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**Testing – Non-destructive**

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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.

# Define non-destructive testing.

A process used to determine the nature and extent of serious problems within stressed industrial components.

1. **Describe an example of a non-destructive testing procedure.**
* **Ultrasonic crack detection** – uses high frequency audio sound waves sent from a metal surface; when they pass a ‘crack’, the waves are reflected to a receiver that records the results
1. **Explain the common applications of non-destructive testing.**

Non-destructive testing is carried out on highly stressed components of machinery, engines, and civil structures to determine the presence of cracks and to assess their significance.

1. **Describe these non-destructive testing procedures:**
* **dye penetrant**
* **X-ray and gamma ray**
* **magnetic particle**
* **ultrasonic**
* **Finite Element Analysis**

1. **Explain the limitations of non-destructive testing.**

All test methods require a variety of equipment to enable successful results to be gained. Many places, where testing has to be done, have limited access making the work much harder. There are health issues with some methods such as using isotopes.