NARSIMHA REDDY ENGINEERING COLLEGE

UGC AUTONOMOUS INSTITUTION

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UGC - Autonomous Institute

Accredited by NBA & NAAC with 'A' Grade

Approved by AICTE

Permanently affiliated to JNTUH

Department of Mechanical Engineering

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Subject: Metrology And Machines

UNIT-1

UNIT -1 Metal cutting Introduction

Metal cutting is the process of producing a job by removing a layer of unwanted material from a given work piece. of a typical metal cutting process in which a wedge shaped, sharp edged tool is set to a certain depth of cut and relatives to our the work piece.

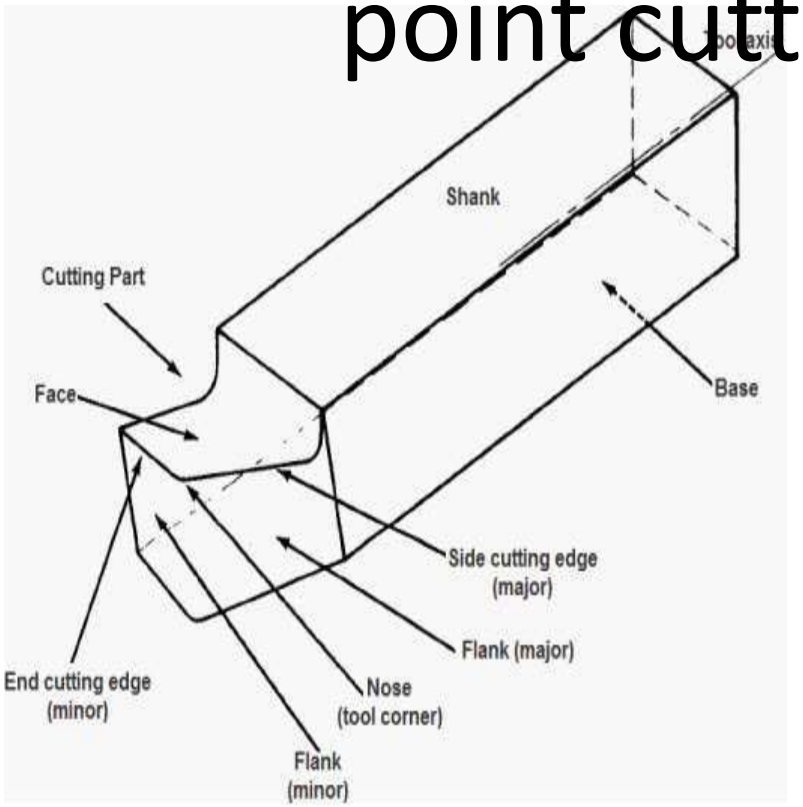
ELEMENTS OF CUTTING PROCESS

The basic elements involved in this process are:(i) A block of metal (work piece).(ii) Cutting Tool.(iii) Machine Tool.(iv) Cutting Fluid.

Geometry of single point cutting tool.

A single point cutting tool consists of a solitary cutting edge, typically made of high-speed steel, carbide, or other robust materials. It is designed to remove material from a workpiece with precision and efficiency.

Geometry of single point cutting tool



Shank:

The shank refers to the clamped section of the tool, constituting the main body situated beside the cutting point. Held securely by the tool post, it provides stability and support to the cutting tool during machining operations.

Side Relief Angle:

The side relief angle represents the angle formed by the side flank concerning the plane perpendicular to the base. Designed to offer relief to the tool, this angle prevents friction between the tool and the workpiece, as well as any unwanted contact between them.

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The face of the tool is the top surface over which the chips slide after the cutting process. Positioned horizontally adjacent to the cutting edges, it plays a crucial role in guiding and directing the metal chips away from the workpiece.

5. <u>Heel</u> –

A line of intersection of flank and base surfaces is known as the Heel of a single-point cutting tool.