HIGH VANADIUM TOOL STEEL UNS T30311

Rev	Reason of Change	Date	Made By	Reviewed By	Approved By	Status
0	Initial release	28-02-2018	MN	AS	KKD	Released

Summary: This specification covers material for high vanadium tool steel UNS T30311 (AISI A11) made with a powder metal process. This material is recommended for high oscillation rate applications requiring high wear resistance and toughness.

1.0 SCOPE

1.1 This specification covers material for high vanadium tool steel UNS T30311 (AISI A11) made with a powder metal process. This material is recommended for high oscillation rate applications requiring high wear resistance and toughness.

2.0 APPLICABLE SPECIFICATIONS

2.1 AISI A11, ASTM A686

3.0 CHEMICAL REQUIREMENTS

3.1 The chemical analysis shall be as follows:

Carbon 2.35- 2.55%
Chromium 4.90- 5.60%
Molybdenum 1.05- 1.50%
Vanadium 9.15-10.10%
Manganese 0.35- 0.65%
Silicone 0.70- 1.10%
Phosphorous ..... .040% Max
Sulfur ..... 0.13% Max
Iron..... Balance

4.0 MECHANICAL PROPERTIES

4.1 The material shall consist of the following mechanical properties in the hardened and tempered condition:

Hardness ..... 60-64 HRC

5.0 HEAT TREATMENT

5.1 The material shall be furnished in the annealed condition prior to machining. Material to be annealed by slowly heating up to 1600-1650°F (871-899°C) and holding for 2 hours before slowly cooling at a rate of 20-40°F (11-22°C) down to 1000°F (538°C) then air cooling.

5.2 After machining to final dimensions, parts are to be hardened by heat treatment.

5.3 Preheat parts to 1500-1550°F (815-845°C) and hold. After equalizing, austenitize by increasing temperature to 2050°F (1120°C) and hold for 30-40 minutes.

5.4 After austenitizing, quench with either air or positive pressure (vacuum furnace) to below 125°F (50°C) or oil quench to about 1000°F (540°C) before air cooling to below 125°F (50°C).

5.5 After quenching, immediately temper to 1000°F (538°C) and hold for 2 hours before cooling to room temperature. Repeat temper process again.

6.0 MARKINGS

6.1 The heat number shall be marked on a bag securely attached to each batch.