

<b>TAM International, Inc.</b>	
<b>AISI 4130, 95 KSI MYS Forged Material</b>	Specification: <b>ESMA-2000</b>
	Revision Level: <b>A</b>
Reviewed By:	Issue Date:
Approved By:	Review Date:

**1. Scope**

- 1.1. This document provides specifications for AISI 4130 forged material with 95 ksi minimum yield strength used in TAM products.
- 1.2. Materials specified by this document are not in accordance with NACE MR-01-75.

**2. Chemistry**

- 2.1. Materials specified by this document shall conform to the following compositional requirements:

<u>ELEMENT</u>	<u>SYMBOL</u>	<u>WEIGHT %</u>
CARBON	(C)	0.28 - 0.33
MANGANESE	(Mn)	0.50 – 0.75
SILICON	(Si)	0.30 MAX
PHOSPHOROUS	(P)	0.012 MAX
SULFUR	(S)	0.10 MAX
MOLYBDENUM	(Mo)	0.020 – 0.030
ALUMINUM	(Al)	0.015 – 0.050
TIN	(Sn)	0.005 MAX
ARSENIC	(As)	0.008 MAX
NITROGEN	(N)	0.0075 MAX
CHROMIUM	(Cr)	0.90 – 1.15
NICKEL	(Ni)	0.25 MAX
COPPER	(Cu)	0.25 MAX
VANADIUM	(V)	0.03 – 0.05
NIOBIUM	(Nb)	0.04 MAX
TITANIUM	(Ti)	0.03 MAX
CALCIUM	(Ca)	0.005 MAX
LEAD	(Pb)	0.008 MAX
ANTIMONY	(Sb)	0.005 MAX
BISMUTH	(Bi)	0.008 MAX

**3. Mechanical Properties**

- 3.1. The mechanical properties of this material shall conform to the following requirements:

Yield Strength	95,000 – 110,000 psi
Tensile Strength	105,000 psi min
Hardness	18 Rockwell C min
Elongation	15% min
Reduction of Area	40% min

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3.2. Mechanical testing shall be performed in accordance with the latest revision of ASTM A370 on a prolongation which has undergone the same heat treatment and mechanical processing as the finished product. Testing shall be performed for each heat of raw material.

3.2.1. Tensile test specimens shall be machined from mid-radius (round bar shapes), mid-wall (tube shapes), ¼ thickness (plate shapes) locations or full thickness longitudinal strip.

3.3. Hardness testing is not required.

**4. Condition**

4.1. Material shall be rough machined to size and/or descaled unless otherwise stated on purchase order.

**5. Quality**

5.1. Materials specified by this document shall meet the requirements of ASTM A788/A788M-13.

5.2. Material identification number (heat, melt code, etc.) shall be permanently marked on each piece of material, preferable steel stamped.

**6. Reports**

6.1. Material ordered to this specification shall be accompanied by a Material Test Report. Reports shall contain the following minimum information which will be subject to inspection upon receipt:

1. Statement of material condition.
2. Chemical Analysis
3. Mechanical Properties
4. Material Identification Number

**7. Material Acceptance**

7.1. All requirements of this specification are subject to verification at the discretion of TAM International.

7.2. TAM Engineering Manager or designee is ultimately responsible for accepting or rejecting material that does not conform to any portion of this specification.

Rev	Date	Description	Prepared By:	Reviewed By / Approved By	Date
A	2/26/15	New Document	Mark Wyatt	M. Wyatt, G. Fletcher, T. Young	03/20/2015