

NSMAX™-GR

Field Connection Inspection Procedure

Date	2020.10.22
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Revision	Date	Reason
0	2020.10.22	Creation

NSMAX™-GR Field Connection Inspection Procedure

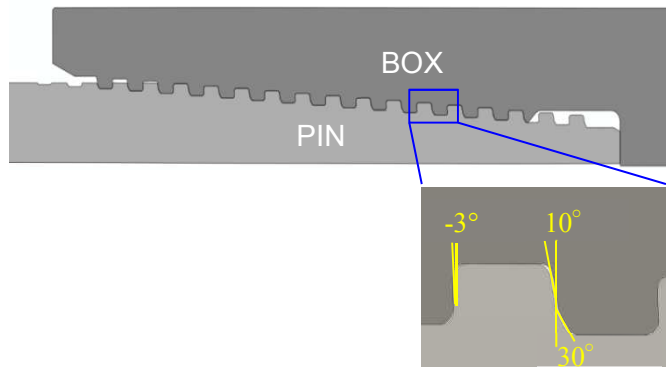
1.0 Preparations

- 1.1 Pipes are to be spaced out on racks with adequate distance to allow rolling 360° for removing protectors, cleaning PIN/BOX connections and for inspection
- 1.2 Protector removal equipment, such as chain wrench, “T” type bar and/or strap wrench, should be available.
- 1.3 Cleaning-PIN/BOX-equipment, such as steam cleaner, high pressure water, dry solvent, new nylon brushes, compressed air and rags should be provided.
- 1.4 Cleaning-Pipe OD/ID-equipment: In case Pipe OD/ID has been contaminated with corrosive fluids the same equipment listed in 1.3 above should be accessible.
- 1.5 It is recommended to perform inspection in dry conditions preferably inside covered facility.
- 1.6 Before inspection, “Pipe and Connection Identification”, such as size, weight, grade, connection type and mill I.D., should be checked and recorded by noting of “Pipe and Coupling Stenciling”.
- 1.7 If “Drift-test” is also conducted, the test should be done before “Connection Inspection” to ensure connection surface is not contaminated or damaged by the drifting process.

2.0 Connection Identification

- 2.1 Before connection inspection, the following characteristics of NSMAX-GR should be studied for connection identification.

NSMAX-GR is 3 TPI, with Torque-shoulder and without Metal-seal connection.



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

- 2.2 If “Pipe and Coupling Stenciling” are unreadable, the connection may be identified by measurement of connection dimensions by ruler and/or caliper. As a reference, “Drift-size and Connection Dimensions Table” is shown in Appendix.

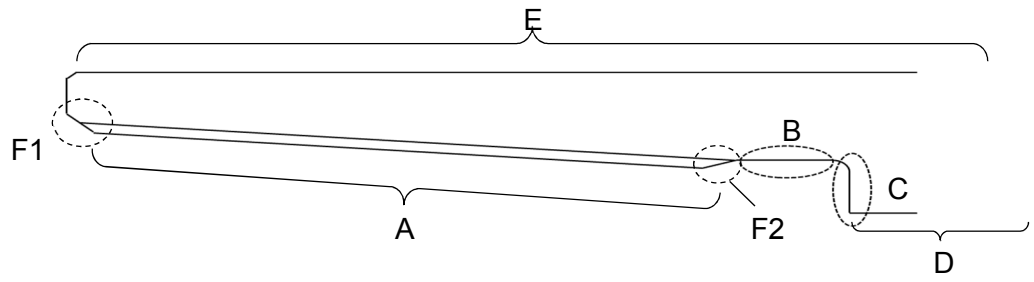
3.0 Pre-inspection works

- 3.1 Protector-removal and Damage Check
Protectors should be removed before connection inspection.
If a damaged protectors are found, the identification number(s) of the pipe(s) should be recorded.
→ Connections of those pipes shall be inspected carefully to confirm that there is no damage on thread surface nor any severe ovality deformation.
- 3.2 Connection Cleaning- Cleaning work should be done carefully not to damage thread surface. The entire thread surface shall be cleaned for visual inspection.

4.0 BOX (Coupling) Inspection

Area-definition

- A: Thread Area
- B: Groove
- C: Torque Shoulder
- D: Internal Bore
- E: Outside Surface
- F1, F2: Chamfer



4.1 Internal Surface (Area A, B and C)

<Surface Treatment> Manganese -phosphated

Presence of the manganese phosphate shall be visually verified.

- No missing areas of phosphate are allowed.
 - Lack of homogeneity area bigger than 1 square inch shall be rejected.
- <Rust and Corrosion> Rust and/or corrosion on surfaces are not allowed

4.2 Thread Area (Area A)

- Step, ding, crack, burr, pitting, inclusion are not allowed.
 - Slight chatter is acceptable, but severe chatter is not allowed.
- ($R_a \leq 3.2$ or equivalent max bumping height)

4.3 Groove (Area B)

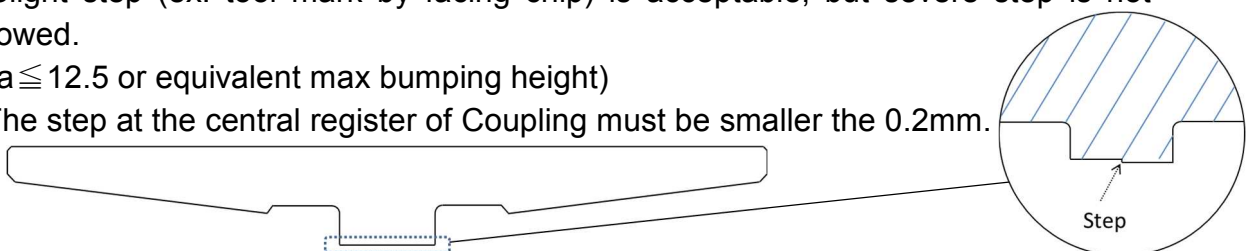
- Ding, crack, pitting, inclusion are not allowed.
 - Slight step (ex. tool mark by facing chip) is acceptable, but severe step is not allowed.
- ($R_a \leq 6.3$ or equivalent max bumping height)

4.4 Torque Shoulder (Area C)

- Ding, crack, pitting, inclusion are not allowed.
 - Slight step (ex. tool mark by facing chip) is acceptable, but severe step is not allowed.
- ($R_a \leq 6.3$ or equivalent max bumping height)

4.5 Internal Bore (Area D)

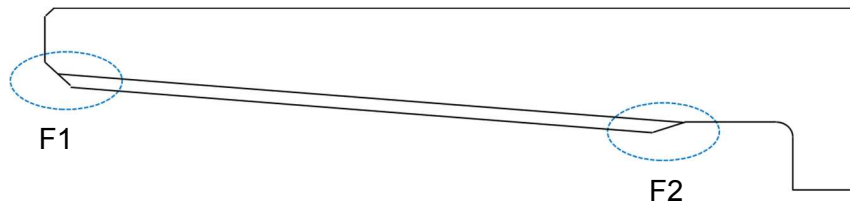
- Ding, crack, pitting, inclusion are not allowed.
 - Slight step (ex. tool mark by facing chip) is acceptable, but severe step is not allowed.
- ($R_a \leq 12.5$ or equivalent max bumping height)
- The step at the central register of Coupling must be smaller the 0.2mm.



4.6 Outside Surface (Area E)

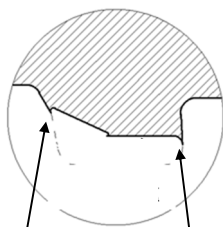
- Crack and sharp severe damage are not allowed on machined surface.
- Round bottom ding or round bottom pitting are acceptable if depth is smaller than 1.0mm.

4.7 Chamfer (Area F1 and F2)

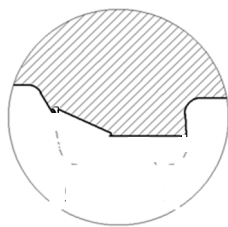


<Burrs>

Area F1

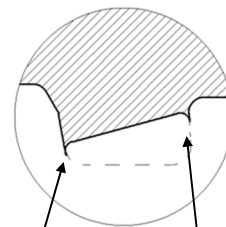


Feather or sharp edge is not allowed.

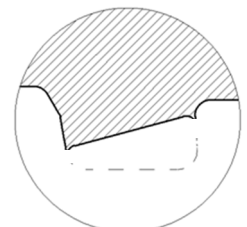


Reduced burrs are acceptable.

Area F2



Feather or sharp edge is not allowed.



Reduced burrs are acceptable.

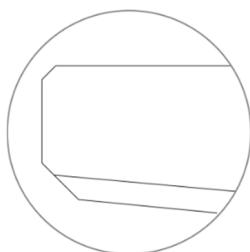
Severe burr, feather edge, sharp edge in the area F1 and F2 are not allowed and should be quarantined for remediation by a qualified inspector.

<Thread Start Position>

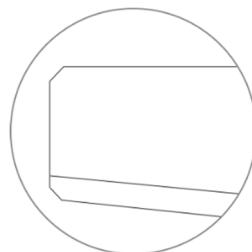
Area F1

The thread shall be started on the chamfer area as shown in following.

In other words, if thread-start-position is found on box (coupling) face, it shall be rejected.



Acceptable

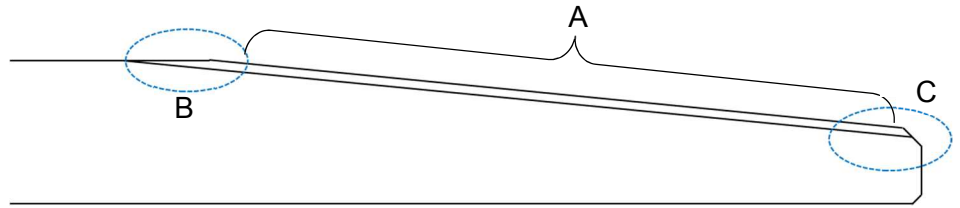


Reject

5.0 PIN Inspection

Area-definition

- A: Perfect Thread Area
- B: Imperfect Thread Area
- C: Chamfer

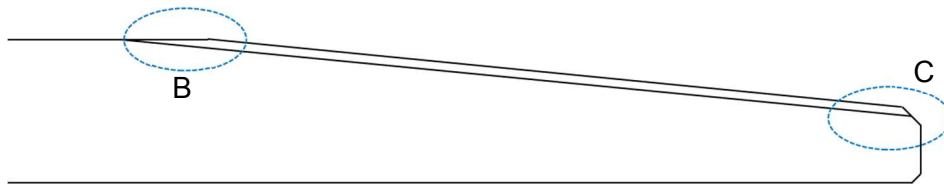


- 5.1 External Surface (Area A, B and C)
 <Surface Treatment> As-machined
 <Rust and Corrosion> Rust and/or corrosion on surfaces are not allowed

- 5.2 Perfect Thread Area (Area A)
 - Step, ding, crack, burr, pitting, inclusion are not allowed.
 - Slight chatter is acceptable, but severe chatter is not allowed.
 ($Ra \leq 3.2$ or equivalent max bumping height)

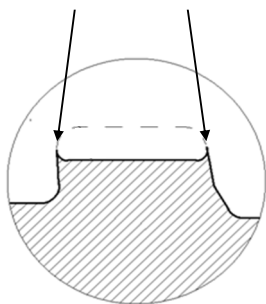
- 5.3 Imperfect Thread Area (Area B)
 - Step, ding, crack, pitting, inclusion are not allowed on machined surface.
 - Slight chatter is acceptable, but severe chatter is not allowed.
 ($Ra \leq 3.2$ or equivalent max bumping height)

- 5.4 Burrs in Imperfect Tread Area and Chamfer (Area B and C)

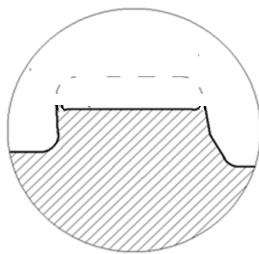


Area B

Feather or sharp edge is not allowed.

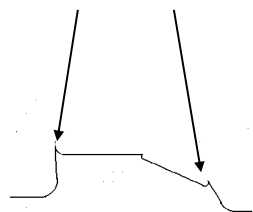


Reduced burrs are acceptable.

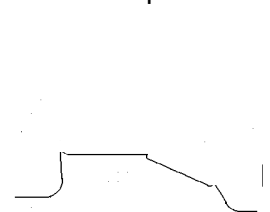


Area C

Feather or sharp edge is not allowed.



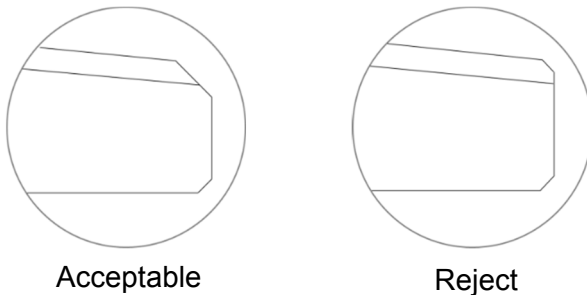
Reduced burrs are acceptable.



Severe burr, feather edge, sharp edge in the area B and C are not allowed and should be quarantined for remediation by a qualified inspector.

5.5 Chamfer (Area C)

The thread shall be started on the chamfer area as shown in following diagram. If thread-start-position is found on pin shoulder f face, it shall be rejected.

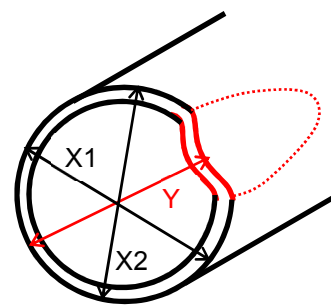
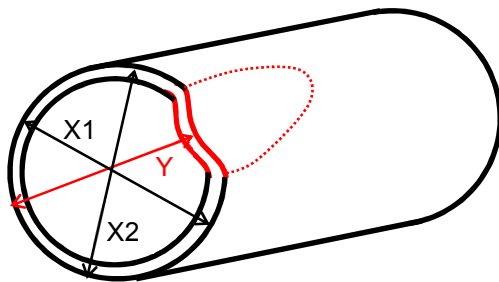


6.0 Ovality Deformation

Severe localized ovality deformation on thread by bad transportation shall be rejected. Rejection Criteria are as follows.

<BOX> Deformation amount $\leq 3.0\text{mm}$

<PIN> Deformation amount $\leq 3.0\text{mm}$



$$\text{Deformation amount} = (X1+X2)/2 - Y$$

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

Y: Min. OD of deformed area

7.0 Post-inspection works

7.1 Connection and Protector Cleaning

- Cleaning and air-blowing the connection and protector thread surface to dry and to remove any contaminants.

7.2 Dope Application

- If the pipe will be run immediately, thread compound (make-up dope) should be applied in reference to "Recommended Running Manual of NSMAX-GR" (RRM001-R1).
- If NOT, storage dope should be applied appropriately on pin and box.

7.3 - Protectors must be refitted and tightened properly by hand.

Appendix

Drift-size and Connection Dimensions Table of NSMAX-GR

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
Tolerance					+0.125 / -0.063	±0.020	±0.006	+0.236 / -0
18	94	0.500	16.812	2	18.937	17.000	5.549	12.280
	105	0.562	16.688		18.937	16.876	5.549	12.280
	117	0.625	16.562	3	19.055	16.750	6.252	13.685
	119	0.640	16.532		19.055	16.720	6.252	13.685
	128	0.688	16.500★		19.055	16.624	6.252	13.685
18 5/8	87.5	0.435	17.567	1	19.626	17.755	5.614	12.409
	94.5	0.468	17.501		19.626	17.689	5.614	12.409
	96.5	0.486	17.500★	2	19.626	17.653	5.549	12.280
	101	0.510	17.500★		19.626	17.605	5.549	12.280
	106	0.531	17.375		19.626	17.563	5.549	12.280
	109.4	0.563	17.311	3	19.626	17.499	5.549	12.280
	112	0.579	17.279		20.000	17.467	6.252	13.685
	115	0.594	17.249		20.000	17.437	6.252	13.685
	122	0.636	17.165		20.000	17.353	6.252	13.685
	136	0.693	17.051		20.000	17.239	6.252	13.685
20	94	0.438	18.936	1	21.000	19.124	5.661	12.504
	106.5	0.500	18.812	2	21.000	19.000	5.596	12.374
	117	0.563	18.686		21.000	18.874	5.596	12.374
	133	0.635	18.542	3	21.063	18.730	6.315	13.811
	144	0.693	18.500★		21.063	18.614	6.315	13.811

★ special drift

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