

CSI Hot Tips

NEWS ABOUT THE PRODUCTS AND SERVICES OF CONTROLS SOUTHEAST, INC.

ControTrace on large pipe = big savings.

Application Report: by Dave Hornbaker

For many applications, ControTrace is a viable, money-saving alternative to jacketed pipe. Here's one example that saved a customer more than \$100,000.00.

We received a request to quote on jacketed piping for a large grass roots project. The design specified a 32" core with a 36" jacket. The line was 110 feet long with three elbows. It was to be fabricated in four pieces. The process pressure ranged from full vacuum to 50 psig. The heating fluid was steam, 300 psig at 420 F.

Several factors made this a very expensive proposition. First, stainless steel fittings in 36" sizes are very costly. Further, it would be necessary to cut the 36" elbow fittings in half longitudinally to permit clamshell construction of the jacket. A quick check showed that the steam pressure acting externally on the core pipe required the core pipe to be about an inch thick, which would add significantly to the cost of both material and labor. The added core weight also had complex ramifications for support and hanger designs.

It was obvious to us that if the ControTrace heating element concept was acceptable to Process, a lot of money could be saved. Using ControTrace would allow the use of standard weight piping and fittings for the core. That's because the steam pressure would be removed from the exterior of the core piping and contained in the ControTrace. We

discussed the advantages of ControTrace with the customer's process engineers. They gave us a tentative okay... *provided* the ControTrace system would maintain the process at $420\text{ F} \pm 2.5\text{ F}$.

Whew! At this point we began to wonder if our enthusiastic salesmanship had exceeded our brilliant engineering capabilities. After burning the midnight oil on process flow analysis, we came up with a computerized finite difference heat transfer program that allowed us (and

the customer) to play numerous "what ifs" with the thermal performance of the system.

The net result was a definite win-win. ControTrace has been working for more than two

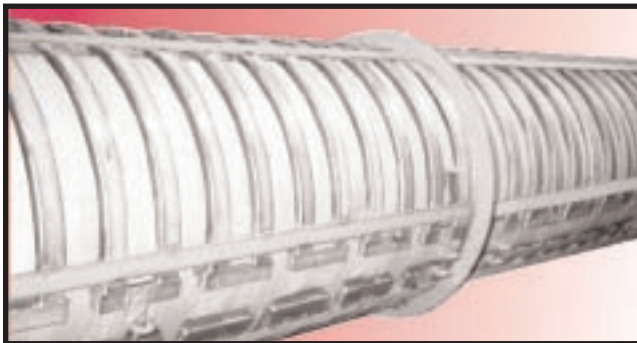


Fig. 1. Using ControTrace instead of a full 36-inch jacket on 32-inch core piping saved the customer more than \$100,000.00.

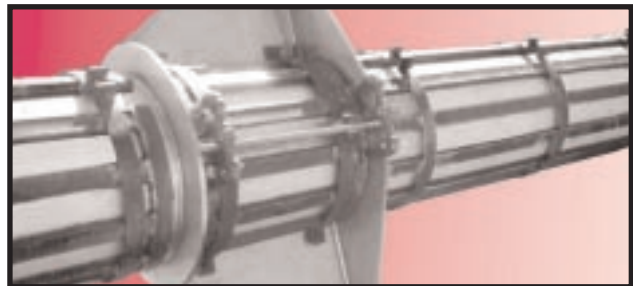


Fig. 2. The ControTrace maintains the large piping at $420\text{ F} \pm 2.5\text{ F}$.

years in this application. It saved the customer over \$100,000.00. And CSI developed an analytical tool that's helped many other customers optimize the thermal performance of their processes.

Maybe we can help you with a tough process-heating problem. Call us. **xx**

QC Report

The QC program at CSI is a vital component of our business. Radiography, Ultrasonic Testing, Liquid Penetrant Testing, Boroscopic Examination, Magnetic Particle Testing, Visual Examinations and Material Validations --in addition to routine hydrotesting and helium mass spec. testing -- are routinely performed by a staff of three ASNT-trained professionals. QC functions that we contract to outside agencies include PMI (positive material identification), Destructive Testing and some overloads in the areas mentioned.

The CSI QC Staff recently completed a training program, to qualify more personnel to ASME standards on Dye Penetrant Testing. Not so long ago, when a welder completed a particular task requiring Liquid Penetrant Testing, a busy QC staff was not always immediately available to perform the testing. Result: non-productive hold time for the welder. Now, with 20 qualified people (welders, fitters, lead men and

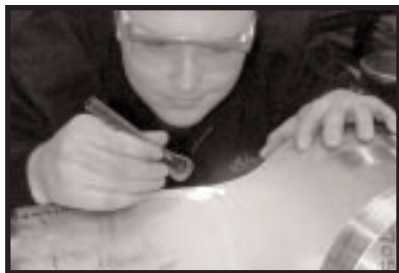


Fig. 7. A recent QC Training Program at CSI increased the number of qualified Dye Penetrant Testing personnel to 20.

supervisors) available to perform the testing, hold times have been minimized. Production efficiencies have improved.

For you, the customer, the benefit is we've shortened our delivery times on jacketed piping and other labor-intensive fabrications. xx

Surf www.csiheat.com

The CSI web page is now on-line, and it's packed with information about jacketed products and services. One of the most "visited" pages is the Pattern List for ControHeat Jackets. The list gets an update at least once a month, so it's very current. More than 3000 items are listed for 130 manufacturers of processing equipment. So give us a visit and tell us what you think. If you want an updated CSI Pattern List, but don't have access to the web, write or fax us and we'll mail one promptly. xx

GOOD MORNING, TEXAS, OKLAHOMA, AND NEW MEXICO.

Meet Brian Meagher, your recently-appointed sales engineer from CSI. Brian has been with us about eight months. During that time he has...

- Advanced pretty high on the learning curve of process heating.
- Been hunting (four times).
- Got married (once).

Originally from Freeport, Brian and his wife, Cindy, now live in Houston. He is a Chemical Engineer out of Texas A&M with a heavy process background from Dow, Arizona Chemical and others. Here's

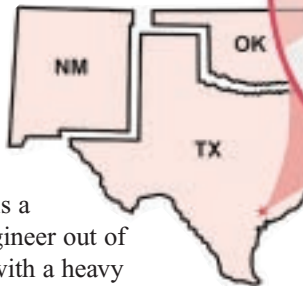
how to get in touch with Brian when you have a process heating problem, want to discuss an application for CSI products, or just swap Aggie jokes:



Phone: (713) 524-5291
Ex. 163

Fax: (713) 838-1525

e-mail: meagherbc@aol.com xx



ISO 9001: In Our Sights

Slowly but surely we're making progress at CSI toward ISO 9001. For a manufacturer of labor intensive, custom-designed process heating systems, as well as hundreds of "standard" process heating products, the task is very complex.

Procedures today that cover a particular production process may be outdated tomorrow (and probably will be) due to a variety reasons. The reasons range from rapidly changing technology to the fabrication of something so new that few meaningful guidelines--beyond vigilance and experience--can be established to insure uniformity of quality and, equally important, customer satisfaction.

Reportedly, the bedrock of ISO 9001 is to, *say what you do, then do it*. Unfortunately, we make our living in a business where doing the same thing twice usually is an exception.

You may be sure, however, that ISO 9001 is on the CSI horizon and we are steadily advancing the quality of CSI products and services.

Thanks,

Fred Stubblefield, Jr.
President



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Steam-service jumper hoses, by the numbers...

Sometimes, in an effort to simplify things, we don't. In fact, we may even make them more confusing. Take the simple, "Standard", CSI flexible metal jumper hose for steam service. For years we've been wrestling with the task of finding an easy way to help you order hoses quickly and precisely the way you want them.

It's not your problem, but our computer system simply does not appreciate "easy". It craves the likes of, "HS-07-JSN-JDN-002-36" which, incidentally, is typical coding you'll see on CSI invoices for jumper hoses. Translated, it means:

1. **HS** (HoSe)--a jumper hose in 321 stainless steel (S/S) with braid of 304 S/S.
2. **07** (hose nominal ID)-3/4-inch.
3. **JSN** (JIC, single nut)--a zinc dichromate-plated carbon steel (C/S) single-nut JIC, and 90 degree C/S tubing elbow, one end.
4. **JDN** (JIC, double nut)--a zinc dichromate-plated C/S JIC double-nut and 90 degree C/S tubing elbow, other end.
5. **002**--hose to be insulated with black silicone sponge.
6. **36**--overall length to be 36 inches.

Fig. 3. shows you what the

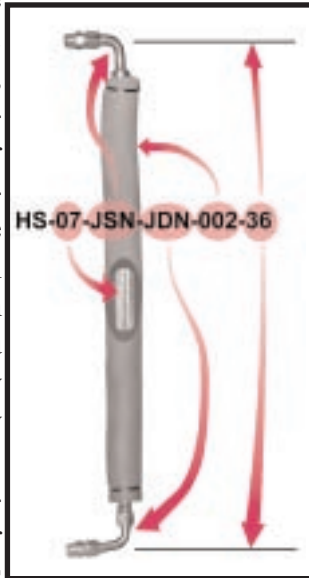


Fig. 3. Standard CSI Jumper Hose for steam service.

jumper hose with the above coding looks like. And Fig. 4. shows you what HS-07-JSN-JDN-002-36 looks like when it's installed.

If you're only slightly confused, congratulations. You passed jump-over 101 with flying colors! Ready for the next semester? It's all about options and the CSI codes for those options? The cheat sheet on the right shows the coding breakdown.





And here's the open-book final exam: What's an HS-05-JSN-HTE-002-24?



Fig. 4. Jumper shown above in Fig. 3 connecting jacketed piping spools.

No problem? Then you're ready for some post grad work. Suppose you don't want a standard jumper hose, you want a *special* jumper. Easy, just dial 704-588-3030, and be ready to answer a few questions:

- Service temperature?
- Operating pressure?
- Hose core material?
- Hose nominal ID?
- Connector and material, one end?
- Connector and material, other end?
- Black Silicone Insulation (Y/N)?
- Overall length?

Standard CSI Jumper Designation	Options	Code
1. Standard Jumper Hose	CSI Standard	HS
2. Nominal Hose Size, ID (IN.)	3/8-inch	02
	1/2-inch	05
	3/4-Inch	07
	1-Inch	09
3. Connection, one end		JIC
		JSN
		HTE
4. Connection, other end		JDN
	(Same as JIC above)	JIC
	5. Insulation Designation	No insulation
Black silicone sponge		002
6. Overall Length (IN.)	18 inches	18
	24 inches	24
	30 inches	30
	36 inches	36
	40 inches	40

Keep in mind that we've covered only the lesson plan for steam service jumpovers. Jumpovers for hot oil service is an entirely different course, which we'll cover in a future Hot Tips. xx

Reducing The Cost Of Jacketed Pipe

Jacketed pipe can be two to three times more expensive than un-jacketed pipe. The higher cost results from more material for a given pipe length, more labor, and more engineering time.

One method used by some companies to reduce the cost of jacketed pipe is to specify different materials of construction for the core and jacket. This can save on material costs, and possibly labor costs. However, buyer beware! For satisfactory results, due diligence on all operating conditions is necessary. The following example demonstrates:

Let's assume that a particular process operates very well on 50-lb. steam with the 3" x 4"

and a carbon steel jacket, as depicted in Fig. 5. By heating the core and jacket to 297 F (50-lb. steam), the carbon steel jacket creates a maximum stress in the 3-inch stainless steel core pipe of about 10,780 psi. No problem... and we've saved about \$2.00 per pound over the cost of the stainless steel jacket (20 feet of 4-inch Sch. 40 S/S pipe weighs about 215 pounds). If the process allows a Sch 10 core, the core stress rises to 13,116 psi. We're still okay. And we've saved a few more bucks.

Now, here's the high inside curve: Suppose the 50-lb. steam

the core and the weld zones on the welding caps. Since the expansion joint

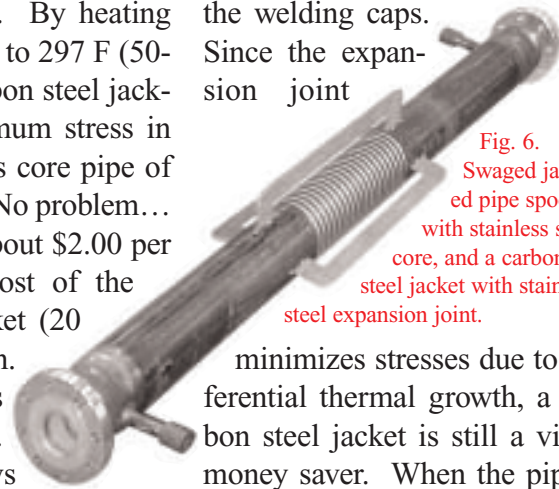


Fig. 6. Swaged jacketed pipe spool with stainless steel core, and a carbon steel jacket with stainless steel expansion joint.

minimizes stresses due to differential thermal growth, a carbon steel jacket is still a viable money saver. When the pipe is installed in the line, the braces over the expansion joint are removed. Pipe spacers between the core and jacket keep the jacket axially oriented. The Material Guide, below, lists some of the different materials of construction for cores and jackets that may be money savers for you. xx

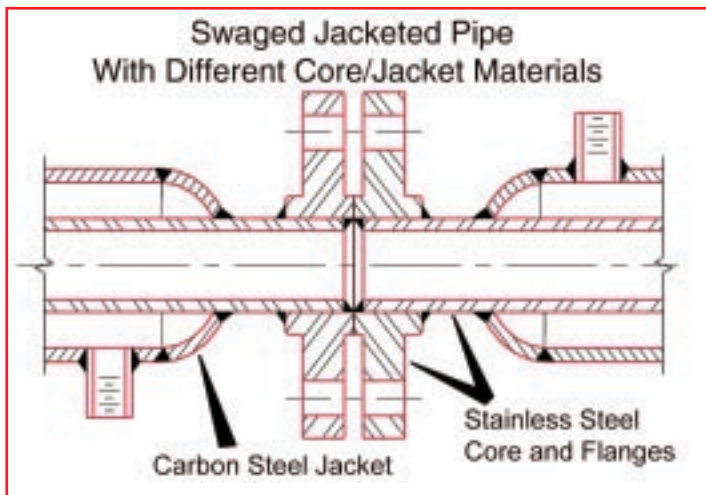


Fig. 5. Swaged jacketed pipe spools with Sch. 40 stainless steel core and Sch. 40 carbon steel jacket. As temperatures rise, jacket induces stress in core piping--a potential problem.

Sch. 40 all-stainless swaged construction, a typical construction. Now let's assume that we need to modify this existing piping system -- as inexpensively as possible. So, we opt to fabricate the new piping spools with a 300-Series stainless steel core

450 F + Jacket at 297 F = Problem. Stress in core goes to 43,660 psi. B31.3 frowns on such designs.

For a solution to this dilemma, take a look at Fig. 6. The jacket has an integral expansion joint, which minimizes stress on

is a preheat, maintaining the pipe at a minimum temperature until the process at 450 F rolls through.

New condition: Core at

S/S = Stainless Steel C/S = Carbon Steel	
Core Material	Jacket * Material
300-Series S/S	C/S
Inconel	C/S
Monel	C/S
Hastelloy C	C/S
Hastelloy B	C/S
AL6XN	304 S/S
Duplex S/S	304 S/S

***Make selection only after evaluating all process conditons.**