

ABSTRACT

**METALLIC MATERIAL HAVING CHROMATE-FREE-TREATED SURFACE
EXCELLENT IN CORROSION RESISTANCE, HEAT RESISTANCE, ANTI-
FINGERPRINT PROPERTY, CONDUCTIVITY, COATING PROPERTY AND
BLACK DEPOSIT RESISTANCE DURING PROCESSING**

Disclosed is a metallic material having a chromate-free-treated surface which satisfies all of corrosion resistance, heat resistance, anti-fingerprint property, conductivity, coating property and black deposition resistance during processing which have been difficult to overcome by conventional chromate-free techniques. The metallic material comprises a metallic material and a composite coating film formed on the surface of the metallic material. The composite coating film is formed by coating an aqueous metal surface treatment agent on the surface of the metallic material and then drying the agent. The aqueous metal surface treatment agent comprises: an organic silicon compound (W) produced by compounding a silane coupling agent (A) having one amino group in the molecule with a silane coupling agent (B) having one glycidyl group in the molecule at a ratio [(A)/(B)] of 0.5 to 1.7 by mass in terms of solid content; at least one fluoro compound (X) selected from titanium hydrofluoride and zirconium hydrofluoride; phosphoric acid (Y); and a vanadium compound (Z), and the composite coating film contains all of the components (W), (X), (Y) and (Z).