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| **طرح نگهداشت و افزایش تولید 27 مخزن** | | | | | | | |
| **HARDNESS TESTING PROCEDURE (TOWER, COLUMNS, REBOILER, DRUMS, FILTERS & EXCHANGERS)**  **نگهداشت و افزایش تولید میدان نفتی بینک** | | | | | | | |
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| V00 | Apr. 2025 | IFA | MFS | M.Fakharian | S.Faramarzpour |  |
| **Rev.** | **Date** | **Purpose of Issue/Status** | **Prepared by:** | **Checked by:** | **Approved by:** | **CLIENT Approval** |
|  | | | | | | |
| **Status:** | **IFA: Issued For Approval**  **IFI: Issued For Information**  **AFC: Approved For Construction** | | | | | |

**REVISION RECORD SHEET**

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1. **SCOPE**

This specification covers minimum requirements for production hardness testing of weld and HAZ areas on pressure equipment. Hardness testing on completed production welds, when required, shall be done after any PWHT.

1. **DEFINITION AND TERMINOLOGY**

|  |  |
| --- | --- |
| **CLIENT:** | National Iranian South Oilfields Company (NISOC) |
| **PROJECT:** | Binak Oilfield Development – General Facilities |
| **EPD/EPC CONTRACTOR (GC):** | Petro Iran Development Company (PEDCO) |
| **EPC CONTRACTOR:** | Joint Venture of: Hirgan Energy – Design & Inspection(D&I) Companies |
| **VENDOR:** | MFS Co. |

1. **VENDOR: Masnouat Felezi Sangin References**

|  |  |
| --- | --- |
| **Project spec** | **Doc No.** |
| **SPECIFICATION FOR WELDING OF PLANT PIPING SYSTEM & NDT** | BK-GNRL-PEDCO-000-PI-SP-0011-D01 |
| **SPECIFICATION FOR MATERIAL REQUIREMENTS IN SOUR SERVICE** | BK-GNRL-PEDCO-000-PI-SP-0008-D01 |
| **Code** |  |
| ASME BPVC | Section II: Materials |
| Standard Test Method for Leeb Hardness Testing of Steel Products | ASTM A956 |

1. **USE OF LANGUAGE**

Throughout this specification, the words "will", "may", "should", "shall" when used have the following meanings:

* “Will” is used normally in conjunction with an action.
* “May” is used where alternatives are equally acceptable.
* “Should” is used where a solution is preferred.
* “Shall” is used where a provision is mandatory.

1. **DESCRIPTION OF EQUIPMENT**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No.** | **Tag No.** | **Material Type** | **PWHT** | | **Hardness requirement** |
| **Shell Side** | **Tube Side** |
|  | C-100 | SA-516 70 N | Yes | | Yes |
|  | E-200 | SA106B N | Yes | No | Yes, for Shell Side Only |
|  | E-300 | SA106B N / SA-234WPB N | Yes | Yes | Yes |
|  | F-100 A/B | SA106B N / SA-234WPB N | Yes | | Yes |
|  | F-200 A/B | SA106B N / SA-234WPB N | Yes | | Yes |
|  | R-100 | SA-516 70 N | Yes | | Yes |
|  | V-120 | SA-516 70 N | Yes | | Yes |

1. **Equipment**

Portable hardness equipment along with reference calibration block and valid calibration certificate shall be used.

Before the start of testing, the accuracy shall be checked using reference calibration block.

1. **Procedure**

Hardness testing on completed production welds, when required, shall be done after any PWHT. Mount the tester in such a position that the axis of the inventor is perpendicular to the surface to be tested. Impact direction shall be in normal position. Make sure that there is no relative motion between the tester and the piece when the force is applied. From each welding line, hardness is measured in one section, Base Metal (two point), HAZ (tow Point), and Weld Metal (one Point).

1. **ACCCEPTANCE CRITERIA**

8.1 According to Project Specification and NACE MR0175 hardness for NACE material and weld is as per below table:

|  |  |
| --- | --- |
| **P No.** | **Max. hardness** |
| 1 | 235 HB |
|

1. **Reporting**

For sample hardness test report refer to the attachment.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | **Hardness Inspection Report** | | | |  | | | | |
| **REFERENCE CODE:PR-08-01** | | | | | **FORM CODE:FR-08-01/34** | | | | |
| **REVISION NO.:05** | | | | | **REVISION NO.:03** | | | | |
| **REVISION DATE:** **2024-05-29** | | | | | **REVISION DATE:** **2024-05-29** | | | | |
| Project: | | | | | OWNER: | | | | Report No.: | | | | |
| Reference: | | | | | Equipment No.: | | | | DWG NO.: | | | | |
| ITP No: | | | | | Report Date: | | | | Page: | | | | |
| Row | Point  (HB) | Base Metal  (HB) | | Range  (HB) | | HD Unit | Row | Point  (HB | | Base Metal  (HB) | | Range  (HB) | HD Unit |
|  |  |  | |  | |  |  |  | |  | |  |  |
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