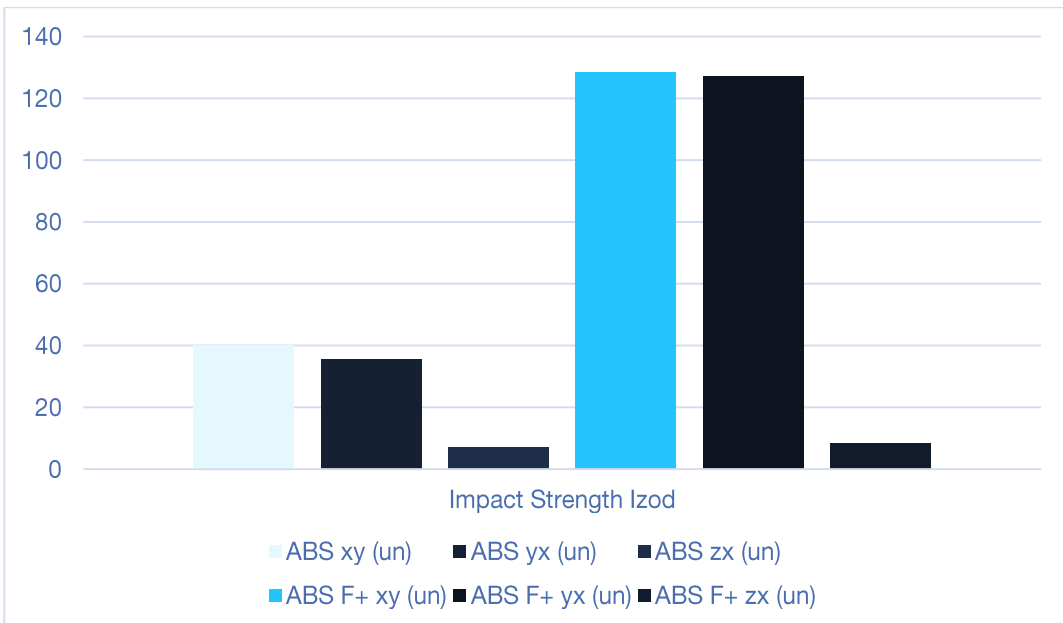
Impact Strength Charpy notched comparison Ultrafuse® ABS and Ultrafuse® ABS F+



Impact Strength Charpy unnotched comparison Ultrafuse® ABS and Ultrafuse® ABS F+



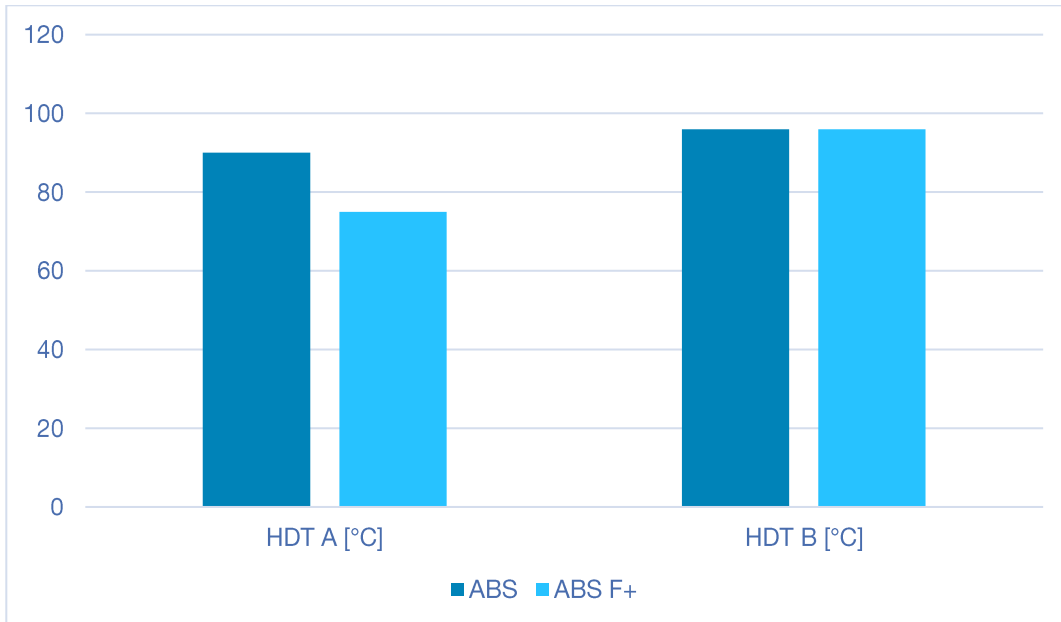
*Impact Strength Izod notched comparison Ultrafuse® ABS and Ultrafuse® ABS F+*



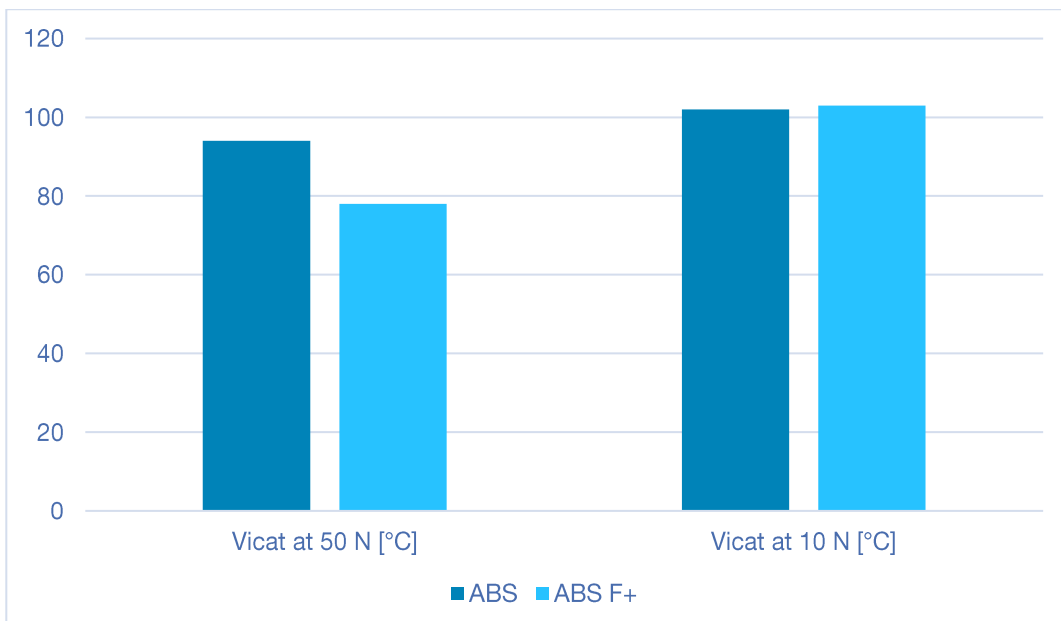
*Impact Strength Izod unnotched comparison Ultrafuse® ABS and Ultrafuse® ABS F+*

# Thermal Properties Diagrams

## Comparison Ultrafuse® ABS and Ultrafuse® ABS F+



*HDT comparison Ultrafuse® ABS and Ultrafuse® ABS F+*



*Vicat comparison Ultrafuse® ABS and Ultrafuse® ABS F+*