TAM International Incorporated

AISI 41XX
132 KSI MYS Mechanical Tubing

ESMA-2001

Approval of Document ***ESMA-2001***

Signature _____ Sept. 16, 2021

Luis Garcia – Engineering Manager - Sustaining (Date)

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Scope

1.1 This document provides specifications for AISI 4130 – 4150 Series mechanical tubing with 132,000 ksi minimum yield strength used in TAM products.

1.2 Material specified by this document is **not required to be compliant with NACE MR0175.**

2 Chemistry

2.1 Materials specified by this document shall conform to the following compositional requirements: **See Appendix "A" for specific grade (Page 6).**

3 Mechanical Properties

3.1 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. Test specimens shall be machined from a prolongation removed from the product only after completion of all thermal processing. Testing shall be performed for each heat and lot of raw material.

3.2 The mechanical properties of this material shall conform to the following requirements:

Yield Strength	132,000 psi min
Tensile Strength	148,000 psi min
Hardness	30-36 RC
Elongation	15% min
Reduction of Area	40% min

3.3 Test specimens shall be machined from mid-wall locations or a full thickness longitudinal strip.

4 CONDITION

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

5 QUALITY

5.1 Volumetric NDE

5.1.1 *Volumetric NDE shall be performed with either ultrasonic or radiographic inspection as follows:*

5.1.1.1 As far as practical, the entire volume of each part shall be volumetrically inspected after heat treatment or any other thermal treatment for mechanical properties and prior to machining operations that limit effective interpretation of the results of the examination.

5.1.1.2 For quench-and-tempered products, the volumetric inspection shall be performed after heat treatment for mechanical properties exclusive of stress relief treatments or retempering to reduce hardness.

5.1.1.3 Radiographic NDE – Shall comply with procedures specified in ASTM E94.

5.1.1.4 Ultrasonic NDE – Specification/Acceptance Criteria is per API 5CT SR-2 latest edition. Allows for one or more of the following: ASTM E213, ASTM E570, or ASTM E309.

5.2 No weld repair is permitted.

5.3 Material identification number (heat, melt code, alloy designation, etc.) shall be permanently marked on each piece of material, preferably low stress stamps.

6 COUNTRY OF ORIGIN

6.1 Acceptable countries of origin are United States, Canada, Mexico, United Kingdom, Italy, Spain, France, Germany, Japan, and South Korea. Other countries can be accepted with approval from TAM.

7 REPORTS

7.1 Material ordered to this specification shall be accompanied by a Material Test Report. Reports shall reference the final condition of the material and shall contain the following minimum information which will be subject to inspection upon receipt:

- Statement of material condition
- Dimensions
- Chemical Analysis and Governing Specification
- Yield Strength and Governing Specification
- Tensile Strength and Governing Specification
- % Elongation and Governing Specification
- Reduction of Area and Governing Specification
- Hardness and Governing Specification
- Location of Testing and Test Samples
- "No Weld Repair" statement
- Volumetric NDE Type, Results, and Governing Specification
- Material Identification Number
- Heat Treatment times, temperatures, and quench media.
- Tempering Temperature
- Country of Origin

8 MATERIAL ACCEPTANCE

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

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

8.3 All material deviations must be submitted in writing and approved before machining can begin.

9 REFERENCE DOCUMENTS

9.1 ASTM A519, ASTM 370, API 5CT, ASTM E213, ASTM E570, ASTM E309, ASTM A751, **NACE MR0175**.

10 DOCUMENT REVISION

10.1 Document revisions will be handled in accordance with SOP-009 Document Control.

Appendix "A"

ASTM - 519 – Table 3

Chemical Requirements for Alloy Steels

Chemical Composition Limits, %

Grade	Carbon	Manganese	Phosphorus	Sulfur-Max	Silicon	Nickel	Chromium	Molybdenum
4130	0.28–0.33	0.40–0.60	0.040	0.040	0.15–0.35	...	0.80–1.10	0.15–0.25
4135	0.33–0.38	0.70–0.90	0.040	0.040	0.15–0.35	...	0.80–1.10	0.15–0.25
4137	0.35–0.40	0.70–0.90	0.040	0.040	0.15–0.35	...	0.80–1.10	0.15–0.25
4140	0.38–0.43	0.75–1.00	0.040	0.040	0.15–0.35	...	0.80–1.10	0.15–0.25
4142	0.40–0.45	0.75–1.00	0.040	0.040	0.15–0.35	...	0.80–1.10	0.15–0.25
4145	0.43–0.48	0.75–1.00	0.040	0.040	0.15–0.35	...	0.80–1.10	0.15–0.25
4147	0.45–0.50	0.75–1.00	0.040	0.040	0.15–0.35	...	0.80–1.10	0.15–0.25
4150	0.48–0.53	0.75–1.00	0.040	0.040	0.15–0.35	...	0.80–1.10	0.15–0.25

Rev	Date	Description	Prepared by:	Reviewed By / Approved By	Date
A	7/10/2015	Initial Release / New Document	Mark Wyatt	M. Wyatt, T. Young. / G. Fletcher	7/15/2015
B	09/14/2021	Updated to current standards. Updates denoted in **RED**.	T. Davis/J. Dinkel	J. Dinkel, T. Davis, L. Garcia, C. Kelley, M. Newman, T. Young, D. Gregory / G. Fletcher	09/17/2021