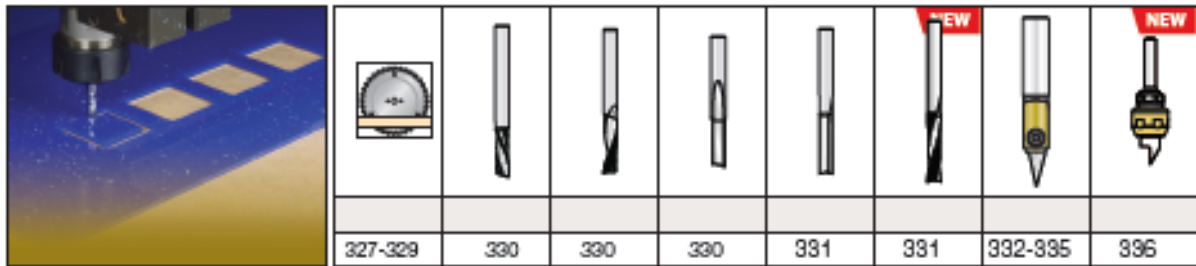


Plastic



Generic Name for Materials Made from Polymer Chains

There is enormous variety of plastics. Various combinations of Polymer structures & sizes could create new mechanical properties. Those different materials are spread over the complete scale of each property (very soft to very hard, clear to blank, heat sensitivity to heat resistance, e.g.). No doubt it is difficult to define the exact cutting condition of rotation speed in related to the cutting feed.

Kindly, refer to a couple guidelines to optimize cutting process:

- The larger the chip size, the larger the tool lifetime.
- For "elastic/soft" material, we highly recommend to work with a minimal number of cutting edges; For instance, it is preferable to work with 1 flute, not with 2 flutes.
- For "hard/breakable" material, it is preferable to use with additional cutting edges; for instance: Using 300 diameter saw with 96 teeth, not 60 teeth.
- Tools for use in plastics are characterized by extremely sharp cutting angles. Carbide tips is required to support an angle in order not to crumble during cutting.



Plastic

Solid Surface
Materials

Aluminum



Composites

In order to define the material it is recommended to use the table below:

Polymer	Tensile Strength MPa	(%) Elongation	Tensile Modulus MPa
HDPE	21-35	15-100	700-1400
LDPE	7-21	50-800	100-250
PP	30-40	150-600	1150-1550
PS	33-35	1-4	2400-3350
PVC	35-63	2-30	2000-4200
ABS	35-48	15-80	1750-2500
PA 6/6	84	60-100	2070-3245
PA 6/12	62	150-340	2100
PC	63	110	2400
PMMA	55-75	5	2400-3100
Polyester	56	300	2400
Polysulfones	70.3	5-6	2482
PEEK	100	40	3900
PET	45-145		2300-10300
PVDC	19	350	345-552
Cellulosics	14-15	6-60	690-2100
PAI	125-185	5-12	710-4900
Polyacrylates	69	50	2400-16600
PPO	55	50	2484-2622
Polyimides	69	50	3588

The property of the tensile modulus and the elongation can give a good idea where the material belongs: is it more breakable or is it considered to be soft?

As the tensile modulus gets bigger and the elongation gets smaller, the material becomes harder and more cutting edges can be used.

This table can also give a perspective of a new material regarding a material that is already known.