



**Guidance notes for administering:
The BESCA Welding Test in
Conjunction with Engineering
Services SKILLcard**

Helping businesses meet industry standards

BESCA Welding Test Centre Guidelines

Table of Contents

1. Introduction	3
2. Test Centre Guidelines	4
3. Test Procedures	
• Before the test	5
• During the test	5
• After the test	6
4. Full Welding Test Certification Procedure	7
5. Provisional Welding Test Certification Procedure	8
6. Appendix 1 – Extract taken from BESA publication TR5 Welding of Carbon Steel Pipework. © 2003 BESA	9

Introduction

As from January 1st 2006 only organisations that have received 'centre approval' from BESCA will be able to receive certification for this weld test. The following document provides practical advice on how to administer the weld test and also provides clarification on the certification process.

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BESCA Welding Test – Centre Guidelines

This document provides guidelines for BESCA approved test centres to administer the BESCA Weld test (formerly known as SummitSkills weld test).

- Centre & Candidate should be familiar with the testing procedure in accordance with BESA 2003 code of practice for welding of carbon steel pipework (TR5).
- All candidates should be working in the H&V industry and have access to welding experience on site (*guidance for unemployed welders can be found on page 2).
- Candidates can take practical tests in the following welding disciplines:
 - Oxy-Acetylene
 - Metal-Arc
 - TIG/TAG
 - MIG/MAG
- Candidates can obtain two types of welding competency:
 - Provisional certification (for apprentices – QA with C&G/SQA), valid for 1 year under supervision of a qualified welder
 - Full certification (for welders over the age of 20 with at least 6 months site welding experience), valid for 3 years.
- Test centres should provide facilities (or ensure that facilities on site) that are adequate in terms of size, equipment and health & safety, for the maximum number of tests it operates at any one time. It is recommended that the ratio should be no more than 6 candidates per 1 examiner.
- The fee for the weld test and any refresher training (if deemed necessary) is determined by the test centre.
- Tests must be administered by suitably qualified staff who are conversant with the weld test arrangements and are approved by BESCA.
- To eliminate issues regarding identification, the candidate must provide photographic ID (i.e., passport, photo type Driving licence, SKILLcard) before the Weld test is administered.

Test Procedures (before test)

- The candidate should be briefed on the following points prior to the test date:
 - The requirement of photographic Identification (passport etc.)
 - Cost of weld test
 - Materials, consumables used in the test
 - Option of welds (various choice of butt welds – 1 or 2 joints)
 - Time allowance (recommended Maximum 4 hours)
 - Fixed Positioning of welds during test
 - Health & Safety requirements (PPE etc.)
 - Test specification (reverse bend test & visual inspection etc.)
 - Certification procedure & the link to the Skill card application/renewal process (see separate guidance note)
- The candidate should prepare all welds before the test (either on-site or at the test centre) to allow the examiner to mark for joint set-up.
- Before commencing the test the examiner should fill out the candidate's details on the appropriate mark sheet and confirm employer details. It is essential that these details are accurate and up to date because the application form sent by Engineering Services SKILLcard will be sent to this contact address)
- If candidates are not currently employed in the industry they can still undertake the welding test. To gain certification they will need to supply a previous employers name & address, who will endorse that they have carried out at least 6 months welding experience on-site to industrial standards.
- During assessment of set-up the examiner should stamp all the welds with the candidate's identification number and also mark top/bottom, stop/start positions on the candidates weld test pieces for ease of end assessment.

Test Procedures (during test) – please refer to appendix A for test specification

- The examiner should monitor the candidate throughout the test to ensure that the candidate is carrying out the welding in the correct fixed positions:
- If candidate selects to weld 2 joints (H/V & Fixed horizontal):
 - For the weld piece 1 - butt weld with pipe in the vertical (PC) position. The pipe may be rotated about its vertical axis (ref: 1.1 & 4.1)
 - For the weld piece 2 - butt weld with pipe in the horizontal (PG) position. The pipe should be fixed and maintained at a height convenient to the welder (ref: 2.1 & 5.1)
 - If candidate selects to weld 1 joint (butt weld at 45 degrees):

- For the weld piece 3 – butt weld maintained in the 45 degree inclined (HL045) position. The pipe should be fixed and maintained at a height convenient to the welder (ref: 3.1 & 6.1)
- The examiner should also monitor that the candidate is:
 - Observing health & safety requirements at all times
 - Only using the weld test pieces that have been stamped

Test Procedures (after test)

- After the weld test pieces have been allowed to cool the examiner should explain the 'cutting up' arrangements and mark out the appropriate test coupons to be sawn or flame cut out from each weld (ensure that all ID numbers are kept intact).
- Once the test coupons have been cut from the welds the candidate should prepare the coupons according to the guidance by the examiner (& in BESA TR5 – see page 10) to allow a reverse bend test to be applied to each test coupon.
- The examiner should inspect the candidates weld test pieces and coupons and award marks on the appropriate mark sheet for:
 - Set-up (alignment of pipes, gap setting & tacking)
 - Reinforcement (width, height, smoothness of ripples, freedom from undercutting and overlapping)
 - Penetration (regularity, continuity and full fusion)
 - Reverse bend test (coupon to bend 90 degrees over 3 x T former with root of weld in tension)
- All bend test coupons should be the correct size and properly prepared, before carrying out bending.
- The outcome of the weld test is pass or fail. The pass mark for both categories of test is as follows:
 - Provisional certificate = 55% minimum in each weld
 - Full certificate = 65 % minimum in each weld
- The examiner should complete the mark sheet (if 2 weld tests have been selected the candidate's lowest mark out of the 2 welds is their final score), notify the candidate of the outcome and again explain the certification process via Engineering Services SKILLcard (see pages 7 & 8).
- The examiner or test centre should not advise the candidate's employer of the welding test result, Engineering Services SKILLcard will be corresponding direct to the employers on receipt of the examiners mark sheet.
- The examiner / test centre should forward all mark sheets (pass and fails) to Engineering Services SKILLcard as soon as possible after the test (for provisional

certificates a separate application should be filled out for each candidate and sent to Engineering Services SKILLcard as well)

- The test centre should keep copies of all mark sheets and retain a range of test pieces for at least one year to ensure sampling can be moderated (by the BESCA welding moderator) across all processes offered and each examiner that has conducted weld tests recently.
- All 'failed' test pieces should be retained by the test centre for sampling by the BESCA welding moderator to provide independent examination.

Test Procedure for full certification of competency taking all welding disciplines

Booking

- 1) Candidate/Employer approaches a BESCA approved test centre to undertake any of the above disciplines.

Test(s) must be invigilated and marked by a BESCA approved welding examiner.

The fee for the test is set by the centre.

After Test

- 2) Completed examiners mark sheets are forwarded immediately after the test to Engineering Services SKILLcard at Penrith.

Administration

- 3) Upon receipt of the mark sheet(s), Engineering Services SKILLcard will forward an application form for welding competency together with an invoice* (where applicable) to the candidate (where self-employed/un-employed) or designated employer as stated on the mark sheet for completion.

* BESA Members – no charge / Non Members £20.00 per competency

Applying for Competency

- 4) When the employer has returned the completed application form for welding competency together with remittance (where applicable), the following action is taken:
 - confirmation of competency awarding letter is sent to the employer (with a copy of the examiners score sheet) and candidate; this contains the candidate competency number and certification expiry date (three years from date of test)
 - if the candidate holds an Engineering Services SKILLcard they will need to apply

to add their new welding qualification to their card. An application form can be downloaded from their website, www.skillcard.org.uk

- if the candidate does not hold an Engineering Services SKILLcard, an application form can be downloaded from their website www.skillcard.org.uk

Test Procedure for provisional certification of competency for taking all welding disciplines

Booking

- 1) Provisional tests are carried out for apprentices; test(s) must be invigilated and marked by a BESCA approved welding examiner.

After Test

- 2) Completed provisional application forms are forwarded immediately after the test to Engineering Services SKILLcard at Penrith.

Administration

- 3) When Engineering Services SKILLcard receive the completed examiners mark sheet/application form for welding competency from the test centre, the following action is taken:
 - confirmation of competency awarding letter is sent to the employer (with a copy of the examiners score sheet) and candidate; this contains the candidate competency number and expiry certification date (one year from date of test)
 - if the candidate holds an Engineering Services SKILLcard they will need to apply to add their new welding qualification to their card. An application form can be downloaded from their website, www.skillcard.org.uk
 - if the candidate does not hold an Engineering Services SKILLcard, an application form can be downloaded from their website, www.skillcard.org.uk

Appendix 1

STANDARD TESTS FOR WELDER APPROVAL

All welder approval tests should be carried out using BS 1387 heavy pipe and consumables as specified in Section 4 of this Code of Practice.

Welder approval certification on each process requires satisfactory completion of one fixed vertical (PC) and one fixed horizontal (PG) pipe butt weld. As an alternative, one fixed 45° inclined (H-L045) pipe butt weld may be completed.

1	OXY-ACETYLENE OR TIG WELD TEST-PIECE NO.1	3	OXY-ACETYLENE OR TIG WELD TEST-PIECE NO.3
	Welding procedure:		Welding procedure:
1.1	A butt weld to be made in 50mm nominal size pipe maintained in the vertical (PC) position. The starting point of the first run to be marked on the pipe to facilitate the correct testing procedure as required below. The pipe may be rotated about its vertical axis.	3.1	A butt weld to be made in 50mm nominal size pipe maintained in the fixed 45° inclined (H-L045) position. The pipe should be fixed and maintained at a height convenient to the operator and the top position marked before welding commences.
	Bend test:		Bend Test:
1.2	The weld test-piece shall be prepared in accordance with Fig. 12. One coupon (i.e., segment of the weld cut out for test purposes) to be taken at the start/stop point and the other diametrically opposite. Each coupon to be subjected to a root bend through 90° over a former having a diameter equal to 3 times the pipe wall thickness. See Figure 15.	3.2	Three coupons shall be taken from the weld test-piece as shown in Fig. 14. Each coupon to be subjected to a root bend through 90° over a former having a diameter equal to 3 times the pipe wall thickness.
2	OXY-ACETYLENE OR TIG WELD TEST-PIECE NO.2	4	MANUAL METAL-ARC OR MIG/MAG WELD TEST-PIECE NO.1
	Welding procedure:		Welding procedure:
2.1	A butt weld to be made in 50mm nominal size pipe in the fixed horizontal (PG) position. The pipe should be fixed and maintained at a height convenient to the operator and the top position marked before welding commences.	4.1	A butt weld to be made in 100mm nominal size pipe in the vertical (PC) position. The starting point of the first run to be marked on the pipe to facilitate the correct testing procedure as required below. The pipe may be rotated about its vertical axis.
	Bend test:		Bend test:
2.2	Three coupons shall be taken from the weld test-piece as shown in Fig. 13. Each coupon to be subjected to a root bend through 90° over a former having a diameter equal to 3 times the pipe wall thickness.	4.2	The weld test-piece shall be prepared in accordance with Fig. 12. One coupon to be taken at the start/stop point and the other diametrically opposite. Each coupon to be subjected to a root bend through 90° over a former having a diameter equal to 3 times the pipe wall thickness.
5	MANUAL METAL-ARC OR MIG/MAG WELD TEST-PIECE NO.2	5	MANUAL METAL-ARC OR MIG/MAG WELD TEST-PIECE NO.2
	Welding procedure:		Welding procedure:
5.1	A butt weld to be made in 50mm nominal size pipe in the fixed horizontal (PG) position. The pipe should be fixed and maintained at a height convenient to the operator and the top position marked before welding commences.	5.1	A butt weld to be made in 100mm nominal size pipe in the fixed horizontal (PG) position. The pipe should be fixed and maintained at a height convenient to the operator and the top position marked before welding commences.
	Bend test:		Bend test:
5.2	Three coupons shall be taken from the weld test-piece as shown in Fig. 13. Each coupon to be subjected to a root bend through 90° over a former having a diameter equal to 3 times the pipe wall thickness.	5.2	Three coupons shall be taken from the weld test-piece as shown in Fig 13. Each coupon to be subjected to a root bend through 90° over a former having a diameter equal to 3 times the pipe wall thickness.

Extract taken from BESA publication TR5 Welding of Carbon Steel Pipework. © 2003 BESA

6 MANUAL METAL-ARC OR MIG/MAG WELD TEST-PIECE NO.3

Welding procedure:

- 6.1 A butt weld to be made in 100mm nominal size pipe maintained in the fixed 45° inclined (H-L045) position. The pipe should be fixed and maintained at a height convenient to the operator

and the top position marked before welding commences.

- 6.2 Bend test: Three coupons shall be taken from the weld test-piece as shown in Fig. 14. Each coupon to be subjected to a root bend through 90° over a former having a diameter equal to 3 times the pipe wall thickness.

Fig. 12 TEST-PIECE No.1 PIPE WELDED IN VERTICAL (PC) POSITION

Fig. 13 TEST-PIECE NO.2 PIPE WELDED IN HORIZONTAL (PG) POSITION

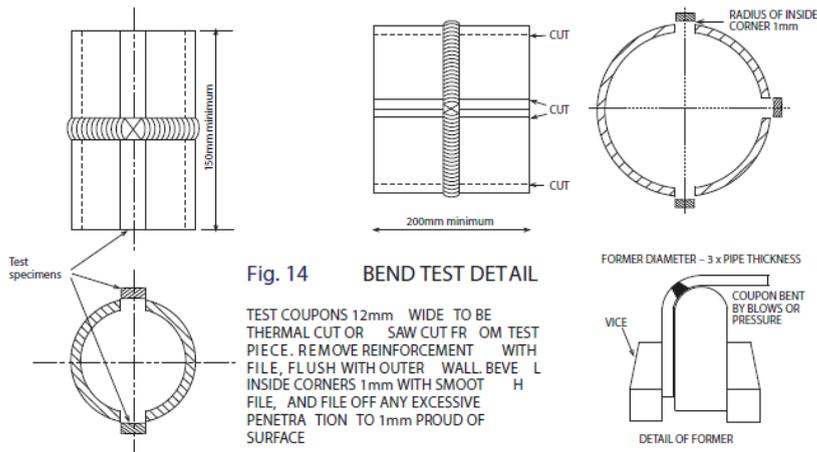
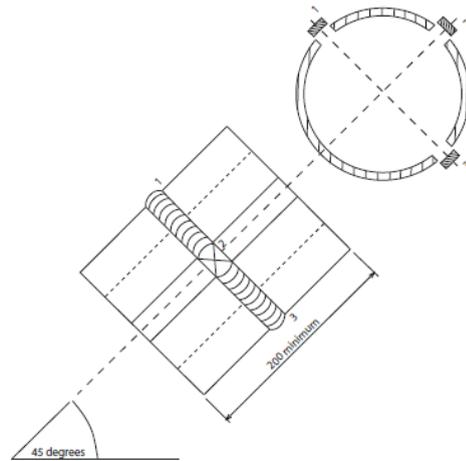


Fig. 14 BEND TEST DETAIL

TEST COUPONS 12mm WIDE TO BE THERMAL CUT OR SAW CUT FROM TEST PIECE. REMOVE REINFORCEMENT WITH FILE, FLUSH WITH OUTER WALL BEVEL INSIDE CORNERS 1mm WITH SMOOTH FILE, AND FILE OFF ANY EXCESSIVE PENETRATION TO 1mm PROUD OF SURFACE

Fig. 14 TEST-PIECE No.3 PIPE WELDED IN FIXED 45° INCLINED (H-L 045)



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