In the currently subdued economic climate for stainless steel, tubes, pipes and fittings are doing relatively well. Companies are investing in new plant and products, and many contracts are being signed. Growth areas include water, oil & gas, power generation and aerospace. This article looks at each of these sectors in turn.

Keywords: Aerospace; Nickel; Oil & gas; Power generation; Titanium; Tubes, pipes & fittings

By James Chater

Outlook
When it comes to stainless steel, the tubes, pipes and fittings industry is a good place to be. Demand for welded stainless tube and pipe grew to a record high in 2007 before the financial crisis took its toll. By 2011, however, demand had bounced back, exceeding the 2007 figure. Asia dominates both supply and demand and is a net exporter to the rest of the world (1).

Investment
The tube and pipes sector is rife with investment. Even in economically challenged Europe, expansion is taking place. Sandvik opened a finishing line for high-alloyed tubes and bar in Sandviken, Sweden. Butting has recently completed a new hall at its Schwedt/Oder factory, while Tubacex has completed a pickling plant for stainless pipes in Bilbao. The UK’s Corrotherm International has opened a new office in Perth, Australia, to cater for the growing demand from Asia and, presumably, Australia itself. In the United States, MST is building a new cold pilger mill in a new 14,400 square foot building, and a new atmosphere-controlled furnace.

Among suppliers of fittings, it is largely the same story. German supplier Damstahl is increasing its warehouse capacity in the field of flanges and fittings, following its last expansion in 2008. Swagelok has set up Indofluid System Technologies in Indonesia to cater for increased sales there.

Water
Demand for tubes and pipes generally is forecast to increase in coming years, the main drivers being infrastructure projects in Asia and other regions of rapid economic growth. One sector in particular deserves attention: water. Not only...
Jeanne d’Arc Basin off Canada’s east coast, and its super duplex pipes will be used in the Knarr field in the North Sea; TMK has shipped the first pilot batch of vacuum insulated tubing (VIT) made of 13CrS steel for Gazprom’s Bovanenkovo oil and gas condensate field on the Yamal peninsula.

Orders for stainless umbilicals continue to multiply. Vallourec launched a new welded stainless steel tube for umbilicals, which it developed in collaboration with Total. Technip is working closely with Brazil’s Petrobras on flexible pipes for the Sapinhoá Norte field and I5 at Lula field (former Tupi field), located in the Santos Basin pre-salt area (Brazil). The contracts include 100 km of flexible pipes for oil production, gas lift and gas injection. It is also supplying flexible pipes for the Iraçema Sul (formerly Cernambi Sul) field, located in the Santos Basin pre-salt area.

desalination and wastewater treatment, but potable water in general is a sector in which stainless steel can be expected to play an important role.

Desalination is opening up to several duplex grades, all the way from lean duplex to super duplex 2507. When an Israeli desalination plant decided to upgrade, it turned to Butting for the pipes of manifolds and other parts in UNS S32750 (2507). The world is only slowly waking up to the growing shortage of drinking water. Even in the United States, years of neglect (some of the water pipes are still made of wood!) mean that there is a considerable backlog of upgrades needing to be done. Hygiene, corrosion resistance and weight saving (leading to a reduction in raw material costs) are just some of the advantages of stainless steel over carbon steel. Stainless pipes have been used in water projects at Mesa Verde National Park, in British Columbia, the San Carlos Creek Wetlands in Florida; stainless valves and risers were installed in New York. Type 316 is the most commonly used grade, though various duplex grades are also used (2).

Oil & gas

Perhaps the most promising market for stainless tubes, pipes and fittings is oil and gas extraction. Long term, demand is increasing, even though in the short term supply has increased and prices fallen thanks to the availability of US shale gas. The sector is abuzz with contracts: for instance, Butting supplied the

Butting has supplied prefabricated welded stainless steel pipes (duplex S32750) for the manifolds and other instrumentation of a seawater desalination plant in Israel.

tube fittings from Swagelok.

For the Knarr project in the North Sea, Butting supplied superduplex UNS S32760 for the production pipeline to transport the oil and gas form the seabed to an FPSO.
Companies are continuing to launch products designed to meet the most hostile conditions. Thus Centravis obtained NORSOK M650 approval for its seamless stainless steel tubes and pipes, which it can now supply to the petroleum industry in the UK and Scandinavia; and Parker Hannifin became the first company to make fluid instrumentation products (valves, manifolds, tubes and fittings) in the alloy 6Mo in conformity with the same standard.

Another product that received NORSOK approval was Sandvik’s 254 SMO. The fittings sector is also feeling the effects of the oil and gas boom. Swagelok is one of several companies offering new products that can withstand corrosive environments. It is offering an easier system for preswaging nut-ferrule sets onto stainless steel tubing, called High-Volume Swaging Unit (HVSU). To service surface and subsea installations in the offshore industry it has introduced products for process instrumentation and controls, chemical injection, and testing applications. These include valves, tubing, nipples, coned & threaded fittings, tools and other accessories in 316 stainless steel. Swagelok is also offering tubing, tube fittings and weld fittings in super duplex SAF 2507™ in response to the problem of chloride attack of grades 316 and 316L.

Fittings – the view from suppliers

Most of the fittings suppliers I contacted in a recent survey are optimistic and feeling the benefits of economic recovery. However, some emphasized the dangers and uncertainties ahead: overcapacity, weak prices, financial risks, price of raw materials and so on. Noxon sums it up thus: “We have proven to be successful also in a difficult market.”

Some suppliers note the weak demand from Europe. By contrast, Ezeflow is bullish with regard to North America and the Middle East, while Schmidt + Clemens also expects demand from the Middle East to grow. For European and North American producers, competition from the Asia Pacific region is a major challenge. Schmidt + Clemens believes that developing the African market is an important task in the years ahead.

Cangzhou KH Fittings notes that greater demand came from pipe fittings than from pipe or flanges. Swagelok has experienced steady demand for its products, especially for fittings in high-pressure and corrosive applications, while Steuer Nederland believes that reducing maintenance costs is a priority among end users. Stainless Steel Fasteners (SSF) sees the market as “quality-driven”, with a greater focus on integrity determined via audits and more extensive documentation; it perceives approvals and certification as vital to success.

The emphasis on high-end applications is reflected in the trend in materials. Steuer has seen an increase in demand for duplex and other higher-grade materials.

Most of the suppliers see energy as the most promising end user sector, with SSF singling out the oil and gas in Brazil, Venezuela and the USA. Sealweld anticipates that the Asia Pacific region will see a rise in demand for pipelines fittings and that the Keystone XL pipeline (if it gets the go-ahead) will boost demand in North America. Titanium Industries expressed surprise at the recent lack of expansion in chemical processing but forecasts improvement up to 2014, while noting increased sales in oil and gas and aerospace. According to Seaweld, upgrade and maintenance of existing plants provides a ready market for suppliers of valve-related fittings.

To conclude, oil and gas emerges as the key sector, while the dominant theme turns out, not surprisingly, seems to be quality and maintenance-free service in severe environments.

Nuclear power is a growing market for stainless steel tubes. Alloy 690 is often called for in the steam generator tubes used in new PWRs, and the condenser tubes use various grades of stainless steel.
Companies have expressed their confidence in the oil and gas sector by opening offices and warehouses. In October Sandvik reported that it has established a new oil and gas business unit and opened a sales office in Aberdeen. Oil and gas is a major growth area for the company, and the company intends to enhance its activity in OCTG materials in corrosion resistant alloys and in control tubing for umbilicals and control lines. Tubacex is continuing to expand its capacity in oil and gas extraction tubes: a new cold rolling mill was installed in Amurrio, Spain, at the end of 2012. Australia’s gas boom has led International Piping Products to expand its offering in pipes, fittings and flanges for its projects on the east coast, and the company has moved to a new office and warehouse in Brisbane. Vallourec has recently opened a new research centre in Rio, after expanding its research centre in Belo Horizonte. Butting, which opened a branch office in Brazil in 2009, has recently moved this office to the centre of Rio de Janeiro.

**Power generation**

Power generation continues to provide opportunities for stainless and alloyed tube and pipe manufacturers. The nuclear industry in China is especially dynamic. Vallourec recently inaugurated a new plant to manufacture steam generator tubes in Nansha, China, and it is also supplying tubes for power stations in France. Centravis also reports that it is selling more stainless seamless SG tubes and pipes for nuclear power plants using Russian technology. A growing market in future years is likely to be CPS (concentrated solar power) stations, such as the Gemasolar power plant in Spain, for which Fine Tubes recently supplied 15km of tubing in alloy 625. An important breakthrough is that solar power can be stored at 565°C thanks to molten salt heat storage technology. It is this process for which Fine Tubes’ products will be used.

**Aerospace**

Finally, we may cite aerospace as an industry where stainless tubing and titanium tubings and fittings are in great demand. This is an industry where there is constant pressure to develop lighter alloys that reduce weight and fuel consumption. Tubes used in aerospace include the workhorse Ti3/2.5V, but alloy 718 will be used in the SABRE (Synergetic Air-Breathing Rocket Engine), while seamless titanium tubing will be used in the Solar Orbiter space module that will take off in 2017 to take photos of the sun’s polar regions. Alloy tubing will also be used in the Airbus XWB due to go into service in 2014. Nickel and titanium alloys will also be used in the hydraulic tubing of new engines being developed for use in Snecma aircraft.

**Conclusion**

Among suppliers of tubes, pipes and fittings, meeting the ever greater challenges of end users is paying off. As offshore goes deeper and corrosion and pressure challenges increase, so it becomes clearer that suppliers who can provide specific solutions to end users’ ever greater requirements have the advantage. This is why such partnerships are Vallourec + Total and Technip + Petrobras provide the key to the future.

**References**

(1) www.businesswire.com/news/home/20120223006390/en
(2) http://www.s-p-l-a-s-h.org
(3) I would like to thank the following companies for responding to my questionnaire concerning the fittings market: Cangzhou KH Fittings, Ezeflow, Noxon, Schmidt + Clemens, Sealweld Corporation, Stainless Steel Fasteners Limited, Steuer Nederland, Swagelok and Titanium Industries.