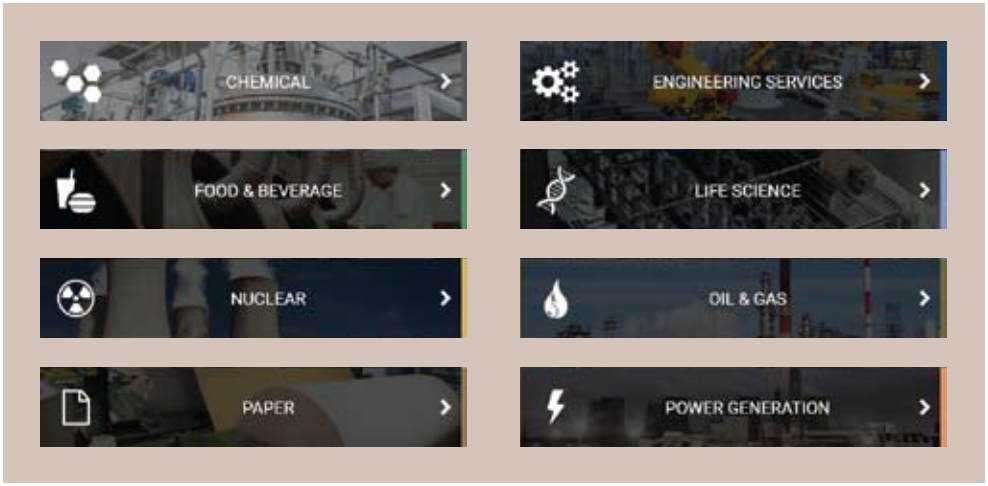
ENGINEERING SERVICES AND TURNKEY MANUFACTURING CAPABILITIES FOR INDUSTRIAL COMPANIES

R-V INDUSTRIES INC.

WHO WE ARE

R-V Industries is a uniquely diversified engineering and manufacturing company with over 250 employees and three locations in southeastern Pennsylvania. As a company diversified across a variety of different industries, our employees maintain a diversity of skills and abilities.

INDUSTRIES WE SERVE



METALS

COMPANY HEADQUARTERS

TURNKEY MANUFACTURING CAPABILITY

With over 200 skilled machinists and fabricators, we have the ability to enhance our engineering services by providing turn-key equipment thus becoming a single source resource for our clients. The option to provide engineering services only or design and build services gives our clients flexible options to better facilitate projects.

ENGINEERING SERVICES FOR INDUSTRIAL COMPANIES

DESIGN SERVICES

Drafting and Design Support

- Staff augmentation during busy times
- On-site/Off-site support as needed
- Software: SolidWorks, AutoCad
- Specialized for industrial/ manufacturing organizations

Project Engineering/Management

- *Project Planning for Capital Approval*
  - » Identify requirements and develop scope
  - » Create project schedules (utilizing Microsoft Project)
  - » Perform preliminary engineering to determine feasibility and develop project costs
  - » Prepare documentation for capital approval

- *Project Implementation*
  - » Project management
  - » Coordinate vendors and contractors
  - » Design engineering
  - » Bid specifications
  - » Bid analysis
  - » Installation planning and support
  - » Start-up support
  - » Training (classroom, OJT, documentation)
  - » Maintain and monitor project schedule
  - » Create and maintain cash flow forecasts
  - » Manage costs and budget

DESIGN STRENGTHS

- 3D Modeling
- Machine/equipment design
- Plant layout
- Process piping
- ASME Section VIII (Pressure Vessel)
- Cooling water systems
- Compressed air
- Hydraulic/pneumatic systems design
- P&IDs
- Reverse engineering
- Electrical/controls engineering

SAFETY

A company culture focused on safety, evidenced by our Safety and Health Achievement Recognition Program.

A NETWORK OF DESIGN AND ENGINEERING PARTNERS

- **Structural / Civil**
- **Chemical Process**
- **Industrial Furnace Design**

PROJECT PROFILE: COOLING TOWER

As part of a manufacturing expansion at our customer's primary metals facility, R-V Industries was contracted to engineer, design, specify equipment, and manage the installation of a complete recirculated cooling water system for a new Powder Atomization Facility. In addition to the mechanical components, the R-V project scope included all of the electrical design and controls programming as well. The equipment list included:

- Piping system (including valves and controls)
- Sump tanks
- Pumps
- Filtration systems
- Cooling tower

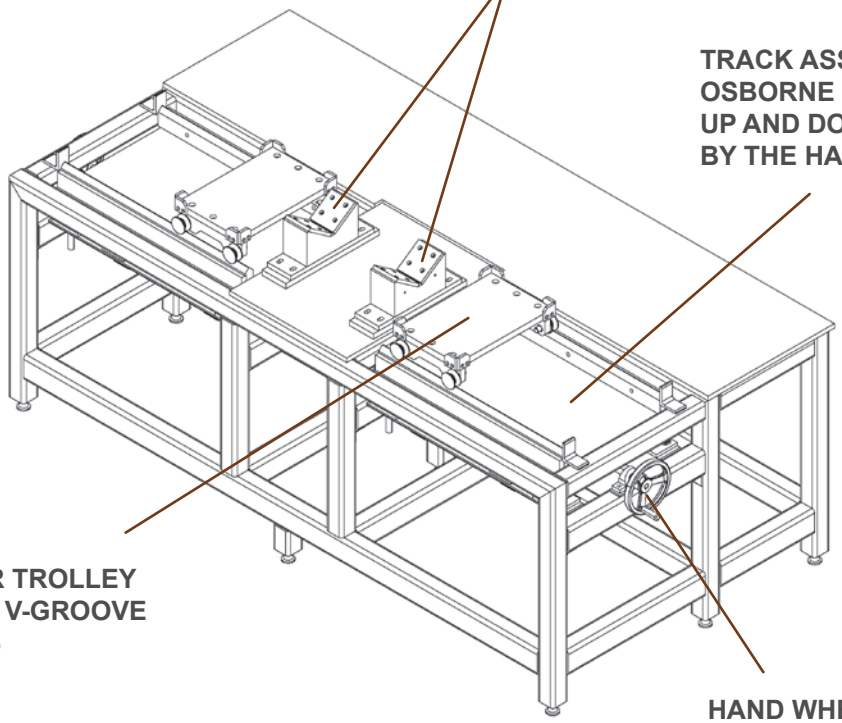
All of these equipment components were designed to handle **1,200 GPM** for the powder atomization and processing equipment. The building, platform, equipment and piping for the **4-story facility** was modeled in 3D using SolidWorks. During the design phase, additional scope was added for R-V to provide design and 3D modeling for additional services at the facility. This included **hot gas exhaust, compressed air, hydraulic piping, argon and nitrogen piping.**

DESIGN

BUILD

PROJECT PROFILE: CHOCK CHANGING TABLE (COLD ROLLING MILL)

Our scope for this project, supplied to an international primary metals company, was to design a work table that will allow two operators to independently remove work roll chocks from each end of a large diameter work roll assembly.



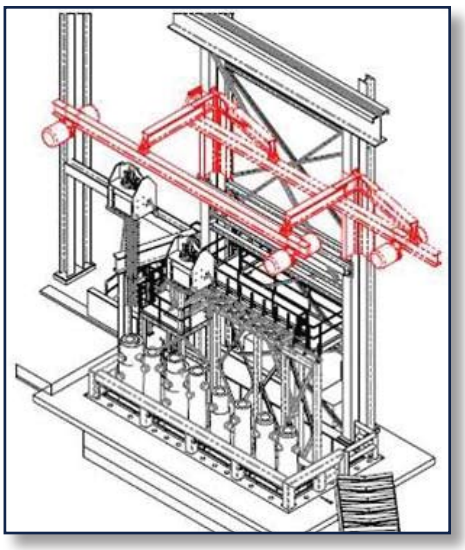


CHOCK CHANGING TABLE (COLD ROLLING MILL) INSTALLATION PHOTOS

PROJECT PROFILE: MOLD PROCESSING WORK CELL

SCOPE

The customer required us to integrate a Mold Flailer, used to clean the inside of cylindrical cast iron molds, into an existing melting bay pit area. Included in this design was a structural work platform to support the flailer and attachments for different size molds. In addition, the existing crane in the area was redesigned and replaced to handle the cast iron molds.



GA APPROVAL DRAWING

DELIVERED

- Wrote **Functional Description** of entire flailing process
- Developed install specifications for all of the equipment
- Complete startup and debugging of all equipment
- Converted all SolidWorks drawings to AutoCAD for storage

DEMO / SITE PREP

HYDRAULIC LOCKING ARM AND MOLD CORRAL

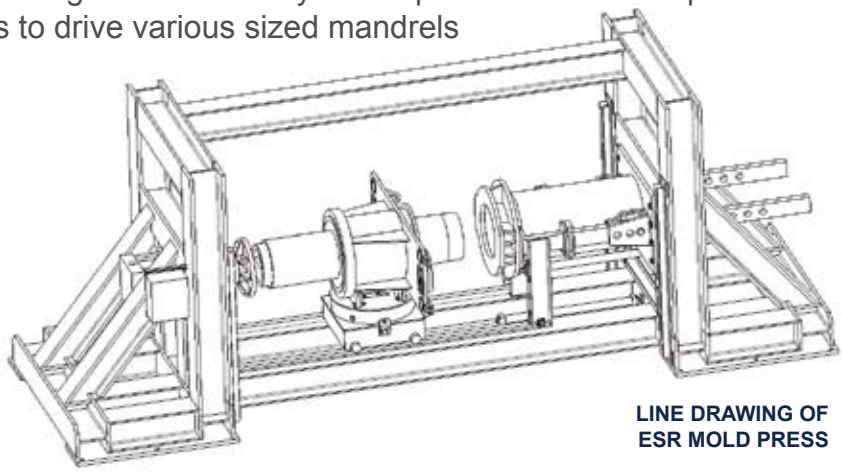
COMPLETE INSTALL SUPERVISION

INSTALLATION COMPLETE MACHINE READY FOR TESTING

PROJECT PROFILE: ELECTRO-SLAG REMELTING (ESR) MOLD PRESS

BACKGROUND

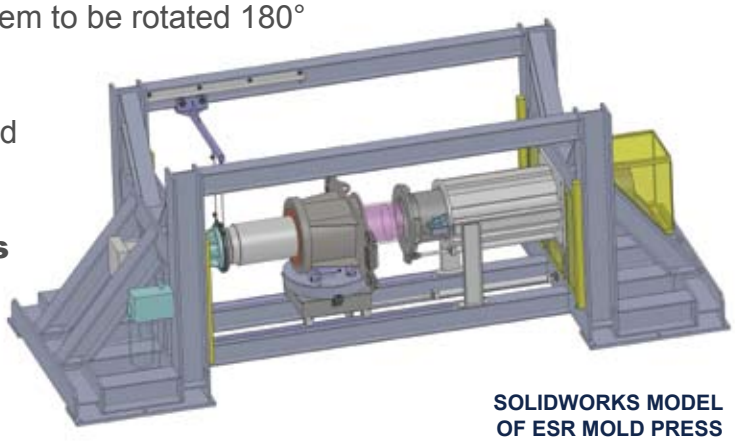
Electro-Slag Remelting (ESR) Furnaces utilize a water-cooled round copper mold to form a larger diameter ingot from a remelted electrode. As the mold is used throughout it's campaign, it's inner diameter (ID) becomes distorted to a smaller size due to the heat of the melting process. Our customer wanted us to design a **250-ton** hydraulic press with built in operator safety features to allow the operators to drive various sized mandrels into the molds to restore them to the correct diameter(s).



LINE DRAWING OF ESR MOLD PRESS

DESIGN

This press was designed to fit a large range of mandrel and mold sizes. The frame is designed to utilize an overhead crane or towmotor to place the molds into the press. This press uses a turntable to support the molds, allowing them to be rotated 180° to push the mandrels out after resizing. This R-V design was a significant efficiency and safety improvement. A modular skid mounted hydraulic system is included to power the press with a complete set of PLC controls. The press includes **safety light curtains** to prevent the operators from entering the work zone in the front or rear of the press during operation.



SOLIDWORKS MODEL OF ESR MOLD PRESS

FABRICATION

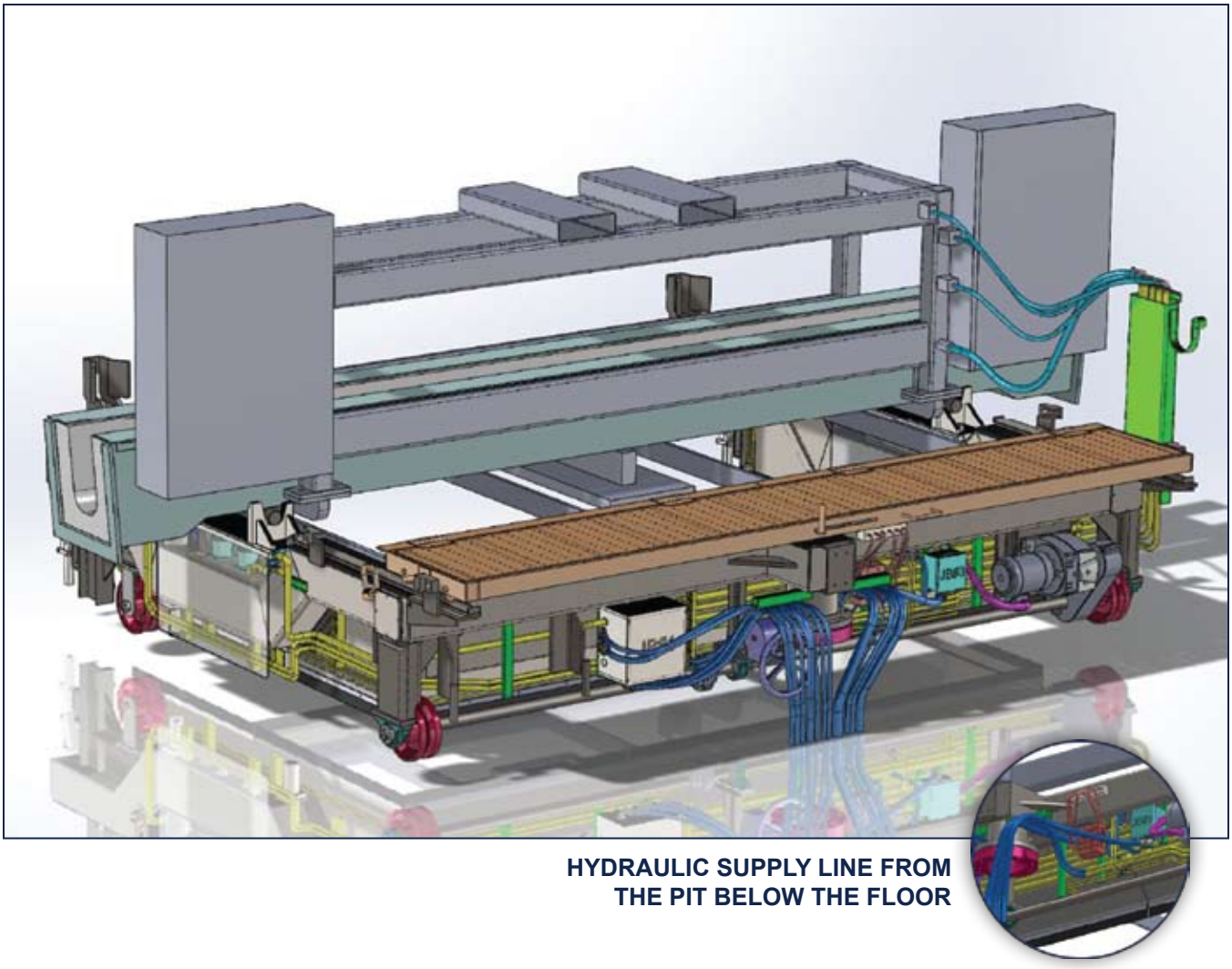
All fabrications on the press were **built in our shop**, painted, and assembled with the commercial components to form the complete press unit. The customer supplied a mold and mandrel to complete Factory Acceptance Tests. All testing was completed in our assembly shop with the customer present to witness the successful testing.

PROJECT PROFILE: MOLD TABLE

The mold table utilizes a refractory lined tundish feeding a group of molds below it to pour multiple ingots simultaneously. The customer purchased a new mold level control system, and wanted to protect the mold level control system.

SCOPE

To **protect the mold control system**, the system was redesigned to improve the operation of the lift and tilt functions with the mold car drive for smoother operation. After project commencement, the R-V scope was expanded to include a redesign of the stainless steel car to accommodate powered lifting screws at each end. All equipment was designed utilizing SolidWorks, allowing the operation of the table to be simulated to check for interferences.



HYDRAULIC SUPPLY LINE FROM THE PIT BELOW THE FLOOR

PROJECT PROFILE: LABORATORY AGITATION MACHINE

An international drug development company came to R-V for the turnkey design and manufacture of an agitation machine to streamline their manufacturing.

The existing process required the chemist to inefficiently load the chemical compound into multiple processes. The new machine combined loading and agitation capabilities into one machine to reduce inter-machine transfer.

This **turnkey project** was Factory Acceptance Tested in our shop. The agitation machine exceeded customer performance expectations while meeting delivery and budgetary deadlines.

TECHNICAL REQUIREMENTS

- PLC Controlled agitation speed and safeguarding
- 30 RPM, with programmable range of 15-60 RPM
- Operating light and safety glass panel alert user during operation
- Programmable cycle time
- Emergency stop button halts operation, and returns protective glass to up position

CONTACT US TODAY FOR FACTORY TESTING VIDEO

PROJECT PROFILE: COMPLETE PAPER MACHINE

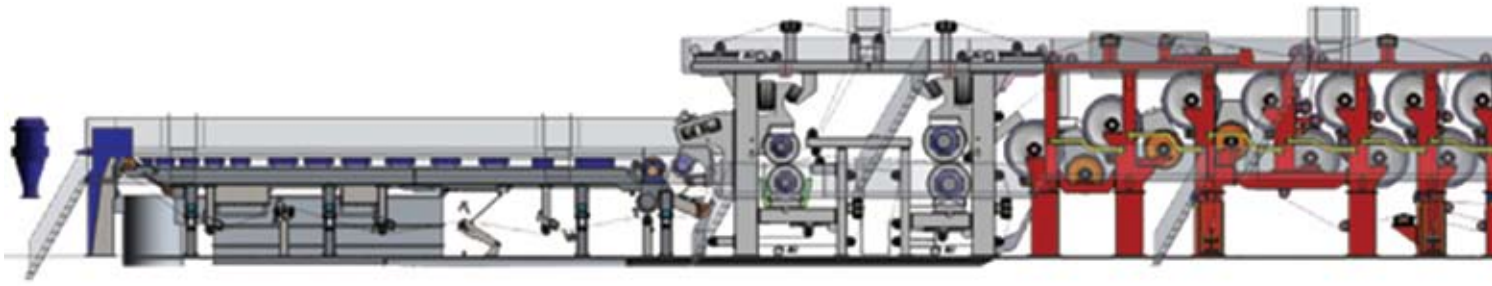
In addition to single machine projects, R-V has completed process design and manufactured solutions for overhauling entire industrial processes. One example, in 2009, R-V completed a **$13 million design and build** project for an international paper and industrial packaging company. This machine included fourdrinier, press, and dryer sections with a horizontal track reel that produces corrugated boxes and shipping containers at a rate of 334 tons per day.

The machine sends the pulp through the sections of the paper machine to bring the consistency of the paper from 0.5% solid to 94% solid on large rolls for final processing and shipping. Built into this machine are powerful vacuums, felted rolls, and heated steam rollers assembled to the steel framework controlled by an **extensive system of PLC Controls**. As a celebration of the success of manufacturing and industrial processing in the US, the Paper Machine project was featured in PaperAge, a national pulp and paper magazine.

FOURDRINIER SECTION

PRESS SECTION

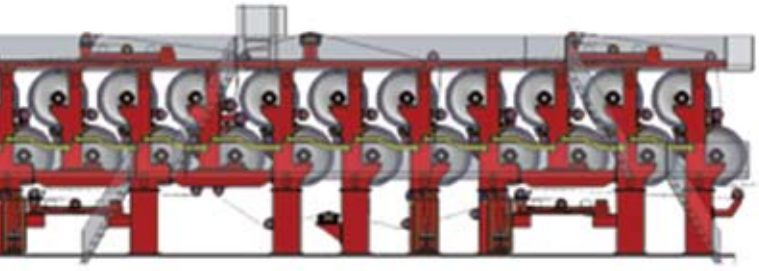
DRYER SECTION



"The list of equipment vendors and contractors is a who's who within the paper industry. R-V Industries was the primary supplier for design, engineering and manufacturing services..."

"To get to the point though, Mill Manager, Chip Shew and Plant Engineer, Jack Eschliman, developed a criteria of vendor selection which not only included the usual price, quality, delivery and terms, but something much more abstract - confidence."

- John Yolton, *PaperAge*



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