

MILL CERTIFICATE

Drop-Weight Tear Tests

Heat Qualifiers

REGINA SPIRAL MILL

Certification Package ID:	4987
Certificate Form Number:	L 3521

Customer: TRANSCANADA PIPELINES LTD. Specification: API 5L 44TH ED / TCPL TES-PIPE-SAW-US REV 1 2009/06/24	Mill Order No: 70009092	Date: 10/30/2012	Size: 36.000 in
	Customer Order No: PPA#5160 007	Time: 05:07:29	Wall: 0.465 in
	Primary Changeover: L-296		Grade: X70M PSL 2

Heat	Coil	Pipe	Test Type	Orientation	Energy (ft. lbs)			Percent Shear			Fracture Angle		Pos. of Test	Temp. ° F	FLAT	NOTCH
					#1	#2	Avg	#1	#2	Avg	#1	#2				
484389	A91	54483	QUAL INITIAL	PIPE TPA	6634	6634	6634	100	100	100			90	23	Y	P

TPA - Transverse Pipe Axis
LPA - Longitudinal Pipe Axis
TWA - Transverse Weld Axis
LRD - Longitudinal Rolling Direction
TRD - Transverse Rolling Direction

Flat - Flattened Y/N
Notch - P = Pressed C = Chevron

WE HEREBY CERTIFY THAT THE PRODUCT DESCRIBED ABOVE HAS PASSED ALL THE TESTS REQUIRED BY THE SPECIFICATIONS.



Quality Assurance

Form: Cpr7871

MILL CERTIFICATE
Charpy V-Notch Impact Tests
Heat Qualifiers

Certification Package ID:	4987
Certificate Form Number:	L 3522

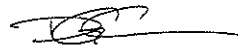
REGINA SPIRAL MILL

Customer: TRANSCANADA PIPELINES LTD. Specification: API 5L 44TH ED / TCPL TES-PIPE-SAW-US REV 1 2009/06/24	Mill Order No:70009092	Date: 10/30/2012	Size: 36.000 in
	Customer Order No:PPA#5160 007	Time: 05:07:20	Wall: 0.465 in
	Primary Changeover: L-296		Grade: X70M PSL 2

Heat	Coil	Pipe	Test Type	Orient.	Energy (ft. lbs)				Percent Shear				Pos. of Test	Temp. ° F	F L A T
					#1	#2	#3	Avg	#1	#2	#3	Avg			
484389	A91	54483	QUAL INITIAL	PIPE TPA	216	257	202	225	100	100	100	100	90	23	N
484389	A91	54483	QUAL INITIAL	PIPE TWA	147	140	136	141	100	100	100	100	HAZ	23	N
484389	A91	54483	QUAL INITIAL	PIPE TWA	75	56	80	70	55	35	55	48	WMZ	23	N

TPA - Transverse Pipe Axis
LPA - Longitudinal Pipe Axis
TWA - Transverse Weld Axis
LRD - Longitudinal Rolling Direction
TRD - Transverse Rolling Direction
HAZ - Heat Affected Zone
WMZ - Weld Metal Zone
Flat - Flattened Y/N

WE HEREBY CERTIFY THAT THE PRODUCT DESCRIBED ABOVE HAS PASSED ALL THE TESTS REQUIRED BY THE SPECIFICATIONS.



Quality Assurance

Full Size Acceptance Criteria

Charpy Size: Full Size

WMZ: 30 HAZ: 30 BODY: 41

Form: Cpr7872

MILL CERTIFICATE

Macrohardness Tests
Heat Qualifiers

REGINA SPIRAL MILL

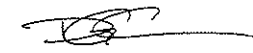
Certification Package ID:	4987
Certificate Form Number:	L 3524

Customer: TRANSCANADA PIPELINES LTD. Specification: API 5L 44TH ED / TCPL TES-PIPE-SAW-US REV 1 2009/06/24	Mill Order No: 70009092 Customer Order No: PPA#5160 007 Primary Changeover: L-296	Date 10/30/2012 Time 05:07:38	Size: 36.000 in Wall: 0.465 in Grade: X70M PSL 2
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Heat	Coil	Pipe	Test Type	Scale	MS		PM	PM	PM	HAZ	HAZ	HAZ	WMZ	WMZ	WMZ	HAZ	HAZ	HAZ	PM	PM	PM
484389	A91	54483	QUAL INITIAL	Vickers	OK	OD	220	223		219	219		240	241		203	222		211	218	
						ID	219	224		230	213		232	226		207	223		208	220	

MS = Micro Structure
Vickers Measurement Taken In HV 10 Kg.

WE HEREBY CERTIFY THAT THE PRODUCT DESCRIBED ABOVE HAS PASSED ALL THE TESTS REQUIRED BY THE SPECIFICATIONS.



Quality Assurance

Form: C1pr8773

MILL CERTIFICATE

Microhardness Test
Heat Qualifiers

Certification Package ID:	4987
Certificate Form Number:	L 3525

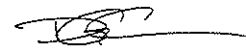
REGINA SPIRAL MILL

Customer: TRANSCANADA PIPELINES LTD. Specification: API 5L 44TH ED / TCPL TES-PIPE-SAW-US REV 1 2009/06/24	Mill Order No: 70009092 Customer Order No: PPA#5160 007 Primary Changeover: L-296	Date: 10/30/2012 Time: 05:07:47	Size: 36.000 in Wall: 0.465 in Grade: X70M PSL 2
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Heat	Coil	Pipe	Test Type	Scale	MS	OD	ID	PM	PM	PM	HAZ	HAZ	HAZ	WMZ	WMZ	WMZ	HAZ	HAZ	HAZ	PM	PM	PM	
484389	A91	54483	QUAL INITIAL	Vickers	OK	200	210	200	210	210	197	235	235	215	190	208	205	208	209	208	209	208	209
						ID	203	195	225	206	211	207	200	227	208	209							

MS = Micro Structure

WE HEREBY CERTIFY THAT THE PRODUCT DESCRIBED ABOVE HAS PASSED ALL THE TESTS REQUIRED BY THE SPECIFICATIONS.



Quality Assurance

Form: Cidr8773



MILL CERTIFICATE

Tensile


REGINA SPIRAL MILL

Certificate Package ID:	4987
Certificate Form Number:	L 3526

Customer: TRANSCANADA PIPELINES LTD. Specification: API 5L 44TH ED / TCPL TES-PIPE-SAW-US REV 1 2009/06/24	Mill Order No: 70009092	Date: 10/30/2012 Time: 05:06:26	Size: 36.000 in Wall: 0.465 in Grade: X70M PSL 2
	Customer Order No: PPA#5160 007 Primary Changeover: L-296		

Coil	Pipe	Test Type	Orientation	Test Width (in)	Yield Strength (psi)	Tensile Strength (psi)	% Elongation		Weld Break (in)
							2 in	Uniform	
Heat 484389									
A91	54483	QUAL INITIAL	PIPE TPA	1.505	76100	91800	39.0		.83
A91	54483	QUAL INITIAL	PIPE TWA	1.505		99500	30.0		

WE HEREBY CERTIFY THAT THE PRODUCT DESCRIBED ABOVE HAS PASSED ALL THE TESTS REQUIRED BY THE SPECIFICATIONS.



Quality Assurance

Orientation Legend TPA - Transverse Pipe Axis LPA - Longitudinal Pipe Axis TWA - Transverse Weld Axis LRD - Longitudinal Rolling Direction TRD - Transverse Rolling Direction FST - Full Section (Width is the Diameter)	Hydrostatic Parameters Pressure: 1730 PSI Hold Time: 10 sec. Hydro(%): 95.0
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Guided Bend Tests Were Performed In Accordance With And Meet The Requirements Of The Above Specification.



MILL CERTIFICATE Chemistry

REGINA SPIRAL MILL

Customer: TRANSCANADA PIPELINES LTD.
Specification: API 5L 44TH ED / TCPL TES-PIPE-SAW-US REV 1 2009/06/24

Customer Order
No: PPA#5160 007
Mill Order
No: 70009092
Primary
Changeover: L-296

Date:
10/30/2012
Time:
05:07:58

Size: 36.000 in
Wall: 0.465 in
Grade: X70M PSL 2

Certificate
Package ID: 4987

Certificate
Form Number: L 3523

Coil	Pipe	Type	C	Mn	S	P	Si	Cu	Ni	Cr	V	Cb	Sn	Mo	Al	Ca	B	Ti	N	Ce	CEpcm	SoAl
Heat 484389																						
		HEAT	0.036	1.71	0.002	0.009	0.30	0.22	0.09	0.21	0.001	0.073	0.010	0.07	0.047	0.0028	0.0000	0.018	0.010	0.0002	0.16	0.041
A91	54483	PRODUCT	0.038	1.71	0.001	0.010	0.28	0.21	0.09	0.22	0.001	0.072	0.009	0.07	0.048	0.0026	0.0001	0.018	0.010	0.0001	0.16	0.042
A93		PRODUCT	0.040	1.71	0.003	0.010	0.29	0.22	0.09	0.22	0.001	0.072	0.010	0.07	0.044	0.0023	0.0000	0.016	0.011	0.0001	0.16	0.038

Deoxidization Practice: Aluminum Fully Killed
Furnace: ELECTRIC ARC Casting: CONTINUOUS SLAB Rolling Mill: STECKEL

WE HEREBY CERTIFY THAT THE PRODUCT
DESCRIBED ABOVE HAS PASSED ALL THE
TESTS REQUIRED BY THE SPECIFICATIONS.