

BLUBOX of tricks

The result of a collaboration between Air Mercury and MTB Recycling, the BLUBOX is an automatic, closed system which is described by one of its developers as the only available technology yielding operators an array of valuable materials from the dry processing of lamps, tubes and screens. Recycling International went along to find out more.

It is a clear but cold February morning in Vienna. Roger Burri, CEO of Swiss company Air Mercury, manoeuvres his rental car carefully through the dense early-morning traffic to the outskirts of Austria's capital. Our destination: the e-waste plant of waste management and recycling company Saubermacher where Air Mercury's first BLUBOX in Austria is now in operation. The BLUBOX is the first automatic and integrated 'plug-and-recycle' plant for mixed lamps and flat screen recycling such as LCDs and plasma screens. And according to Mr Burri, it is currently 'the best available technology for mixed lamps and flat screen recycling'. With the BLUBOX, it is possible to process these two different materials simultaneously in one machine. Both scraps have one problem in common: mercury. 'The unique feature is that the BLUBOX is a closed box with a closed-loop system,' he explains. 'There is nothing like it in the market today.'

Embedded in container

Mr Burri - who has more than 25 years' experience in the mercury recycling business - was the founder of Switzerland-based battery recycler Batrec, which is one of the world's major recyclers and producers of mercury. He had the idea for a lamp recycling plant some 15 years ago when he was one of the owners of battery recycling company Citron in Le Havre, France. But the idea got mothballed until a few years ago. 'Then I visited one of my customers and they asked me to develop such a machine,' he explains. Mr Burri contacted MTB Recycling, based at Trept in France, which is a renowned manufacturer of shredder machines and plant for the recycling industry, and together they started

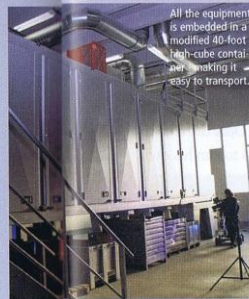
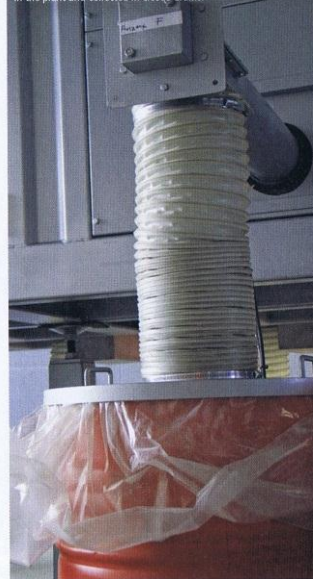
working on the first concept of the BLUBOX. The development was carried out by MTB's engineering team, where the plant is also produced. Right from the beginning, the idea had been to embed all the equipment in a modified 40-foot high-cube container - making it easy to transport - and the engineering team succeeded in this objective. After four years of development, Air Mercury sold the first BLUBOXes last year to Veolia in Switzerland and Saubermacher in Austria.

Dry process

The BLUBOX uses a dry, mechanical process, in contrast to the existing lamp recycling plants on the market. Basically, the lamps, flat screens and other screens are fed into a shredder and then into a rotating mixer in a process that takes several hours. The mercury and rare earth metals-containing layer of powder inside the fluorescent lamps - which contains some 30 different elements - is sucked out via a series of filters in the shredding process, a magnet removes the ferrous caps from the glass. Subsequently, an eddy current separates a mix of aluminium, copper, plastics etc. A rotary sieve sorts the material into different sizes of glass, aluminium and plastics. Currently, original equipment manufacturers (OEMs) are obliged by law to take back this material, and it is profitable for them too because metals prices are currently high. They have started to process the dust themselves and recover the high-value rare earth metals they use again in their production. 'In the USA, recovery of rare earth metals has been designated a strategic industry and



The mercury and rare earth metals-containing layer of powder inside the fluorescent lamps is sucked out via a series of filters in the plant and collected in closed drums.



All the equipment is embedded in a modified 40-foot high-cube container - making it easy to transport.



Roger Burri, CEO of Swiss company Air Mercury.



The BLUBOX is suitable for processing all types of flat screens up to 100 cm in length; notebooks; and mobile phones.



Toasting Creative Recycling's exclusive dealership for North America. From left to right: Roger Burri of Air Mercury; Joe Yob of Creative Recycling; and Jean-Philippe Fusier of MTB Recycling.

BLUBOX Trading AG
Schnawaldstr. 7, 57068 Birrwil, Switzerland
Tel: +41 62 785 1003. Fax: +41 62 785 1004
info@blubox.ch, blubox.ch

Creative Recycling seals BLUBOX dealership

During the International Electronics Recycling Congress held in the Austrian city of Salzburg in January this year, an agreement was signed between Air Mercury and electronics recycling company Creative Recycling of Florida in the USA. Creative Recycling has purchased twelve BLUBOXes and has the exclusive rights to use the technology in North America. Air Mercury will train Creative Recycling's staff and they will create a US maintenance team for the machines.

the business is booming. For this reason, Florida-based Creative recycling purchased 12 BluBoxes to offer this recycling service.'

Valuable materials

'What the BLUBOX does is process hazardous waste into valuable raw materials,' Mr Burri goes on to explain. 'Our innovation and technology enable it to simultaneously recycle several kinds of mercurial wastes. The flat screens, for instance, contain very valuable materials such as, for instance, polymethyl methacrylate (PMMA) - a transparent plastic sometimes called acrylic glass. Currently, the price of PMMA is between US\$ 600 and US\$ 800 per tonne.' The BLUBOX is suitable for processing a wide range of wastes, including: all fluorescent tubes and lamps up to three metres in length; fluorescent tubes with plastic protection; compact fluorescent lamps; all electronic compact fluorescent lamps, also with heavy sockets; all halogen lamps; most high-pressure discharge lamps; all kinds of light bulbs and lamp scrap; all types of flat screens up to 100 cm in length; notebooks; and mobile phones.

Payback

The composition of the output depends on the type of waste processed, while the grain size is determined by the installed screen grids. The fractions from flat screen recycling are in general: ferrous; non-ferrous (aluminium, electrodes); plastics; printed circuit boards and other LCD/plasma parts sorted out by the grids; non-ferrous parts not fitting through the grids; powder (fluorescent powder, glass dust, metal dust); and foils and films (including indium-oxide and LC parts).

The fractions from lamp and tube recycling are: ferrous electrodes and wires (with brass pins attached); glass which is directly saleable to the glass processing industry; an end fraction comprising aluminium caps and sockets, PC boards, plastics, etc; and powder (fluorescent powder and a small amount of glass dust).

'In general, a payback time of four years should be easily achievable,' Mr Burri says of the plant. 'I am so convinced that our clients will be satisfied with the BLUBOX that, in case they are not, Air Mercury is ready to buy the machine back after two years for the sales price.'

Safety first

Safety was a big issue when designing the BLUBOX - after all, the workers must deal with

mercury-containing dust. However, Mr Burri stresses that no mercury can leak from the container because even in stand-by mode, the BLUBOX is permanently maintained under negative pressure to ensure a totally clean environment and to protect the operating staff. Several easily-accessible emergency stop buttons have also been incorporated into the design and, even in situations where these are used, the ventilation system continues to run. A sophisticated mercury measuring instrument alerts the crew if ambient air readings exceed healthy standards. For safe handling, all moving parts are contained. The capacity fits with the wastes to be processed and the skills of the operating personnel. In general, the following capacities can be achieved assuming an eight-hour working day: 500 kg of flat screens per hour plus 500 kg of lamp waste per hour, totalling 2000 tonnes of lamps and flat screens per year. The BLUBOX requires three people to operate. It takes only four days to install the plants at customers' site. □

Air Mercury at a glance

Air Mercury is active in three business areas:

- **Waste and metals trading:** The company buys copper-containing e-scraps and residues from shredder plants, but also buys and sells high-priced metals such as cobalt, mercury, indium and nickel-containing metals worldwide. In addition, it buys small volumes of metals from battery recyclers.
- **Warehousing:** In 2010, Air Mercury built a warehouse where it stores metals for third parties such as banks. Currently, it has some 5000 tonnes of metals in stock. A non-LME member, the company offers its services to, among others, processing industries, private investors and the finance business. A new and even bigger warehouse has been planned for this year.
- **Machinery:** The BLUBOX, a fully-automatic LCD screen and mixed lamp recycling plant, was originally developed for the Swiss market but is now marketed globally.

www.airmercury.com www.metaldepot.ch

For more information:

BLUBOX Trading, Birrwil, Switzerland,
Phone: +41 62 785 1003,
E-mail: info@blubox.ch
www.blubox.ch