

Question 4.

a) The material to be selected to manufacture a cylinder needs to have the following properties:-

- low density, as the diver needs to bear the full weight of the cylinder.
- Corrosion resistant, its going into the sea!!
- Ductile, to form it into a cylinder. (malleable).
- Yield strength, high elasticity to cope being under pressure holding the gas.

b) Aluminium = Yield strength is suitable, density is favourable. Already used in lightweight circumstances such as aeroplanes. Also corrosion resistant.

Steel Alloy = lower yield strength but adequate. Maybe too heavy for this application, corrodes.

Stainless Steel = Significant yield strength, maybe too heavy. Although already used as storage tanks, a diver needs to transport it on his/her body, so must be lightweight.

Carbon Fibre = Impressive yield strength, very low density, but so expensive.