

LALLY NEW MILL SECONDARY TUBULAR PRODUCTS GREENEST FOR THE PLANET AND YOUR BOTTOM LINE

A Whitepaper by Lally Pipe & Tube

June 2014

1. Introduction

New mill secondary tubular products are recognized as an industry standard for use in applications such as bollards, casing, columns, culverts, fencing, piling, rollers, sign poles, supports, water well, etc. Experienced users of these products prefer secondary material for these applications due to stock availability, installation and in-service performance, longstanding use, and lower price.

Prime tubular products with mill test reports offer no compelling advantages over properly verified mill secondary tubular products for these types of applications. Furthermore, prime material costs significantly more than mill secondary material and needlessly wastes the owner's resources. Prime material can easily cost up to twenty percent or more in typical applications and up to two to three times more in some applications vs. secondary material.

Properly verified mill secondary material for these types of applications is the most economical option and the preferred option by informed users of these materials.

Our goal with this whitepaper is to inform contractors, owners, and specifiers on the use of mill secondary tubular products so that a money-saving end product will be provided that performs the intended purpose.

2. Mill Secondary vs. Prime Terminology

"Prime" material refers to tubular products that are certified by the producing mill to be in compliance with a particular specification. Prime material comes with Mill Certification, and certifies compliance with a particular specification.

"Mill Secondary" material refers to tubular products that have been rejected by the producing mill at the time of production due to some physical or chemical variance that prevents the product from being classified as "Prime."

3. Domestic Production Overview

The United States currently has world-class mills producing Electric Resistance Weld (E.R.W.) and Seamless tubular products for Standard Pipe, Line Pipe, and Oil Country Tubular Goods markets. The quality and performance of today's tubular products

exceed the quality of tubular products that were produced several years ago. For example, Oil Country Tubular products produced years ago were used for traditional vertical drilled wells, but today's new drilling and completion techniques demand higher quality tubulars and connections for horizontal-drilled wells in more demanding environments.

These new demanding applications have led to higher quality, tighter tolerances and improved inspection techniques at the tubular mills. These factors also lead to the rejection of high-quality tubular products that may have been considered Prime years ago. Many of these rejected tubular products can be repurposed for less demanding applications, and still meet or exceed the specifications for those applications. With the United States tubular production at all time records, these high-quality rejected tubular products are available in an ever-growing volume.

4. PIPEEXPERTS™ Since 1933

In 1933, Lally Pipe & Tube's founders saw value and potential markets for mill secondary tubular products. Today, Lally Pipe & Tube is America's largest single source of New Secondary, Structural, and Limited Service tubular products and customized solutions.

Lally Pipe & Tube stocks over 120,000 tons of new tubular products on over 175 acres of company-owned facilities across the United States. We offer essential services such as beveling, cutting and splicing to length, attaching conical points and end plates, CNC threading, hydrotesting, special end finishing, O.D. coatings, and I.D. linings.

Every day, customers rely on us for money-saving tubular solutions that meet or exceed their expectations. Over the years, we've supplied tubular products to thousands of contractors, fabricators, original equipment manufacturers, owners, service centers, and tubular distributors. We've shipped to projects in Canada, Mexico, the United States, and numerous other countries.

Here are a few typical structural projects we've supplied:

- Security Bollards, Pease Air National Guard Base, Newington, NH
- Foundation Casing, The Statue of Liberty, Liberty Island, NY
- Pipe Piles, New Yankee Stadium, Bronx, NY
- Security Bollards, JFK Airport, New York, NY
- Pipe Piles, New York City Police Academy, College Point, NY
- Marine Pipe Piles, Harborview Marina, Baltimore, MD
- Security Bollards, U.S. Army's 108th ADA TEMP Complex, Fort Bragg, NC
- Marine Pipe Piles, Bucksport Marina, Conway, SC
- Pipe Piles, Valero Refining Company, Norco, LA

5. LALLY Testing and Inspection Procedures

Lally Pipe & Tube receives Electric Resistance Weld (E.R.W.) and Seamless new secondary tubular products from various major domestic mills. We do not know the reasons for these tubular products being rejected by the mills. These tubular products can be rejected by the mills for many reasons such as O.D. dimensions, I.D. or drift dimensions, wall thickness dimensions, chemistry, surface condition, tensile and yield, threads, non-technical issues like order overage, etc. Normally it will not meet the intended ASTM, API, or customer specification that it was produced to. When these tubular products do not meet the intended specification, the mill classifies the material as reject, and it is shipped to Lally Pipe & Tube facilities.

The following are LALLY testing and inspection procedures:

5.1 For General Structural Applications

5.1.1 We will check the O.D., I.D., wall thickness, straightness, and general surface condition. We will further check for any applicable customer requirements.

5.1.2 We can also provide:

- Manufactured in the U.S.A. verification
- Tensile and yield information
- Independent Test Reports (I.T.R)
- Rockwell Hardness Verification (R.H.V.)
- Documented Welding Procedures for splice to length and end attachment services
- Ultrasound testing for splice to length and end attachment services
- Coating product data sheets
- Project submittals and drawings

5.2 For Limited Service Water Well Applications

5.2.1 We will check the O.D., I.D., wall thickness, straightness, and general surface condition. We will further check for any applicable customer requirements.

5.2.2 We will thread to API (American Petroleum Institute), NPT (National Pipe Thread), or any other specified standard.

5.2.3 We will supply and install API couplings or couplings to customer specifications.

5.2.4 We can, if required, perform full length drift (FLD) to API or customer-specified standards.

5.2.5 We can, if required, perform hydrostatic test to API or customer-specified standards.

5.2.6 We can also provide:

- Manufactured in the U.S.A. verification
- Tensile and yield information
- Independent Test Reports (I.T.R)
- Rockwell Hardness Verification (R.H.V.)
- Documented Welding Procedures for splice to length
- Ultrasound testing for splice to length
- Coating product data sheets
- Project submittals and drawings

6. Independent Test Reports (I.T.R) vs. Mill Test Reports (M.T.R.)

Mill Test Reports are documents that are provided by the producing mill that document compliance with specific requirements of the mill product. Mill Test Reports normally include the yield and tensile strength, elongation, and chemical composition, if required. Mill Test Reports are not available for mill secondary material. However, some mills' downgrade material that does not meet, for example, API-5L X60 to ASTM-A-252 Grade 2 or 3 and provide Mill Test Reports. See Figure 1 and 2 for Mill Test Report examples.

Independent Test Reports (I.T.R.), or coupon testing, is testing that is performed on a coupon sample from the mill secondary material to verify physical properties of the product. Several tests can be performed on the coupon sample, but the most common tests are mechanical tests to verify yield, tensile and elongation. This information is the same information that is provided by the Mill Test Report in terms of physical properties, excluding the chemistry. The chemical testing can be performed if required. Lally Pipe & Tube typically includes chemical testing to the better represent the material being tested. See Figure 3 for Independent Test Report example.



AMERICAN STEEL PIPE
 A division of American Cast Iron Pipe Co.,
 P.O. Box 2727, Birmingham, AL 35202-2727
 QUALIFICATION REPORT OF SHIPMENT

DATE: 25/JAN/2008

CUSTOMER ADDRESS: LALLY PIPE & TUBE
 P O BOX 15430 LATONIA STATION Customer Order Number P80116DD002 MFG Order Number S108123
 COVINGTON KY 41015

LINE	PIECES	FOOTAGE	SIZE	WALL	SHIP. NO	DESCRIPTION	SPECIFICATIONS	GRADE
1	38	1458.5	24.00	.375	1-4	ERW STEEL PIPE PILING	ASTM A252	2
2	10	403.4	24.00	.375		DITTO		3

All tests are from the body of the pipe in the transverse direction unless otherwise noted.
 Standard tensile gage length 1-1/2" x 2".

HEAT	C	MN	P	S	CB	SI	TI	CU	NI	MO	CR	V	AL	B	N	C.E.
59841	*	LINE 1														
EDITION REFERENCE 4 YEAR 2007 Yield Strength by Strap																
H=	0.060	0.690	0.012	0.004	0.021	0.187	0.017	0.020	0.010	0.010	0.030	0.002	0.035	.0002	.0059	0.185
P=	0.061	0.670	0.014	0.005	0.022	0.166	0.014	0.000	0.009	0.006	0.030	0.009	0.028	.0006	.0000	0.182
M=Weld Ten.		73.0	ksi	Ten.	69.5	ksi	Yield	55.5	ksi	%EL 43.5	RB	Hydro:				10/20
Y/T RATIO																RUN: 53-7
59841	*	LINE 1														
EDITION REFERENCE 4 YEAR 2007 Yield Strength by Strap																
H=	0.060	0.690	0.012	0.004	0.021	0.187	0.017	0.020	0.010	0.010	0.030	0.002	0.035	.0002	.0059	0.185
P=	0.055	0.670	0.014	0.005	0.021	0.166	0.014	0.000	0.009	0.007	0.029	0.009	0.028	.0006	.0000	0.176
M=Weld Ten.		00.0	ksi	Ten.	00.0	ksi	Yield	00.0	ksi	%EL 00.0	RB	Hydro:				53-7
Y/T RATIO																RUN: 53-7

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 Continued

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Figure 2 - Mill Test Report for ASTM-A-252 Grade 3 (Page 2 of 2)



CUSTOMER NAME: LALLY PIPE & TUBE

Customer Order Number
P80116DD002

Date: 25/JAN/2008
MFG Order Number
S108123

HEAT	C	MN	P	S	CB	SI	TI	CU	NI	MO	CR	V	AL	B	N	C.E.
86517	*	LINE 2														Coil
H=	0.060	1.250	0.008	0.002	0.064	0.184	0.019	0.020	0.010	0.010	0.030	0.003	0.045	.0003	.0047	0.279
P=	0.062	1.250	0.008	0.005	0.066	0.174	0.016	0.018	0.004	0.008	0.035	0.004	0.039	.0002	.0000	0.281
M=Weld Ten.	86.0	ksi	Ten.	91.5	ksi	Yield	73.5	ksi	%EL	31.5	RB	Hydro:		Psi		RUN: 08-7
Y/T RATIO	= 0.80															

Legend Analyses:

- A-Z - Additional Testing
- R - Retest
- H - Heat Analysis
- L - Longitudinal
- P - Product Analysis
- T - Transitional
- M - Mechanical Properties
- W - Weld Line

EDITION REFERENCE 1: API 5L 41ST EDITION 4/1/1995
 EDITION REFERENCE 2: API 5L 42ND EDITION 7/1/2000
 EDITION REFERENCE 3: API 5L 43RD EDITION 10/4/2004
 EDITION REFERENCE 4: ASTM/ASME ANNUAL BOOK OF STANDARDS SECT.1, VOL 01.01

* Manufactured and Melted in the USA.

We hereby certify that the above figures are correct as contained in the records of this company, and that the pipe were manufactured, tested and inspected in compliance with the latest edition of the applicable specification, in Birmingham, Alabama, U.S.A.

Noel A. Gordon

Noel A. Gordon
 Manager of Quality Assurance - Steel Pipe

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 End Of Report
 Form Date: 10/18/2004

QD-AW3F055

Figure 3 - Independent Test Report



179 State Street • Struthers, Ohio 44471 • (330) 755-7373

April 23, 2014

Test Report:

Lally Pipe & Tube
534 Lowellville Rd.
Struthers, Ohio 44471

Phone (330) 750-1002
Fax (330) 750-1535

P.O. # 4539 C, dated 4-16-14

(1) Steel pipe sample – 16" O.D. x 0.375" wall ERW new secondary steel pipe – received 4-23-14 from Lally Pipe & Tube, Struthers facility for chemical and mechanical testing.

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Mechanical Test Results: (ASTM A 370)

Job #	Lally id	Yield (0.2%) psi	Tensile psi	Elongation / 2" %
112010	4539 C	71,500	91,500	24.7

Results of Chemical Analysis: (ASTM E 415)

Job# 112010
Lally id 4539 C

ELEMENT	%
C	0.08
Mn	1.51
P	0.012
S	0.007
Si	0.18
Cu	0.02
Sn	0.003
Ni	0.01
Cr	0.05
Mo	0.02
Al	0.039
V	0.068
Cb	0.059
Ti	0.012
Zr	0.002

Frank L. Galletta
Frank L. Galletta, Mgr.



The results reported are limited to the sample tested and constitute data only with respect to the sample tested. Information and data in this report are correct and reliable to the best of our knowledge; however, results are not guaranteed and no responsibility is assumed. This report may not be reproduced except in full. Spectrochemical Testing, Inc. is accredited by the American Association for Laboratory Accreditation in the field of Mechanical Testing (Certi. #766.01).

7. LALLY MIN-YIELD™ Specification

7.1 This specification covers nominal (average) wall tubular products in sizes up to 26” O.D. made by the Electric Resistance Weld (E.R.W.) or Seamless process. The seams of the welded material are longitudinal.

7.2 This standard is intended for general structural tubular applications for bollards, casing, columns, culverts, fencing, piling, rollers, sign poles, supports, water well, etc.

7.3 This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices, and determine the applicability of regulatory limitations prior to use.

7.4 The tubular products were made by major domestic mills using one or more of the following processes: open-hearth, basic-oxygen, or electric-furnace.

7.5 These tubular products were generally produced to Standard Pipe, Line Pipe, or Oil Country Tubular Goods specifications, and then classified as reject or mill seconds.

7.6 We do not know the reasons for these tubular products being rejected by the mills. These tubular products can be rejected by the mills for many reasons such as O.D. dimensions, I.D. or drift dimensions, wall thickness dimensions, chemistry, surface condition, tensile and yield, threads, non-technical issues like order overage, etc. Normally, it will not meet the intended ASTM, API, or customer specification that it was produced to. When these tubular products do not meet the intended specification, the mill classifies the material as reject, and it is shipped to Lally Pipe & Tube facilities.

7.7 We will check the O.D., I.D., wall thickness, straightness, and general surface condition. We will further check for any applicable customer requirements.

7.8 We will verify the physical requirements via one or more Independent Test Report(s) taken from randomly selected samples of Lally Pipe & Tube inventory lot(s). This testing will include chemical analysis per ASTM-E415 and mechanical testing per ASTM-A370 for yield, tensile and elongation.

7.9 Table 1 - LALLY MIN-YIELD™ Specification

Product	Minimum Yield Strength	Maximum Yield Strength	Minimum Tensile Strength
LALLY 35K MIN-YIELD™	35,000 psi	n/a	n/a
LALLY 42K MIN-YIELD™	42,000 psi	n/a	n/a
LALLY 45K MIN-YIELD™	45,000 psi	n/a	n/a
LALLY 50K MIN-YIELD™	50,000 psi	n/a	n/a
LALLY 80K MIN-YIELD™	80,000 psi	n/a	n/a

8. LALLY MIN-YIELD™ LIMITED SERVICE WATER WELL Specification

8.1 This specification covers nominal (average) wall tubular products in sizes up to 26” O.D. made by the Electric Resistance Weld (E.R.W.) or Seamless process. The seams of the welded material are longitudinal.

8.2 This standard is intended for down hole tubular applications for water well casing.

8.3 This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices, and determine the applicability of regulatory limitations prior to use.

8.4 The tubular products were made by major domestic mills using one or more of the following processes: open-hearth, basic-oxygen, or electric-furnace.

8.5 These tubular products were generally produced to Standard Pipe, Line Pipe, or Oil Country Tubular Goods specifications, and then classified as reject or mill seconds.

8.6 We do not know the reasons for these tubular products being rejected by the mills. These tubular products can be rejected by the mills for many reasons such as O.D. dimensions, I.D. or drift dimensions, wall thickness dimensions, chemistry, surface condition, tensile and yield, threads, non-technical issues like order overage, etc. Normally, it will not meet the intended ASTM, API, or customer specification that it was produced to. When these tubular products do not meet the intended specification, the mill classifies the material as reject, and it is shipped to Lally Pipe & Tube facilities.

8.7 We will check the O.D., I.D., wall thickness, straightness, and general surface condition. We will further check for any applicable customer requirements.

8.8 We will verify the physical requirements via one or more Independent Test Report(s) taken from randomly selected samples of Lally Pipe & Tube inventory lot(s). This testing will include chemical analysis per ASTM-E415 and mechanical testing per ASTM-A370 for yield, tensile and elongation.

8.9 We will thread to API (American Petroleum Institute), NPT (National Pipe Thread), or any other specified standard.

8.10 We will supply and install API couplings or couplings to customer specifications.

8.11 We can, if required, perform full length drift (FLD) to API or customer-specified standards.

8.12 We can, if required, perform hydrostatic test to API or customer-specified standards.

8.13 Table 2 – LALLY MIN-YIELD™ LIMITED SERVICE WATER WELL Specification

Product	Minimum Yield Strength	Maximum Yield Strength	Minimum Tensile Strength
LALLY 35K MIN-YIELD™ LIMITED SERVICE WATER WELL	35,000 psi	n/a	n/a

9. Greenest for the Planet

Lally Pipe & Tube is proud to be one of the largest recyclers in the world. Just like using waste vegetable cooking oil to run vehicles, we solved one of the biggest pollution problems for domestic tubular producers and the environment. The mills’ problem centered on what to do with the large quantities of secondary tubular products considered a “by-product” or “production scrap.”

Our solution to the mills’ problem was simply to purchase their secondary tubular products and repurpose the material. Lally Pipe & Tube processes, recycles, and distributes the secondary material for use in applications such as bollards, casing, columns, culverts, fencing, piling, rollers, sign poles, supports, water well, etc. By not having to cut up and scrap secondary material, Lally Pipe & Tube saves the mills and the planet massive amounts of energy and pollution.

During the processing of this secondary material into various products, we generate about five to eight percent of unusable material. This, too, is not a problem, because we sell this unusable material to scrap dealers. The scrap dealers process, recycle, and distribute this unusable material back to the producing steel mills for melting and manufacturing, which starts the process again.

Lally Pipe & Tube consumes one hundred percent of what we receive from domestic tubular mills.

10. Greenest for Your Bottom Line

New mill secondary tubular products are an industry standard for use in applications such as bollards, casing, columns, culverts, fencing, piling, rollers, sign poles, supports, water well, etc. Prime tubular products offer no compelling advantages over properly verified mill secondary tubular products for these types of applications. And prime material costs significantly more than mill secondary material. These additional costs add up to twenty percent or more in typical applications, and up to two to three times more in some applications. Properly verified mill secondary material for these applications is the most economical option and the preferred option by experienced users of these materials. To illustrate these benefits, here are three LALLY secondary vs. Mill prime material comparisons:

10.1 Example 1

10.1.1 Let’s look at a manufacturer making prefabricated foundation piles and see why LALLY new mill secondary material is the superior choice vs. ABC SMLS mill prime API-5L N-80. In this example, we’ll look at truckload quantities of 13-5/8” O.D. X .625” Wall in 35’ lengths.

10.1.2 Table 3 - Example 1 (LALLY Secondary vs. Mill Prime Comparison)

	LALLY	ABC SMLS Mill
Origin	Domestic	Domestic
Material	New Secondary	New Prime
Certification	Independent Test Reports	Mill Test Reports
Type	Seamless	Seamless
Lengths	40’ Random	40’ Random
Availability	Stock	Rolling
Wall Thickness	.625”	.625”
Yield Strength	80,000 psi min. yield	80,000 psi min. yield
Price	2 to 3 times lower than Mill Price	Mill Price

10.1.3 Lally Pipe & Tube can usually deliver orders like this in less than one week. Mill delivery could be several months. And the price for the LALLY option is significantly lower. We can offer similar money-saving solutions for sizes like 4-1/2” O.D., 5-1/2” O.D., 7” O.D., 7-5/8” O.D. and 9-5/8” O.D. We’re the Greenest for the planet too.

10.2 Example 2

10.2.1 Now let’s look at a steel pipe piling project and see why LALLY new mill secondary material is a better option vs. 123 HSS mill prime ASTM-A-252 Grade 3. In this example, we’ll look at truckload quantities of 16” O.D. X .500” Wall in 60’ lengths.

10.2.2 Table 4 - Example 2 (LALLY Secondary vs. Mill Prime Comparison)

	LALLY	123 HSS Mill
Origin	Domestic	Domestic
Material	New Secondary	New Prime
Certification	Independent Test Reports	Mill Test Reports
Type	Seamless	E.R.W.
Lengths	60' Spliced to Length	60'
Availability	Stock	Rolling
Wall Thickness	.575"	.500" (Normal 7% light = .465")
Yield Strength	120,000 psi min. yield	45,000 psi min. yield
Price	Up to 20% or more lower than Mill Price	Mill Price

10.2.3 Can you see how a rushed construction schedule, on a site with tough driving conditions, could benefit from the LALLY secondary option? And what if the geotechnical conditions were ideal for increased pile loads due to pile setup? The LALLY option would handily beat the mill option when it comes to the lowest support cost per ton. And it's the Greenest option.

10.3 Example 3

10.3.1 In the last example, let's look at a vertical drilling contractor and see why LALLY new mill secondary is the superior choice vs. XYZ HSS mill prime ASTM-A-500 Grade B. In this example, we'll look at truckload quantities of 20" O.D. X .375" Wall in 38' to 42' random lengths.

10.3.2 Table 5 - Example 3 (LALLY Secondary vs. Mill Prime Comparison)

	LALLY	XYZ HSS Mill
Origin	Domestic	Domestic
Material	New Secondary	New Prime
Certification	Independent Test Reports	Mill Test Reports
Type	E.R.W.	E.R.W.
Lengths	38' to 42' Randoms	38' to 42' Randoms
Availability	Stock	Rolling
Wall Thickness	.375"	.375" (Normal 7% light = .348")
Yield Strength	50,000 psi min. yield	42,000 psi min. yield
Price	Up to 20% or more lower than Mill Price	Mill Price

10.3.3 Again, we can normally deliver orders like this in less than one week. And mill delivery could be weeks to months. The LALLY option is much lower than the mill price, and you get significantly more steel. We offer money-saving solutions for other sizes like 12-3/4" O.D., 14" O.D., 16" O.D., 18" O.D. and 24" O.D. LALLY options are Greenest for the planet and your bottom line.

11. Conclusion

We hope this whitepaper has informed you on the use of LALLY new mill secondary tubular products, and that we may provide you with a money-saving end product that performs the intended purpose.

To get answers to your questions, please visit www.LallyPipe.com and contact our nearest sales office.

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