

Intermetallic galvanic reaction

A major concern when combining steel and aluminium components in salty environments is the degradation of the aluminium components due to intermetallic galvanic corrosion. When aluminium and steel touch in a wet or damp place, a galvanic reaction occurs which leads to corrosion. Aluminium acts as the anode and corrodes rapidly, while steel acts as the protected cathode. This electrochemical process causes pitting, white powdery build up and structural weakening of the aluminium. This risk gets much worse near salt water or harsh chemicals, conditions wheels on cars and other vehicles can have when driving on damp or wet road surfaces. To prevent galvanic corrosion between aluminium and steel, you must break the electrical circuit and block moisture. This can be done by physically insulating the two metals with non-conductive barriers and using protective coatings.

How to try and stop galvanic corrosion?

You can use barriers, for example by using plastic washers, rubber gaskets, nylon bushings or non-conductive sleeves to keep the metals from touching. You can add coatings over the metals (particularly where the aluminium and steel parts are in contact) or cover them with a water dispersant spray like WD40. WD40 can and does displace any water and allows the oil in the mix to form a waterproof coating on the metals.



With Dunlop composite wheels the crevice on the inner side of the chromed steel rim where it is in contact with the lower edge of the aluminium centre is an area particularly prone to intermetallic corrosion. So spraying WD40 there can help resist corrosion.