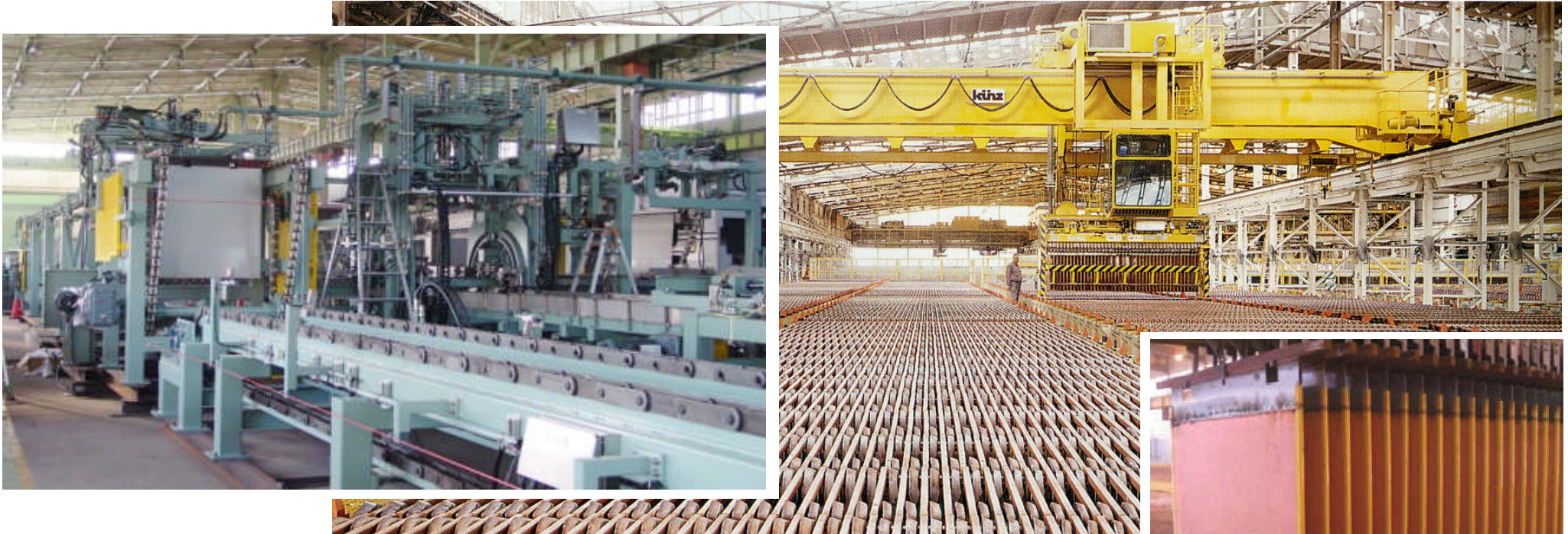


ISA Process Cathode Stripping Machine

ISA Process & Its History



- **ISA Process is an electrolytic copper production process (applicable to both the electrorefining and electrowinning processes) that utilizes permanent cathode plates for copper deposition which can be used repeatedly. It is an extremely simple process that eliminates a need for producing starting sheets for each copper plating cycle.**
- **ISA Process was first developed and put into operation in 1978 at Copper Refineries Pty., Ltd. of Xstrata Copper (formerly named MIM Holdings. Ltd.) in Townsville, Queensland, Australia. The name of the ISA Process comes from Mount Isa Mines, Ltd of the MIM Holdings group.**

Cathode Stripping Machine

ISA Process & Its History

- The following are the core elements of the ISA Process :
 - The electrolysis technology and permanent cathode plate technology developed by Xstrata Technology Pty., Ltd. of the Xstrata group
 - Mesco's copper cathode stripping machines and other materials handling machines (such as anode preparation machines and anode scrap washing machines).
- Marketing, sales, and licensing of the ISA Process to outside customers started thereafter and the ISA Process has established itself as a de-facto standard in the electrolytic copper production industry, with further improvements being added ever since.
- For further details of the ISA Process and its presentations, please visit the following website of Xstrata Technology's.



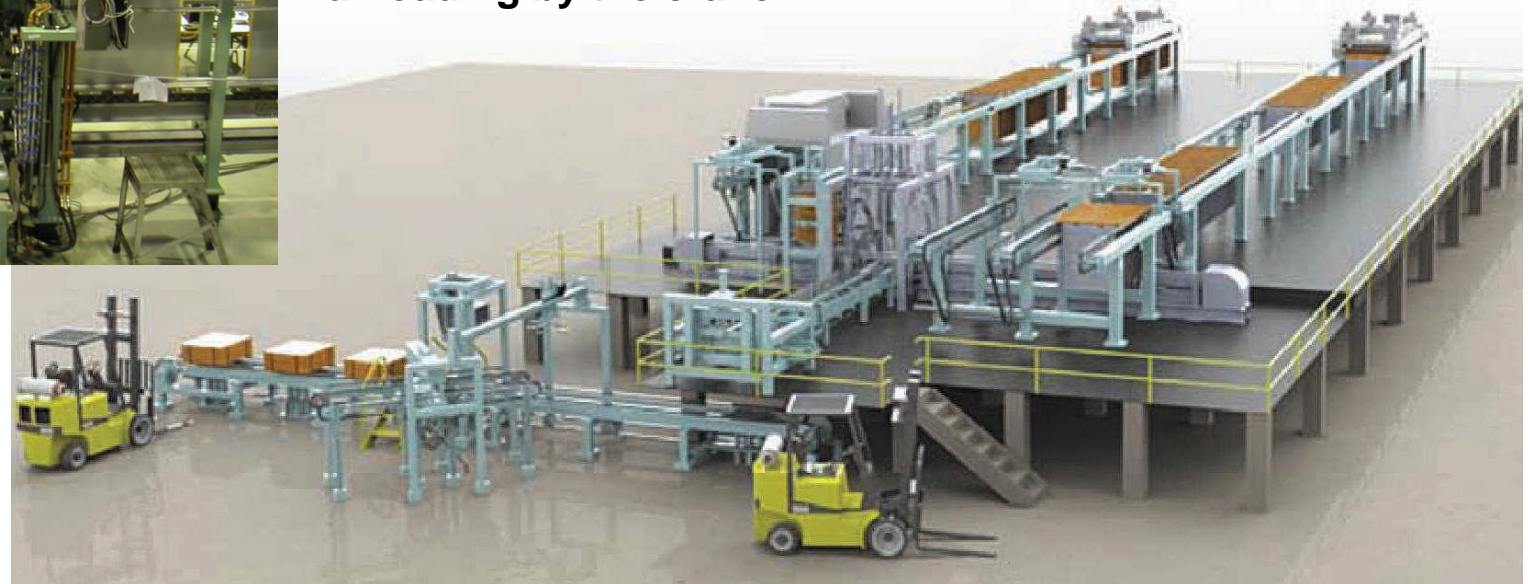
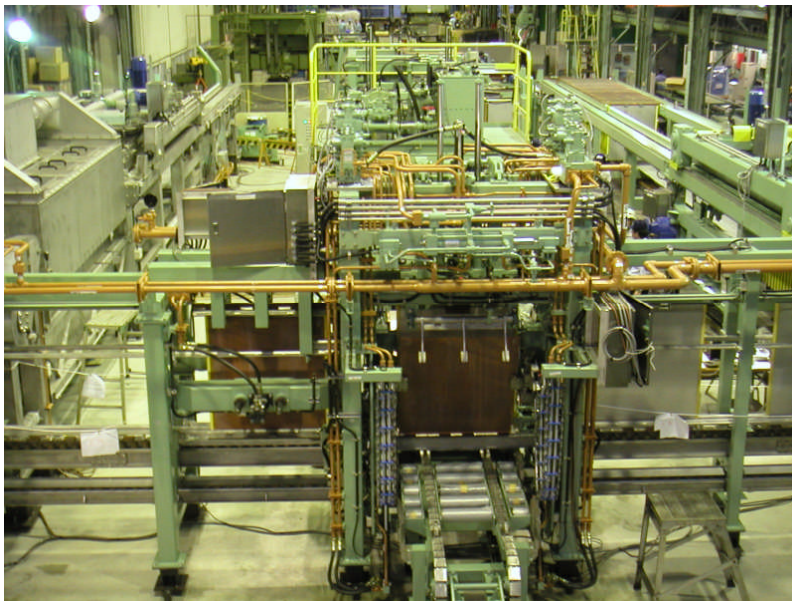
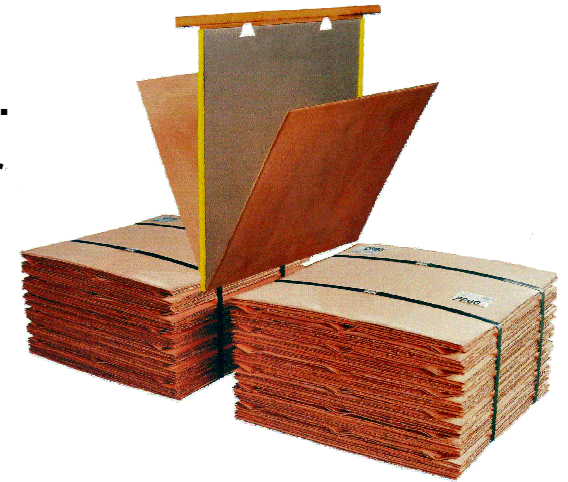
Townsville Copper Refinery

<http://www.isaprocess.com/EN/Pages/default.aspx>

ISA Process Cathode Stripping Machine

MESCO's Cathode Stripping Machine

- It is an indispensable key component of the ISA Process Package.
- MESCO's unique machine of high standards of safety and reliability.
 - A system which receives copper deposited cathode plates from the copper tankhouse overhead crane, wash them, strip copper, stack the stripped copper sheet bundles for unloading, and discharge the stripped cathode mother blank plates for unloading by the crane.



ISA Process Cathode Stripping Machine

MESCO's Cathode Stripping Machine

- A full range of lineup is available from fully automatic, high speed machines to semi-automatic low speed machines to meet the requirements of the respective tankhouse sizes and the customer's needs.
- Standard processing rate: 60 - 500 cathode plates per hour



Fully Automatic Medium Speed Machine



Fully Automatic High Speed Machine



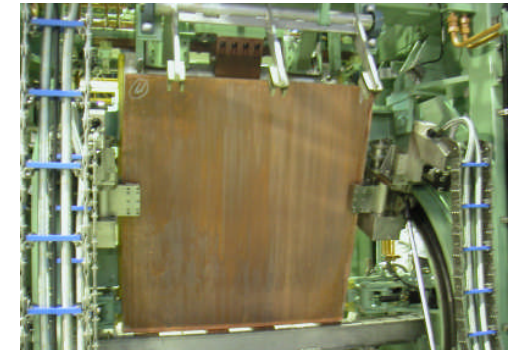
Semi-Automatic Low Speed Machine

ISA Process Cathode Stripping Machine

Mesco's Cathode Stripping Machine - Functions

➤ Typical Functions of the Cathode Stripping Machine

- * Receipt of copper deposited cathode plates from the crane
- * Washing off slimes and impurities from the cathode surfaces
- * Flexing of the cathode plates for loosening the deposit top
- * Separation of the copper deposits by chiseling and downending
- * Stacking of the stripped copper sheets and discharge
- * Discharge of the stripped cathode plate mother blanks
- * Rejection of faulty cathodes, if any



Chiseling & Downending

➤ Optional Functions Available upon Request

- * Corrugation of the stripped copper sheet
- * Sampling of the stripped copper sheet
- * Weighing of the copper sheet stack
- * Labeling on the copper sheet stack for weight, etc.
- * Strapping of the copper sheet stack
- * Make-up cathode plate feed in case of cathode plate rejection
- * Other items as required and available



Stack Weighing & Labeling



Corrugated Sheets

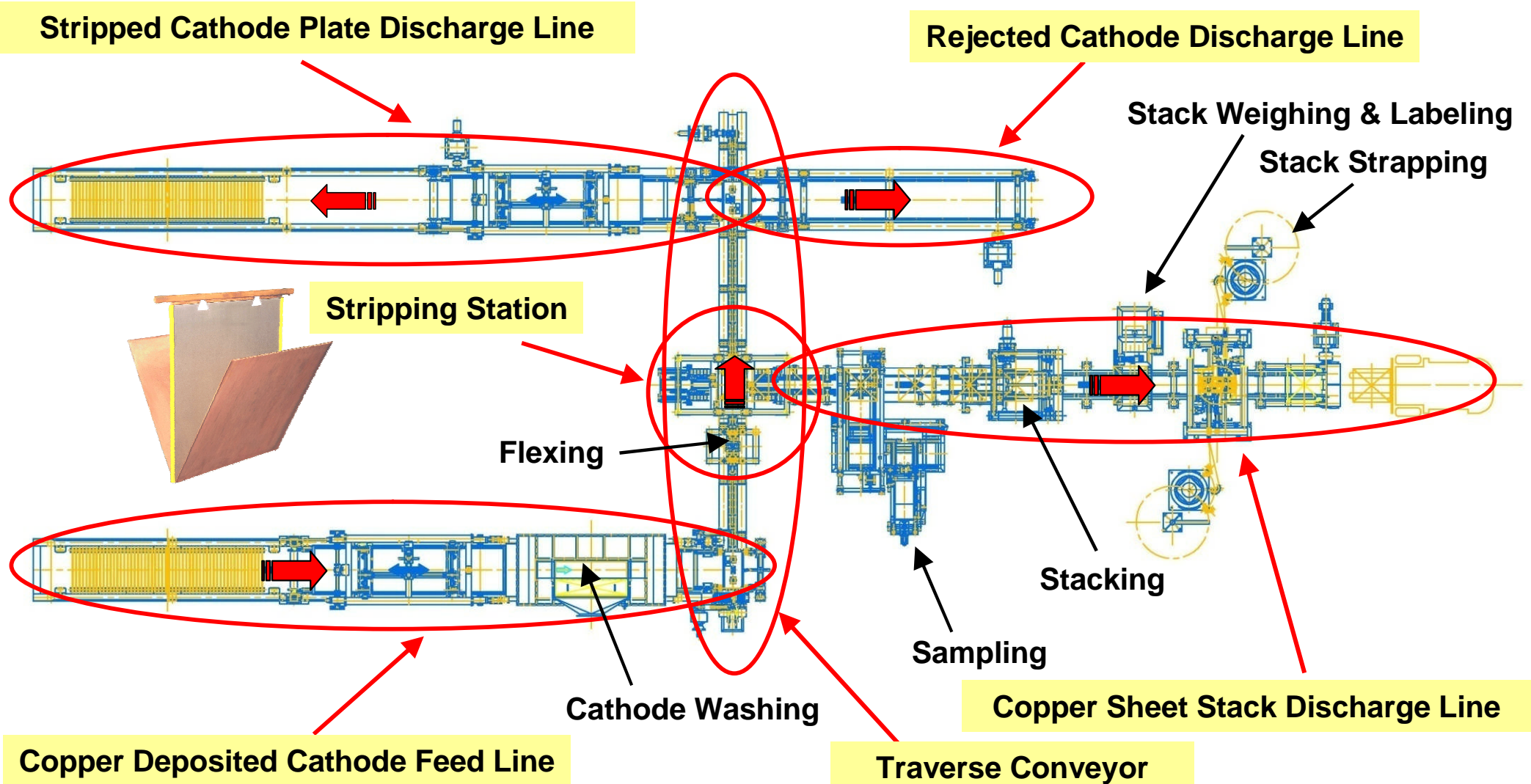


Strapped Stacks

ISA Process Cathode Stripping Machine

Mesco's Cathode Stripping Machine – Layout & Materials Flow

Typical Machine Layout & Materials Flow



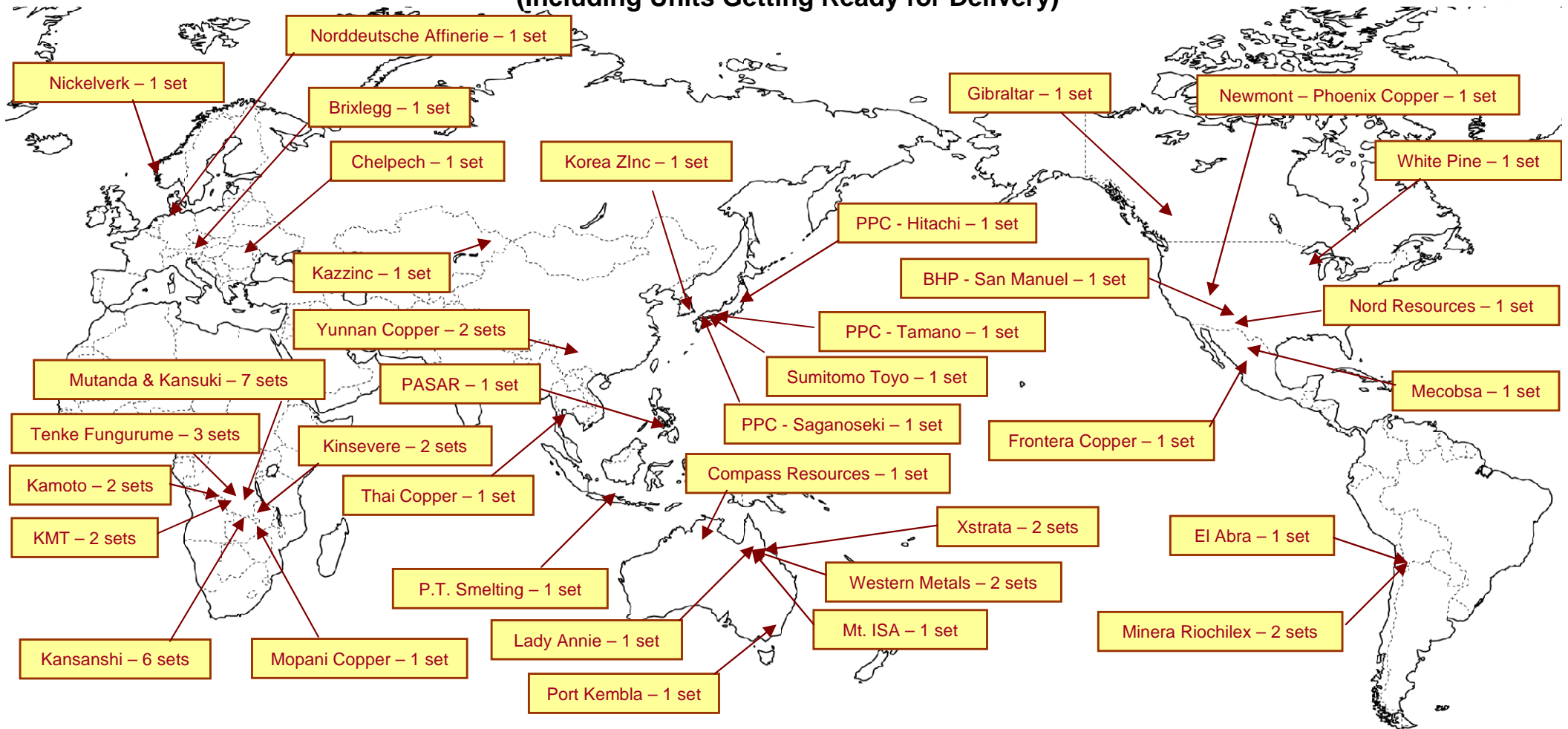
ISA Process Cathode Stripping Machine

Mesco's Cathode Stripping Machine - References

Delivery References – as of April 2012

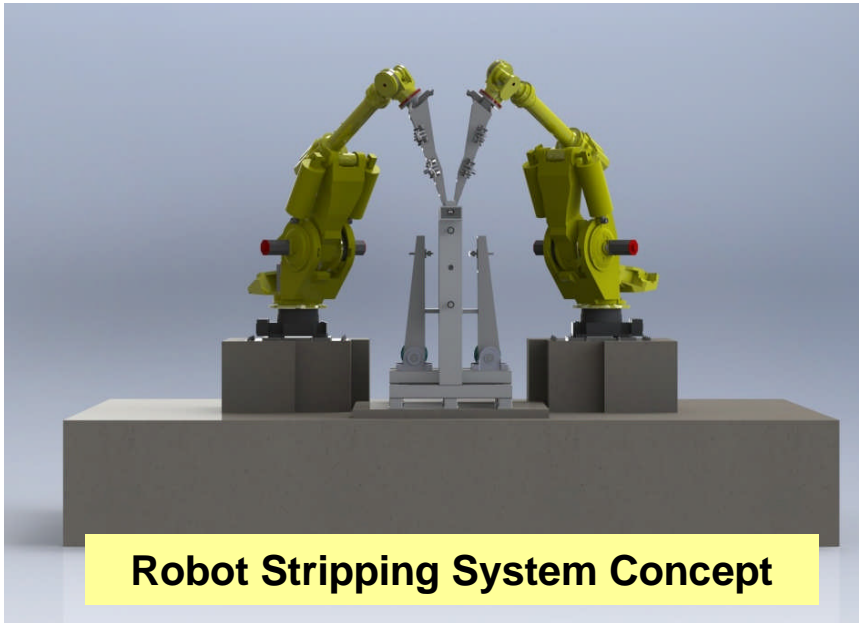
58 Sets Total

(Including Units Getting Ready for Delivery)

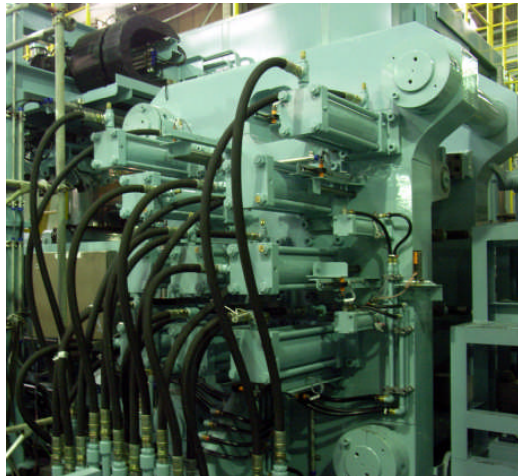


Cathode Stripping Machine

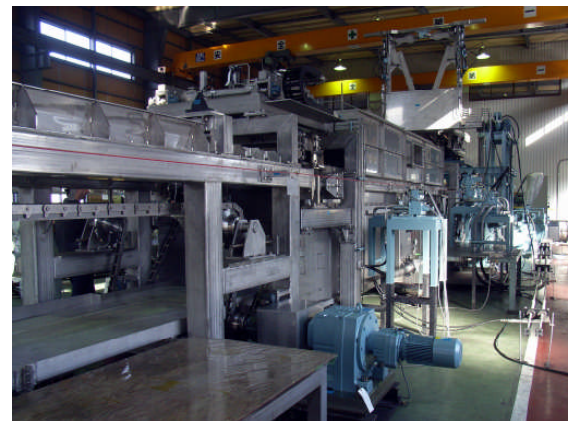
Mesco's Cathode Stripping Machine – Development & Other Machines Available



- Mesco continues development of the cathode stripping machines in the areas of both performance and materials to add values to our customers and to meet their demands.
- Robotic applications for the stripping and handling operations is one of the development areas. Two orders have been received for a robotic stripping machine each and one is already in operation.
- Also available from Mesco are anode preparation machines and anode scrap washing and stacking machines which are also indispensable to copper tankhouse operations.



Anode Preparation Machine – Anode Press



Anode Scrap Washing & Stacking Machine

