

PENBERTHY

application report

Section 2000
 Application Report 2797.1
 Issued 05/05
 Replaces 08/97

For: NACE MATERIAL REQUIREMENTS MR0175 &/OR MR0103

The National Association of Corrosion Engineers (NACE) has examined metallic materials used in sour gas (hydrogen sulfide) service due to the need for resistance to sulfide stress cracking. These materials are critical in petroleum production, drilling, gathering and flowline equipment to be used in H₂S hydrocarbon service.

Factors which may effect the tendency toward sulfide stress cracking include: 1) metallic characteristics, e.g., strength, heat treatment and microstructure; 2) pH; 3) hydrogen sulfide concentration and total pressure; 4) total tensile stress; 5) temperature and 6) time.

NACE has tested materials for use with sour gas and provide a guideline for material usage as documented in NACE MR0175 &/OR MR0103.

Penberthy gages and gagecocks are available in materials which meet the NACE criteria.

Hardware for Penberthy's NACE environmental gages are 100% tested (to **M** standards as referenced in ASTM A193 and A194).

The following table lists Penberthy's standard materials of construction for applications which require NACE qualification.

Typical Materials of Construction

	environmental NACE (non-wetted)			
	Chamber	Bolts	Nuts	Cover
GAGES steel construction	ASTM A105 Carbon Steel per NACE MR0175 &/OR MR0103	AISI 4140 or 4142 Alloy Steel per ASTM A193 Gr B7M per NACE MR0175 &/OR MR0103	ASTM A194 Gr 2HM Carbon Steel per NACE MR0175 &/OR MR0103	ASTM A105 Carbon Steel per NACE MR0175 &/OR MR0103
	Body	Vessel Tailpipe	Trim	Ball Retainer
GAGECOCKS steel construction	ASTM A105 forged Carbon Steel per NACE MR0175 &/OR MR0103	ASTM A108 Carbon Steel per NACE MR0175 &/OR MR0103	ASTM A276 316/316L or 410 STS per NACE MR0175 &/OR MR0103	ASTM A313 316 STS

If the sour gas operation is contained, the end user may only require wetted NACE components. If sour gas vapors exist exterior to the process flow stream, the end user should specify environmental NACE requirements to ensure material longevity.

To identify whether a particular gage or gagecock is constructed per NACE MR0175 &/OR MR0103 standards see Application Report 2797.2.

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Section 2000
 Application Report 2797.2
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For: IDENTIFYING NACE MR0175 &/OR MR0103 MATERIAL

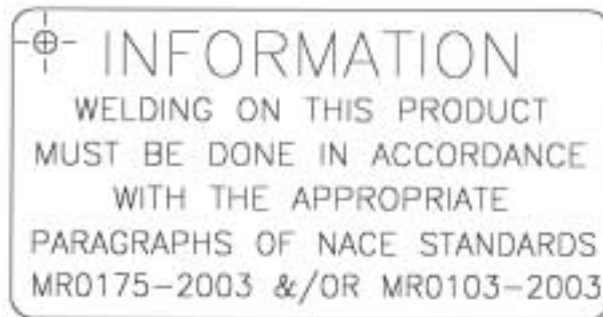
If the sour gas operation is contained, the end user may only require **wetted** NACE components. If sour gas vapors exist exterior to the process flow stream, the end user should specify **environmental** NACE requirements to ensure material longevity. See Application Report #2797 to identify specific materials.

Penberthy provides tags on its gages and gagecocks to identify whether the material is appropriate for sour gas service.

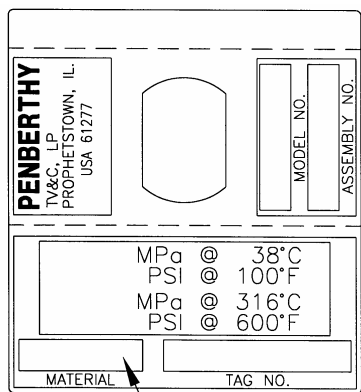
NACE (sour gas) GAGES AND GAGECOCKS

NACE Wetted and NACE Environmental

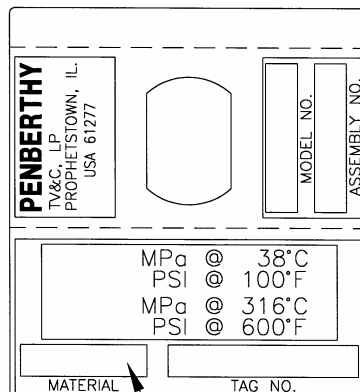
A "process" blue tag is wired onto the bolting along the side of the gage. This tag identifies that the chamber material meets NACE specifications. Both upper and lower NACE gagecocks have the same blue tag attached to the stem with a spring ring.



The nameplate on a gage will include a -NW (NACE wetted) or -NE (NACE environmental) in the material identification blank. The gagecock nameplate will include -NE (NACE environmental) in the material identification blank.



STL-NW



STL-NE

