

PROCESS FOR TREATING METAL WITH AQUEOUS ACIDIC COMPOSITION THAT IS
SUBSTANTIALLY FREE FROM CHROMIUM (VI)
Abstract of the Disclosure

A chromium free conversion coating at least equivalent in corrosion protective quality to conventional chromate conversion coatings can be formed on metals, particularly galvanized steel, by a dry-in-place aqueous acidic liquid comprising:

- (A) a component of anions, each of said anions consisting of (i) at least four fluorine atoms and (ii) at least one atom of an element selected from the group consisting of titanium, zirconium, hafnium, silicon, and boron and, optionally, (iii) one or more oxygen atoms;
- (B) a component of cations of elements selected from the group consisting of cobalt, magnesium, manganese, zinc, nickel, tin, zirconium, iron, aluminum and copper; the ratio of the total number of cations of this component to the total number of anions of component (A) being at least 2:5; and
- (C) sufficient free acid to give the composition, after dilution with from 1 to 19 times its own weight of water, a pH in the range from 0.5 to 5.0; and, optionally,
- (D) a composition that will form an organic resinous film upon drying in place.