



**CERTIFICADO DE CALIDAD**  
MILL TEST CERTIFICATE

Cod/ Code: FP-DQ-08-01  
Edición/ Edit: 0 Revisión: 2  
Fecha de Rev / Rev Date:  
15-Diciembre-2016

|  |                             |                            |                                    |
|--|-----------------------------|----------------------------|------------------------------------|
| No.Planta API/ API Plant #:            | Remisión /Delivery: 5030282 | Requerimiento/Requirement: | 5006019                            |
| Nivel Especifico / Specific Level: -   | Elaboró/By : 0              | Cliente/Customer:          | Plesa Anahuac y Cias., S.A de C.V. |
| Condición de Entrega/ Delivery Term: - |                             | Fecha /Date:               | 11/09/2018                         |
|  |                             | Reporte FS / FS Report :   | 5030282                            |

| Tipo de Producto ( Pipe Type /Delivery Condition): | Orden Interna de Fabricación (Internal Work Order) | Diámetro /Medida (Diameter/Size): | Espesor (Thickness) pulg (In): | Espesor (Thickness) (mm): | Longitud (Lenght) mtrs: | Longitud (Lenght) pies (ft): | Norma (Specification): | Grado (Grade): | Peso Unitario (mass) lbs. | Peso Unitario (mass) kg. | Peso Lineal lbs. x pie Linear Mass lbs x feet : | Peso Lineal kg. x mtr Linear Mass: | Piezas / Pieces |
|--|--|-----------------------------------|--------------------------------|---------------------------|-------------------------|------------------------------|------------------------|----------------|---------------------------|--------------------------|---|------------------------------------|-----------------|
| ERW  | OIF 1484   | 16                                | 0.375                          | 9.53                      | 12.20                   | 40.03                        | ASTM A500              | Grado B        | 2,506.84                  | 1,137.16                 | 62.63   | 93.21                              | 15              |

|                     |           |           |            |           |           |           |           |           |            |            |           |           |           |           |           |
|---------------------|-----------|-----------|------------|-----------|-----------|-----------|-----------|-----------|------------|------------|-----------|-----------|-----------|-----------|-----------|
| No. Lote (Lote No.) | 1484-10-7 | 1484-10-8 | 1484-16-18 | 1484-16-2 | 1484-16-3 | 1484-16-4 | 1484-16-8 | 1484-17-7 | 1484-18-10 | 1484-18-17 | 1484-18-6 | 1484-18-8 | 1484-18-9 | 1484-9-12 | 1484-9-15 |
|---------------------|-----------|-----------|------------|-----------|-----------|-----------|-----------|-----------|------------|------------|-----------|-----------|-----------|-----------|-----------|

| Composición Química ( Chemical Analysis) |        |        |        |        |        |        |        |        |        |        |        |        | Propiedades mecánicas (Mechanical Test) |             |            |                      |             |                           |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|-------------|------------|----------------------|-------------|---------------------------|
| Colada / Heat                            | C      | Si     | Mn     | P      | S      | V      | Nb     | Cr     | Cu     | Ni     | Mo     | Ciiw   | Limite Tracción ( Ts)                   |             |            | Limite Elástico (Yp) |             | % Elongación (Elongation) |
|  |        |        |        |        |        |        |        |        |        |        |        |        | L KSI (MPA)                             | T KSI (MPA) | W          | L KSI (MPA)          | T KSI (MPA) |                           |
| D18503498                                | 0.1320 | 0.1130 | 0.2750 | 0.0170 | 0.0040 | 0.0051 | 0.0063 | 0.0270 | 0.0210 | 0.0170 | 0.0089 | 0.1886 | 72.20(498)                              |             | 75.10(518) | 50.10(345)           |             | 35                        |
| D18803208                                | 0.1520 | 0.1160 | 0.2890 | 0.0240 | 0.0055 | 0.0052 | 0.0067 | 0.0320 | 0.0190 | 0.0160 | 0.0071 | 0.2114 | 68.90(475)                              |             | 72.50(500) | 49.90(344)           |             | 32                        |

| Prueba Hidrostática. (PSI) / Hydrostatic Test |                  | Tratamiento Térmico / Seam annealing |                 |                             |   | Pruebas de Laboratorio Propiedades Mecánicas (Lab Test) |   |   |   |  |                                       |
|---|------------------|--------------------------------------|-----------------|-----------------------------|---|---|---|---|---|--|---------------------------------------|
| Presión (Pressure)                            | Duración (Time). | Tipo (Type).                         | T°C min. (Temp) | Metalografía/ Metallography | Metodo de Inspección No-Destructiva (Non destructive Test Method) | Indicadores de Referencia (Reference Indicator)         | Resultado de Macrografía (Macrographic test Result) | Prueba de Aplastamiento (Flattening Test) | Resultado de Prueba de Impacto (Charpy Test) Metal Base (Base Metal). Prom (Average). | Temperatura de Prueba de Impacto (Charpy Test Temperature) | Doblez Guiado (Bending Test) (QW-160) |
| N/A   |                  |                                      |                 |                             |   |   |   |   |   |  |                                       |

Este certificado ampara los números de serie de los tubos manifestados, los cuales fueron fabricados, inspeccionados y aceptados de acuerdo a los requerimientos de las especificaciones arriba mencionadas; FORZA STEEL no garantiza el producto que sea utilizado inapropiadamente. / FORZA STEEL certify that this MTC covers the material here in described. That it has been manufactured, sampled, tested and inspected as stated. FORZA STEEL is not and will not be responsible for any missusage.  
N/A: No Aplica

Autorizó (Approve):  
Ing. Ramón González  
Cert. y Lab. FS

| Tipo de Producto ( Pipe Type /Delivery Condition): | Orden Interna de Fabricación (Internal Work Order) | Diámetro /Medida (Diameter/Size): | Espesor (Thickness) pulg (In): | Espesor (Thickness) (mm): | Longitud (Lenght) mtrs: | Longitud (Lenght) pies (ft): | Norma (Specification): | Grado (Grade): | Peso Unitario (mass) lbs. | Peso Unitario (mass) kg. | Peso Lineal lbs. x pie Linear Mass lbs x feet : | Peso Lineal kg. x mtr Linear Mass: | Piezas / Pieces |
|--|--|-----------------------------------|--------------------------------|---------------------------|-------------------------|------------------------------|------------------------|----------------|---------------------------|--------------------------|---|------------------------------------|-----------------|
| ERW  | OIF 1484   | 16                                | 0.375                          | 9.53                      | 12.20                   | 40.03                        | ASTM A500              | Grado B        | 2,506.84                  | 1,137.16                 | 62.63   | 93.21                              | 15              |

|                     |           |           |            |           |           |           |           |           |            |            |           |           |           |           |           |
|---------------------|-----------|-----------|------------|-----------|-----------|-----------|-----------|-----------|------------|------------|-----------|-----------|-----------|-----------|-----------|
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|---------------------|-----------|-----------|------------|-----------|-----------|-----------|-----------|-----------|------------|------------|-----------|-----------|-----------|-----------|-----------|

| Composición Química ( Chemical Analysis) |        |        |        |        |        |        |        |        |        |        |        |        | Propiedades mecánicas (Mechanical Test) |             |            |                      |             |                           |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|-------------|------------|----------------------|-------------|---------------------------|
| Colada / Heat                            | C      | Si     | Mn     | P      | S      | V      | Nb     | Cr     | Cu     | Ni     | Mo     | Ciw    | Limite Tracción ( Ts)                   |             |            | Limite Elástico (Yp) |             | % Elongación (Elongation) |
|  |        |        |        |        |        |        |        |        |        |        |        |        | L KSI (MPA)                             | T KSI (MPA) | W          | L KSI (MPA)          | T KSI (MPA) |                           |
| D18803214                                | 0.1450 | 0.1210 | 0.2820 | 0.0160 | 0.0051 | 0.0053 | 0.0061 | 0.0330 | 0.0240 | 0.0140 | 0.0076 | 0.2037 | 70.60(487)                              |             | 73.10(504) | 51.30(354)           |             | 34                        |
| D18803215                                | 0.1600 | 0.1230 | 0.3060 | 0.0260 | 0.0057 | 0.0054 | 0.0065 | 0.0300 | 0.0170 | 0.0130 | 0.0078 | 0.2216 | 69.70(481)                              |             | 72.80(502) | 47.20(325)           |             | 36                        |

| Prueba Hidrostática. (PSI) / Hydrostatic Test |                  | Tratamiento Térmico / Seam annealing |                 |                             |   |   | Pruebas de Laboratorio Propiedades Mecánicas (Lab Test) |   |   |  |                                       |  |
|---|------------------|--------------------------------------|-----------------|-----------------------------|---|---|---|---|---|--|---------------------------------------|--|
| Presión (Pressure)                            | Duración (Time). | Tipo (Type).                         | T°C min. (Temp) | Metalografía/ Metallography | Metodo de Inspección No-Destructiva (Non destructive Test Method) | Indicadores de Referencia (Reference Indicator) | Resultado de Macrografia (Macrographic test Result)     | Prueba de Aplastamiento (Flattening Test) | Resultado de Prueba de Impacto (Charpy Test) Metal Base (Base Metal). Prom (Average). | Temperatura de Prueba de Impacto (Charpy Test Temperature) | Doblez Guiado (Bending Test) (QW-160) |  |
| N/A   |                  |                                      |                 |                             |   |   |   |   |   |  |                                       |  |

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