

ABSTRACT

5 The present invention provides a metal material  
given a chrome-free surface treatment satisfying all of  
the requirements of corrosion resistance, heat  
resistance, fingerprint resistance, conductivity,  
coatability, and blackening resistance at the time of  
working, which was difficult to achieve with conventional  
chromate-free technology. The chromate-free surface  
10 treated metal material of the present invention is  
comprised of a metal material on the surface of which is  
coated and dried an aqueous metal surface treatment agent  
comprising an organic silicon compound (W), obtained by  
blending a silane coupling agent (A) containing one amino  
15 group in its molecule and a silane coupling agent (B)  
containing one glycidyl group in its molecule in a solid  
weight ratio [(A)/(B)] of 0.5 to 1.7, at least one type  
of fluorocompound (X) selected from fluorotitanic acid or  
fluorozirconic acid, phosphoric acid (Y), and a vanadium  
20 compound (Z) so as to form a composite coating containing  
the different ingredients.