

1.0 PURPOSE

To establish and maintain documented procedures to ensure that the micro Examination is carried out as per the applicable specifications / standards for the Bends manufactured by Bendco.

2.0 SCOPE

This work instruction is intended for Micro examination of samples of Hot Pulled Induction Bend manufactured by Bendco.

3.0 RESPONSIBILITY

Asst. Manager/Sr. Engineer / Engineer / Officer (Lab.) and HOD (QA/QC) shall be responsible for examination and maintaining of records of these results.

3.1 APPLICABLE CODES

- API 5L 45th Edition Dec 2012: "Specification for Line Pipe".
- ASTM 112 – 2010: Standard Test Methods for Determining Average Grain Size.
- ISO 15590-1:2009: 'Petroleum and natural gas industries —Induction bends, fittings and flanges for Pipeline transportation systems.'
- ASTM E1382 – 1997: Standard Test Methods for Determining Average Grain Size.
- Quality Assurance Plan – QAP, Process Chart
- Customer Specification / Other applicable specification.

4.0 METHOD

4.1 A test specimen for Micro Examination shall be taken as per requirement of applicable code / specification.

4.2 Preliminary grinding of the specimen is done with the help of emery papers of different grades, starting with 180 in straight-line motion. This operation is done till all the file marks are erased.

4.3 Turn the specimen through 90° and hold it in this new position. The next emery papers 1/0, 2/0, 3/0 & 4/0.

4.4 This procedure is to be carried on till the size 4/0 is reached, keeping in mind to turn the specimen through 90° for every change of paper.

MANUFACTURING PROCEDURE SPECIFICATION AND INSPECTION TEST PLAN FOR INDUCTION BENDING METALLOGRAPHY		PAGE 1	PASADENA, TEXAS November 17, 2020
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Prepared By:	GORDON AAKER		DECEMBER 07, 2016
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4.5 Final polishing is to be done either using diamond paste in the cloth or by wet polishing. Wet polishing is carried out by using an appropriate polishing powder on the polishing disc covered either by a solvent/velvet cloth. Final polishing is carried out till the specimen surface becomes mirror polished i.e. no scratches observed when seen under microscope up to 1500X magnification.

4.6 The sample is etched with suitable etchant i.e. NITAL (2 % or 5 %) and washed with spirit / methanol. Make the sample dry.

4.7 Keep the specimen on the disc and clamp by using the specimen clamp.

4.8 Switch on the CCD CAMERA and PC.

4.9 Proceed as per the steps described in the flowchart given in page no. 3 of 3.

4.10 For changing magnification lower the coarse focusing adjustment. Rotate the head, index the required objective and repeat steps.

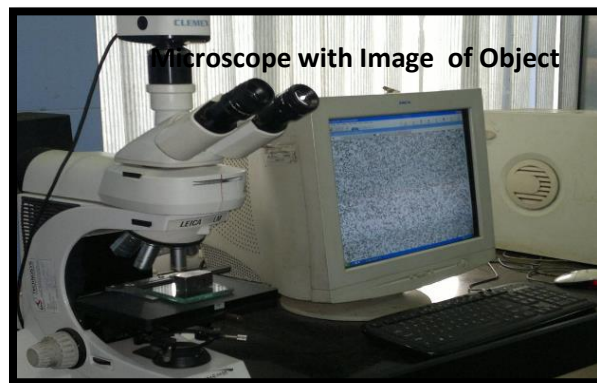
4.11 ACCEPTANCE CRITERIA: As per Approved QAP & Customer specification

4.12 RE-TEST CRITERIA: As per API 5L 45th Edition Dec 2012/ Customer specification / QAP

5.0 RECORDS

5.1 Orientation, No. of sample & Identification mark shall be recorded.

5.2 Test results shall be recorded on Bendco Form:

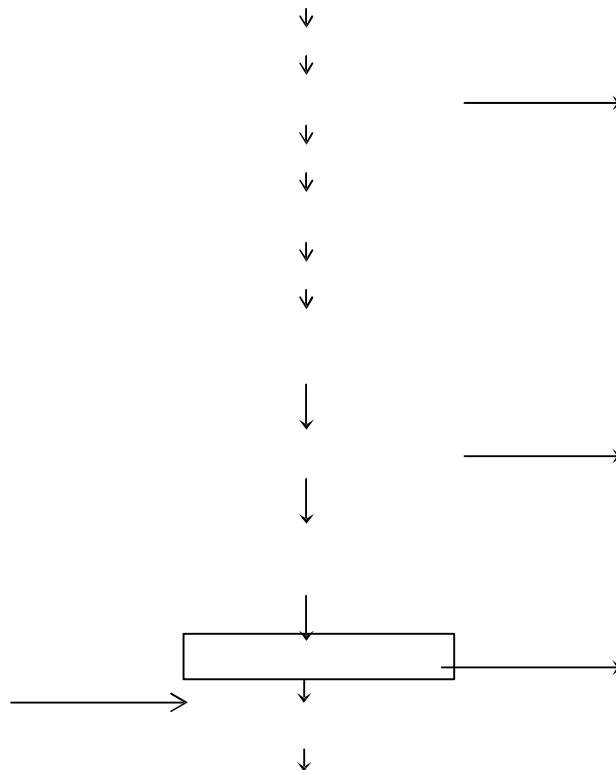


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BENDING PROCEDURE 17

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