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**Stainless Steel**

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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.

# What properties of stainless steel make if suitable for use in biomedical applications?

Stainless steel is relatively inert and therefore not subject to corrosion when in contact with chemical and bodily fluids. Stainless steel is very strong and readily formed by hot forging and, rolling into sheets.

1. **Name applications where stainless steel is typically used.**
2. **Describe the significant alloying elements of stainless steel.**

* Iron (Fe)
* Nickel (Ni)
* Carbon (C)
* Chromium (Cr)

1. **How would a stainless steel microstructure drawing differ from a mild steel microstructure drawing?**

The microstructure of low carbon mild steel shows an area of eutectoid Pearlite (Ferrite and Cementite) surrounded by some primary grains of Ferrite. Ratios change with composition.

Stainless steels may be whole grains of Austenite or, Martensite depending on composition.

1. **What processes are used to shape stainless steel?**

Stainless steel can be:

* hot forged
* rolled
* cast
* welded
* wrought