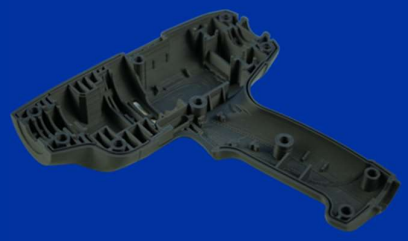
ASA



It is a hybrid polymer, halfway between ABS and PMMA (commercially known as Plexyglass™): of first takes machinability and ease of printing, while the second proposes weather resistance (where the PMMA excels) and mechanical strength.

Compared to ABS we can count on better UV resistance and a surface finish (brighter), as well as good impact resistance. It has good stability for the ageing of colors and under heat.

It is soluble in chlorinated solvents (1,2-chloro ethane, dichloromethane) in 2-butanone and cyclohexane. It has good properties antistatic.

You can use cyanoacrylates and acrylates.

Suggested use

Prototypes	Multi-material applications
Fit and assembly	Final parts
Mech tests	Spare parts
Tools	MRO
Jig and fixtures	

Compatibilities

Support compatibility	SSU00 (break-away)
	SSU09 (Soluble with WAVE powder [1])
Material compatibility	ABS ESD
	Elasto 85, Elasto 95
	Igus I180-PF
	PC-ABS, PC-ABS V0

[1] The SSU09 support is degradable with an alkaline solution obtained by WAVE powder; the proportion of 170 g of powder per 7 liters of water is recommended. We recommend the use of an ultrasonic tank and water at 70 °C.

Easy profiles suggested

Layer	Ø 0.3 mm	Ø 0.4 mm	Ø 0.6mm	Ø 0.8 mm
0.10	**			
0.15	**	*		
0.20	*	**	**	
0.25		**		
0.30		*	**	*
0.40			*	**
0.50				*

** : Recommended
* : Discrete quality

Before printing

Drying	Gentle drying (55 °C) before and during the job is recommended
Cleaning	It's suggested to clean the bed with IPA before print
Print directly on Veltra bed	Feasible but brim is recommended
Extruder	NORMAL (HI-TEMP recommended)
Nozzle	Standard
SPFU	Not compatible

General advice

In case of multi-material print in combination with ELASTO 95, by SSI it is possible to choose SSU00 as support. Both ELASTO have not a good adhesion with SSU00, thus, it is preferable to orientate object in the way that only ABS touches the support.

*Physical properties**

Propriety	Symbol	Standard	Value
Density	ρ	$ISO\ 1183$	1 g/cm^3
Water absorption	w_w	N/A	N/A

*Thermal properties**

Propriety	Symbol	Standard	Value
Melting flow index	$M.F.I.$	ISO 1133	N/A
Glass transition temperature	T_g	ISO 11357	105 °C
Temperature deflection under load	$T_f\ 1{,}8$	ASTM D648	72 °C
Vicat softening temperature	$VST\ B50$	ASTM D1525	98 °C
Coefficient of linear thermal expansion	α	ISO 11359	N/A
Flammability		UL94	N/A

*Electrical properties**

Propriety	Symbol	Standard	Value
Surface resistivity	σ_e	N/A	N/A
Electric strength	E_B	N/A	N/A

* values provided by polymer supplier

Mechanical properties

Based on layer-by-layer deposition, additively manufactured parts, especially with the FDM technique, present a not negligible anisotropy on mechanical properties.

The user must think about the correct displacement of the part in the machine for maximize its mechanical properties.

For this reason, we report the mechanical properties of our specimens considering the three main orientations, by plane x-y (flat), by plane y-z (on edge), and by plane z-x (upright).

All specimens are made with the same printing conditions:

- Infill: 100%
- Nozzle: 0,4 mm
- Layer thickness: 0.2 mm
- Raster angle: 45 °

For more information about the test and specimens' conditions, we suggest checking the ISO references that are reported in the following tables.

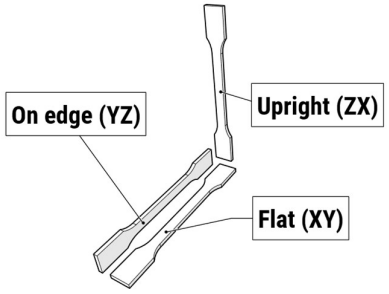


Figure 1: specimen displacement to determine tensile properties (ref. ISO 527-2)

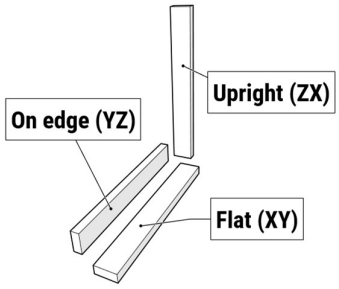
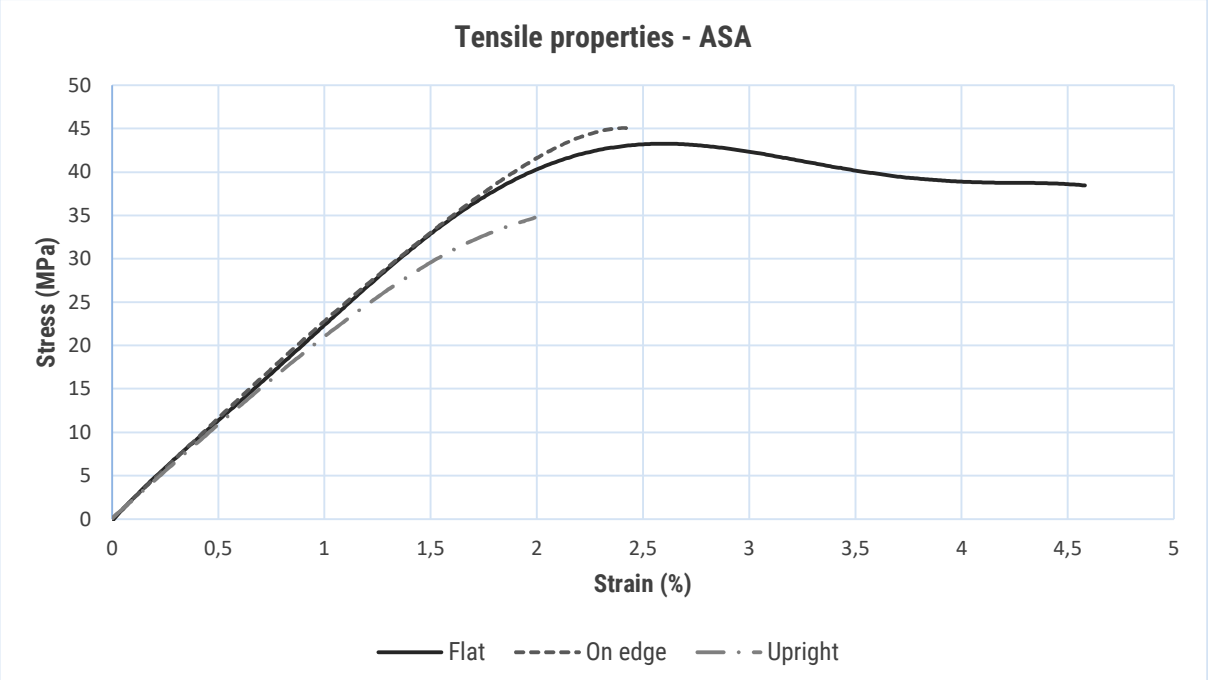


Figure 2: specimen displacement to determine flexural and impact properties (ref. ISO 178 and 179-1)

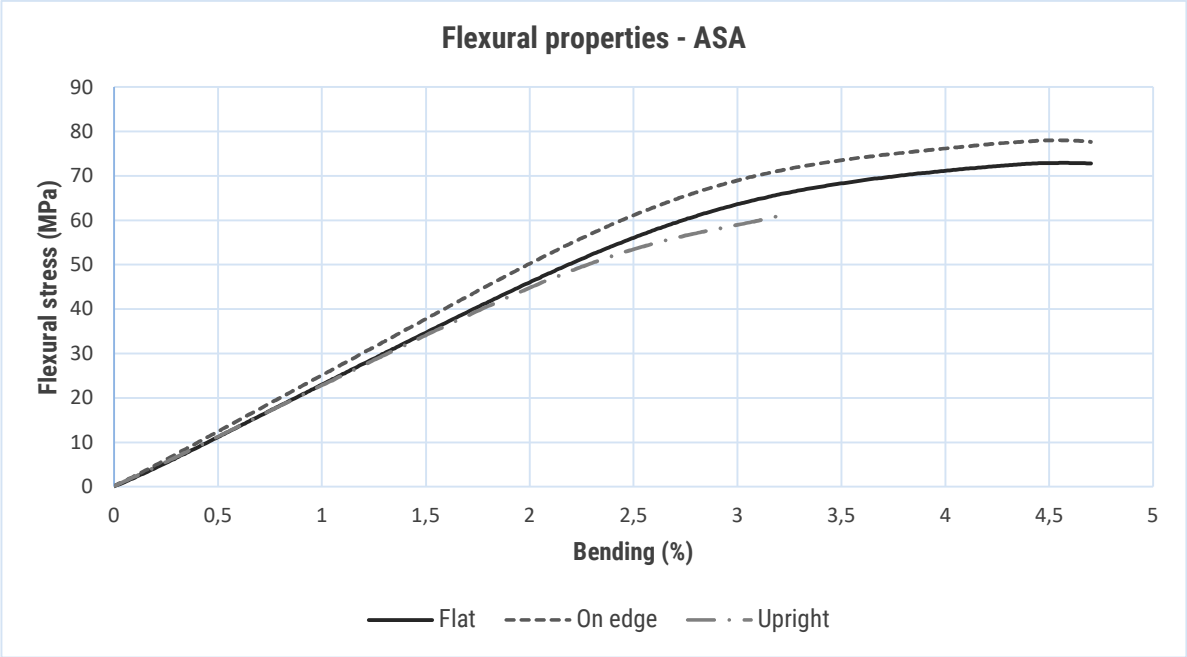
Tensile properties

Propriety	Symbol	Standard	Specimens build direction	Value
Tensile modulus	E_t	ISO 527-2	Flat	2295 MPa
			On edge	2311 MPa
			Upright	2108 MPa
Yield stress	σ_y		Flat	44 MPa
			On Edge	45 MPa
			Upright	No Yield
Yield strain	ε_y		Flat	2.5 %
			On Edge	2.5 %
			Upright	No Yield
Strength at break	σ_b		Flat	38 MPa
			On Edge	44 MPa
			Upright	34 MPa
Strain at break	ε_b		Flat	4.6 %
			On Edge	2.1 %
			Upright	2.0 %



Flexural properties

Propriety	Symbol	Standard	Specimens build direction	Value
Flexural modulus	E_f	ISO 178	Flat	2166 MPa
			On edge	2403 MPa
			Upright	2177 MPa
Flexural strength	σ_{fc}		Flat	68 MPa
			On Edge	74 MPa
			Upright	64 MPa



Impact properties

Propriety	Symbol	Standard	Specimens build direction	Value
Charpy unnotched impact strength	a_{cu}	ISO 179	Flat	32 kJ/m^2
			On edge	65 kJ/m^2
			Upright	10 kJ/m^2
Type of failure	ToF		Flat	Comp. Break
			On Edge	Comp. Break
			Upright	Comp. Break

The fine print

The information and values listed into this document are provided in good faith, based on specimens printed with 3ntr machines according to the latest version of SSI print parameters valid at the date of issuance, with 0.4mm nozzle and 0.2mm layers (if not otherwise specified).

3ntr provides you with this information for your guidance to select the correct polymer and setup but user is responsible for determining that 3ntr material is safe, technically correct and legal for the selected application.

The values listed in this documents are not meant for design specification or quality control guidelines: is it user responsibility to design parts with appropriate safety margins to comply with any material variation due part design, production, test conditions, use conditions.

The user has also the responsibility to assess the suitability of the product to the selected use, built with part(s) made with 3ntr materials and/or technologies.

3ntr is not responsible for any warranty about suitability, merchantability or fitness of any part manufactured with 3ntr materials and/or technologies.

3ntr is not responsible for any patent infringement from use of any part printed with 3ntr materials and/or technologies.

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