Types of Chips in Metal Cutting,

In this article, we will learn about different types of chips in metal cutting. When metals are finished in manufacturing industries through the machining process than metal chips are produced. These metal chips may be of different types. The chips formed depend upon the types of materials used and other factors too. Here we will discuss them in detail.

during the machining process of the work piece to give it the desired shape, metal chips are produced. The chips formed may be of continuous, discontinuous and continuous with built-up edge type. The types of chips formed in the machining process depend upon so many factors, we will discuss it later. Basically there are three types of chips produced in the metal machining and these are continuous, discontinuous and continuous with built-up edge.

The various types of chips in metal cutting are

1. Continuous chips
2. Discontinuous chips &
3. Continuous chips with built-up edge (or BUE chips)

Let's discuss about them one by one

Continuous Chips

If the metal chips formed during machining is without segments i.e. without breakage, then it is called as continuous types of chips.

continuous chips are formed when the ductile material is machined with high cutting speed and minimum friction between the chip and tool face.

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Discontinuous Chips

If the chips formed during machining process is not continuous i.e. formed with breakage is called discontinuous chips.

discontinuous types of chips are formed when hard and brittle metals like brass, bronze and cast iron is machined.

Conditions which are responsible for the formation of discontinuous chips are:

- Low feed rate.
- Small rake angle of the tool.
- High cutting speed.
- High friction forces at the chip tool interface.
- Too much depth of cut.

Advantages

The formation of discontinuous types of chips in brittle materials provides good surface finish, increases the tool life and reduces the consumption of power.

Disadvantages

When discontinuous chips are formed in the ductile materials, the work piece result in poor surface finish and excessive wear and tear of the tool takes place.

Continuous Chips with Built Up Edge

continuous chips with built up edge is formed by machining ductile material with high friction at the chip-tool interface.

It is similar to the continuous types of chips but it is of less smoothness due to the built up edge.

use to formation of the built up edge the rake angle of the tool gets changed and so is the cutting force.

The factors which are responsible for promoting the formation of the BUE chips are:

- Excessive feed rate.
- The small rake angle of the tool.
- Low cutting speed.
- Lack of coolant and this increase the friction between the chip tool interfaces.

Advantages,

The making of the BUE has one advantage i.e. it protects the tool from getting damaged from high friction and temperature generated during the machining process and hence the tool life increases.

Disadvantages,

The formation of these types of chips results in rough surface finish, change in the rake angle and cutting forces.