

Table 6.4.2 K: Summary Assessment of Alternatives to Hard Chromium Electroplating of Industrial Components

Factor		Cr(VI) Plating (Ref.)	Thermal Sprays	Weld Facing Methods	Heat Treatments & Plasma Nitriding	Nano-crystal-line Deposits	Vapor Deposition Methods	Functional Cr(III)
Technical and Performance Criteria	Wear Resistance	Very good	+	+	+	-/+	+ (CrN)	=/+
	Hardness	800VHN	+	+	=/+	-/+	+	=/+
	Impact Resistance	Poor	=	?	+	?	+	?
	Non-Line-of-Sight Plating	Yes	No	?	Yes	Yes	Yes (CVD) No (PVD)	Yes
	Hydrogen Embrittlement	Poor	+	?	+	+	+	?
	Corrosion Resistance	Moderate	+	N/A	+	+	Varies	=
	Smoothness	Requires grinding	=	=	?	+	+	=
	Fatigue Strength	Poor	+	=	?	?	?	?
	Deposition rate	Slow	+	?	?	+	+	?
Human Health Criteria	Carcinogenic	Yes	+	+	+	+	+	+
Environmental Criteria	Volume of waste generated	Significant	+	+	+	+	+	+

COMPARISON KEY							
+	Better	=	Similar	-	Worse	?	Unknown