



Bathurst Aero Club

Science Week – Aircraft Metals

Aircraft are made out of many different materials including metal, wood and plastic. Selecting the correct materials to build an aircraft is important as they all have positive and negative features. Metal components of aircraft can be shaped using the processes such as casting, machining and forming.

Casting is a process where molten (liquid) metal is injected at high pressure or poured into a mold containing a hollow cavity in the shape of the required part.

The most common casting defects occur when small pockets of gas and foreign materials combine with the liquid metal. These weaken the parts and may cause them to fail when exposed to forces in flight.

Casting is used for a number of aircraft parts such as valves, fluid management systems and engine components. Metals include special casting alloys such as those of aluminium, magnesium and titanium.

Experiment – Casting Chocolate

1. Heat a packet of chocolate melts in a bowl over a pan of warm water (as described on the pack)
2. Pour the liquid chocolate into a mold. If you don't have a chocolate mold you could use an ice-cube tray
3. You might like to add some additional sweets like Smarties, sultanas or sprinkles
4. Place in the fridge to cool
5. Pop the chocolate out of the mold onto a plate
6. Before eating each chocolate try breaking it into pieces



Do you notice any imperfections? Which chocolates were the easiest to break?

Analysis:

This process is similar to how metals are cast for aircraft parts. Metals (solid) are melted (liquid) down and then poured into a cast of the desired shape (solid). Did you notice any imperfections in your chocolates such as air bubbles? Were the chocolates with added sweets easier to break? Imperfections can also occur in metal casting which can weaken the material.