

WORLD STAINLESS STEEL

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- The European market for duplex stainless steels
- Some pitfalls in welding duplex stainless steels
- A material for the future: with a new Secretary General, ISSF enters its next phase
- Finnish base of metal pickling expertise
- Stainless Steel World Conference & Exhibition 2009 - a retrospect

COVER STORY

Nippon Yakin Kogyo
implements its plan to become a
top producer of high-performance
flat products

(Lean & Super)
Duplex Special

Finnish base of metal pickling expertise

The Finnish company Meteco Oy prides itself on supplying high-end products, systems and services to clients around the globe. Meteco has two mills in Finland in Karstula and in Kuhmoinen. It is also one of the largest metal pickling operators in Europe and has been the exclusive pickler of Stalatable Oys' pipes and tubes for the past five years. Stainless Steel World's editor John Butterfield recently travelled to Finland to meet some of the Meteco team and find out more about its operations.

By John Butterfield & Joanne McIntyre

Meteco Oy is a supplier of high-quality, high-tech products, systems and services for the mechanical engineering industry which has carried out the pickling of stainless steel tubes and pipes for Stalatable Oy since 2004. "Pickling is the final surface treatment for acid-proof materials before the product is shipped to the end user," explains Mr Jukka Autio, Managing Director at Meteco. "Our facilities are able to handle tubes and pipes of all sizes up to 13x2x2m and for even larger pieces we can use the pickling paste method." Meteco pickles around 30,000 kg of pipes and tubes each month at its pickling plant in Kuhmoinen in Finland. The process involves lowering the items into a pool of liquid to seal the surfaces. These are then lifted out, washed with high pressure water, then packaged in batches as required before being shipped back to the customer.



Mr Jukka Autio (left) and Mr Petri Parni

"In Stalatable's case they deliver pipes and tubes to us twice a week and three days later we ship them back, pickled and packaged, ready for delivery to their customers. Setting up a new pickling plant

is no small task as the environmental regulations are very strict; the pickling liquor is composed of strong chemicals and all water must be re-circulated and cleaned in our own treatment station."

Nuclear accreditation

"Meteco is one of the few pickling plants in Europe to have gained accreditation to be to pickle tubes and pipes for the nuclear power generation industry, and our plant is one of the largest in Scandinavia," says Mr Petri Parni, Director of Sales at Meteco. "We are currently supplying materials to our client Kraft Anlagen Arge, a company which is working on the construction of Finland's new-build Olkiluoto nuclear power station. The nuclear business will clearly be a significant growth market for us in the future."

There are several important differences between pickling pipes and tubes for the nuclear market compared to those destined for 'regular' applications, explains Mr Parni. "All items destined for



Machining for aerospace tooling



The 10.5 m long invar mould for Airbus composite manufacturing

the nuclear industry are produced in a separate part of the factory. The main difference – as anyone involved in the nuclear business knows – is the amount of documentation required. Every single item which will be used in a nuclear power plant must be thoroughly documented down to the finest detail; records must state who did what, which processes were used, where and why it was done. We also need to have sufficient storage space because it's not simply a question of pickling the pipes and tubes; they must then be carefully neutralized, washed and dried, every piece tested and then packaged separately. Finally unique stickers are applied to each item which links it with the correct documentation. In order to gain nuclear accreditation Meteco was also required to invest in an in-house laboratory so that we can carry out tests on every batch we pickle."

Pipes and tubes which will be used in a nuclear power station must each be separately packaged. "Every piece down to the smallest item is individually wrapped, tagged and placed in our stores ready for shipping. Even at this stage there are strict controls in place to ensure only a specific halogen-free type of plastic is used for packaging the items."

The pickling liquid itself is also subjected

to extra control for nuclear items. "A certain chemical mix must be used with clearly defined limits. For nuclear products the pickling liquid must be thoroughly checked and documented before each pickling batch."

All of these extra controls more than double the turnaround time for pickling pipes and tubes to about 7 days. "While the actual pickling time is the same, the drying, packing, and documentation takes

a lot of time to complete," says Mr Autio. "Drying takes longer because we must guarantee that the pipes or tubes are completely dry before being wrapped. This is because when they are shipped to the site of the nuclear power plant they will go straight to welding for final assembly and can't afford to have any sort of contamination."

Of course it's not possible for a process to proceed perfectly every time and



Parts packed ready for shipping to a nuclear power plant

occasionally something does go amiss. "If we notice any anomalies during the process then the entire pickling process has to be stopped, the problem rectified, then re-started, and this also has to be fully documented. For example if we find a spot of grease on a pipe before it is lowered into the pickling pool this must be carefully removed, cleaned, and prepared for pickling again."

Composite manufacturing

In addition to its pickling activities, Meteco also carries out complete composite manufacturing, specializing in large size out-of-autoclave tooling technology, including complete packages with engineering and testing. "We have been delivering composite manufacturing technology since 2003," explains Mr Parni, "for customers such as Airbus, Israel Aircraft Industries and Patria. Our largest delivered infusion mould and tooling system was 10 meters in length and weighed 35 tones. Recent investments in our manufacturing and engineering capacity means we can now deliver pieces up to 18x3.5m with a maximum weight of 40 tons in a temperature controlled environment. In addition to stainless and alloys we are able to manufacture these in special tooling materials such as cast Invar."

Meteco supplies complete systems, carrying out welding, machining and assembly in-house before shipping the item directly to its customers.

The company has a dual relationship with Stalatube Oy, as both a partner in producing finished pipes, and as an end user. "We use their pipes and tubes to make frame structures, such structural frames for the Airbus."

Meteco supplies a range of industries from heavy industry to the aviation, paper mills, food and beverage, wind power and cable industries. The company works with a huge range of materials although stainless 316L is the most commonly used product, particularly since prices have started dropping.

"We have over 35 years of experience in welding exotic alloys such as super duplex and duplex," says Mr Parni. "With a high degree of specialist knowledge in house we have the ability to weld all materials including very difficult ones such as Invar, which is a challenging metal due to the way it reacts to heat. You can't afford to have any leakage at all during the welding and once welded it must be subjected to a helium leak test to ensure that there are absolutely no bubbles inside



Pickling of paper machine parts

the weld. That's the standard for the casting process and therefore it's also the standard for the welding process." Meteco is justifiably proud of its welding team which includes a full time IWS rated person for quality control and training. "Some companies have difficulty in retaining their staff but we have a good solid team. We carry out all of our own welding and the welders are all highly certified. Any new welders we employ are trained by our IWS expert to gain the necessary certificates. Very few companies have the degree of welding expertise in-house that we do simply because we deal with so many different types of metals."

It's hardly surprising to learn that Meteco also provides welding services for other companies. "One of the main applications for which we provide welding services is the offshore industry, for example in producing duplex loading valves for tankers."

When they are not busy at the Meteco plant Mr Autio and Mr Parni both enjoy pursuing their favorite sport; fishing. "There are plenty of good fishing spots around here, but we also like to get together with a group of friends and make the 1,000 km trip up to Lapland to fish there," Mr Autio explains. "We both do plenty of travelling for the company but our fishing trips are strictly for fun only!"

What is pickling?

Pickling is the treatment of metallic surfaces in order to remove impurities, stains, rust or scale with a solution called pickle liquor, containing strong mineral acids, before subsequent processing such as extrusion, rolling, painting, galvanizing or plating. The two acids commonly used are hydrochloric acid and sulfuric acid. Pickling liquor may be a combination of acids and may also contain nitric or hydrofluoric acids.

Carbon steel is pickled usually by either sulfuric acid or hydrochloric acid. At one time, sulfuric acid was the pickling agent of choice for picklers running integrated steel works. Hydrochloric acid is chosen in modern lines when bright surfaces, low energy consumption, reduced over-pickling and the total recovery of the pickling agent from the waste pickle liquor are desired.