

TOOLING - CNC

Diamond-Like Carbon (DLC) cutting tools

DLC are premium carbide tools coated with a thin, amorphous carbon film, offering an extremely low friction coefficient and high hardness.

These tools are specifically Carbide, Inc. and [ScienceDirect.com](https://www.sciencedirect.com), excel at machining non-ferrous materials like aluminium, copper, and plastics, allowing for superior chip evacuation and increased tool life.

Key Features and Benefits:

- *Reduced Friction & Adhesion:* The smooth, slippery surface prevents aluminium from welding to the cutting edge, resulting in superior surface finishes.
- *High Performance in Non-Ferrous Materials:* Specifically optimized for aluminium, copper, brass, and plastics.
- *Increased Tool Life:* Often extends tool life significantly over conventional uncoated tools.
- *Dry Machining Capable:* Reduces or eliminates the need for coolant, offering cleaner, more efficient operation.
- *Versatile Applications:* Common in CNC end mills, drills, and specialty milling tools.

Typical Applications:

- Aerospace & Automotive: Machining aluminium parts.
- Die & Mold: Finishing of aluminium moulds.
- General Engineering: High-speed milling and drilling in plastics or non-ferrous materials.

DLC coatings are sometimes referred to as diamond-like bonds (sp^3) * or graphite-like bonds (sp^2)*. They offer high hardness, but in some, limited adhesion can occur on hard materials.

* sp^3 hybridization is the mixing of one **s** orbital and three **p** orbitals to form four equivalent, tetrahedral-shaped hybrid orbitals, commonly found in single-bonded atoms like carbon in methane (CH_4) or ethane (C_2H_6). These orbitals, with 25% **s** and 75% **p** character, are arranged at 109.5° angles.

TOOLING - CNC

PART CODE	TOOL
PA143/05B1	Ø5 mm x CL20 Z1 x OA60 x Ø5mm
ACC01/06B1	Ø6 mm x CL20 Z1 x OA80 x Ø6mm
ACC01/08A1	Ø8 mm x CL22 Z1 x OA65 x Ø8mm
ACC01/10C1	Ø10 mm x CL30 Z1 x OA85 x Ø10mm
ACC02/05H1	Ø5 mm x CL20 Z1 x 60 x OA100 x Ø8mm
PA144/10C1	Ø10 mm x CL25 Z1 x 95 x OA120 x Ø10mm

Tool Specifications: Ø5 mm x CL20 Z1 x OA60 x Ø5mm

Here is a breakdown of what each part of the specification typically means in CNC tooling:

- **Ø5mm** (First instance) - **cutting diameter**

This refers to the cutting diameter of the tool, the diameter of the circle formed by the cutting edges as the tool rotates.

- **CL20** - **Cutting Length / Flute Length (LOC)**

This likely stands for **Cutting Length** (also known as flute length), which is the maximum depth the tool can cut vertically in a single pass while fully engaging the flutes. In this case, it is **20 mm**.

- **Z1** - **Number of cutting edges - “flutes”**

This indicates the number of **flutes** (cutting edges) the tool has. **Z1** means it is a **single-flute** cutter. Single-flute cutters are commonly used for aluminium to aid in chip evacuation and prevent chip re-welding.

- **OA60** - **Overall Length**

This likely refers to the Overall Length of the cutting tool, which is the total distance from one end of the bit to the other. In this case, it is **60 mm**.

- **Ø5mm** (Second instance) **shank diameter**



ALUMINIUM MACHINERY

TOOLING - CNC

This refers to the **shank diameter** (the non-cutting part of the tool that fits into the machine's collet or tool holder). In this case, the shank diameter is also **5 mm**, which is a common practice for consistency.

Single-flute bits like this are the "gold standard" for aluminium machining on CNC routers because:

- They allow for higher **feed rates** while keeping heat down.
- They provide superior surface finishes by ejecting large chips quickly.

For Price and availability Contact:

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