

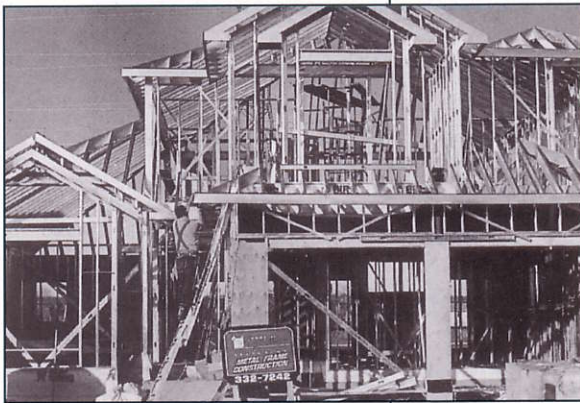


Technical BULLETIN

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In many practical construction applications the contact of dissimilar materials is sometimes unavoidable. When dissimilar metals are in contact with one another in the right medium the condition is called Galvanic Coupling. The effects of galvanic coupling depend on how different the electrochemical properties of the metals are. The following Technical Bulletin describes

the compatibility of Galvanized steel and Aluminum, two materials commonly found together in the construction of lightgauge steel framed homes. Dr. X.G. Zhang is a Corrosion Scientist for Cominco Ltd., and is author of Corrosion and Electrochemistry of Zinc.

Galvanic Compatibility of Galvanized Steel and Aluminum

By X.G. Zhang, Cominco Ltd.

Zinc and aluminum are galvanically compatible materials in atmospheric environments. That is, when these two metals are in direct contact there will be very little galvanic corrosion of either metal resulting from the coupling.

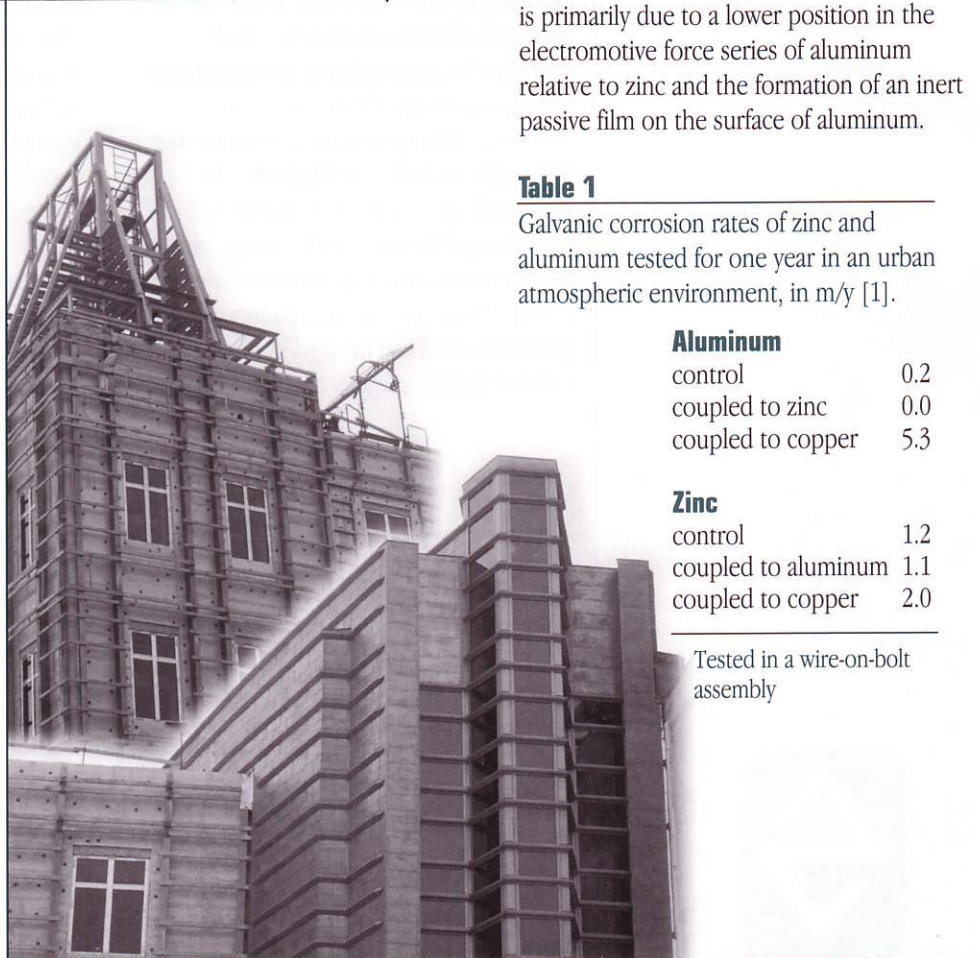
As shown in the Table 1 below, the amount of corrosion of both zinc and aluminum when coupled to each other is close to that of the controls, indicating that there is very little galvanic corrosion. This is in contrast to the coupling with copper for which the amounts of corrosion on both zinc and aluminum are greatly increased due to the galvanic action. The reason for the low galvanic action between zinc and aluminum is primarily due to a lower position in the electromotive force series of aluminum relative to zinc and the formation of an inert passive film on the surface of aluminum.

Table 1

Galvanic corrosion rates of zinc and aluminum tested for one year in an urban atmospheric environment, in m/y [1].

Aluminum	
control	0.2
coupled to zinc	0.0
coupled to copper	5.3
Zinc	
control	1.2
coupled to aluminum	1.1
coupled to copper	2.0

Tested in a wire-on-bolt assembly



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