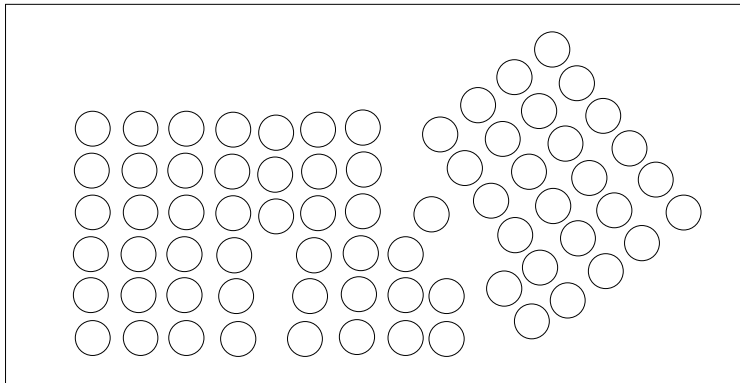
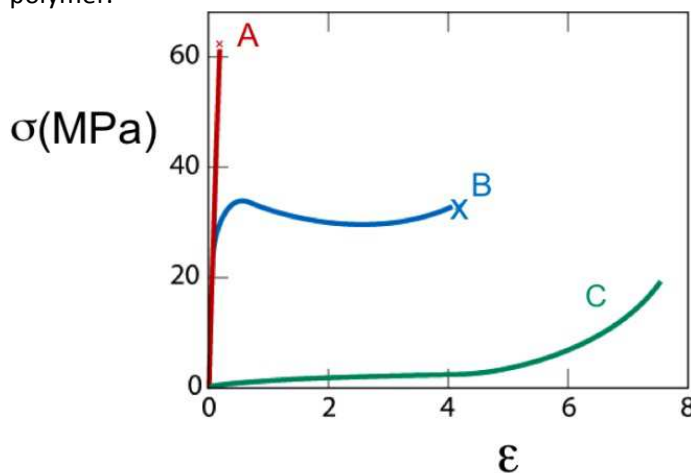


AE4ASM001: Design of Light weight structures 1: Composites & Metals
Preparatory Assignment

1. a) The figure below shows the atomic arrangement in Aluminum. Identify and mark clearly: the individual grains, the edge dislocation line and the grain boundary.



2. b) The figure below shows the 3 typical stress-strain curves of different polymers, i.e. an elastomer, a thermoplast and a thermoset. Match the labels A, B and C with the correct polymer.



2. a) The shear stress distribution of a bonded single lap joint can be defined as a “bath tub curve”. Make a sketch of a “bath tub curve” and indicate the parameters that are presented in this curve.

2. b) Give an explanation of the occurrence of the bath tub curve in bonded joints.

3. a) Two composite manufacturing techniques are Resin Transfer Moulding (RTM) and Vacuum Infusion (VI). Name three other parameters than “viscosity of the resin” that influence the infusion time during the RTM process.

3. b) Explain why RTM is not suitable for large object, while VI is suitable.

4. a) Why is it not possible to ‘electrical discharge machine’ glass reinforced thermoplastic composites?

4. b) What is the main material related difference between processing thermoplastic composite materials and thermoset composite materials?