

1106 Kansas Street, Memphis Tennessee
Phone: (270) 331-0578
Fax: (901) 774-1308

Special Interest Articles:

Page 1: Tube Plugging in Shell and Tube Heat Exchangers

Stainless Prices are mixed and Nickel prices are down for May.

How Many Tubes Can I Plug in my Shell and Tube Heat Exchanger?

As I am sure all of you have learned; if you have a shell and tube heat exchanger, you will have a tube failure. A question I am asked frequently is:

“How many tubes can I plug in my heat exchanger?”

The general consensus of most plant engineers and maintenance personnel is that 10% of the unit (heat exchanger) can be plugged without losing efficiency. I am not sure where that number comes from; there is no reference in National Board I can find that addresses tube plugging. There is a section on “U” tubes in TEMA (Tubular Exchanger Manufacturers Association) that stipulates you may plug a maximum of 1% of the tubes.

When it is necessary to plug tubes, you need to consider several variables, including:

- A. Designs: most units are “overdesigned” by a percentage. However, that percentage varies with the customer requirements, products, and flows. Trumbo usually overdesigns a shell and tube heat exchanger by 10-35%. If you need to plug a few tubes, check the original thermal designs to see what percentage the unit was “over” designed.
- B. Cleanliness: Is there any product fouling in the tubes? Even though

the unit might be overdesigned, you need to insure the fouling factors in the original design are correct. If 10% of the tubes are plugged with product, and the overdesign is 10%, you will most likely start losing efficiency when you mechanically plug any additional tubes.

- C. How many passes are there? I had a customer call me a few years ago with a heat exchanger performance problem. He had some leaking tubes and plugged less than 10%; however, his performance was so drastically reduced he had to shut the line down. When I arrived and looked at the unit, I learned he had a six (6) pass heat exchanger. My customer had plugged 10% of the total number of tubes in the unit; however, 70% of those plugs were in the first (1st) pass, severely restricting his flow. Therefore, location of the plugged tubes is important.

If you are interested in obtaining more information about Trumbo, or if you are looking for a quote, just click here. nlockard@trumboinc.com

If you wish to be removed from the mailing list, click here and install “remove me” in the subject line.

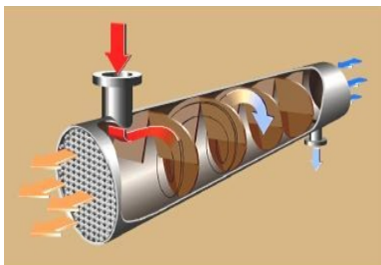
Tube plugging should be a temporary “fix” until the unit can be evaluated as to why the tubes have failed. Hopefully, tube plugging will give the end user enough time to fabricate a new unit, or, schedule a time that the leaking unit can be removed and re-tubed.



NON FERROUS SURCHARGE CHART

Stainless prices are mixed and Nickel prices are down (↓) for May deliveries. Remember, this chart is for surcharge only, it does not include the base price for materials.

Alloy	Jan	Feb	March	April	May	June	July	Aug	Sept
2205	0.7185	0.7195	0.7352	0.7523	0.7574	0	0	0	0
304 CLAD	0.3464	0.3398	0.3365	0.3534	0.3347	0	0	0	0
304/304L	0.6285	0.5995	0.5933	0.6016	0.5687	0	0	0	0
304H	0.6285	0.5955	0.5933	0.6016	0.5687	0	0	0	0
304LN	0.6285	0.5955	0.5933	0.6016	0.5687	0	0	0	0
304N	0.6285	0.5955	0.5933	0.6016	0.5687	0	0	0	0
309/309S/309H	0.8358	0.7776	0.7762	0.7841	0.7366	0	0	0	0
310/310S	1.124	1.0244	1.0223	1.0369	0.964	0	0	0	0
316/316L	0.757	0.7235	0.7335	0.7608	0.739	0	0	0	0
316LN	0.757	0.7235	0.7355	0.7608	0.739	0	0	0	0
316Ti	0.7828	0.7461	0.7561	0.7833	0.7597	0	0	0	0
317/317L	0.8662	0.8317	0.8478	0.8799	0.8639	0	0	0	0
AL-6XN Plus	1.132	1.1611	1.2828	1.4162	1.3372	1.4477	1.449	0	0
alloy 20	1.2687	1.3511	1.5248	1.6467	1.4871	1.6107	1.5444	0	0
AL-200 TM	2.6748	2.7167	3.1892	3.1192	2.5648	2.907	2.6976	0	0
Al-400 TM	1.8828	1.913	2.3223	2.3123	1.9708	2.2196	2.0685	0	0
Al-600 Tm	2.1406	2.206	2.5506	2.6038	2.2021	2.4507	2.2798	0	0
Altemp 625	3.896	3.9472	4.219	4.344	4.0843	4.3166	4.2492	0	0
Alloy 276	3.225	3.2347	3.4967	3.5832	3.3826	3.6396	3.6576	0	0



Click the logo to visit
Trumbo's web site

