

<b>MATERIAL DATA SHEET</b>		<b>MDS C11</b>		<b>Rev. 3</b>
<b>TYPE OF MATERIAL:</b> Carbon Steel Type 235LT				Page 1 of 2
<b>PRODUCT</b>	<b>STANDARD</b>	<b>GRADE</b>	<b>ACCEPT. CLASS</b>	<b>SUPPL. REQ.</b>
Wrought fittings	ASTM A 420	WPL 6	-	S51, S53, S69
Welded pipes	ASTM A 671	CC60, CC70	t ≤ 19 mm: Class 12 t > 19 mm: Class 22	S2, S7 S2, S7
Seamless pipes	ASTM A 333	6	-	-
Forgings	ASTM A 350	LF2	Class 1	S6, S55
Plates	ASTM A 516	60, 70	-	S5
<b>1. SCOPE</b>	This MDS specifies the selected options in the referred standard and additional requirements which shall be added or supersede the corresponding requirements in the referred standard.			
<b>2. MANUFACTURING PROCESS</b>	<i>All welded products:</i> Welding shall be carried out by qualified welders according to qualified procedures approved by a 3 <sup>rd</sup> party organization recognized by an EC member State.			
<b>3. CHEMICAL COMPOSITION</b>	C ≤ 0.20 %; Mn = 0.50 - 1.55 %; S ≤ 0.025 %; P ≤ 0.030 %; CE <sub>(IIW long formula)</sub> = C + Mn/6 + (Cr+Mo+V)/5 + (Cu+Ni)/15 ≤ 0.43. <i>Seamless pipes to A 333:</i> Cr ≤ 0.40, Ni ≤ 0.40, Mo ≤ 0.15, Cu ≤ 0.40, Nb ≤ 0.010 V ≤ 0.08			
<b>4. IMPACT TESTING</b>	Charpy V-notch testing at - 46°C is required for the thickness ≥ 6 mm. For flanges apply the thickness at the weld neck. The minimum absorbed energy for full size specimens shall be 27 J average and 20 J single. Reduction factors for sub-size specimens shall be: 7.5mm - 5/6 and 5 mm - 2/3.			
<b>5. EXTENT OF TESTING</b>	<p><i>Fittings to A 420:</i> Supplementary requirement ASTM A 960, S51 shall apply. Impact testing shall be carried out to the same extent as tensile testing.</p> <p><i>Pipes to A 671:</i> Supplementary requirement S2 shall apply to the same extent as for tensile testing.</p> <p><i>Forgings to A 350:</i> One set of tensile and impact testing shall be carried out for each heat and heat treatment load. A test lot shall not exceed 2000 kg for forgings with as forged weight ≤ 50 kg, and 5000 kg for forgings with as forged weight &gt; 50 kg.</p>			
<b>6. TEST SAMPLING</b>	<p><i>All products:</i> Samples for production testing shall realistically reflect the properties in the actual component.</p> <p><i>Forgings to A350:</i> Sketches shall be established showing type, size and location of test samples and extraction of test specimens.</p>			

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<b>7. NON DESTRUCTIVE TESTING</b>	<p><i>Fittings to A 420:</i> Ultrasonic testing is not acceptable as replacement of radiographic testing.</p> <p>Supplementary requirement ASTM A 960, S53 and S69, magnetic particle testing, shall apply to 10 % of all fittings (same test lot as defined for mechanical testing) for nominal thickness &lt; 12.7 mm and 100 % of all fittings for nominal thickness ≥ 12.7 mm. The testing shall be carried out after calibration. The acceptance criteria shall be to ASME VIII, Div. 1, Appendix 6.</p> <p><i>Forgings to A 350:</i> Supplementary Requirement ASTM A 961, S55, magnetic particle testing shall apply to 10 % of all forgings (same test lot as defined for mechanical testing) with NPS &gt; 2. The testing shall be carried out after final machining. The acceptance criteria shall be to ASME VIII, Div. 1, Appendix 6.</p> <p><i>All products:</i> NDT operator qualification shall be approved by a 3<sup>rd</sup> party organization recognized by an EC member state</p>			
<b>8. REPAIR OF DEFECTS</b>	Weld repair of base material is not acceptable.			
<b>9. MARKING</b>	Heat treatment load number shall be permanently marked on the component where testing is required per heat treatment load.			
<b>10. CERTIFICATION</b>	<p>Certification shall affirm compliance with the specification and shall be according to EN 10204 Type 3.1B provided the manufacturer has a quality assurance system certified by a competent body established within the EC, and having undergone a specific assessment for materials.</p> <p>Heat treatment temperature, soaking time and cooling medium should be stated in the certificate.</p>			