**435**

**Glass – Shaping and Joining**

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**Acknowledgement**

Mr John Gibson is a highly regarded educator and engineer. John taught Industrial Arts at a number of high schools before taking a position at Sydney Teachers’ College, then University of Sydney. He had an engineering education consultancy and has extensive experiencing working with NESA on Engineering Studies syllabus development and the HSC examination committee. The STEM Industry School Partnerships (SISP) Program asked John for his responses to the iTeachSTEM topic discussion questions. SISP is grateful to John for submitting these example discussion responses.

# Explain the properties of glass that make it suitable for many biomedical applications.

As an engineering material, glass is suited to applications of a biomedical nature due to a combination of its properties such as:

* stability, for joint replacement
* strength, for joint replacement
* transparency, for optical applications
* resistance to heat
* chemical neutrality
* insulation for thermal protection

1. **Describe the structure of glass.**

A glass has the nature of a liquid of extremely high viscosity, which, on heating shows no sharp transition to the fluid state. It may consist of one chemical substance or many, and at ordinary temperatures, is hard and brittle.

1. **Describe a shaping method used for a glass in an example of a biomedical product.**

Suitable methods for the production of artefacts in glass come from these processes:

* casting – as for objects
* centrifugal casting – as for glassware
* pressing – as for glassware
* blowing – as for bottles
* rolling – as for glazing
* drawing – as for glazing
* float glass – as for glazing

1. **Describe joining methods used for glass.**

Glassware produced for biomedical applications is fabricated from soda/lime or Pyrex glass pieces ‘welded’ together.