

U L T R A

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EXPERTISE

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For:

Expertise contents:

EXECUTORS: M. Eng. Władysław Michnowski
Third level expert on non destructive testing according to EN-473
Having certificate UDT-Cert nr 02-001-00015

Rafał Miś

Wrocław, ...

OPINION CONTENTS:

1. THE RANGE OF PERFORMED TESTINGS:

The range of testing was determined by customer according to specification, after alignment with a customer.

2. BASE OF PERFORMED EXAMINATIONS AND ACCEPTANCE AGREEMENT

Ultrasonic testings were performed according to procedure for the ultrasonic examination of welds 41100 E (6.4). According to requirements of that procedure, assumed parameters of examination are given in table 1 for testing level B.

Table 1. Examination parameters.

l.p	Welds numbers according to Attachment 1	Probes	Diameter of reference hole DAC made on calibration block (Attachment 2)	Number of shift pages in probe	Number of items/ distance in mm	Total distance of testing mm
1	1	2T45 ⁰ 9X10	6	4	2/ 600+680	4x1280 = 5 120
2	2	2T45 ⁰ 9X10	6	4	3/ 140	4x420 = 1 680
3	5 i 6	2L0 ⁰ Φ 20	3	1	1/ 7190	7190
4	4	2 items of weld 4(80 mm) weren't tested because of lack of access				
5		Total performed distance of welds testing				= 13 990

On 3rd position in table 1, is written that welds 5 and 6 were tested together from one shift area with usage of normal double-transducer 2x2L0⁰ Φ 20 with transducer diameter 2x 0,5Φ 20 mm. These welds, because lack of access, can't be examined with usage of angle probes.

DAC curves were generated according to special calibration block.

Magnetic testings and valuation of welds 3, 7, 8 in range of magnetic testing were performed according to general procedure for the magnetic particle examination MM 21000 E (6.7). Acceptance criteria:

1. Lack of relevant linear indications.
2. Lack of relevant rounded indications greater than 5.0 mm..
3. Lack of four or more relevant rounded indications in a line separated by 1.5 mm or less, edge to edge.

Examinations didn't show indications larger than acceptance criterias.

Total distance of tested welds 3, 7, 8 is: 4x230 +5890 +6740 = 13 550mm

3. EQUIPMENT USED FOR TESTING

- Ultrasonic flaw detector CUD 05 nr 01003
- Ultrasonic angle probe with mark 2T45⁰ 9X10
- Ultrasonic normal double-transducer probe 2x2L0⁰ 05-20
- Equipmente (water moisten system, acumulators, power adapters, calibration blocks).
- Magnetic-current flaw detector DM 1
- Set of powders (Producer – MR Chemie GMBH):
 - White base – MR-72
 - Black powder – MR-76

4. ADDITIONAL INFORMATION

- condition of welds surface: smooth, polished surface
- object temperature: about 13 degrees
- acceptance level – according to procedures 6.4 and 6.7
- results of testing of native material: indications of home material splitting on depth of about 80 mm of ring material next to welds 2
- calibration of probes and settings: according to DAC curves – calibration block in Attachment 2
- value of attenuation of ultrasonic beam in material: 9 dB/m
- value of transfer loss: 2dB

5. GENERAL TESTING RESULT

Ultrasonic testing was performed on welds with total distance of 8645 mm. Whole tested welds fulfil acceptance criterion of standard PN-EN – 1714.

Magnetic testing was performed on welds with total distance of 13 550 mm. Whole tested welds fulfil acceptance criterion of standards PN-EN -1290 and PN-EN -1291.

6. STANDARDS AND PROCEDURES

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|---------------------|-------------------------|
| 1. PN-EN - 1712 | 5. PN-EN - 1290 |
| 2. PN-EN - 1713 | 6. PN-EN – 1291 |
| 3. PN-EN - 1714 | 7. Procedure MM 21000 E |
| 4. Procedure 41100E | |

Wrocław,