

UR P2.11 "Type Approval of Mechanical Joints"

Part A. Revision History

| Version no. | Approval date | Implementation date when applicable |
|-------------------|------------------|-------------------------------------|
| Rev.3 (Aug 2012) | 09 August 2012 | 1 January 2014 |
| Corr.1 (Apr 2007) | 11 April 2007 | - |
| Rev.2 (Nov 2006) | 28 November 2006 | - |
| Rev.1 (May 2006) | 12 May 2006 | - |
| New (Nov 2001) | 17 November 2001 | 1 January 2007 |

- **Rev.3 (Aug 2012)**

.1 Origin of Change:

- Suggestion by an IACS member

.2 Main Reason for Change:

To specify realistic axial forces and specify range of test objects.

.3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None

.4 History of Decisions Made:

The test 2.11.5, pull-out, is revised to reflect the industrial practise.

.5 Other Resolutions Changes

None

.6 Dates:

Original Proposal: *02 March 2011 Made by a Member*
 Panel Approval: *15 November 2011*
 GPG Approval: *09 August 2012 (Ref: 11042_IGi)*

- **Corr.1 (Apr 2007)**

GPG Reference: 5059a

See TB document in Part B.

- **Rev.2 (Nov 2006)**

GPG Reference: 5059a

See TB document in Part B.

- **Rev.1 (May 2006)**

GPG Reference: 5059b

See TB document in Part B.

- **NEW (Nov 2001)**

AHG/PPV submitted the draft new UR P2.11 to GPG 48 for approval. It requested GPG to refer the draft to external review (9099d). AHG completed reviewing external bodies' comments and submitted final text to GPG 50 (0077a, 18/1/2001).

No TB document available.

Part B. Technical Background

List of Technical Background (TB) documents for UR P2.11:

Annex 1. **TB for Rev.1 (May 2006)**

See separate TB document in Annex 1.



Annex 2. **TB for Rev.2 (Nov 2006)**

See separate TB document in Annex 2.



Annex 3. **TB for Corr.1 (April 2007)**

See separate TB document in Annex 3.



Annex 4. **TB for Rev.3 (Aug 2012)**

See separate TB document in Annex 4.



Note: *There are no separate Technical Background (TB) documents for the original resolution (Nov 2001)*

Technical Background

UR P2.7.4 (**Rev.6**, May 2006) and UR P2.11(**Rev.1**, May 2006)

1. Background:

ABS reported to Council on 13 Feb 06 as follows:

In reviewing the latest UR Implementation Matrix distributed by Perm Sec's 5059_I Af, it is noted that besides ABS, three other Societies (KR, LR and IRS) had not indicated that they have implemented UR P2.7.4 (Rev. 5/Nov 2003).

It is further noted that these Societies also did not indicate an expected date of implementation on their Form 2.

Further UR P2.11 (Rev.2/Nov 2001) was adopted for type approval of mechanical (pipe) joints in 2001, but was made mandatory for all mechanical (pipe) joints by the amendment to P2.7.4.1 in 2003. Again, looking at the UR Implementation Matrix distributed by 5059_I Af, we note that seven other Societies (BV, CCS, DNV, GL, KR, LR and IRS) had not indicated that they have implemented UR P2.11 (Rev.2/Nov 2001) and that none of these Societies, except IRS, indicated an expected date of implementation on its Form 2.

Therefore, this message is to declare an ABS reservation against UR P2.7.4 (Rev.5/Nov 2003) and P2.11 (Rev.2/Nov 2001) until such time as Members agree to a uniform implementation date for these requirements.

Council tasked GPG to establish a uniform application date for these requirements and ascertain the implementation status.

2. Discussion

2.1 Implementation status

All GPG members provided information relative to their status of implementation for IR P2.

2.2 P2.7.4.1

GPG Chairman assessed: In reading P2.7.4.1, it does not appear to me that the requirement is intended to mandatorily require Type Approval of the subject fittings; it appears to require compliance with the same type testing requirements

as would be required for type approval of the fitting, i.e., pipe unions, compression couplings and slip-on joints are not required to be type approved, but must be approved based on the Type Approval procedure in P2.11. Renewal of approval is only associated with type approval.

2.3 P2.11.1

DNV pointed out that the General Part of P2.11.1 has a vague expression (Individual Societies may specify more severe testing conditions...and also accept alternative testing...).

2.4 A uniform implementation statement was developed and approved.

Approved on 12 May 2006 (5059bICa)

Submitted by Permsec
28 April 2006

**Technical Background for Revision of UR P2.11.5.5.6 and UR P2.11.5.5.1
(UR P2.11, rev. 2, November 2006)**

UR P2.11.5.5.6

For mechanical joints, the fire endurance test is to be conducted according to the procedures specified in UR P2.11.5.5.6.

The current UR P2.11.5.5.6. states that *“Mechanical joint assembly test specimen is to be subjected to fire for 30 min at a temperature of 800 degrees centigrade, while water at the design pressure of the joints is circulated inside. Specimen is to be completely engulfed in the flame envelope.”*

However, it has come to member societies’ attention that there have been cases where tests were conducted using a furnace without apparent “flame” under the consent of several member societies. Whereas other societies were insisting on the “flame engulfing the test specimen”, which often resulted in the use of increased number of flame burners, these additional burners in turn required additional fire-retardant packing due to higher heat input. This inconsistent implementation of the fire test requirements among member societies has prompted the review of the current UR P2.

Member societies agreed to remove the wording *“Specimen is to be completely engulfed in the flame envelope”* as this requirement is contained in the referenced standard ISO 19921:2005 (E), paragraph 7.1 and 7.8, and does not need to be duplicated.

Meanwhile, it was pointed out that:

- the subject UR would need to specify detailed test procedures as well as test acceptance criteria, and ISO 19922 (2005) was found to be the appropriate international standard for this purpose.
- ISO 19921 (2005) specifies nearly identical test conditions and acceptance criteria compared with the current UR, and therefore it would be best to adopt established international standard in its entirety. This reference to ISO 19921 in the UR can eliminate the current wording, i.e., *“Mechanical joint assembly test specimen is to be subjected to fire for 30 min at a temperature of 800 degrees centigrade, while water at the design pressure of the joints is circulated inside. Specimen is to be completely engulfed in the flame envelope.”*

The panel agreed with the above points, and concluded that the final draft should reflect the same.

UR P2.11.5.5.1

Changes to UR P2.11.5.5.1 (a) were made to bring it in line with the ISO standards referenced in UR P2.11.5.5.6.

Hamburg, 14 November 2006

IACS Machinery Panel Chairman

Permanent Secretariat note:

Subject no. 5059a, agreed by GPG and Council 28/11/2006 (IGf)

**Technical Background for Revision of UR P2.11.5.5.6 and UR P2.11.5.5.1
(UR P2.11, Rev. 2, November 2006 and Corr.1, April 2007)**

Rev.2, November 2006

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Hamburg, 14 November 2006
IACS Machinery Panel Chairman

Permanent Secretariat note:

Subject no. 5059a, agreed by GPG and Council 28/11/2006 (IGf)

Correction 1, April 2007

After publication of the revised UR the RS Panel member pointed out that the addition of the requirement in UR P2.11.5.5.1 "For services other than flammable fluids, leakage rate is not to be more than 0.2 l/min" is not appropriate as this requirement relates to the fire endurance test only. At the 5th Machinery Panel (March 2007) meeting this was considered by Panel members and it was agreed that this sentence should be deleted from UR P2.11.5.5.1.

Hamburg, 29 March 2007
IACS Machinery Panel Chairman

Permanent Secretariat note:

During GPG discussion, ABS (5059aABc & ABd) asked Machinery Panel to confirm whether the sentence being deleted from P2.11.5.5.1 would be added to P2.11.5.5.6. Machinery Panel (5059aPMd) confirmed that they felt it was not necessary since P2.11.5.5.6 refers to ISO standard 'ISO 19921: 2005(E)', which includes a Note in Section 8 - Assessment - "For services other than flammable fluids, a leakage rate of not more than 0.2 l/min is considered acceptable".

Technical Background for UR P2.11 Rev.3, Aug 2012

1. Scope and objectives

Update of pull-out test in 2.11.5.5.5.

The panel is in the opinion that this test as specified, where merely the internal pressure is causing the axial force, is not sufficient for proving the coupling's ability to withstand axial forces encountered in actual service.

There is no safety factor included for situations where thermal expansion, vibrations etc. will require the coupling to have increased ability to withstand axial forces.

2. Engineering background for technical basis and rationale

The test requirement is altered such that the test pressure and external axial force are to be applied simultaneously in order to achieve a more realistic situation.

According to experience this amended test procedure is what the manufacturers in the market are already enforcing on their products.

3. Source/derivation of the proposed IACS Resolution

None

4. Summary of Changes intended for the revised Resolution:

Update of pull-out test in 2.11.5.5.5.

5. Points of discussions or possible discussions

None

6. Attachments if any

None