CERTIFICATE NO(성적서 번호) : AC09780 Page 1 of 2
DATE OF ISSUE(발행일자) : 2016-12-30
CONTRACT(P/O) NO.(계약번호) : 24410
PR NO.(주문서번호) : F161000177
COMMODITY(제품명) : ERW/HFI CARBON STEEL PIPE
SPECIFICATION(제품규격) : API 5L B PSL1/ASTM A53B/ASME SA53B

# 검사증명서
# MILL TEST CERTIFICATE
## EN10204 3.1/ISO 10474 3.1B

CUSTOMER(고객사): PLESA ANAHUAC Y CIAS S.A. DE C.V.

HYUNDAI STEEL
울산공장 : 울산광역시 북구 염포로 705
705, Yeompo-ro, Buk-gu, Ulsan, Korea

| No. | TYPE OF PIPE END ※1 | SIZE OUT-DIA×THICK×LENGTH (외경×두께×길이) | PCS (본) | WEIGHT (KG) | TOTAL LENGTH (F) | HEAT No. | Hydrostatic Test Pressure PSI | Hydrostatic Test Time SEC | Spec. Min. | Spec. Max. | ※2 | Tensile Properties(Gage Length : 2 inch) Tensile Strength Base Mpa | Tensile Strength Weld Mpa | Yield Strength Mpa | Y/R Rate % | E.L % | Hardness Test ※3 Max. Value HV | ※2 ※3 | Hardness Test & CVN Impact Test CVN Impact Test(℃) Absorbed Energy(Joule) Specimen size | 1 | 2 | 3 | avg | Shear Area (%) | D.W.T Test(℃) Shear Area(%) 1 | 2 | avg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | PSI | SEC | Min. | | | 415 | 415 | 245 | | | | | | | | | | | | | |
| | | | | | | | | | Max. | | | | | | | | 248 | | Criteria : In the case of 10×10 | | | | | | | | |
| 1 | EB BE | 14" X 0.225 " X 20.177 F | 150 | 45,489 | 3,026.55 | P13088 | 680 | 5 | | T | | 485 | 477 | 371 | | 41 | | | | | | | | | | | |
| 2 | EB BE | 14" X 0.250 " X 20.177 F | 90 | 30,508 | 1,815.93 | SU84058 | 770 | 5 | | T | | 530 | 527 | 411 | | 37 | | | | | | | | | | | |
| 3 | EB BE | 14" X 0.375 " X 20.177 F | 56 | 27,920 | 1,129.912 | SU84060 | 1140 | 5 | | T | | 532 | 508 | 422 | | 38 | | | | | | | | | | | |
| 4 | EB BE | 16" X 0.250 " X 20.177 F | 1 | 388 | 20.177 | 6942424 | 670 | 5 | | T | | 557 | 536 | 378 | | 34 | | | | | | | | | | | |

| No. | Heat No. | Spec. | | Chemical Composition(%) 2:×100 3:×1000 4:×10000 C | Si | Mn ※7 | P | S | Cu | Ni | Cr | Mo | V | Ti | Nb | B | CM1 ※8 | CM2 ※9 | | | Zn-Coating Test Zn Coating | Copper Sulfate Test Time | Copper Sulfate Test Result | HC-Test Collapse Pressure | H.I.C Test CLR | CTR | CSR | S.S.C.C Test |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ※4 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 2 | 2 | | | | | | psi | % | % | % | |
| | | Min. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Max. | | 26 | | 120 | 30 | 30 | 50 | 50 | 50 | 15 | | | | 10 | 6 | 15 | | | | | | | | | | |
| 1 | P13088 | | H | 6 | 2 | 83 | 15 | 5 | | | | | | | | | | | | | | | | | | | |
| | | | P | 7 | 2 | 84 | 15 | 7 | 2 | 1 | 4 | 1 | TR | TR | 1 | 1 | 1 | 2 | | | | | | | | | |
| | | | P | 6 | 2 | 84 | 15 | 7 | 2 | 1 | 4 | TR | TR | TR | 1 | 1 | 1 | 2 | | | | | | | | | |
| 2 | SU84058 | | H | 7 | 20 | 101 | 12 | 2 | | | | | | | | | | | | | | | | | | | |
| | | | P | 7 | 19 | 107 | 11 | 3 | 1 | 2 | 2 | TR | TR | TR | 1 | 2 | 1 | 2 | | | | | | | | | |
| | | | P | 6 | 20 | 108 | 10 | 3 | 1 | 2 | 2 | TR | TR | TR | 1 | 2 | 2 | 2 | | | | | | | | | |
| 3 | SU84060 | | H | 7 | 19 | 99 | 13 | 2 | | | | | | | | | | | | | | | | | | | |
| | | | P | 7 | 20 | 104 | 12 | 4 | 2 | 2 | 2 | TR | TR | TR | 2 | 3 | 2 | 2 | | | | | | | | | |
| | | | P | 7 | 20 | 103 | 12 | 4 | 2 | 2 | 2 | TR | TR | TR | 2 | 3 | 2 | 2 | | | | | | | | | |
| 4 | 6942424 | | H | 18 | 2 | 62 | 19 | 2 | | | | | | | | | | | | | | | | | | | |
| | | | P | 16 | 2 | 62 | 16 | 4 | 2 | 2 | 2 | TR | TR | TR | 2 | 1 | 2 | 2 | | | | | | | | | |
| | | | P | 17 | 2 | 62 | 16 | 4 | 2 | 2 | 2 | TR | TR | TR | 2 | 1 | 2 | 2 | | | | | | | | | |

Remark

※1) Type of pipe end(관종)
EB:ERW Black BE:Bevel End
※2) L: Longitudinal, T: Transverse
※3) B: Base, W: Weld Line, H: Heat Affected Zone
※4) H: Heat(Ladle) Analysis, P: Product Analysis
※7) For each reduction of 0.01% below the specified max. for C, an increase of 0.05% above the specified max. for Mn is permissible, up to a max. of 1.65%
※8) CM1=Nb+V
※9) CM2=Nb+V+Ti
※ SPEC YEAR - API 5L 45th Edition(2013)/ASTM A53(2012)/ASME SA53 (2015)
※ License No. : 5L-0026
※ Hardness to NACE MR0175(2013ED) / ISO 15156
※ API 5L Annex E(N.D.E) : O.D<6":ECT(1.6mm hole), O.D>6":UT(3.2mm hole)
※ Heat treatment : Normalizing(Temp.871~1100℃, Holding time : max30m/min)

COPY

| Heat Treatment | Non-Destructive Test (U.T) | Flattening / Bending Test | Visual & Dimension | Residual Magnetism (Gauss) |
|---|---|---|---|---|
| GOOD | GOOD | GOOD | GOOD | GOOD |

SURVEYOR

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H.K.CHOI
QA Manager


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You are able to check an original electronic document at hyundaisteel's customer portal.( http://sm.hyundai-steel.com/cs/cm/login.jsp) * QRcode scanner App : 'QReal'

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# MILL TEST CERTIFICATE
## EN10204 3.1/ISO 10474 3.1B

CUSTOMER(고객사): PLESA ANAHUAC Y CIAS S.A. DE C.V.

HYUNDAI STEEL
울산공장 : 울산광역시 북구 염포로 706
706, Yeompo-ro, Buk-gu, Ulsan, Korea

| No. | TYPE OF PIPE END ※1 | SIZE OUT-DIA×THICK×LENGTH (외경×두께×길이) | PCS (본) | WEIGHT (KG) | TOTAL LENGTH (F) | HEAT No. | Hydrostatic Test Pressure PSI | Hydrostatic Test Time SEC | Spec. | ※2 | Tensile Properties(Gage Length : 2 inch) Tensile Strength Base Mpa | Tensile Strength Weld Mpa | Yield Strength Mpa | Y/R Rate % | E.L % | Hardness Test ※3 | Max. Value HV | ※2 ※3 | Hardness Test & CVN Impact Test Specimen size | CVN Impact Test(℃) Absorbed Energy(Joule) 1 | 2 | 3 | avg | Shear Area (%) | D.W.T Test(℃) Shear Area(%) 1 | 2 | avg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Min. | | 415 | 415 | 245 | | | | | | | | | | | | | | |
| | | | | | | | | | Max. | | | | | | | | 248 | | Criteria : In the case of 10×10 | | | | | | | | |
| 5 | EB BE | 16" X 0.250 " X 20.177 F | 42 | 16,305 | 847.434 | G56071 | 670 | 5 | | T | 491 | 478 | 324 | | 41 | | | | | | | | | | | | |
| 6 | EB BE | 16" X 0.250 " X 20.177 F | 40 | 15,528 | 807.08 | P10101 | 670 | 5 | | T | 473 | 455 | 345 | | 38 | | | | | | | | | | | | |
| 7 | EB BE | 20" X 0.375 " X 20.177 F | 29 | 20,825 | 585.133 | G56578 | 800 | 10 | | T | 486 | 491 | 315 | | 45 | | | | | | | | | | | | |
| | | TOTAL | 408 | 156,963 | 8,232.216 | | | | | | | | | | | | | | | | | | | | | | |

| No. | Heat No. | Spec | | Chemical Composition(%) C | Si | Mn ※7 | P | S | Cu | Ni | Cr | Mo | V | Ti | Nb | B | CM1 ※8 | CM2 ※9 | | | Zn-Coating Test Zn Coating | Copper Sulfate Test Time | Copper Sulfate Test Result | HC-Test Collapse Pressure | H.I.C Test CLR | CTR | CSR | S.S.C.C Test |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ※4 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 2 | 2 | | | | | | | | | |
| | | Min. | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Max. | | 26 | | 120 | 30 | 30 | 50 | 50 | 50 | 15 | | | | 10 | 6 | 15 | | | | | | | | | |
| 5 | G56071 | | H | 7 | 14 | 71 | 14 | 3 | | | | | | | | | | | | | | | | | | | |
| | | | P | 7 | 14 | 72 | 12 | 4 | 1 | 1 | 2 | TR | TR | 2 | 1 | 1 | 1 | 3 | | | | | | | | | |
| | | | P | 7 | 14 | 72 | 13 | 4 | 1 | 1 | 2 | TR | TR | 2 | 1 | 1 | 1 | 3 | | | | | | | | | |
| 6 | P10101 | | H | 6 | 1 | 76 | 11 | 4 | | | | | | | | | | | | | | | | | | | |
| | | | P | 7 | 1 | 76 | 10 | 6 | 2 | 1 | 3 | TR | TR | TR | 1 | 1 | 1 | 2 | | | | | | | | | |
| | | | P | 7 | 2 | 77 | 11 | 6 | 2 | 1 | 3 | TR | TR | TR | 1 | 1 | 1 | 2 | | | | | | | | | |
| 7 | G56578 | | H | 17 | 2 | 79 | 15 | 4 | | | | | | | | | | | | | | | | | | | |
| | | | P | 15 | 2 | 81 | 14 | 5 | 6 | 2 | 4 | TR | TR | TR | TR | 1 | TR | TR | | | | | | | | | |
| | | | P | 15 | 2 | 80 | 14 | 4 | 5 | 2 | 4 | TR | TR | TR | TR | 1 | TR | TR | | | | | | | | | |

2 : ×100 3 : ×1000 4 : ×10000

Remark
※1) Type of pipe end(관종)
EB:ERW Black BE:Bevel End
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※ Heat treatment : Normalizing(Temp.871~1100℃, Holding time : max30m/min)

| Heat Treatment | Non-Destructive Test (U.T) | Flattening / Bending Test | Visual & Dimension | Residual Magnetism (Gauss) |
|---|---|---|---|---|
| GOOD | GOOD | GOOD | GOOD | GOOD |

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