

Bi-Metallic Corrosion

Because of the number of variables that contribute towards electrolytic or bi-metal corrosion, it is not practical to illustrate all possible situations and therefore the following data should be used for guidance only. If more definitive evidence is required, then we suggest that a test be conducted, employing the materials to be used and analysing the results.

As a general rule the less noble metal corrodes leaving the more noble metal intact, for example, if aluminium and silver are in contact in the presence of a suitable electrolyte a current will flow, resulting in severe corrosion of the aluminium. It should, however, be remembered that many metals are protected from corrosion by natural oxide or passive films and unless these are broken down then they will behave as if they are more noble than their electropotential would suggest. Furthermore the geometry and the relative surface areas of the contacting metals can have a marked reaction on the overall corrosion reaction.

Environmental Conditions

A Internal equipment housed in a room protected from the outside environment.

B External equipment housed outside in a marine atmosphere.

C Equipment immersed in seawater.

Corrosion Effect

1 Severe corrosion may occur between contact material and gasket.

2 Fairly severe corrosion may occur between contact material and gasket.

3 Slight corrosion may occur between contact material and gasket.

4 Very slight or no corrosion may occur between contact material and gasket.

GASKET TYPE	MONEL	SILVER	BERYLLIUM COPPER	STAINLESS STEEL	TINNED COPPERED STEEL	ALUMINIUM
ENVIRONMENTAL CONDITION	A B C	A B C	A B C	A B C	A B C	A B C
CONTACT METAL						
Aluminium	3 1 1	3 1 1	3 1 1	4 2 1	3 1 1	4 4 4
Brass	4 3 2	4 3 2	4 4 3	4 3 3	4 4 3	3 1 1
Cadmium	3 2 1	3 2 1	3 2 1	3 3 2	4 3 2	4 4 4
Carbon	4 3 2	3 2 1	4 3 1	4 4 3	4 2 2	3 1 1
Iron	3 2 1	3 2 1	3 2 1	3 2 1	4 3 2	4 2 1
Chromium	4 4 3		4 4 4	4 4 4	4 2 2	3 2 1
Copper	4 3 2	4 3 2	4 4 4	4 2 1	4 2 2	3 1 1
Phosphor Bronze	4 3 2	4 3 2	4 4 4	4 4 2	4 3 3	3 1 1
Nickel	4 2 2	3 2 1	4 3 2	4 3 2	4 2 2	3 1 1
Silver	4 3 2	4 4 4	3 2 2	4 4 4	4 2 2	3 1 1
Stainless Steel	4 3 2	4 4 4	4 4 3	4 4 4	4 2 2	4 2 1
Tin	4 2 2	4 2 2	4 3 3	4 2 2	4 4 4	3 1 1
Zinc	3 2 1	3 2 1	3 2 1	3 1 2	4 3 2	4 3 3