KEXTRA PRODUCT ADVISORY BULLETIN

METAL AND TIMBER COMPATIBILITY

Metal and timber are naturally different materials, and compatibility between them is critical to the long-term durability, integrity, stability and safety of timber-framed buildings. However, it is not unusual to see premature failures of timber-metal joints due mainly to metal corrosion.
Similar metals are compatible; dissimilar metals are not. When dissimilar metals contact in the presence of an electrolyte, a galvanic action occurs which causes one of the metals to corrode at a much faster than normal rate, while the other corrodes more slowly, if at all. The rate, location, and the extent of the corrosion depend on three factors:

- The difference in electrical potentials
- The conductivity strength of the corroding medium, and
- The relative sizes of the contacting areas.

An important consideration in choosing materials for any project is whether those materials are compatible with each other from a corrosion perspective. In most builds, there are two key scenarios to consider: direct contact of materials (e.g. accessories and fasteners in contact with cladding) and drainage of water from one material to another (e.g. water running from a roof to a gutter or cladding).

Drainage systems should be designed so that direct contact between two or more incompatible metals or alloys does not occur. Drainage from copper or copper alloy roofs, pipes, etc, must not be discharged onto or into aluminium alloy, zinc, zinc-coated or zinc/aluminium alloy-coated steel gutters, downpipes and the like.

Contact with (or run-off from) some materials can damage coated steel products. Buildings can also be susceptible to condensation on inside surfaces. The materials include certain metals, treated timbers and chemicals

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• Don't allow any contact of coated steel products with incompatible materials. (Table 2.1)
• Don't allow discharge of rainwater from incompatible materials onto coated steel products. (Table 2.1).
• Ensure that supporting members are compatible with the coated steel products or, alternatively, appropriately coated.

If there are doubts about the compatibility of other products being used, seek advice from our information line.
Incompatible materials include:
• lead
• copper
• monel metal
• bare steel
• stainless steel
• carbon (in pencils and some rubbers)
• green or some chemically-treated timber (like CCA or tanalith treatments)
• materials subject to cycles of dryness and wetness or which have excessive moisture content (such as improperly-seasoned timber)
• wet and dry concrete
• soils
• vegetable matter
• cleaning agents (e.g. brick cleaning)
• any material which will inhibit normal exposure to the atmosphere.

Table 1.1
Acceptability of drainage from upper surface onto a lower metal surface and direct contact.

COMPATIBILITY OF DIRECT CONTACT BETWEEN METALS OR ALLOYS

ROOF DRAINAGE SYSTEM COMPONENTS & ANY CLADDING MATERIAL	Zincalume (Aluminium Zinc Coated)	Galvanised (Zinc Coated)	Zinc	Stainless Steel	Aluminium Alloys	Copper & Copper Allloys	Lead
Zincalume (Aluminium Zinc Coated)	YES	YES	YES	NO	NO	NO	NO
Galvanised (Zinc Coated)	YES	YES	YES	NO	NO	NO	NO
Zinc	YES	YES	YES	NO	NO	NO	NO
Stainless Steel	NO	NO	NO	YES	NO	NO	NO
Aluminium Alloys	YES	YES	YES	NO	YES	NO	NO
Copper & Copper Allloys	NO	NO	NO	NO	NO	YES	NO
Lead	N0	NO	NO	NO	NO	YES	YES

ACCEPTABILITY OF DRAINAGE FROM AN UPPER SURFACE TO A LOWER METAL SURFACE

LOWER ROOF DRAINAGE SYSTEM MATERIAL	Zincalume (Aluminium Zinc Coated)	Galvanised (Zinc Coated)	Zinc	Stainless Steel	Aluminium Alloys	Copper & Copper Allloys	Lead	Glazed Roof Tiles, Glass & Plastic
Zincalume (Aluminium Zinc Coated)	YES	YES	YES	YES	YES	NO	NO	YES
Galvanised (Zinc Coated)	NO	YES	YES	NO	NO	NO	YES	NO
Zinc	NO	YES	YES	NO	NO	NO	YES	NO
Stainless Steel	YES	YES	YES	YES	YES	YES	YES	YES
Aluminium Alloys	YES	YES	YES	YES	YES	NO	NO	YES
Copper & Copper Allloys	YES	YES	YES	YES	YES	YES	YES	YES
Lead	YES	YES	YES	YES	YES	YES	YES	YES