Table 2 Results obtained from charpy tests at room temperature

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Sample  Set | Specimen  # | Specimen Width  (mm) | Test Temperature  (℃) | Actual impact energy  (ft-lb) | Full size energy  (10mm×10mm)  (ft-lb) | Fracture appearance | |
| Percent shear fracture | Lateral expansion  (inches) |
| Base metal | 1 | 5.3 | 19 | 64 | 121 | 100% | 0.086 |
| 2 | 5.3 | 19 | 67 | 126 | 100% | 0.094 |
| 3 | 5.3 | 19 | 64 | 121 | 100% | 0.089 |
| **Average** | **5.3** | **19** | **65** | **123 (167 J)** | **100%** | **0.090** |
| Old weld metal | 4 | 5.7 | 22 | 42 | 74 | 100% | 0.070 |
| 5 | 5.7 | 22 | 33 | 58 | 100% | 0.057 |
| 6 | 5.7 | 22 | 43 | 75 | 100% | 0.059 |
| **Average** | **5.7** | **22** | **39** | **69 (94 J)** | **100%** | **0.062** |
| Old HAZ | 7 | 5.7 | 22 | 94 | 165 | Did not break | |
| 8 | 5.7 | 22 | 73 | 128 | Did not break | |
| 9 | 5.7 | 22 | 87 | 153 | Did not break | |
| **Average** | **5.7** | **22** | **85** | **149 (202 J)** |  |  |
| New weld metal | 10 | 5.0 | 22 | 71 | 142 | Did not break | |
| 11 | 5.0 | 22 | 61a | 122a | 100% | ? |
| **Average** | **5.0** | **22** | **71** | **142 (193 J)** |  | |
| New HAZ | 12 | 5.0 | 22 | 84 | 168 | Did not break | |
| 13 | 5.0 | 22 | 78a | 156a | 100% | ? |
| **Average** | **5.0** | **22** | **84** | **168 (228J)** |  |  |

**a** For results obtained from new weld metal, specimen 11 is less accurate than specimen 10 because an eccentric loading rather than an concentric loading was applied to break specimen 11 into two pieces. The heavy pendulum may be released imperfectly, so that the hammer hit the specimen eccentrically. Only value measured from specimen 10 should be considered as a “valid” value. Similarly, for results obtained from new HAZ, specimen 13 is less accurate than specimen 12 because an eccentric loading rather than a concentric loading was applied to break specimen 13 into two pieces. Only value measured from specimen 12 should be considered as a “valid” value. Photos of final fracture of these four specimens are included below.

|  |  |  |  |
| --- | --- | --- | --- |
| New weld metal | | New HAZ | |
| Specimen 10 | Specimen 11 | Specimen 12 | Specimen 13 |
| F:\Pipe test photo and video\small scale\Charpy\photo\final\New3A.JPG | F:\Pipe test photo and video\small scale\Charpy\photo\final\New3B.JPG | F:\Pipe test photo and video\small scale\Charpy\photo\final\New3E.JPG | F:\Pipe test photo and video\small scale\Charpy\photo\final\New3F.JPG |