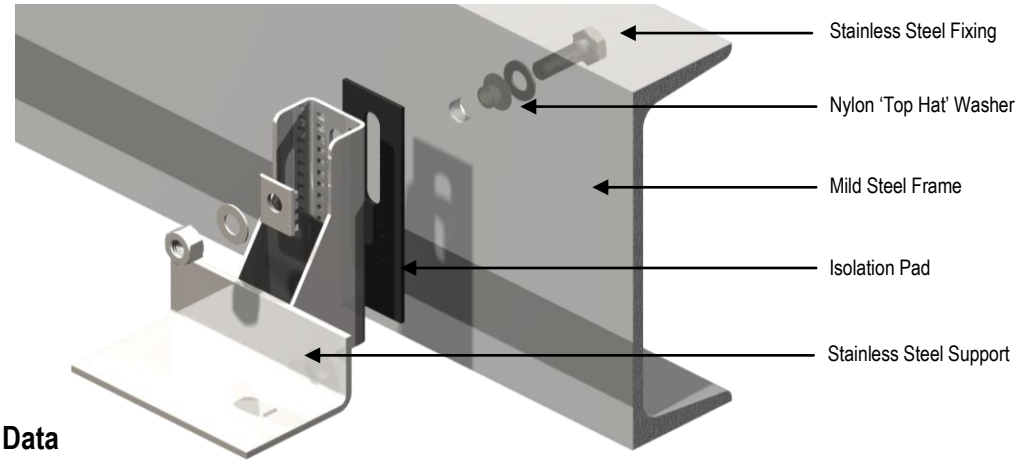
Technical Data Sheet

Bimetallic Corrosion



Technical Data

Bimetallic (galvanic) corrosion may occur when dissimilar metals are in contact in a common electrolyte (e.g. rain, condensation etc.), forming a galvanic corrosion cell. Current can then flow through the solution from the anodic or baser material to the cathodic or nobler material. If this reaction occurs, the less noble material (the anode) corrodes at a faster rate than would have occurred if the metals were not in contact.

Where contact is unavoidable in instances where moisture is likely to be present, the two metals should be isolated from one another with a non-metal barrier.

The degree and rate of corrosion is dependant of a number of contributory factors, including

- The relative areas of the of the metals in contact
- The differential in nobility of the anode and cathode
- The temperature and composition of the electrolyte
- The time that the galvanic corrosion cell remains wet/moist

Avoidance & Prevention

Prevention is possible by excluding water from the bimetallic interface by painting, taping or otherwise coating the joint. Alternatively the two materials should be isolated from one another by painting the contact surfaces or using an isolation material. This can be achieved by using nylon, neoprene or Teflon washers, pads, gaskets or bushes depending on the particular application.

The table (right) provides details of materials that may be used together in certain instances.

	Stainless Steel	Mild Steel	Aluminium Bronze	Phosphor Bronze	Copper	Cast Iron	Aluminium	Zinc
Stainless Steel	✓	×	●	●	●	×	×	●
Mild Steel	×	✓	×	×	×	●	×	×
Aluminium Bronze	●	●	✓	✓	✓	×	×	×
Phosphor Bronze	●	●	✓	✓	✓	×	×	×
Copper	●	●	✓	✓	✓	×	×	×
Cast Iron	×	●	×	×	×	✓	×	×
Aluminium	×	×	×	×	×	×	✓	●
Zinc	●	×	×	×	×	×	●	✓

Key

✓	Can be used in direct contact in all conditions
●	Can be used in direct contact in dry conditions (e.g. above d.p.c. level in a cavity)
×	Should not be used in direct contact

For further information refer to British Standard PD6484: 1979 – Commentary on corrosion at bimetallic contacts and its alleviation

For further information or technical assistance please contact the ACS Technical Department on 0870 850 0860 or email technical@acsstainless.co.uk

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