

RWMA Class 14 - Pure Molybdenum & TZM  
UNS R03600

RWMA CLASS 14Ref: AWS J1.3/J1.3M:2020 - Specification for Materials Used in Resistance Welding Electrodes and Related Equipment

MINIMUM AWS J1.3 PROPERTIES - CLASS 14			CHEMICAL COMPOSITION			
Property	Minimum	Unit	Grade	Mo	Ti	Zr
Electrical Conductivity	30	% IACS	Pure Mo	99.95%	-	-
Hardness	85	HRB	TZM	Balance	0.5%	0.08%

PHYSICAL PROPERTIES - Pure Molybdenum vs TZM		
Property	Pure Mo	TZM
Electrical Conductivity	≥30% IACS	≥30% IACS
Hardness	≥85 HRB	95-100 HRB
Density	10.22 g/cm3	10.16 g/cm3
Melting Point	2,623 C	2,623 C
Recrystallization Temp.	1,100 C	1,400 C
Thermal Conductivity	138 W/m-K	126 W/m-K

RECOMMENDED APPLICATIONS	TZM ADVANTAGES VS PURE MO
<ul style="list-style-type: none"><li>Electrodes for molybdenum welding</li><li>Refractory inserts</li><li>High-temperature applications</li><li>EDM electrodes</li><li>Glass injection molds</li><li>Vacuum furnace components</li></ul>	<ul style="list-style-type: none"><li>+300C higher recrystallization temperature</li><li>Higher hardness (+10-15 HRB)</li><li>Better high-temperature resistance</li><li>Longer life in thermal cycles</li><li>Ideal for intensive 24/7 production</li></ul>

EQUIVALENT DESIGNATIONS					
RWMA Class 14	UNS R03600 (Mo)	UNS R03630 (TZM)	Molybdenum	TZM Alloy	Moly

APPLICATION NOTE: TZM (Titanium-Zirconium-Molybdenum) is the most advanced molybdenum alloy for resistance welding applications. The addition of Ti and Zr raises the recrystallization temperature from 1,100C to 1,400C, resulting in longer life under intensive thermal cycling. For moderate temperature applications, pure Mo is more economical and meets Class 14 requirements.

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Page 1 of 1