

# AISI 4330M Sucker Rod

## Chemical Composition and Alloy Function

Data-focused reference for Ni-Cr-Mo alloy steel used in high-load sucker rod service. The ranges below consolidate published 4330M / G43300 sucker rod datasheet values. Final acceptance should follow API 11B, project specification, MTC and heat-lot records.

### Material identity

AISI 4330M / modified UNS G43300 is a nickel-chromium-molybdenum alloy steel route for high-load sucker rod service.

### Strength direction

Typical HS / special-strength 4330M rod data commonly list about 115 ksi min. yield and 140-150 ksi tensile strength.

### Acceptance logic

Composition proves alloy route. Finished rod review still needs heat treatment, tensile test, thread/coupling and traceability records.

## Chemical Composition - Datasheet-Based Typical Range

Element	Typical range	Alloy function	Sucker rod review meaning
<b>C</b>	0.30-0.34%	Strength and heat-treatment response	Controls hardness and tensile response. Excessive carbon can reduce toughness and raise crack sensitivity.
<b>Mn</b>	0.70-1.10%	Strength contribution and steelmaking control	Supports hardenability and deoxidation; helps maintain stable mechanical response after heat treatment.
<b>Si</b>	0.15-0.35%	Deoxidation and secondary strengthening	Useful for clean steelmaking control; should remain within the MTC range.
<b>Ni</b>	1.65-1.85% typical; some references list to 2.00%	Toughness support and high-load service behavior	Key difference from Cr-Mo-only sucker rod routes; helps support impact behavior under heavy rod load.
<b>Cr</b>	0.90-1.10%	Hardenability and strength consistency	Supports through-section response after normalizing and tempering; important for rod body and upset-end uniformity.
<b>Mo</b>	0.15-0.30%; some routes use 0.20-0.30%	Temper resistance and hardenability	Helps strength stability after tempering and supports fatigue-sensitive service areas.
<b>V</b>	0.04-0.10% where specified	Microalloy strengthening / grain refinement	May support refined microstructure and mechanical stability in modified 4330M routes.
<b>P</b>	<= 0.030% typical max.	Residual control	High P can hurt toughness; keep within the certified heat chemistry.
<b>S</b>	<= 0.035% typical max.	Residual control	Lower sulfur helps reduce inclusion-related toughness and fatigue concerns.
<b>Cu</b>	<= 0.35% typical max.	Residual / incidental element	Generally reviewed as a controlled residual in the material certificate.

Note: Published 4330M/G43300 ranges vary slightly by grade route; final acceptance follows project specification, MTC and heat number record.

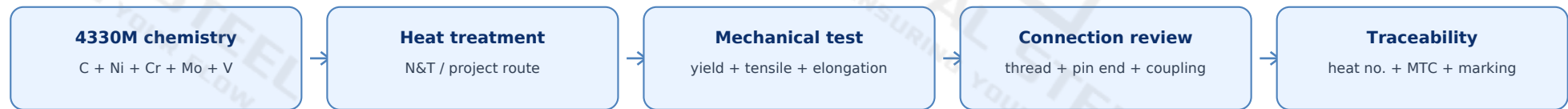
# Alloy Function in Sucker Rod Service

From chemistry to heat treatment, mechanical strength, connection behavior and traceable records.

## Element Function and Rod-Service Meaning

Alloy input	Metallurgical effect	Rod-service meaning
<b>C + heat treatment</b>	Creates strength and hardness response during normalizing / tempering or specified project route.	Supports finished rod tensile level, but must be confirmed by tensile test and heat treatment record.
<b>Ni + Cr + Mo</b>	Improves hardenability, toughness support, temper response and section consistency.	Useful in deep wells, high-load rod strings, PCP service and torque-sensitive applications when corrosion is controlled.
<b>Mo + V</b>	Supports temper resistance, microstructure refinement and mechanical stability where specified.	Helps control fatigue-sensitive areas such as pin end, thread root, shoulder and coupling interface.
<b>Low P / S</b>	Limits harmful residuals that can reduce toughness and fatigue behavior.	Important for consistent performance where repeated tensile load and bending/contact stress occur.

## Material-to-Document Control Chain



**Mechanical Direction**  
Published high-strength 4330M/G43300 sucker rod references commonly list about 115 ksi minimum yield strength, 140-150 ksi tensile strength, 10% minimum elongation in 8 in., and about 40% minimum reduction of area. These are reference values; the actual MTC governs acceptance.

**Engineering Takeaways**  
AISI 4330M is a material route, not the complete finished sucker rod identity. Nickel is the key alloying difference versus many Cr-Mo rod materials. Composition must be linked to heat treatment, mechanical test, thread inspection, coupling match and traceability.

**Data Basis and Caution**  
This PDF consolidates public 4330M / G43300 sucker rod datasheet ranges and comparison-guide values. It is intended for technical communication. Final chemistry, mechanical properties and acceptance status must follow the applicable MTC, API 11B requirement, ITP and project specification.