CERTIFICATE NO(성적서 번호) : C706465
DATE OF ISSUE(발행일자) : 2018-07-28
CONTRACT(P/O) NO.(계약번호) : 26550
PR NO.(주문서번호) : F180200166
COMMODITY(제품명) : E.R.W. CARBON STEEL PIPE
SPECIFICATION(제품규격) : ASTM A53 B



# 검사증명서
# MILL TEST CERTIFICATE
## EN 10204 TYPE 3.1 - 2004

CUSTOMER(고객사): 현대종합상사(주)

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 (M) | HEAT No. | Hydrostatic Test Pressure (PSI) | Hydrostatic Test Time (SEC) | Spec. Min. / 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 | Hardness Test Max. Value | Hardness Test & CVN Impact Test ※2 ※3 | 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 | 240 | | | | | | | | | | | | | | |
| | | | | | | | | | Max. | | | | | | | | | | | Criteria : In the case of 10×10) | | | | | | | |
| 1 | EB BE | 12" X 0.250 " X 6.150 M | 256 | 78,263 | 1,574.4 | SP09229 | 820 | 5 | | T | 459 | 470 | 305 | | 39 | | | | | | | | | | | | |
| 2 | EB BE | 12" X 0.250 " X 6.150 M | 88 | 26,903 | 541.2 | SP09708 | 820 | 5 | | T | 443 | 453 | 293 | | 37 | | | | | | | | | | | | |
| 3 | EB BE | 12" X 0.250 " X 6.150 M | 87 | 26,598 | 535.05 | SP99802 | 820 | 5 | | T | 483 | 461 | 317 | | 40 | | | | | | | | | | | | |
| 4 | EB BE | 12" X 0.250 " X 6.150 M | 88 | 26,903 | 541.2 | SU10697 | 820 | 5 | | T | 468 | 465 | 314 | | 38 | | | | | | | | | | | | |

| No. | Heat No. | Spec. | | Chemical Composition(%) C | Si | Mn ※7 | P | S | Cu | Ni | Cr | Mo | V | CM3 ※10 | Zn-Coating Test Zn Coating | Copper Sulfate Test Time | Copper Sulfate Test Result | HIC-Test Collapse Pressure | H.I.C Test CLR | CTR | CSR | S.S.C.C Test |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ※4 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | | | | psi | % | % | % | |
| | | Min. | | | | | | | | | | | | | | | | | | | | |
| | | Max. | | 30 | | 120 | 50 | 45 | 40 | 40 | 40 | 150 | 80 | 1000 | | | | | | | | |
| 1 | SP09229 | | H | 17 | 1 | 50 | 12 | 3 | | | | | | | | | | | | | | |
| | | | P | 18 | 1 | 49 | 14 | 4 | 2 | 1 | 3 | 2 | 2 | 63 | | | | | | | | |
| | | | P | 18 | 1 | 50 | 14 | 4 | 2 | 1 | 3 | 2 | 2 | 65 | | | | | | | | |
| 2 | SP09708 | | H | 17 | 1 | 46 | 11 | 4 | | | | | | | | | | | | | | |
| | | | P | 18 | 1 | 48 | 12 | 6 | 1 | 1 | 2 | 2 | 2 | 39 | | | | | | | | |
| | | | P | 17 | 1 | 48 | 11 | 6 | 1 | 1 | 2 | 2 | 2 | 41 | | | | | | | | |
| 3 | SP99802 | | H | 18 | 1 | 45 | 8 | 3 | | | | | | | | | | | | | | |
| | | | P | 18 | 1 | 44 | 8 | 4 | 2 | 1 | 2 | 2 | 1 | 53 | | | | | | | | |
| | | | P | 18 | 1 | 45 | 8 | 4 | 2 | 1 | 2 | 2 | 1 | 54 | | | | | | | | |
| 4 | SU10697 | | H | 17 | 1 | 48 | 11 | 2 | | | | | | | | | | | | | | |
| | | | P | 18 | 1 | 49 | 12 | 3 | 2 | 1 | 3 | 2 | 1 | 60 | | | | | | | | |
| | | | P | 17 | 1 | 49 | 11 | 3 | 2 | 1 | 3 | 3 | 1 | 61 | | | | | | | | |

2 : ×100 3 : ×1000 4 : ×10000

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

**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 C max. an increase of 0.06% Mn above the specified max. will be permitted up to a max. of 1.65%
※10) CM3=Cu+Ni+Cr+Mo+V
※ SPEC YEAR - ASTM A53(2012ED)

SURVEYOR

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T. h. lim
QA Manager

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## EN 10204 TYPE 3.1 - 2004

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

CUSTOMER(고객사): 현대종합상사(주)

| No. | TYPE OF PIPE END ※1 | SIZE OUT-DIA×THICK×LENGTH (외경×두께×길이) | PCS (본) | WEIGHT (KG) | TOTAL LENGTH (M) | HEAT No. | Hydrostatic Test Pressure (PSI) | Hydrostatic Test Time (SEC) | Spec. | ※2 | Tensile Strength Base (MPa) | Tensile Strength Weld (MPa) | Yield Strength (MPa) | Y/R Rate (%) | E.L (%) | ※3 | Hardness Test Max. Value | ※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 | 240 | | | | | | | | | | | | | | |
| | | | | | | | | | Max. | | | | | | | | | | | | | | | | | | |
| | | TOTAL | 519 | 158,667 | 3,191.85 | | | | | | | | | | | | | | | Criteria : In the case of 10×10) | | | | | | | |

| No. | Heat No. | Spec. | ※4 | C | Si | Mn ※7 | P | S | Cu | Ni | Cr | Mo | V | CM3 ※10 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | | | | psi | % | % | % | |
| | | Min. | | | | | | | | | | | | | | | | | | | | |
| | | Max. | | 30 | | 120 | 50 | 45 | 40 | 40 | 40 | 150 | 80 | 1000 | | | | | | | | |

2 : ×100 3 : ×1000 4 : ×10000

Zn-Coating Test

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 C max. an increase of 0.06% Mn above the specified max. will be permitted up to a max. of 1.65%
※10) CM3=Cu+Ni+Cr+Mo+V
※ SPEC YEAR - ASTM A53(2012ED)

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

SURVEYOR

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