AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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STEEL TUBING, SEAMLESS, CORROSION AND HEAT RESISTANT
23Cr - 13.5Ni (309S)

1. ACKNOWLEDGMENT: A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.

2. APPLICATION: Primarily for parts and assemblies requiring both corrosion and heat resistance and especially when such parts and assemblies are welded during fabrication. Parts and assemblies requiring oxidation resistance up to approximately 2000 F, but useful at that temperature only when stresses are low.

3. COMPOSITION:

		Check Analysis Under Min or Over Max	
Carbon	0.08 max	--	0.01
Manganese	2.00 max	--	0.04
Silicon	1.00 max	--	0.05
Phosphorus	0.040 max	--	0.005
Sulfur	0.030 max	--	0.005
Chromium	22.00 - 24.00	0.25	0.25
Nickel	12.00 - 15.00	0.15	0.15
Molybdenum	0.50 max	--	0.03
Copper	0.50 max	--	0.03

4. CONDITION: Solution heat treated free from continuous carbide network, and descaled.

4.1 Fabrication: Any surface finishing operation applied to remove objectionable pits and surface blemished shall be performed prior to the last solution heat treatment. A light polish to improve surface appearance may be employed after solution heat treatment. Passivation treatment shall follow any polishing treatment.

5. TECHNICAL REQUIREMENTS:

5.1 Tensile Properties:

Tensile Strength, psi	100,000 max
Elongation, % in 2 in.	
Strip	35 min
Full Section	40 min

5.2 Flarability: Tubing shall be capable of being flared without formation of cracks or other visisble defects. Specimens for flaring may be cut from any portion of the tube, or an entire tube may be used as a specimen. The end of the specimen to be flared shall be cut square, with the cut end smooth and free from burrs, but not rounded. The specimens shall, at room temperature, be forced axially with steady pressure over a hardened and polished tapered steel pin having a 74 degree included angle, to produce a permanent expanded OD not less than 1.30 times the original nominal OD.