NSMAX^{TM}-GR-PS Connection
Field Inspection Procedure

Revision	Date	Reason
0	2023.05.24	Creation
1	2025.12.25	• "Field Repair" has been newly added. • The wording throughout the document has been revised for clarity and accuracy. • Added compound list reference under "9.2 Dope Application" section.

CONTENTS

1. Introduction and Scope

This document outlines the field inspection procedure for NSMAX™ GR-PS semi-premium connections. It provides standardized criteria and methods for inspecting connections both new and in-service connections, whether at rig sites or in storage yards, as well as for evaluating and repairing connections in service when required, ensuring connection integrity and performance.
The procedure covers visual inspection of both PIN and BOX components, including preparation, cleaning, defect evaluation, and post-inspection handling.

3 different versions of NSMAX™ connection have been developed. These are:

- NSMAX™ GR — "GR" stands for "Good Running"
- NSMAX™ GRC — "GRC" stands for "Good Running Coated" for enhanced gas sealability
- NSMAX™ GR-PS — "GR-PS" stands for "Good Running Positioning Shoulder" where the coupling has no J area, and the field end pin shoulders against the mill end pin.

NS MAX™ GR and NS MAX™ GRC are interchangeable, while NSMAX™ GRC-PS is not.
Specifics concerning NSMAX™ GR-PS design are detailed in Para 3. Connection identification.

2. Preparation

2.1 Pipes are to be spaced out on racks with adequate distance to allow rolling 360° for removing protectors, cleaning PIN/BOX connections and for visual inspection.

2.2 Protector removal equipment, such as chain wrench, "T" type bar and/or strap wrench, should be available.

2.3 Cleaning equipment for PIN/BOX, such as steam cleaner, high pressure water, new nylon brushes, compressed air and rags should be provided.

2.4 Cleaning equipment for Pipe OD/ID: In case Pipe OD/ID has been contaminated with, the same equipment listed in 2.3 above should be accessible.

2.5 It is recommended to perform inspection in dry conditions preferably in a covered facility.

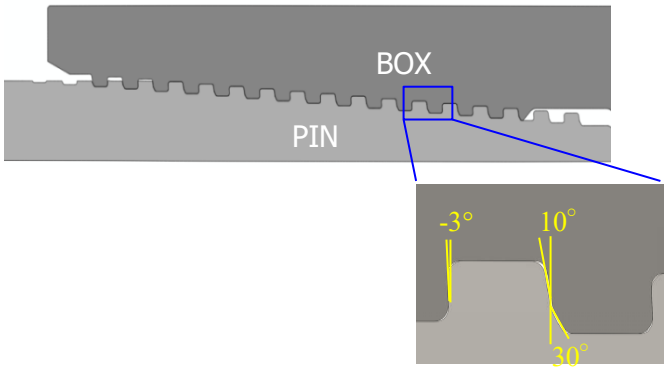
2.6 Before inspection, "Pipe and Connection Identification", such as size, weight, grade, connection type and mill I.D., stencils shall be checked and recorded.

2.7 If "Drifting" is required, it should be performed before the pipe body high-pressure wash where applicable, and always before cleaning and connection inspection. This ensures that the drifting process does not contaminate or damage the connection surfaces.

3. Connection Identification

3.1 Prior to connection inspection, the following characteristics of NSMAX-GR-PS should be verified for connection identification.

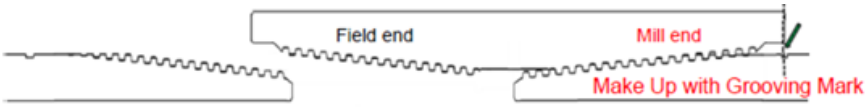
- Design features: 3 TPI, with Pin to Pin shoulder, and without metal-to-metal seal.
- Surface condition: Box is Manganese phosphated, and pin is as machined.



Type	Stepped tapered thread	
Threads / inch	3	Quick make-up
Stabbing angle	10 deg.	Better Compression-resistance
	30 deg.	No cross-threading
Load angle	- 3 deg.	No jump-out

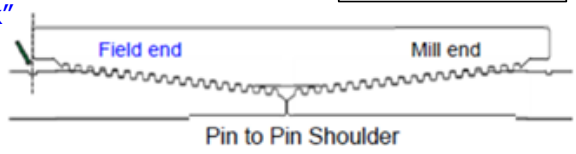
3.2 NSMAX-GR-PS is made up using a positioning shoulder, with a grooving mark provided for visual identification.

Field end make up



Mill end make up

Make up with "Torque + Check with Grooving Mark"
(No torque turn check is required)
➔ **Fast Running**



3.3 If "Pipe and Coupling Stenciling" are unreadable, the pipe shall not be used.

4. Pre-inspection Works

4.1 Protector-removal and Damage Check

If damaged protectors are found, the identification number(s) of the pipe(s) shall be recorded.
→Connections for these pipes shall be thoroughly inspected to confirm that there is no damage on thread surface nor any severe deformation affecting the connection ovality (see Para 7).

4.3 Connection Cleaning

Cleaning should be carried out carefully not to damage phosphating or thread surface. The entire thread surface shall be cleaned for visual inspection.

5. BOX (Coupling Inspection)

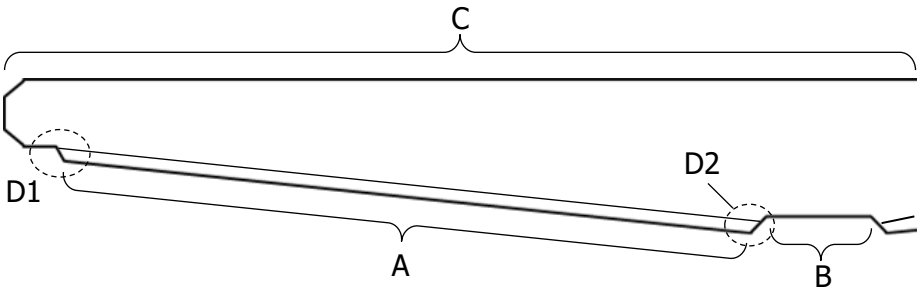
Area definition

A: Thread Area

B: Groove

C: Outside Surface

D1, D2: Chamfer



5.1 Internal Surface (Area A, B and D1/D2)

- The manganese phosphate condition shall be visually verified.
- All areas must be fully phosphated with a uniform coating. Any un-phosphated or unevenly coated area exceeding 1 square inch shall be cause for rejection.

5.2 Thread area (Area A)

- Rust: acceptable if removable with a Scotchbrite pad.
- Corrosion, pitting/inclusion, galling, ding, and burrs: not allowed.
- Chatter that can be detected by a sharp tip or fingernail shall be rejected. On the other hand, chatter that is only visible but not detectable is acceptable.

5.3 Groove (Area B)

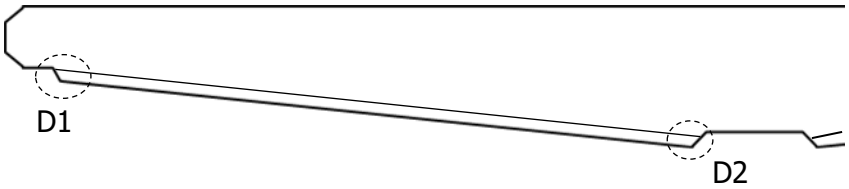
- Rust: acceptable if removable with a Scotch-Brite pad.
- Corrosion, pitting/inclusion: not allowed.
- Light ding: acceptable after field repair.
- Tool mark by threading insert is allowed.

5.4 Outside Surface including coupling surface (Area C)

- Light rust: acceptable.
- Corrosion: not allowed.
- Pitting/ding: not allowed, except round-bottom type with depth < 1.0 mm, acceptable.

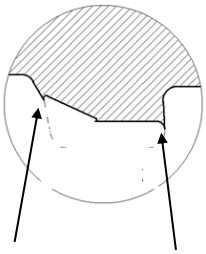
5.6 Chamfer (Area D1 and D2)

- Rust: acceptable if removable with a Scotch-Brite pad.
- Corrosion, pitting/inclusion: not allowed.
- Ding: acceptable after field repair.
- Feather/sharp burrs: not allowed. Reduced burrs: acceptable.

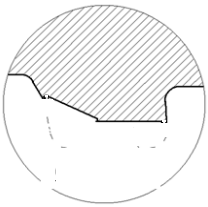


<Burrs>

Area D1

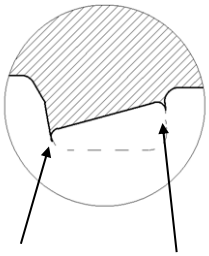


Feather or sharp edge is not allowed.

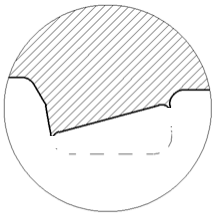


Reduced burrs are acceptable.

Area D2



Feather or sharp edge is not allowed.

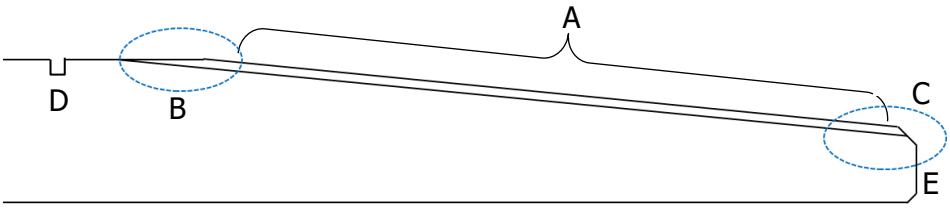


Reduced burrs are acceptable.

6. PIN Inspection

Area definition

A: Perfect Thread Area
B: Imperfect Thread Area
C: Chamfer
D: Groove
E: Shoulder including ID chamfer



6.1 External Surface (Area A, B, C, D and E)

- Rust: acceptable if removable with a Scotch-Brite pad.
- Corrosion, pitting/inclusion: not allowed.

6.2 Perfect Thread Area (Area A)

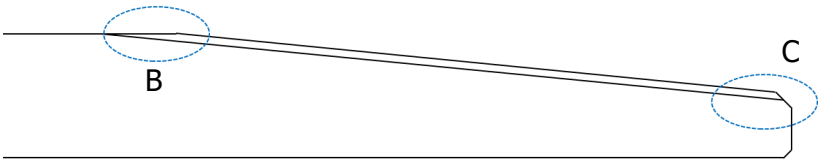
- Galling, Ding and Burrs: not allowed, except front 12.7 mm area where field repair is acceptable if no heavy protrusions.
- Chatter that can be detected by a sharp tip or fingernail shall be rejected. On the other hand, chatter that is only visible but not detectable is acceptable.

6.3 Imperfect Thread Area (Area B)

- Light galling/ding: acceptable after field repair.
- Chatter that can be detected by a sharp tip or fingernail shall be rejected. On the other hand, chatter that is only visible but not detectable is acceptable.

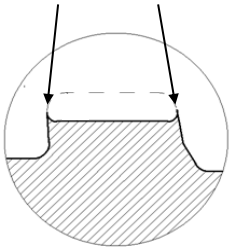
6.4 Burrs in Imperfect Tread Area and Chamfer (Area B and C)

- Light galling/ding: acceptable after field repair.
- Burrs: feather/sharp not allowed; reduced acceptable.

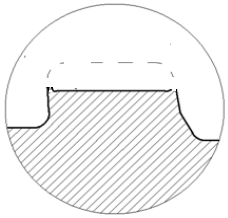


<Burrs>

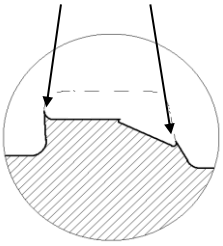
Area B
Feather or sharp edge is not allowed.



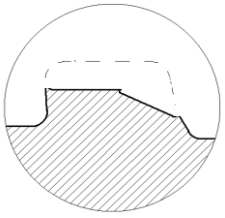
Reduced burrs are acceptable.



Area C
Feather or sharp edge is not allowed.

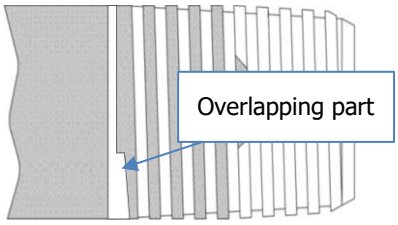


Reduced burrs are acceptable.



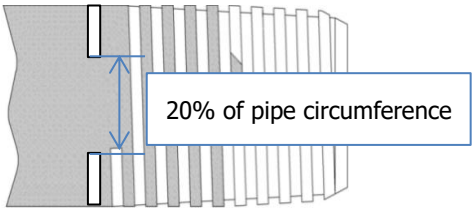
6.5 Groove (Area D)

- Rust: acceptable if removable with a Scotch-Brite pad.
- Corrosion, pitting/inclusion: not allowed.
- The groove overlapped with Pin thread runout is not allowed.

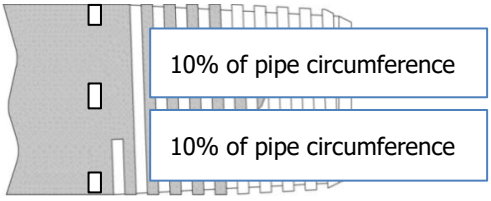


Reject

- Black grooves resulting from pipe ovality, where the surface remains unmachined (raw material exposed) over more than 20% of the pipe's circumference, are not permitted.



Reject



Reject

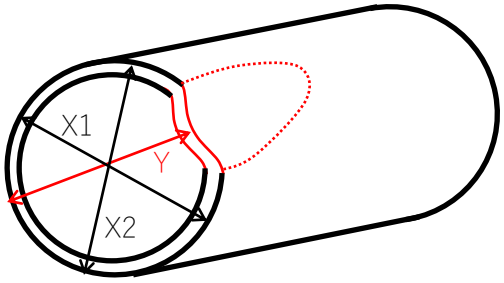
6.6 Shoulder (Area E)

- Pitting and/or inclusion are all not allowed.
- Light damage such as ding accepted after field repair.

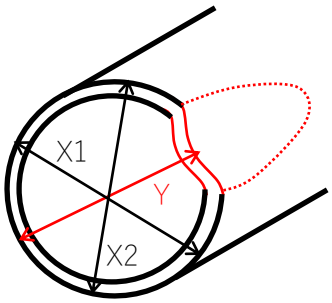
7. Ovality (Mashed) Deformation

Localized deformation affecting the ovality of the pin or box end, caused by handling or transportation damage, shall be rejected if it exceeds the rejection criteria specified below.

<BOX> Deformation amount ≤ 3.0mm



<PIN> Deformation amount ≤ 3.0mm



Deformation mount = (X1+X2)/2 - Y

X1, X2: OD of non-deformed area (at Pin-end / at Box-face)

Y: Min. OD of deformed area

8 Post-inspection Works

8.1 Connection and Protector Cleaning

- Cleaning and compressed air-drying the connection and protector thread surface to remove any contaminants.

8.2 Dope Application

- If the pipe will be run immediately, apply a thread compound (make-up dope) in accordance with the latest version of "NSMAX™ Compounds List (NSMAX_TM_CL_Rx)", available for download at: https://www.tubular.nipponsteel.com/octg-connections/connection-list/nsmax-gr

← Scan to access NSMAX™ Connection & Compounds List page

- If running is not immediate, apply a storage compound in accordance with the same list.

8.3 Protectors

- Protectors shall be made up hand tight.

9. Summary of field connection inspection

Field Repairs: NSMAX™-GR-PS is designed with the threads providing sealability when engaged, consequently a leak path may be created when the perfect thread is damaged and deformed.

BOX	Rust	Corrosion	Pitting /Inclusion	Galling	Ding	Burr
A: Thread Area	Accept if it can be removed with Scotch-Brite pad	Reject	Reject	Reject	Reject	Reject
B: Groove	Accept if it can be removed with Scotch-Brite pad	Reject	Reject	N/A	Light accepted after field repair	N/A
C: Outside Surface	Light accepted	Reject	Reject, except round-bottom depth < 1.0 mm acceptable	N/A	Reject, except round-bottom depth < 1.0 mm acceptable	N/A
D1, D2: Chamfer	Accept if it can be removed with Scotch-Brite pad	Reject	Reject	N/A	Light accepted after field repair	Reject feather /sharp burrs; Reduced burrs acceptable

Pin	Rust	Corrosion	Pitting /Inclusion	Galling	Ding	Burr
A: Perfect Thread Area	Accept if it can be removed with Scotch-Brite pad	Reject	Reject	Field repair on front 12.7mm area is acceptable(*) Otherwise Reject		
B: Imperfect Thread Area	Accept if it can be removed with Scotch-Brite pad	Reject	Reject	Light damage accepted after field repair		Reject feather /sharp burrs; Reduced burrs acceptable
C: Chamfer	Accept if it can be removed with Scotch-Brite pad	Reject	Reject	Light damage accepted after field repair		Reject feather /sharp burrs; Reduced burrs acceptable
D: Groove		Reject	Reject	N/A	N/A	N/A
E: Shoulder	Accept if it can be removed with Scotch-Brite pad	Reject	Reject	N/A	Light damage accepted after field repair	N/A

Note:

- **Rust**: A reddish-brown oxide film forms on the surface, but without any metal loss or pitting.
- **Corrosion**: A phenomenon in which metals in general deteriorate and lose material due to chemical or electrochemical reactions, resulting in actual metal loss.
- **Light damage**: Very minor dressing may be permitted at the inspector's discretion, limited to such minor imperfections, provided it can be completed within approximately two minutes per joint and does not alter the original profile.
- **Field repair on thread**: Field repair on front 12.7mm area is acceptable if there are no heavy protrusions, since that area is a non-thread seal area; for other thread areas, please contact NSC representatives for instructions.
- **Ovality (Mashed Deformation)**: Localized out-of-roundness at **PIN or BOX** ends caused by handling or transportation impact. Rejection applies if deformation exceeds 3.0 mm (see Para. 7).

10. Appendix: Drift-size and Connection Dimensions Table of NSMAX™-GR-PS

OD	Weight	Wall	drift	Connection Dimension				
				Group	Connection OD (nom)	Connection ID (nom)	Make-up Loss	Coupling Length
inch	lb/ft	inch	inch		inch	inch	inch	inch
Torelance					+0.125/-0.063	-	±0.006	±0.008
18	94	0.500	16.812	2	19.063	17.000	5.374	10.748
	105	0.562	16.688		19.063	16.876	5.374	10.748
18 5/8	87.5	0.435	17.567	1	20.000	17.755	5.374	10.748
	94.5	0.468	17.501		20.000	17.689	5.374	10.748
	96.5	0.486	17.500(*)	2	20.000	17.653	5.374	10.748
	101	0.510	17.500(*)		20.000	17.605	5.374	10.748
	106	0.531	17.375		20.000	17.563	5.374	10.748
	109.4	0.563	17.311		20.000	17.499	5.374	10.748
	112	0.579	17.279	3	20.000	17.467	5.374	10.748
	115	0.594	17.249		20.000	17.437	5.374	10.748
20	94	0.438	18.936	1	21.063	19.124	5.413	10.827
	106.5	0.500	18.812	2	21.063	19.000	5.413	10.827
	117	0.563	18.686		21.063	18.874	5.413	10.827
	133	0.635	18.542	3	21.063	18.730	5.413	10.827

(*) Special drift