

Q1 Discuss purpose of applying cutting fluid in the metal cutting. Briefly discuss their required properties.

Ans Purpose of applying cutting fluid in the metal cutting operation:

- (a) To cool the tool and workpiece and conduct the heat generated in cutting away from the cutting zone.
- (b) To decrease adhesion b/w chip and tool, provide lower friction and wear and a smaller build up edge.
- (c) Cutting action is improved due to increased shear angle.
- (d) To wash away the chips and keep the cutting region free.
- (e) It helps in keeping freshly machine surface bright by giving a protective coating against atmospheric oxygen and thus protect the finished surface from corrosion.
- (f) To decrease wear and tear of the tool and hence to increase the tool life.
- (g) To improve machinability and reduce machining forces.
- (h) To prevent the expansion of the workpiece.

\* Properties of cutting fluids :- The desirable properties of the cutting fluid are lubricating quality, high heat absorption capacity, high flash point stability, emit no fumes while in contact with hot surface and harmless to workers & workpiece. It must be understood that at high cutting speed heating of tool approaches adiabatic condition and heat flow by conduction has a smaller effect and thus coolant can't be effective in cooling the tool. Lubricants or coolants with tungsten carbide are seldom used as these have detrimental effect on tool life by causing thermal cracking.

Q2 Discuss the mechanism of wear & types of wear.

Ans Wear means any process by which material is removed