



# New burner technology: Turning low-grade scrap metal into high-efficiency savings

**Petr Tlamicha\*** explores how aluminium processors can overcome some of the issues associated with low quality secondary material.

Faced with today's tough economic conditions, aluminium plants across Europe are looking for better ways to process low-grade scrap metal. It makes good financial sense, but it also presents many challenges.

Low-grade scrap metal is often contaminated with oil, paint and plastic and this is where the problems emerge. Heavy fumes, flames and post-combustion outside of the furnace cause high temperatures in the ducting system and influence baghouse operation, efficiency and emissions.

Air Products has developed a new generation oxy-fuel melting technology, which consists of two main features – a High Yield Oxy-Fuel Burner and an Advanced Low Emission Melting control system (ALEM), which can be tailored to specific melting requirements for increased flexibility. The aim is to enable the processing of highly contaminated scrap, minimise melt losses, and flux usage whilst also increasing productivity by reducing costs and total emissions. The ALEM system measures the degree of contamination, automatically controlling the oxygen flow to ensure more efficient combustion. As a result, combustion is contained within the furnace where the extra heat generated can be used for melting, reducing energy costs and shortening the cycle time.

The High-Yield Oxy-Fuel Burner is designed to provide the same benefits as conventional oxy-fuel technology – fuel savings, increased production and reduced baghouse temperatures and loadings. Additionally, comparable testing with conventional oxy-fuel burners has proven that, with the high-yield burner, flux is reduced by 10-15% and yield is further increased by 1-2%.

The new melting technology also provides savings through reduced melt times and excess air, protective furnace flow patterns and a more consistent operation, when compared to air-fuel systems. An added advantage is that the technology can easily be retro-fitted to existing air and oxy-fuel operations with minimal interruption to production schedules.

### Case study

For many years Air Products has worked with REMET Spol s.r.o., one of the largest producers of aluminium casting alloys in the Czech Republic, to help improve its melting technologies on rotary and reverb furnaces.

The company has been using Air Products' new melting technology since early 2012 and production manager Mr Ludek Septun is pleased with the results: "We've measured a positive impact to yield and, with the combination of further

melting control optimisation such as with the ALEM technology, we've achieved great results in production, yield and lower maintenance on the ducting and baghouse system."

REMET has experience in processing low-grade scrap. "In the last few years we have started to improve our operations in terms of controlling the combustion process. The new ALEM advanced control system designed by Air Products has brought many hard and soft advantages – one of which being an enhanced ability to process a higher percentage of contaminated scrap material than before," continued Mr Septun.

"The installation and implementation was initially carried out by Air Products' trained experts, including training of our own operators. Following the successful installation, the system needed to be tuned to our specific operating conditions - a very important part of the set-up process. The initial settings were set by Air Products and then, working together over the following weeks, we optimised the system functionality with online data and hands on experience from our facility operators. With the results we've experienced, we now operate this new burner and advanced control system on two of our rotary furnaces, where we continue to realise real financial and operational benefits." ■

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