# WELDING NEWS

2 • 2010

100 % Stainless




Avesta Welding

*Fredrik Hägg*

# Have a wonderful summer!

With almost half of 2010 gone, it can be noted that the business climate now looks even better than at any time during the past six months. However, we are still far from the levels before the financial crisis and the downturn in the economy. It is thus important to continue with streamlining that leads to cost reductions and higher productivity. As an element in this, we have intensified our lean-production initiatives. These are aimed at identifying and eliminating all factors that, in a production process, create no value for the end customer. Simply put, it is a question of "More value for less work". I am convinced that, through increased productivity and improved product availability, this will give visibly positive results, both for ourselves and our customers.

That business levels are picking up is reflected by the contents of this Welding News. One article is devoted to Outokumpu's major environmental investment in the acid recycling plant being built here in Avesta. As shown by the article on Fueltech, one of Avesta Finishing Chemicals' most important customers, the hard-hit automotive industry is also beginning to recover. Here too, there is a link with the increasing significance of environmental considerations.

As usual, we are presenting a number of innovations in our product programme. On top of this, straight from the presses, there is a glimpse of the highly requested Swedish version of our welding manual.

Finally, I would like to wish all our readers a wonderful summer and, remember, if you are welding stainless, the natural choice is Avesta Welding – 100% Stainless!

**Fredrik Hägg**
Brand Marketing manager, Avesta Welding

# Avesta's welding manual in Swedish

Having previously only been available in English and German, a Swedish version of Avesta Welding's manual is now available.

Published in December 2004, the first edition of the Avesta Welding Manual was in English. Reaction from customers and distributors was overwhelming:

"The best of its kind. Nothing else comes near it."

"It's not just a welding manual. It's a manual on stainless steel."

"The format is practical and the layout is clear and simple."

"It's going to have a permanent place on my desk and on my customer visits."

Eighteen thousand copies of the English manual have since been printed. Last year, the first German version appeared just in time for the world's largest welding fair, Schweissen & Schneiden (Essen, Germany). And now, as mentioned in the previous issue of Welding News, the Swedish version is ready. The manual's 320 pages have up-to-date information on virtually all practical aspects of stainless steel and how it should be welded.


Contact your nearest Avesta Welding representative or write to weldingnews@avestawelding.com for a free copy. Hammock reading?

**Editorial:** Eva Söderberg, Tel:+46 (0)226-857 05
eva.soderberg@avestawelding.com
Susanne Rosén, Susanne Rosén Kommunikation

**Translations:**
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**Cover picture:**
Diesel engines with selective catalytic reduction (SCR) have tanks for AdBlue, a liquid urea that breaks down diesel exhaust to water and hydrogen. Fueltech manufactures these tanks in duplex steel LDX 2101®. Avesta Welding supplies the welding consumables and Avesta Finishing Chemicals takes care of pickling and passivation.

# Acid regeneration at Avesta's steelworks – a boost for the environment

At the start of June, German company Kramer & Best began welding Outokumpu's new acid recycling plant at Avesta Works. Böhler Welding Group has supplied all the welding consumables, the stainless elements in these coming from Avesta Welding.

*The building is starting to take shape.*

The primary reason for this major investment by Outokompu is an environmental requirement that imposes a reduction in nitrate emissions to the Dalälven river. It is calculated that acid recycling will reduce nitrate emissions to one third of today's levels.

"The project is in an intensive phase. We are finishing the fabric of the building itself. Process installation comes after that," explains **Jonas Nordlöf**, project manager.

Construction of Outokumpu's acid recycling plant started in November 2009 and operation is scheduled for May 2011. However, Jonas Nordlöf reveals that, to enable testing throughout winter and spring, plant start-up will be as soon as the end of this autumn.

*German company Kramer & Best is doing the welding.*

In the manufacture of stainless steel plates, the nitric and hydrofluoric acids used in the annealing and pickling line at Avesta Works are toxic. The process itself generates environmentally hazardous waste in the form of nitrates and metal sludge.

Thanks to the new plant, it will be possible to recycle over 95 percent of the acid. Consequently, consumption of new acid will decrease dramatically. Metal ions released during the pickling of stainless steel plates will also be separated and used again in the process. This further reduces the load on the environment.

The acid recycling plant is Outokumpu's largest environmental investment in Avesta. It is to cost a little over SEK 300 million and is the first of its kind in Europe to use the Steuler Total Acid Regeneration (STAR) process.

For understandable reasons, the plant uses a great deal of acid-resistant materials. Stainless steel is used primarily in process equipment and in pipes for liquefied petroleum gas, water and compressed air.

"We also have a small furnace, a roaster, made in Inconel, a special type of material. This is acid resistant and has a very high nickel content," says Jonas Nordlöf.

He states that the German welding company, Kramer & Best, selected Avesta Welding electrodes, "Because, quite simply, they were the best choice." Welding is being carried out from June to August this year.

Acid recycling is part of the large capacity-increasing investment decided on by Outokumpu in September 2007. Owing to the poor economic climate, most of the group's investments were shelved in December 2008. The acid recycling plant is one of the few to have been maintained. Jonas Nordlöf feels that the plant is a reason for optimism, both for the company and the community at large.

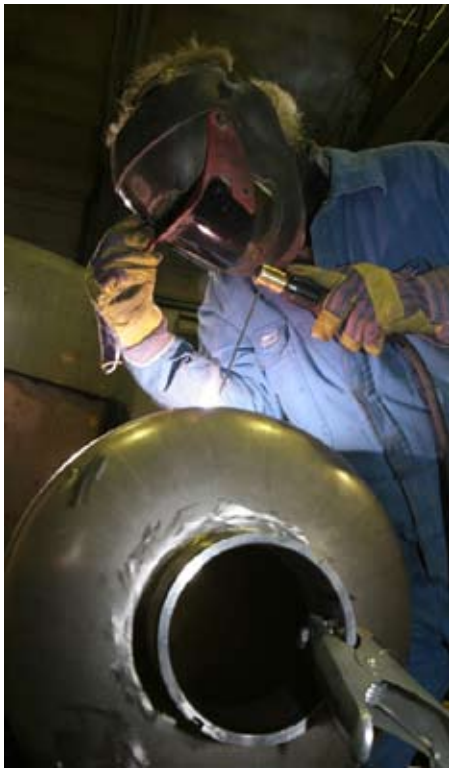
"This is an entirely new process for us. It is creating new employment opportunities. As the plant, which will be 25 metres high, is on the edge of our complex and quite visible, the region's people will be able to see that things are happening." He hopes that this may create a positive spiral locally.

As project manager, Jonas Nordlöf's challenges include ensuring that the programme runs to time and budget. So far, everything is looking good.

"Then, so that we achieve the environmental goals, the recycling process must, of course, work as planned. The final results will only be known around a year from now," he concludes.

# Product news

Two new Avesta Welding electrodes – an all-rounder and one considerably more specialised



### Avesta 16.8.2
(AWS A5.4 E16-8-2-17)

Avesta 16.8.2 is a hybrid of 308H and 316H. It can thus be used to weld many 3XXH type stainless steels with a carbon content of 0.04 – 0.10%. The weld metal gives good creep properties along with good resistance to oxidation.

A low total Cr + Mo content combined with a controlled carbon content and low ferrite content ensures good resistance to the formation of embrittling phases at high operating temperatures.

Typical analysis: C 0.05%, Si 0.45%, Mn 1.6%, Cr 15.5%, Ni 8% and Mo 1.2%. This gives a ferrite content of 0 – 2 FN. Despite the low ferrite content, the weld metal is not prone to hot cracking and the weld tolerates operating temperatures up to around 800°C.

Areas of application for Avesta 16.8.2 include the welding of catalytic crackers and furnace, superheater and steam pipe components in the petrochemical and chemical industries.

Avesta 16.8.2 is available in 3.25 and 4.0 mm dimensions.

### Avesta 308LMo
(AWS A5.4 E308LMo-17)

Avesta 308LMo is an all-round electrode. It is suitable not only for general welding and repair of stainless steels, but also for welding dissimilar joints between unalloyed and stainless steels.

Thanks to its chemical composition, the weld metal shows good tolerance of mixing with the parent metal.

Typical analysis: C 0.02%, Si 0.8%, Cr 19.7%, Ni 9.9% and Mo 2.5%. This gives a relatively high ferrite content, 20 FN (WRC-92).

Typical values for mechanical properties are: yield strength 560 N/mm$^2$, tensile strength 700 N/mm$^2$ and elongation 35%.

Avesta 308LMo is available in 2.5, 3.25 and 4.0 mm dimensions.

# Full speed ahead in purpose-built pickling line for urea tanks

Tougher requirements in respect of emissions from commercial vehicles have created a need for urea tanks such as those made in duplex stainless steel LDX 2101® by Fueltech in Ronneby, Sweden. The company has its tanks pickled at a line specially built by Avesta Finishing Chemicals.

Summarising the advantages of the customer-specific solution provided by Avesta Finishing Chemicals in Malmö, **Matthias Nedfors**, product manager at Fueltech, says: "Previously, for pickling before delivery to Volvo's factories, we sent the tanks to Lyon in France. Now, things are faster, cheaper and better."

The EU is implementing ever more stringent rules on exhaust fumes from vehicles. As of 1 Oct 2009, heavy goods vehicles are subject to the Euro 5 requirement. Amongst other things, this imposes a 50% reduction in the level of nitrogen oxide emissions. To satisfy this, the transport industry has to turn to technology. If selective catalytic reduction (SCR) technology is chosen, vehicles must have tanks for AdBlue, a liquid urea that is sprayed into the exhaust system and breaks down the diesel exhaust to water and hydrogen.

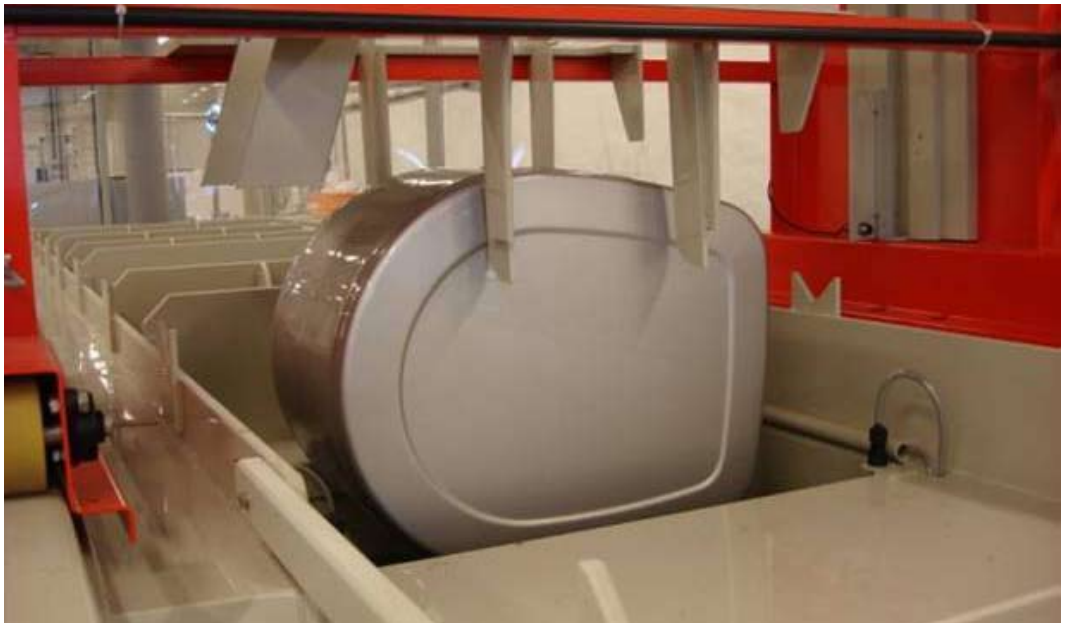
Using Outokumpu's duplex LDX 2101 and filler metals from Avesta Welding, the tanks are made at Fueltech's Ronneby factory. They are then sent to Malmö for surface treatment at Avesta Finishing Chemicals' specially built pickling line.

**André Fasth**, technical manager, Malmö, reveals that Fueltech is Avesta Finishing Chemicals' largest customer for subcontract treatment. From getting the line concept accepted to project implementation, André Fasth has been present throughout.

The tanks arrive untreated on "shuttle lorries" from Ronneby. They are then degreased, pickled, rinsed and passivated before transport to the truck factory in Gothenburg.

"The line works very well. We are now in the fourth year of this collaboration. In 2008, when the financial crisis hit the automotive

*The 30-metre long, specially built, pickling line at Avesta Finishing Chemicals.*



*Newly pickled urea tank in LDX 2101.*

industry hard, production was greatly reduced. The cycle has turned and we are currently up to two shifts," explains André Fasth.

Matthias Nedfors states that production is now constantly increasing. This year's calculations are for around 18,000 tanks (compared to 7,000 last year).

Fueltech is famous for its expertise in aluminium fuel tanks. However, because AdBlue corrodes aluminium and forms deposits that can end up in the engine, the company here uses LDX 2101.

"As LDX 2101 was a new material when production started, we chose to use welding consumables from Avesta Welding and pickling from Avesta Finishing Chemicals. Both companies are nearby and offer ready access to top-class know-how," comments Matthias Nedfors.

He adds that the market is looking good and that the need for this type of tank is growing.

The EU's environmental requirements in respect of commercial diesel vehicles are to become even tighter in 2011 and 2014. They will then also apply to civil construction machines such as excavators.

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Duplex World 2010
13-15 October 2010 - Beaune, France

# Visit us in Beaune!

Duplex World, a combined conference and fair, is being held in the middle of October in Beaune, France.

Besides giving presentations at the conference, Avesta Welding will also have its own stand showcasing the world's most complete programme of products for welding duplex steels.

**We look forward to seeing you at stand 606!**

*The Palais de Congrès (convention centre), Beaune.*

# Great interest at Chinese welding fair

Asia's largest welding fair, Beijing Essen Welding & Cutting, was held for the fifteenth time at the end of May.

*Many visitors came to the stand to discuss welding with the BWG team.*

Almost one thousand exhibitors from 30 countries showed off their goods and services. Chinese companies were the most strongly represented. Nonetheless, nearly a quarter of the exhibitors came from other countries. Compared with the previous year, the number of visitors also saw an increase. This was particularly true of foreign visitors. More than 20,000 people from 83 countries and regions attended the fair.

Böhler Welding Group and Avesta Welding were represented by Böhler Welding Trading (Shanghai) Co. Ltd. The 255 square metre stand attracted lots of attention.Over the years, the fair has become a natural meeting place and contact point for people in the welding industry. The team was pleased to welcome many of these people – potential and existing customers alike.


*Böhler Welding Group's stand.*