

RED THREAD II

Piping Systems

Competitive Materials Installed Cost Comparison

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 **Fiber Glass Systems**

INTRODUCTION

Selecting the right pipe for your corrosive service can result in a system that outlasts carbon steel and even alloys. **RED THREAD II** fiberglass reinforced pipe is constructed of two corrosion-resistant materials: epoxy resin and glass fiber reinforcement. These materials provide a longer service life than pipe made of traditional materials. The longer life means a **reduction in both maintenance and replacement costs**. Plus, compared to metallic piping systems, **RED THREAD II** pipe can be installed easier and faster, and heavy equipment is seldom required. The following installed cost comparison demonstrates that considerable savings on **total installed cost** may be achieved by using **RED THREAD II** pipe and fittings. Unlike metallic systems, **RED THREAD II** pipe is lightweight and easy to handle and field fabricate. **RED THREAD II** does not require labor-intensive welding operations. Review the following **Installed Cost Comparison** for the facts. **RED THREAD II** pipe is an unlined epoxy pipe that is ideal for low pressure water applications.

BASIS FOR INSTALLED COST COMPARISON

1. The three piping systems compared in this analysis include the following:
 - **RED THREAD II** adhesive-bonded tapered pipe and fittings
 - Schedule 40 carbon steel pipe and fittings
 - Schedule 10 stainless steel pipe and fittings
 The piping layout and bill of materials used for comparison is shown in Fig. 1 on page 4.

2. Pipe, fittings, and accessories prices are based on the following price sheets and assumptions:
 - **RED THREAD II** pipe. October 1, 2008, list prices
 - Schedule 40 carbon steel. November 2009, market buy prices
 - Schedule 10 stainless steel. November 2009, market buy prices
 - All bolt sets: Zinc plated. Market buy price
 - Adhesive Kits: 15% extra was added to the adhesive kit totals to account for waste:

Pipe Size	2"	4"	6"	8"	12"	16"	24"	30"	36"
No. of Kits:	10	12	24	24	47	47	94	94	141

3. Labor units are based on the following assumptions and were obtained from the following sources:
 - Labor units for carbon steel pipe and fittings were obtained from **The Richardson Rapid System Process Plant Construction Estimating Standards**, published by Richardson Engineering Services, Inc., Mesa, Arizona. Comparison units were for "Pipe Installed Inside Battery Limits of a Process Area." Labor units for **RED THREAD II** pipe and fittings were based on actual field and test lab experience.

4. To determine labor cost, a composite crew rate of **\$45.00** average per manhour was applied.

Table 1 - Pipe Weights (Lbs. per Foot)

Pipe Material	2"	4"	6"	8"	12"	16"	24"	30"	36"
RED THREAD II	0.4	1.2	2.4	3.3	7.2	13.2	24.3	56.3	80.8
Sch. 40 Carbon Steel	3.6	10.9	19.0	28.6	53.4	62.5	94.5	118.5	142.5
Sch. 10 Stainless Steel	2.6	3.9	9.3	13.4	24.1	-	-	-	-

Table 2 - Pipe Material (\$ Cost per Foot)

Pipe Material	2"	4"	6"	8"	12"	16"	24"	30"	36"
RED THREAD II	3.80	7.50	12.80	21.10	42.30	63.70	87.53	130.85	178.45
Sch. 40 Carbon Steel	4.34	11.73	21.36	32.22	55.81	76.43	150.03	252.44	292.40
Sch. 10 Stainless Steel	7.97	21.96	36.79	53.66	94.73	-	-	-	-

**RED THREAD II Pipe
Features & Benefit**

- **Epoxy Resin and fiberglass Construction.** RED THREAD II pipe delivers longer lifetime with less chance of costly repairs due to corroion.
- **Operating Ratings.** RED THREAD II filament wound fiberglass reinforced pipe is available in 2" through 36" diameters, for temepratures to 210°F and pressures to 450 psig.
- **Better Flow Characteristics.** Larger inside diameter and smoother flow surface give you energy savings.
- **Lightweight.** Six-inch RED THREAD II pipe weighs just 2.4 lbs/ft compared to 19.7 lbs. for stainless steel and 28.6 lbs. for carbon steel (see Table 1). Smaller crews and less installation time save money and the pipe is easier to transport.

Table 3 - Labor Units (Hours)

2" Piping System	Pipe (per foot)	90 Degree Elbow	Tee	Conc. Red.	Cou- pling	Flange	Bolt Set	Field Cut & Bevel	Erection Buttweld
RED THREAD II	0.129	0.90	1.35	0.90	0.90	0.45	0.84	(1)	(1)
Sch. 40 Steel	0.166	2.00	3.00	1.90		1.00	0.84		2.90
Sch. 10 SS 304	0.146	2.60	3.90	2.30		1.30	0.84		3.10
4" Piping System									
RED THREAD II	0.184	1.28	1.92	1.28	1.28	0.64	1.70		
Sch. 40 Steel	0.250	3.80	5.70	3.30		1.90	1.70		4.60
Sch. 10 SS 304	0.236	4.20	6.30	3.50		2.10	1.70		4.80
6" Piping System									
RED THREAD II	0.230	1.75	2.63	1.75	1.75	0.88	2.00		
Sch. 40 Steel	0.350	5.60	8.40	4.70		2.80	2.00		6.30
Sch. 10 SS 304	0.312	6.40	9.60	5.30		3.20	2.00		6.50
8" Piping System									
RED THREAD II	0.271	3.52	5.28	3.52	3.52	1.76	2.00		
Sch.40 Steel	0.456	7.20	10.80	6.40		3.60	2.00		7.80
Sch. 10 SS 304	0.356	7.40	11.10	6.90		3.70	2.00		8.40
12" Piping System									
RED THREAD II	0.391	4.80	7.20	4.80	4.80	2.40	3.50		
Sch. 40 Steel	0.686	10.60	15.90	9.70		5.30	3.50		11.10
Sch. 10 SS 304	0.550	10.60	15.90	9.80		5.30	3.50		12.40
16" Piping System									
RED THREAD II	0.442	8.60	12.90	8.60	8.60	4.30	5.40		
Sch. 40 Steel	0.798	13.80	20.70	12.40		6.90	5.40		14.00
24" Piping System									
RED THREAD II	0.582	15.50	23.25	15.50	15.50	7.75	8.30		
Sch. 40 Steel	10.58	19.20	28.80	17.80		9.60	8.30		19.20
30" Piping System									
RED THREAD II	0.744	19.80	29.70	19.80	19.80	9.90			
Sch. 40 Steel	1.352	30.20	45.30	24.70		15.10			31.70
36" Piping System									
RED THREAD II	0.963	24.20	36.30	24.20	24.20	12.10			
Sch. 40 Steel	1.750	49.80	74.70	40.00		24.90			52.30

⁽¹⁾Field cutting, tapering, and adhesive bonding included in pipe and fittings labor units.

Table 4 - Installed Cost Comparison

	Pipe Material \$ Cost	Fittings Material \$ Cost	Bolt Sets & Adhesive \$ Cost	Field Labor \$ Cost (Pipe)	Field Labor \$ Cost (Fittings)	TOTAL IN-STALLED \$ COST	% Savings RT II Piping
2" Piping System							
RED THREAD II	1,368.00	863.50	280.87	2,373.30	1,296.00	6,181.67	
Sch. 40 Carbon Steel	1,562.40	301.54	48.87	3,602.70	1,800.00	7,315.51	15
Sch. 10 Stainless Steel	2,869.20	376.55	48.87	3,341.70	2,340.00	8,976.32	31
4" Piping System							
RED THREAD II	2,700.00	1,385.90	374.97	3,384.00	1,575.68	9,420.55	
Sch. 40 Carbon Steel	4,222.80	639.60	96.57	5,499.00	3,420.00	13,877.97	32
Sch. 10 Stainless Steel	7,905.60	951.50	96.57	5,335.20	3,780.00	18,068.87	48
6" Piping System							
RED THREAD II	4,608.00	3,438.30	719.61	4,277.25	1,575.68	14,618.84	
Sch. 40 Carbon Steel	7,689.60	1,102.71	162.81	7,654.50	5,040.00	21,649.62	32
Sch. 10 Stainless Steel	13,244.40	1,915.92	162.81	7,101.90	5,760.00	28,185.03	48
8" Piping System							
RED THREAD II	7,596.00	5,904.60	602.31	4,627.80	3,168.00	21,898.71	
Sch. 40 Carbon Steel	11,599.20	2,003.82	187.11	8,440.20	6,480.00	28,710.33	24
Sch. 10 Stainless Steel	19,317.60	4,067.10	187.11	8,413.20	6,660.00	38,645.01	43
12" Piping							
RED THREAD II	15,228.00	10,842.70	1,218.28	6,658.20	4,320.00	38,267.18	
Sch. 40 Carbon Steel	20,091.60	4,994.95	405.18	12,611.70	9,540.00	47,643.43	20
Sch. 10SS	34,102.80	10,535.03	405.18	12,816.00	12,163.50	70,022.51	45
16" Piping							
RED THREAD II	22,752.00	25,053.40	1,676.93	7,740.90	7,740.90	63,963.23	
Sch. 40 Carbon Steel	27,514.80	12,230.08	586.53	14,817.60	12,420.00	67,569.01	5
24" Piping							
RED THREAD II	31,510.80	56,758.91	2,950.30	10,474.65	13,950.00	115,644.66	
Sch. 40 Carbon Steel	54,010.80	32,096.80	769.50	19,731.60	17,280.00	123,888.70	7
30" Piping							
RED THREAD II	47,106.00	81,435.42	3,397.33	13,389.30	17,280.00	163,148.05	
Sch. 40 Carbon Steel	90,878.40	37,181.82	1,216.53	26,181.90	27,180.00	182,738.65	11
36" Piping							
RED THREAD II	64,242.00	97,722.49	5,031.87	17,226.00	21,780.00	206,002.36	
Sch. 40 Carbon Steel	105,264.00	50,739.49	1,760.67	35,410.50	41,458.50	234,633.16	12

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