

Polygood® CNC Cutting Manual

A short guide + cutting parameters table

1. Purpose and Application

This guide describes safe and effective cutting of Polygood® panels using CNC equipment.

2. Safety (PPE) and Basic Rules

- Safety glasses, hearing protection, respirator; dust extraction is mandatory.
- Keep the work surface clear of unnecessary items.
- Securely clamp the panel before starting work.

3. Key Material Differences (Engineering Notes)

- **HIPS** produces smooth chips that are easily removed from the groove.
- **GPPS (translucent panels)** creates fine particles that, without proper dust extraction, can remain in the groove, increasing friction, causing edge melting, or sticking to the cutter.
- Let the panels acclimate in workshop conditions for 12–24 hours before processing to prevent warping and ensure stable results.
- Take your time. It's better to make multiple passes rather than trying to cut everything at once — this reduces heat and tool load. Translucent patterns and Pebble are more brittle and temperature-sensitive, so handle them carefully and avoid excessive loads.
- Ensure cutter cooling. Do not use oil-based fluids for PS. For drilling, you can use localized water cooling but dry the panel thoroughly afterward. The best solution is air cooling, which helps remove chips and reduces cleaning time. If air cooling is not available, water can be used with caution.

4. Tools and Equipment

Use sharp single-flute cutters designed for plastics. Minimize tool overhang and keep the groove clean for the best edge quality. Check the tool condition regularly: if you notice overheating or burrs, it's time to replace or sharpen the cutter.

Photos of each cutter for easy identification:



Pic. 1. Single-flute end mills with diameters 1/4" and 5/32", used in production for panel trimming.



Pic. 2. D80 S20 663.003.11 (3.15") cutter with replaceable knives, used for thickness calibration.



5. Cutting Parameters Table

Patterns	Cutter	Step	Maximum cutting depth	Spindle speed (rpm)	Working feed rate (m/min)	Plunge feed rate (m/min)
Dark Knight	1/4"	0,16"	0,16"	15000	235	40
Pattern No 5	1/4"	0,16"	0,16"	15000	235	40
Reverse Timeless Duo	1/4"	0,16"	0,16"	15000	235	40
Sea Foam Grey	1/4"	0,16"	0,16"	15000	235	40
Pure Grey	1/4"	0,16"	0,16"	15000	235	40
White Lollipop	1/4"	0,16"	0,16"	15000	235	40
Vintage Pearl	1/4"	0,16"	0,16"	15000	235	40
Emerald Ghost	1/4"	0,16"	0,16"	15000	235	40
Marble Desert	1/4"	0,16"	0,16"	15000	235	40
Black Lollipop	1/4"	0,16"	0,16"	15000	235	40
Sea Foam Dark	1/4"	0,16"	0,16"	15000	235	40
Flecked White	1/4"	0,16"	0,16"	15000	235	40
Milky Way	1/4"	0,16"	0,16"	15000	235	40
Fleur De Sel	1/4"	0,16"	0,16"	15000	235	40
Greycious	1/4"	0,16"	0,16"	15000	235	40
Sea Foam Blue	1/4"	0,16"	0,16"	15000	235	40
Salmon Terra	1/4"	0,16"	0,16"	15000	235	40
Marbellous	1/4"	0,16"	0,16"	15000	235	40
Terrazzo Nuovo	1/4"	0,16"	0,16"	15000	235	40
Espresso Noir	1/4"	0,16"	0,16"	15000	235	40
Timeless Duo	1/4"	0,16"	0,16"	15000	235	40
Victorious	1/4"	0,16"	0,16"	15000	235	40
White Terrazzo	1/4"	0,16"	0,16"	15000	235	40
Sapphire Terrazzo	1/4"	0,16"	0,16"	15000	235	40
Glaze Sprinkles	1/4"	0,16"	0,16"	15000	235	40
Salt Dune	1/4"	0,16"	0,16"	15000	235	40
Midnight	1/4"	0,16"	0,16"	15000	235	40
Pumice	1/4"	0,16"	0,16"	15000	235	40
Cliff	1/4"	0,16"	0,16"	15000	235	40
Oyster	1/4"	0,16"	0,16"	15000	235	40
Frost	1/4"	0,16"	0,16"	15000	235	40
Haze	1/4"	0,16"	0,16"	15000	235	40
Gossamer	1/4"	0,16"	0,16"	15000	235	40
Pebble	1/4"	0,16"	0,1"	13000	195	40
Translucent Green	1/4"	0,16"	0,1"	13000	195	40
Translucent Neon Green	1/4"	0,16"	0,1"	13000	195	40
Translucent Clear	1/4"	0,16"	0,1"	13000	195	40
Aqua Drift	1/4"	0,16"	0,1"	13000	195	40
Translucent Black	1/4"	0,16"	0,1"	13000	195	40
Translucent Bronze	1/4"	0,16"	0,1"	13000	195	40
Translucent Orange	1/4"	0,16"	0,1"	13000	195	40
Translucent Glitter Gold	1/4"	0,16"	0,1"	13000	195	40
Ice Lollipop	1/4"	0,16"	0,1"	13000	195	40
Translucent Burgundy	1/4"	0,16"	0,1"	13000	195	40
Translucent Red	1/4"	0,16"	0,1"	13000	195	40
Translucent White	1/4"	0,16"	0,1"	13000	195	40
Potpourri	1/4"	0,16"	0,1"	13000	195	40
Maldives	1/4"	0,16"	0,1"	13000	195	40
Translucent Pink	1/4"	0,16"	0,1"	13000	195	40
Coral Reef	1/4"	0,16"	0,1"	13000	195	40
Translucent Glitter Green	1/4"	0,16"	0,1"	13000	195	40



Patterns	Cutter	Step	Maximum cutting depth	Spindle speed (rpm)	Working feed rate (m/min)	Plunge feed rate (m/min)
Dark Knight	5/32"	0,16"	0,12"	18000	235	40
Pattern No 5	5/32"	0,16"	0,12"	18000	235	40
Reverse Timeless Duo	5/32"	0,16"	0,12"	18000	235	40
Sea Foam Grey	5/32"	0,16"	0,12"	18000	235	40
Pure Grey	5/32"	0,16"	0,12"	18000	235	40
White Lollipop	5/32"	0,16"	0,12"	18000	235	40
Vintage Pearl	5/32"	0,16"	0,12"	18000	235	40
Emerald Ghost	5/32"	0,16"	0,12"	18000	235	40
Marble Desert	5/32"	0,16"	0,12"	18000	235	40
Black Lollipop	5/32"	0,16"	0,12"	18000	235	40
Sea Foam Dark	5/32"	0,16"	0,12"	18000	235	40
Flecked White	5/32"	0,16"	0,12"	18000	235	40
Milky Way	5/32"	0,16"	0,12"	18000	235	40
Fleur De Sel	5/32"	0,16"	0,12"	18000	235	40
Greycious	5/32"	0,16"	0,12"	18000	235	40
Sea Foam Blue	5/32"	0,16"	0,12"	18000	235	40
Salmon Terra	5/32"	0,16"	0,12"	18000	235	40
Marbellous	5/32"	0,16"	0,12"	18000	235	40
Terrazzo Nuovo	5/32"	0,16"	0,12"	18000	235	40
Espresso Noir	5/32"	0,16"	0,12"	18000	235	40
Timeless Duo	5/32"	0,16"	0,12"	18000	235	40
Victorious	5/32"	0,16"	0,12"	18000	235	40
White Terrazzo	5/32"	0,16"	0,12"	18000	235	40
Sapphire Terrazzo	5/32"	0,16"	0,12"	18000	235	40
Glaze Sprinkles	5/32"	0,16"	0,12"	18000	235	40
Salt Dune	5/32"	0,16"	0,12"	18000	235	40
Midnight	5/32"	0,16"	0,12"	18000	235	40
Pumice	5/32"	0,16"	0,12"	18000	235	40
Cliff	5/32"	0,16"	0,12"	18000	235	40
Oyster	5/32"	0,16"	0,12"	18000	235	40
Frost	5/32"	0,16"	0,12"	18000	235	40
Haze	5/32"	0,16"	0,12"	18000	235	40
Gossamer	5/32"	0,16"	0,12"	18000	235	40
Pebble	5/32"	0,16"	0,08"	15000	195	40
Translucent Green	5/32"	0,16"	0,08"	15000	195	40
Translucent Neon Green	5/32"	0,16"	0,08"	15000	195	40
Translucent Clear	5/32"	0,16"	0,08"	15000	195	40
Aqua Drift	5/32"	0,16"	0,08"	15000	195	40
Translucent Black	5/32"	0,16"	0,08"	15000	195	40
Translucent Bronze	5/32"	0,16"	0,08"	15000	195	40
Translucent Orange	5/32"	0,16"	0,08"	15000	195	40
Translucent Glitter Gold	5/32"	0,16"	0,08"	15000	195	40
Ice Lollipop	5/32"	0,16"	0,08"	15000	195	40
Translucent Burgundy	5/32"	0,16"	0,08"	15000	195	40
Translucent Red	5/32"	0,16"	0,08"	15000	195	40
Translucent White	5/32"	0,16"	0,08"	15000	195	40
Potpourri	5/32"	0,16"	0,08"	15000	195	40
Maldives	5/32"	0,16"	0,08"	15000	195	40
Translucent Pink	5/32"	0,16"	0,08"	15000	195	40
Coral Reef	5/32"	0,16"	0,08"	15000	195	40
Translucent Glitter Green	5/32"	0,16"	0,08"	15000	195	40



Patterns	Cutter	Step	Maximum cutting depth	Spindle speed (rpm)	Working feed rate (m/min)	Plunge feed rate (m/min)
Pattern No 5	3.15"	1,30"	0,04"	15000	785	200
Reverse Timeless Duo	3.15"	1,30"	0,04"	15000	785	200
Sea Foam Grey	3.15"	1,30"	0,04"	15000	785	200
Pure Grey	3.15"	1,30"	0,04"	15000	785	200
White Lollipop	3.15"	1,30"	0,04"	15000	785	200
Vintage Pearl	3.15"	1,30"	0,04"	15000	785	200
Marble Desert	3.15"	1,30"	0,04"	15000	785	200
Black Lollipop	3.15"	1,30"	0,04"	15000	785	200
Sea Foam Dark	3.15"	1,30"	0,04"	15000	785	200
Flecked White	3.15"	1,30"	0,04"	15000	785	200
Milky Way	3.15"	1,30"	0,04"	15000	785	200
Fleur De Sel	3.15"	1,30"	0,04"	15000	785	200
Greycious	3.15"	1,30"	0,04"	15000	785	200
Sea Foam Blue	3.15"	1,30"	0,04"	15000	785	200
Salmon Terra	3.15"	1,30"	0,04"	15000	785	200
Espresso Noir	3.15"	1,30"	0,04"	15000	785	200
Timeless Duo	3.15"	1,30"	0,04"	15000	785	200
Victorious	3.15"	1,30"	0,04"	15000	785	200
White Terrazzo	3.15"	1,30"	0,04"	15000	785	200
Pumice	3.15"	1,30"	0,04"	15000	785	200
Oyster	3.15"	1,30"	0,04"	15000	785	200
Frost	3.15"	1,30"	0,04"	15000	785	200
Haze	3.15"	1,30"	0,04"	15000	785	200
Gossamer	3.15"	1,30"	0,04"	15000	785	200
Cliff	3.15"	1,30"	0,04"	15000	785	200
Dark Knight	3.15"	1,30"	0,04"	12000	705	200
Emerald Ghost	3.15"	1,30"	0,04"	12000	705	200
Marbellous	3.15"	1,30"	0,04"	12000	705	200
Terrazzo Nuovo	3.15"	1,30"	0,04"	12000	705	200
Sapphire Terrazzo	3.15"	1,30"	0,04"	12000	705	200
Glaze Sprinkles	3.15"	1,30"	0,04"	12000	705	200
Salt Dune	3.15"	1,30"	0,04"	12000	705	200

The cutting modes listed above are valid only when using tools with a sharp cutting edge. During operation, the tool gradually wears down, reducing cutting efficiency and potentially leading to defects on the machined surface.

If signs of tool wear are detected (such as changes in cutting sound, increased heat generation, burrs, or melting), it is necessary to adjust the cutting parameters. It is recommended to reduce spindle speed and feed rate. The exact reduction values should be determined experimentally, depending on the degree of tool wear and the properties of the material being processed.

6. Common Mistakes and How to Avoid Them

- **Feed rate too low** → Leads to excessive friction and edge melting.
Solution: Increase feed rate or reduce spindle speed.
- **Excessive tool overhang** → Can cause vibration and poor-quality panel edges.
Recommendation: Keep tool overhang within 13/32"–25/32" (0.39"–0.79").
- **Plastic buildup on the tool during plunging** → Use ramped toolpaths for entry cuts. When drilling, use a peck-drilling cycle so the tool periodically exits the hole for cooling and chip removal.
- **Insufficient dust extraction** → Accumulation of fine chips (especially with transparent GPPS) can cause overheating or chipping.
Solution: Ensure maximum dust extraction, use air cooling where possible.
- **Dull tool edge** → Causes plastic to stick to the tool, panel edge melting, or chipping of the material.
Solution: Regular sharpening or tool replacement.

