

4806 West Taft Road
Liverpool, New York 13088
www.tactair.com

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PS1002

Process Specification

Cold Stabilization

Prepared By: F. McClure Date: 9-13-63
Title: Responsible Engineer

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Record of Revisions			
Rev.	Rev. Date	Description	Approved By
-	1963-09-13	Initial date (Ronson Hydraulic Units Corp)	F. McClure
A	2015-11-16	Released in Innovator System per CN-004402	CJR

Acronyms

Acronym	Definition
AISI	American Iron and Steel Institute
AMS	Aerospace Material Specifications
SAE	Society of Automotive Engineers

References

Document	Title
Tactair Documents	
Not Applicable	
Other Documents	
AMS-H-6875	Heat Treatment of Steel

1.0 Scope

This specification covers the procedure to be followed on cold stabilizing heat treated critical parts in extreme temperature valves.

2.0 Applicable Specifications and Drawings

AMS-H-6875 Heat Treatment of Steel Raw Material

3.0 Cold Stabilization Procedure

3.1 Hardening

Hardening shall be accomplished by quenching from the temperature range specified in the applicable specification.

3.2 First Cold Stabilization

Parts shall be transferred from the quench medium into the cold chamber as soon as the parts have cooled to the temperature of the quench medium, but in no case lower than 100°F. Degreasing of parts to remove oil after the quench shall be accomplished rapidly so that transfer into the cold chamber shall not be delayed more than one minute. Continuous cooling from the austenitizing temperature to the cold stabilization temperature is essential in order to accomplish full stabilization and avoid cracks.

Holding time in the cold chamber following quenching shall be 3 hours at the temperature specified in the following table; except when liquid nitrogen is used, the holding time shall be 30 minutes after the boiling reaction stops:

SAE OR AISI NUMBER	MAXIMUM STABILIZATION TEMPERATURE (i)
4340, 4140	-100°F
52100	-140°F
TOOL STEELS	-120°F
440C OR F,431,416	-120°F
NITRIDING STEELS	-120°F

Table 1:0 Hold Time Temperatures

(i) These temperature limits are maximum. Lower temperatures are desirable when practicable.

Following removal from the cold chamber, the parts shall be allowed to reach room temperature, 60°F – 80°F

3.3 First Stress Relief

Within one hour after reaching room temperature, the parts shall be tempered in accordance with specification AMS-H-6875 or stress relieved at 300°F ±15°F for 2 hours. Final hardness of the parts corresponding to drawing requirements shall govern the exact temperature of tempering or stress relieving.

- 3.4**
- A. Nitride or malcomize parts if required by detail drawing
 - B. Parts to have .010 maximum stock on any surface prior to 3.5

3.5 Subsequent Cold Stabilization and Stress Relief

The cold stabilization and stress relief treatments shall be repeated twice in addition to the first stabilization treatment except that the holding times in the cold chamber and during stress relief shall be two hours minimum at temperature, and the stress relief temperature shall be 300°F ±15°F.