

# 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
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No: 70009092

Customer Order  
No:PPA#5160 007

Primary
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Changeover: L-296

Date \_\_\_\_\_

10/30/2012

Time

05:07:29

Size: 36.000	in
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Wall: 0.465 in

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: Cipr7871

# MILL CERTIFICATE

## Charpy V-Notch Impact Tests

### Heat Qualifiers

Certification Package ID:	4987
Certificate Form Number:	L 3522

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 Grade: X70M PSL 2
	Primary Changeover: L-296		

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

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: C1pr7872

## Macrohardness Tests

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	

[illegible]

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



Quality Assurance

Form: Cipr8773

# MILL CERTIFICATE

### Microhardness Test

Heat Qualifiers

REGINA SPIRAL MILL

Certification Package ID:	4987
Certificate Form Number:	L 3525

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 05:07:47	Size: 36.000 in
	Customer Order No:PPA#5160 007		Wall: 0.465 in Grade: X70M PSL 2
	Primary Changeover: L-296		

[illegible]

MS = Micro Structure

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

Quality Assurance

Form: Cipr8773



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 2 in	Uniform	Y/T	Weld Break (in)
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			

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<b>Orientation Legend</b> 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)	<b>Hydrostatic Parameters</b>	
	Pressure: 1730 PSI Hold Time: 10 sec.	Hydro(%): 95.0
Guided Bend Tests Were Performed In Accordance With And Meet The Requirements Of The Above Specification.		

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

Quality Assurance



MILL CERTIFICATE  
Chemistry

REGINA SPIRAL MILL

Certificate Package ID: 4987		Certificate Form Number: L 3523	
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

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.