



North American Stainless

NAS 700 PH, AISI 630, UNS S17400, EN 1.4542

INTRODUCTION

NAS 700 (Type 17-4) is precipitation hardening martensitic stainless steel and is supplied in Hot Rolled and Cold finish condition. It contains 17% Chromium and 4% Ni which makes it superior to corrosion resistance to the regular chromium type martensitic stainless steels. This grade is widely used in the aerospace, petrochemical, chemical, food processing and general metalworking industries.

NAS offers this grade as bar product on hot rolled, annealed and single or double H1150 tempered condition. NAS 700 can be also supplied as Wire Rod in annealed condition.

Typical conditions supplied by NAS with NAS 700:

Annealed condition: Annealed at 1900F (+/- 25F for 1 hr min) then air cool.

Single Temper H1150: Annealed at 1900F (+/-25F for 1 hr min) plus heated to 1150F for 4 hr min and air cooled to room temp.

Double Temper HH1150: Annealed at 1900F (+/-25F for 1 hour min) plus 2X heated to 1150F for 4 hr min and air cooled to room temp.

Most common available specifications: AMS 5643, AMS 2303, ASTM 564

Recent improvement actions:

In the beginning of 2017 NAS has started to conduct special melt shop practice and scrap charge to further improve steel cleanliness, yield, mechanical properties and quality at the end user.

- Improved cleanliness

The new melting practice with the special low P scrap charge has improved steel cleanliness per AMS2303 compare to standard melting practices used in the past. For critical aerospace applications the air melt cleanliness can be achieved with lower inclusion level with typical indication ratings of frequency < 0.10 and severity < 0.05 per AMS 2303. Also material has been routinely tested to AMS 2154 Class AA and Boeing specification requirements and passed with ZERO indications.

- Improved yield at ultrasonic testing machine

By using special scrap and clean steel practices, NAS 700 PH grade is able to achieve better yield at ultrasonic machine testing per API 6A PSL3, ASTM 388-S1 criteria. Typically this yield is 3% higher than standard air melt 17-4.

- Improved machinability

Due to removal of hard inclusions by special melting practice at AOD with lower S, Mn and Ca additions and S additions at the final stage of melting process.

- Improved mechanical properties

Due to special clean steel practice the mechanical properties have been improved to meet requirements at annealed and tempered condition especially toughness and ductility at cryogenic temperature. By using special low P scrap when melting NAS 700 PH grade the residual elements like Phosphorus is below < 0.025% that is very important in Oil Patch industry for achieving better charpy impact results and meeting certain customer specifications and requirements.

Annealed condition: Mechanicals per ASTM A564 with H900 capability

Single and double temper H1150: Mechanicals per ASTM 564. Impact results at room and some cryogenic temperatures.

	Impact AVG 1150 -4F	Impact avg D1150-75F
NAS 700 with special scrap	55	39
Customer/ASTM request (min.)	30	20

- Improved chemistry

Many end user customers have low P specifications < 0.025% that NAS material can now be supplied for those applications.

Chemistry Average	C	CA	CR	CU	MN	MO	N	NB	NI	P	S	SI	TA
NAS 700 PH previous	0.023	0.000	15.25	3.236	0.787	0.109	0.030	0.228	4.238	0.030	0.022	0.569	0.010
NAS 700 PH new chem, scrap, and melt practice	0.020	0.002	15.26	3.255	0.780	0.028	0.025	0.220	4.265	0.017	0.015	0.607	0.010