





# TMK-ARTROM S.A.

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J 28/9/1991; VAT No. RO 1510210/1992

Subscribed and Paid Share Capital: 291.587.538,34 lei

			K55				0.03	0.03												
			N 80(1)				0.03	0.03												
			N 80(Q)				0.03	0.03												
	<b>Group 2</b>	PSL2	L 80 (1)	0.43		1.90	0.03	0.03												
	<b>Group 3</b>	PSL1	P110				0.03	0.03												
<b>API 5L</b>	<b>As rolled or normalizing rolled</b>	PSL1	L210 or A	0.22		0.90	0.03	0.03				0.50	0.50	0.50	0.15			0.001		
			L245 or B	0.28		1.20	0.03	0.03	Nb+V+Ti≤0.15% Nb+V≤0.06%			0.50	0.50	0.50	0.15			0.001		
			L290 or X42	0.28		1.30	0.03	0.03	Nb+V+Ti≤0.15%			0.50	0.50	0.50	0.15			0.001		
			L320 or X46	0.28		1.40	0.03	0.03	Nb+V+Ti≤0.15%			0.50	0.50	0.50	0.15			0.001		
			L360 or X52	0.28		1.40	0.03	0.03	Nb+V+Ti≤0.15%			0.50	0.50	0.50	0.15			0.001		
			L390 or X56	0.28		1.40	0.03	0.03	Nb+V+Ti≤0.15%			0.50	0.50	0.50	0.15			0.001		
			L415 or X60	0.28		1.40	0.03	0.03	Nb+V+Ti≤0.15%			0.50	0.50	0.50	0.15			0.001		
			L450 or X65	0.28		1.40	0.03	0.03	Nb+V+Ti≤0.15%			0.50	0.50	0.50	0.15			0.001		
	<b>Normalized</b>	PSL2	L245N or BN	0.24	0.40	1.20	0.025	0.015	Nb+V≤0.06%		0.04	0.50	0.30	0.30	0.15			0.001	0.43	0.25
			L290N or X42N	0.24	0.40	1.20	0.025	0.015	0.06	0.05	0.04	0.50	0.30	0.30	0.15			0.001	0.43	0.25
			L320N or X46N	0.24	0.40	1.40	0.025	0.015	0.07	0.05	0.04	0.50	0.30	0.30	0.15			0.001	0.43	0.25
									Nb+V+Ti≤0.15%											
			L360N or X52N	0.24	0.45	1.40	0.025	0.015	0.10	0.05	0.04	0.50	0.30	0.30	0.15			0.001	0.43	0.25
									Nb+V+Ti≤0.15%											



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			L390N or X56N	0.24	0.45	1.40	0.025	0.015	0.10	0.05	0.04	0.50	0.30	0.30	0.15			0.001	0.43	0.25						
			Nb+V+Ti≤0.15%																							
				L415N or X60N	0.24	0.45	1.40	0.025	0.015	0.10	0.05	0.04	0.50	0.50	0.50	0.50			0.001	as agreed						
				Nb+V+Ti≤0.15%																						
	<b>Quenched and tempered</b>	PSL2	L245Q or BQ	0.18	0.45	1.40	0.025	0.015	0.05	0.05	0.04	0.50	0.30	0.30	0.15			0.001	0.43	0.25						
			L290Q or X42Q	0.18	0.45	1.40	0.025	0.015	0.05	0.05	0.04							0.001	0.43	0.25						
			L320Q or X46Q	0.18	0.45	1.40	0.025	0.015	0.05	0.05	0.04							0.001	0.43	0.25						
			L360Q or X52Q	0.18	0.45	1.50	0.025	0.015	0.05	0.05	0.04							0.001	0.43	0.25						
			L390Q or X56Q	0.18	0.45	1.50	0.025	0.015	0.07	0.05	0.04							0.50	0.30	0.30	0.15			0.001	0.43	0.25
			Nb+V+Ti≤0.15%																							
			L415Q or X60Q	0.18	0.45	1.70	0.03	0.02	Nb+V+Ti≤0.15%									0.50	0.50	0.50	0.50			0.001	0.43	0.25
	L450Q or X65Q	0.24	0.45	1.70	0.03	0.02	Nb+V+Ti≤0.15%			0.50	0.50	0.50	0.50			0.001	0.43	0.25								
	<b>Annex H Normalized</b>	PSL2	L245NS or BNS	0.14	0.40	1.35	0.02	0.003	Nb+V≤0.06%		0.04	0.35	0.30	0.30	0.15	0.06	0.012	0.0005	0.36	0.19						
									Nb+V+Ti≤0.15%																	
L290NS or X42NS			0.14	0.40	1.35	0.02	0.003	0.05	0.05	0.04	0.35	0.30	0.30	0.15	0.06	0.012	0.0005	0.36	0.19							
			0.14	0.40	1.40	0.02	0.003	0.07	0.05	0.04	0.35	0.30	0.30	0.15	0.06	0.012	0.0005	0.38	0.20							



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		L320NS or X46NS					Nb+V+Ti≤0.15%												
		L360NS or X52NS	0.16	0.45	1.65	0.02	0.003	0.10	0.05	0.04	0.35	0.30	0.30	0.15	0.06	0.012	0.0005	0.43	0.22
<b>Annex H Quenched and tempered</b>	PSL2	L245QS or BQS	0.14	0.40	1.35	0.02	0.003	0.04	0.04	0.04	0.35	0.30	0.30	0.15	0.06	0.012	0.0005	0.34	0.19
		L290QS or X42QS	0.14	0.40	1.35	0.02	0.003	0.04	0.04	0.04	0.35	0.30	0.30	0.15	0.06	0.012	0.0005	0.34	0.19
		L320QS or X46QS	0.15	0.45	1.40	0.02	0.003	0.05	0.05	0.04	0.35	0.30	0.30	0.15	0.06	0.012	0.0005	0.36	0.20
		L360QS or X52QS	0.16	0.45	1.65	0.02	0.003	0.07	0.05	0.04	0.35	0.30	0.30	0.15	0.06	0.012	0.0005	0.39	0.20
		L390QS or X56QS	0.16	0.45	1.65	0.02	0.003	0.07	0.05	0.04	0.35	0.30	0.30	0.15	0.06	0.012	0.0005	0.40	0.21
		L415QS or X60QS	0.16	0.45	1.65	0.02	0.003	0.08	0.05	0.04	0.35	0.50	0.50	0.50	0.06	0.012	0.0005	0.41	0.22
		L450QS or X65QS	0.16	0.45	1.65	0.02	0.003	0.09	0.05	0.06	0.35	0.50	0.50	0.50	0.06	0.012	0.0005	0.42	0.22
									Nb+V+Ti≤0.15%										

## 6. Mechanical Properties

Standard		PSL	Grade	Yield Strength Rt0,5, ksi (MPa) minimum	Tensile Strength Rm, PSI (MPa) minimum	Total elongation under load %	Hardness HRC max
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				<i>minimum</i>	<i>maximum</i>	<i>minimum</i>	<i>maximum</i>		
API 5 CT	Group 1	PSL1	H40	40(276)	80(552)	60(414)		0.5	
			R95	95(655)	110(758)	105(724)		0.5	
		PSL2	J 55	55(379)	80(552)	75(517)		0.5	
			K55	55(379)	80(552)	95(655)		0.5	
			N 80(1)	80(552)	110(758)	100(689)		0.5	23
		N 80(Q)	80(552)	110(758)	100(689)		0.5		
	Group 2	PSL2	L 80 (1)	80(552)	95(655)	95(655)		0.5	
Group 3	PSL1	P110	110(758)	140(965)	125(862)		0.6		
API 5L	As rolled or normalizing rolled	PSL1	L210 or A	30500(210)		48600(335)		Elongation (on 50 mm or 2 in) are calculated acc. to the wall thickness	
			L245 or B	35500(245)		60200(415)			
			L290 or X42	42100(290)		60200(415)			
			L320 or X46	46400(320)		63100(435)			
			L360 or X52	52200(360)		66700(460)			
			L390 or X56	56600(390)		71100(490)			
			L415 or X60	60200(415)		75400(520)			
			L450 or X65	65300(450)		77600(535)			
	Normalized	PSL2	L245N or BN	35500(245)	65300(450)	60200(415)	95000(655)		
			L290N or X42N	42100(290)	71800(495)	60200(415)	95000(655)		
			L320N or X46N	46400(320)	76100(525)	63100(435)	95000(655)		
			L360N or X52N	52200(360)	76900(530)	66700(460)	110200(760)		
			L390N or X56N	56600(390)	79000(545)	71100(490)	110200(760)		
			L415N or X60N	60200(415)	81900(565)	75400(520)	110200(760)		
	PSL2	L245Q or BQ	35500(245)	65300(450)	60200(415)	95000(655)			



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	Quenched and tempered		L290Q or X42Q	42100(290)	71800(495)	60200(415)	95000(655)	
			L320Q or X46Q	46400(320)	76100(525)	63100(435)	95000(655)	
			L360Q or X52Q	52200(360)	76900(530)	66700(460)	110200(760)	
			L390Q or X56Q	56600(390)	79000(545)	71100(490)	110200(760)	
			L415Q or X60Q	60200(415)	81900(565)	75400(520)	110200(760)	
			L450Q or X65Q	65300(450)	87000(600)	77600(535)	110200(760)	
	Annex H Normalized	PSL2	L245NS or BNS	35500(245)	65300(450)	60200(415)	95000(655)	
			L290NS or X42NS	42100(290)	71800(495)	60200(415)	95000(655)	
			L320NS or X46NS	46400(320)	76100(525)	63100(435)	95000(655)	
			L360NS or X52NS	52200(360)	76900(530)	66700(460)	110200(760)	
	Annex H Quenched and tempered	PSL2	L245QS or BQS	35500(245)	65300(450)	60200(415)	95000(655)	
			L290QS or X42QS	42100(290)	71800(495)	60200(415)	95000(655)	
			L320QS or X46QS	46400(320)	76100(525)	63100(435)	95000(655)	
			L360QS or X52QS	52200(360)	76900(530)	66700(460)	110200(760)	
			L390QS or X56QS	56600(390)	79000(545)	71100(490)	110200(760)	
			L415QS or X60QS	60200(415)	81900(565)	75400(520)	110200(760)	



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		L450QS or X65QS	65300(450)	87000(600)	77600(535)	110200(760)	
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**7. Lengths**

Random lengths 4÷8m (13.1÷26.2ft) or fixed length within the random lengths range.

**8. Protection**

Unprotected.

**9. Marking**

According to standard or per customer request.

**10. Delivery**

Bundles up to 4000 kg (8800 lbs).

**11. Mill test report**

Mill test reports are issued to customer requirements. Usually they comply with DIN 50049, EN 10204.

**12. Quality certified:**

LR, API 5CT, API 5L.

**Tab.1 Coupling stocks dimensions**

**Upset tubing**

Size Designation	Outside Diameter	
	in	mm
1 8/9	2.500	63.5
2 3/8	3.063	77.8
2 7/8	3.678	93.2
3 1/2	4.500	114.3
4	5.000	127.0
4 1/2	5.563	141.3

**Nonupset tubing**

Size Designation	Outside Diameter	
	in	mm
2 3/8	2.875	73.0
2 7/8	3.500	88.9
3 1/2	4.250	108.0
4	4.750	120.7
4 1/2	5.200	132.1



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**Casing**

<b>Size Designation</b>	<b>Outside Diameter</b>	
	<i>in</i>	<i>mm</i>
4 1/2	5.000	127.0
5	5.563	141.3
5 1/2	6.050	153.7
6 5/8	7.390	187.7
7	7.656	194.5
7 5/8	8.500	215.9
8 5/8	9.625	244.48

**Line Pipe**

<b>Size Designation</b>	<b>Outside Diameter</b>	
	<i>in</i>	<i>mm</i>
2 3/8	2.875	73.0
2 7/8	3.375	85.7
3 1/2	4.000	101.6
4	4.625	117.5
4 1/2	5.200	132.1
5 9/16	6.296	159.9
6 3/8	7.390	187.7

**Note:** Wall Thickness according to customer's request.