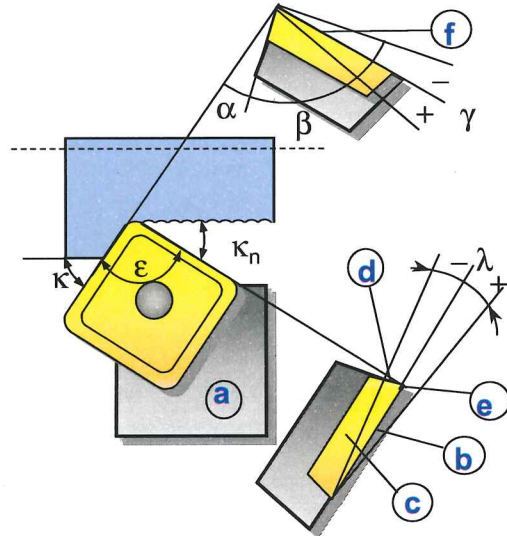


MEC-E7002 Manufacturing methods I
12.4.2019

Answer shortly, use clear and readable fonts.

1. Name a) major cutting edge angle, b) clearance (or relief) angle, c) inclination angle. Explain the purpose and effect of each to the cutting (chip removal and result).



2. Fill in the following table concerning characteristics of cutting tool materials so, that 1 = largest, 3 = smallest and 2 = in between.

| Mater./Char. | Hardness | Toughness | Heat resistance | Density | Modulus of elasticity |
|------------------------|----------|-----------|-----------------|---------|-----------------------|
| Tungsten carbide (WC) | | | | | |
| High speed steel (HSS) | | | | | |
| Ceramic | | | | | |

3. Shortly describe the following:

- whirling
- hobbing
- tapping
- broaching
- reaming

4. Which are the purposes of cutting fluids? 1) _____, 2) _____, 3) _____, 4) _____.

5. Describe shortly which materials (stone, steel, stainless steel) and material thicknesses (in millimetres) are suitable for cutting with the following methods/machines:

- Plasma cutting
- Turret punch press
- Laser cutting
- Water jet cutting
- Flame cutting