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About Us

Combined Technologies Group (ComTech) is a systems integrator providing a wide range of automation solutions. ComTech is located in Dayton, OH and supplies equipment throughout North America. Founded in 1998, ComTech resides in a 50,000 sq. foot facility where all systems are designed, manufactured, and programmed. ComTech has a complete staff of engineers, technicians, assemblers, and fabricators so all facets of a project are done in-house. Typical applications range from an offering of standard products to custom specialty equipment. In addition, we provide warranties on all equipment provided and have a staff of technicians available for field service.

Applications

Typical applications that ComTech builds equipment for include material handling, material removal, material application (spraying & dispensing), vision, and automated inspection. ComTech provides solutions ranging from stand alone machines to fully automated assembly lines.

One Stop Shopping For Die Casting Solutions

A primary focus of ComTech is the die cast market. We offer a full line of standard products that enable us to be your ‘one stop shop’ for all of your die casting needs. Standard solutions include:

- Part Extraction
- Die Spraying
- Part Cooling
- Trimming
- Material Removal
- Fume Collection

ComTech is an authorized distributor for FANUC Robotics and Cognex Cameras. ComTech is a Level IV Integrator for FANUC (highest rating) and is their proud partner in the die casting market.
Robotic Die Cast Extraction

ComTech’s standard Robotic Die Cast Extraction cell is designed to utilize a robot to unload a finished casting from the die cast machine (DCM). Upon removal of the casting from the DCM, the robot will verify the presence of the casting via an adjustable parts sensor tree. After verification, the cell has the capability of cooling the casting, loading the casting into a press, palletizing the casting, or presenting the casting to an operator.

Robotic Die Cast Extraction cells can be used in either horizontal or vertical DCM’s. Typical DCM tonnages can vary from 200-3500 tons.

Standard List of Deliverables

- **FANUC Robot (model dependent on DCM)**
  Robot to include MH Software bundle and 32 discrete inputs and 32 discrete outputs.

- **Robot Riser**
  A steel constructed riser will be provided so that the robot can reach all points in the cell.

- **End of Arm Tooling**
  A 3 jaw parallel gripper will be mounted onto a steel weldment that will bolt to the faceplate of the robot. The gripper fingers will be designed to grab the casting by the outer diameter of the biscuit.

- **Parts Sensor Tree**
  A parts sensor tree will be located in the cell to verify that all the parts were removed from the DCM before the ‘extract complete’ signal is given. The tree will consist of (4) limit switches mounted on aluminum extrusion for easy setup.

- **Cell Guarding**
  Safety yellow painted wire mesh fence will surround the robot and mount up against the DCM. The fence will be 8’ high and include one entry gate for operator access. The gate position will be monitored via a gate interlock.

- **Cell Control & Software**
  The robot will be programmed to extract a casting, verify its presence, and load it to the next casting process. The DCM-Robot interface will be done via discrete I/O.

- **Runoff & Installation**
  The robot will be runoff at ComTech for customer approval. Upon runoff, ComTech personnel will install the system at the customer’s site.

Optional Equipment

- **QC or Scrap Chute**
  A steel chute will be supplied for the robot to place either a scrap part or part for QC inspection. The chute will pass thru the fencing so it can be manually unloaded.

- **Part Conveyor**
  A wire mesh conveyor can be integrated for the robot to place parts onto. The conveyor will be programmed to index parts out of the cell for accumulation. Length and width TBD based upon application.

- **Cooling Fans for Conveyor**
  Multiple industrial fans can be integrated above a parts conveyor to blow ambient air onto the parts for cooling. Size and number of fans TBD based upon application.

- **Quench Tank**
  The robot can dunk the part into a quench tank for cooling. See Quench Tank section of catalog for detailed information.

- **Static Air Cooler**
  The robot can load parts into a Static Air Cooler for part cooling. See Static Air Cooler section of catalog for detailed information.

- **Degate Press or Trim Press**
  The robot can be setup to load either a Degate Press or Trim Press automatically. See either the Degate Press or Trim Press section of catalog for detailed information on each piece of equipment.

- **Spray Package on End of Arm Tooling**
  A die lube spraying package can be integrated into the End of Arm Tooling so the Extraction Robot can spray the die after the part has been removed from the DCM.
Robotic Die Spraying

ComTech’s Robotic Die Spraying cell is designed to spray die lubricant onto the dies prior to a casting cycle. The robot is normally mounted on top of the die cast machine to conserve floor space. The spray system can be utilized in Semi-Auto or Full Auto mode of the DCM. Typical DCM tonnages can vary from 200-3500 tons.

Advantages of robotic spraying include:
- Ability to program precise spray patterns
- Use of less die lube
- Robot has the ability to spray die from infinite amount of angles
- Faster cycle times than reciprocators
- Reliability of robot

Standard List of Deliverables

- **FANUC Robot (model dependent on DCM)**
  Robot to include MH Software bundle and 32 discrete inputs and 32 discrete outputs.
- **Robot Riser**
  A steel constructed riser will be provided so that the robot can mount on top of the DCM.
- **Spray Head & Hose Dressout**
  A spray head with (16) nozzles will be provided to spray both sides of the die at the same time. Standard spray package will have two zones per side. Also, an air blow-off manifold will be integrated into the spray head to remove any excess die lube after the spray cycle is complete. All hoses will be routed to a manifold at the base of the robot.
- **Cell Guarding**
  The robot will be interlocked with the doors on the DCM for guarding. In addition, axis limiting devices will be integrated into the robot.
- **Cell Control & Software**
  The robot will be programmed to spray die lube on to a die. The robot will be setup to handle up to 16 different dies. The DCM-Robot interface will be done via discrete I/O.
- **Runoff & Installation**
  The robot will be runoff at ComTech for customer approval. Upon runoff, ComTech personnel will install the system at the customer’s site.

**Note:** ComTech will also integrate customer supplied spray heads.

Optional Equipment

- **Die Lube Mixing Tank**
  A Die Lube Mixing Tank can be supplied to mix the proper ratio of die lubricant. The Die Lube Mixing Tank will be plumbed directly to the supply lines of the robot. See the Die Lube Mixing section of catalog for detailed information.
- **Custom Spray Head**
  A custom spray head can be provided to optimize the spraying of a particular die. This can be quoted upon request.
- **Flexi-Spray Package**
  *Experience the most flexible spray control package available.*
  ComTech’s Flexi-Spray Package permits spray parameters such as atomization air, fan air, and fluid flow monitoring to be adjusted on the fly thru the robot program.

**How Does it Work?**

- Adjusting the atomization air at different points in the spray provides the control to optimize the cooling potential of the spray and also reduces the amount of die lube needed.
- Having the ability to adjust fan air in the spray process allows the spray pattern to change size to either a broad spray or pin point a deep cavity.
- Monitoring the amount of fluid applied per spray cycle guarantees that your process is running to spec.
ComTech’s Die Lube Mixer is a portable unit that can be setup to feed a single spraying device or multiple spraying devices.

Simply place the intake hose into your container of die lube and the unit will mix the proper dilution ratio (to within 1%) and supply it to your spraying device.

**Specifications:**
- Supply Die Lube Pressure: 10-80 psi
- Supply Die Lube Pump: 35 GPM
- Dilution Ratio: 1:100-1:20
- Dilution Pump: 11 gallon per minute
- Tank Capacity: 30 Gallons
- Air Pressure: 30-100 psi
- Power: 120VAC

Custom units can be designed to fit your individual specifications.

Custom systems can be designed to feed multiple machines.

**Typical Lead Time:** 2-4 weeks
Made in USA.
Robotic Ladle

ComTech’s Robotic Ladle is designed to pour molten metal from a furnace into the shot well of a DCM. Typical weights of metal pours vary from 2-150 pounds.

Advantages of robotic ladle include:

- Extremely consistent pour volume due to repeatability of the robot
- Ability to skim dross prior to dipping metal
- Ability to pour directly into shot well (no funnel)
- Less oxides in your casting
- Laser sensor eliminates touch probes to detect metal depth
- Reliability of robot

Standard List of Deliverables

- **FANUC Robot (model dependent on DCM)**
  Robot to include MH Software bundle and 32 discrete inputs and 32 discrete outputs.
- **Robot Riser**
  A steel constructed riser will be provided for mounting the robot.
- **Ladle Bucket & Arm**
  A ceramic Pyrotek ladle bucket will be supplied with the system. The bucket will be mounted on an arm that bolts to the faceplate of the robot.
- **Heat Jacket**
  A Kevlar jacket will be supplied on the upper arm of the robot to protect it from the heat of the furnace.
- **Level Sensor**
  A laser sensor will be used to detect the depth of the metal in the furnace. *This sensor will never come in contact with the metal.* The depth of the metal will be sent to the robot so its positions can be automatically changed to insure a consistent dip.
- **Cell Guarding**
  The robot will be surrounded by solid metal fencing to prevent the potential for any splashing of molten metal.
- **Cell Control & Software**
  The robot will be programmed to dip metal from a furnace and pour it into the shot well of a DCM. The robot will be setup to handle up to 16 different dies. The DCM-Robot interface will be done via discrete I/O.
- **Runoff & Installation**
  The robot will be runoff at ComTech for customer approval. Upon runoff, ComTech personnel will install the system at the customer’s site.

Thru constant refinement of our product, we have solved all problems inherit with chain driven ladles.

No more problems with chain stretch, ladles diving into metal, touch probe failure, and related drawbacks.
ComTech provides water quench tanks in variable sizes. Each quench tank is provided with a closed loop heat exchanger and water pump to circulate the water. Our standard water pump is a 50gpm. A float switch and fill valve are also integrated to maintain a proper water depth. Included in the tank is a wire mesh screen to capture scrap and a filter to protect the water pump.

**Specifications:**
- Standard Tank Size: 200 gallons
- Standard Circulating Pump: 50 GPM
- Standard Hose Size: 2”
- BTU of Heat Exchanger: Sized to application
- Drain Port with ball valve
- Overflow Port

Custom units can be designed to fit your individual specifications.

**Typical Lead Time:** 4-6 weeks
Made in USA.

As an option, fixtures can be incorporated to hold the part in the water while the robot performs other tasks.
Static Air Coolers

ComTech’s Static Air Coolers are designed to cool your parts using ambient air. The robot will load a freshly cast part and then unload the part that has been in the cooler the longest. Fans blow ambient air onto the parts to cool them over the time period they are in the cooler.

The number of nests in the cooler is dependent on the time it takes to cool the part and the cycle time of the DCM.

Advantages of Static Air Cooler:
- No mess from water
- Safe to use in magnesium casting cells
- Vertical part orientation saves floor space
- No changeover for different parts
- No moving parts = Low maintenance

A 20 Nest Static Air Cooler for use with an automated 1200 Ton DCM cell.

A FANUC Robot places a new casting into the Static Air Cooler.

A 2 cavity engine head cover is shown being clamped in the Static Air Cooler.

Typical Lead Time: 10-12 weeks
Made in USA.
Simply want to knock the gates off of the casting?
If so, try a Degate Press.

ComTech manufactures a line of Degate Presses that are designed to merely knock off the gates and overflows from the casting. This alternative to a close trim provides a quick and cost effective solution to most applications.

The presses come standard in either a vertical or horizontal style. They can be manually loaded or placed into an automated cell. Flexibility for multiple parts is achieved by using low cost die sets that are designed to simply knock off gates from the part.

Standard Specifications:
- Standard Tonnage: 5 tons
- Ram Stroke: 18 inches
- Standard Cycle Time: Less than 10 sec
- Parker hydraulic unit w/ Water Heat Exchanger
- Manual Pushbutton Station
- Scrap Chutes

Optional Equipment:
- Custom Made Die Sets
- Parts Tray for Automated Unloading
- Quick Change Die Tooling
- Scrap Chutes

Custom units can be designed to fit your individual specifications.

Typical Lead Time: 14-16 weeks
Made in USA.
ComTech manufactures its own line of 4 column Manual Trim Presses. These presses can either be manually ran by an operator or placed into an automated cell. Standard tonnages range from 10-70 tons.

**Standard Features:**
- PLC Controlled (Allen Bradley or Mitsubishi)
- Pushbutton Operator Interface
- Cycle time less than 8 seconds
- Top mounted hydraulics
- Parker or Vickers valves
- Hydraulic valves for (2) cores
- Light Curtains for manual operation
- Safety gates on 3 sides
- Safety ratchet
- Paint to your spec
- 1 year warranty

**Optional Features:**
- Hydraulic Ejection Plate
- Parts Tray for automatic unloading
- LVDT integrated into cylinder to detect ram position.
- Scrap chutes
- Scrap conveyor
- Automated lubrication

**Typical Lead Time: 16-18 weeks**
Made in USA.
Shuttle Bed Trim Press

ComTech manufactures its own line of 4 column Shuttle Bed Trim Presses. These presses are designed to be placed into a fully automated die cast cell. Standard tonnages range from 25-80 tons.

This press is designed so that no scrap is left in the trim dies and the trimmed parts are automatically ejected from the cell. The unique feature of this press is that the lower trim die is rotated upside down so all scrap is removed from the die before the next part cycle.

Advantages of the Shuttle Bed Trim Press over a typical manual trim press include:

- Less trim die repair due to improved removal of scrap
- Unlimited overhead clearance of robot to load part into lower die
- Dies can easily be changed with overhead crane
- Part removal from cell is integrated into press
- Existing trim dies do not need to be modified for scrap removal
- Less downtime for robotic loading errors with improved scrap removal

Standard Features:

- PLC Controlled (Allen Bradley or Mitsubishi)
- Touchscreen operator interface
- Cycle time less than 25 seconds
- PLC stores die data. All parameters automatically loaded via die ID from DCM
- Top mounted hydraulics
- Parker or Vickers valves
- Hydraulic valves for (2) cores
- LVDT for ram position monitoring
- Hydraulic ejection plate
- Safety ratchet
- Automated lube system with closed loop feedback
- 1 year warranty
- Paint to your spec

Typical Lead Time: 20-22 weeks

Made in USA.
Fume Hoods

Clean Factory Air and Lower Energy Costs

ComTech provides Fume Hoods that are designed to clean the mist and dirt from the air that the casting process creates. The hood sits over top of the die cast machine (DCM) and creates a vacuum so that air is pulled into the hood. The smoke and die spray mist rises into the hood which keeps the surrounding area clean.

Why buy Fume Hoods?

- Less dirt and mist on equipment and lighting
- Cleaner air for employees to breath
- Reduced energy costs
- Lower maintenance costs
- Less impact on environment

Many options for filtering the air are available:

- If a biodegradeable die lube is used, then ductwork can be connected to exhaust fumes directly out of the building.
- Multiple hoods can be connected via ductwork to a central filtration system. This eliminates make up air.
- A local filter system can be integrated directly into the hood. This eliminates ductwork and make up air.

Standard hoods are designed for DCM ranging in size from 200 - 3500 tons. Custom designs can be done for challenges such as low ceilings, gantry extractors, etc.

Standard Features:

- Pushbutton Operator Interface
- Movable Hood for die removal
- Washable media filter at bulkhead
- Tall enough to fit over a reciprocator or spray robot
- Paint to your spec
- 1 year warranty

Optional Features:

- Self Contained media filtration system
- Motor control for movable hood
- Illumination inside hood
- Installation

Typical Lead Time: 14-16 weeks

Made in USA.
Fully Automated Die Cast Cell

If you add all of the components previously mentioned in this catalog into a single cell, you’ll have one of the most highly automated die cast cells available.

ComTech has created this package to include a single controls system that integrates directly into the die cast machine. A single touch screen operator interface is provided to control all equipment.

**Highlights of the cell:**

- Single point control allows for quick startup, shutdown, and error recovery of all equipment.
- Cell starts and stops automatically based upon the DCM’s transitions from Manual, Semi-Auto, and Full Auto modes.
- Single point Home button sends all equipment to startup position

**Standard Features:**

- PLC Controlled (Allen Bradley or Mitsubishi)
- Touchscreen operator interface
- Cycle time less than 30 seconds
- PLC stores all part data. All parameters automatically loaded via die ID from DCM
- Turnkey project management and installation
- 1 year warranty

**Optional Features:**

- Automated scrap handling to reload furnaces
- QC & Scrap chutes
- Integrated part marking
- Insert Loading
- Insert Heating
- Decking around the cell

Let ComTech be your single source for all peripheral equipment.

One source provides one point of responsibility and support.
Robotic Saw

Remove gates from your part with the flexibility of our Robotic Saw machine

ComTech provides a Robotic Saw machine that is designed to use a saw blade to remove gates from castings.

Cycle times of less than one minute with a cutoff tolerance of less than ±1mm are capable. Spindle speed is adjustable via the operator interface. A coolant system is provided to increase blade life. Also, the PLC monitors the spindle load to detect worn tools.

The machine sits on a common base and is fully enclosed to contain chips and debris. Chips are collected in chip pans while a scrap conveyor removes large pieces of scrap from the cell.

The robot provides unparalleled flexibility by being able to manipulate the part through the cutoff saw. Furthermore, the robot tooling and infeed fixture can easily be changed so multiple parts can be run with minimum changeout time.

The machine is sold as a standard unit where the customer provides tooling and programming. ComTech can also provide fixtures and programming as a turnkey solution.

Standard Features:

- FANUC Robot (M710 or R-2000 model)
- Enclosed Machine w/ Chip Pans
- Variable speed spindle w/ automated coolant unit
- Inclined steel cleated scrap conveyor
- Infeed station w/ hydraulic part clamping valves
- PLC & touchscreen operator interface
- Gravity roller conveyor for finished parts
- 1 year warranty

Optional Features:

- Part Fixtures
- Part Programming
- Installation
- On-Site training and startup support

Typical Lead Time: 18-20 weeks

Made in USA.
Flatness/Deformation Testing Machine
A low cost & fast method to detect if your parts are within spec.

ComTech manufactures a standard line of flatness/deformation machines that provide a quick measurement to determine if your part is within spec.

Each machine contains a fixture to hold a part and a series of sensors that detect datums. The location and number of sensors is determined by application (a standard number is 8 sensors). The PLC analyzes the feedback of the sensors and simply issues a Pass or Fail signal. The machine can either be manually operated or placed into an automated cell.

A touchscreen operator interface is provided where master part tolerances are setup. In addition, the operator interface will display overall part results and which area failed inspection. Overall QC data is also stored on the PLC.

**Standard Features:**
- PLC Controlled (Allen Bradley or Mitsubishi)
- Touchscreen operator interface
- Cycle time less than 2 seconds
- Master Good & Bad Parts are setup via operator interface
- Operator interface displays part results
- 1 year warranty

**Optional Features:**
- Part Clamping
- 2D Barcode Reading
- Data recording to plant database

Typical Lead Time: 10-12 weeks
Made in USA.
Material Dispensing

Apply materials to your parts with the accuracy of robotics

ComTech has much experience with applying different materials onto parts. These materials range from glue, RTV, to acerbic materials.

ComTech offers a standard machine that utilizes a FANUC Robot to place materials. The robot is capable of applying material in a 20”x20”x10” working envelope. The 6 axis robot has the ability to place material on almost any contoured surface. Material pumps and dispense nozzles can be specified by the customer or ComTech. The machine can be either manually loaded by an operator or loaded automatically by another piece of automation.

If your working envelop is larger, ComTech provides custom systems with larger robots and rotary tables so a part can be loaded/unloaded while the robot is applying the material.

Standard Features:

- FANUC LR-Mate Robot
- PLC & Pushbutton Operator Interface (Allen-Bradley or Mitsubishi)
- Purge & Oil Cups
- Part misload sensors
- PLC & touchscreen operator interface
- 1 year warranty

Optional Features:

- Adhesive detection sensors
- Part Fixture
- Part Programming
- Installation
- On-Site training and startup support

Typical Lead Time: 12-14 weeks

Made in USA.
Trying to stay competitive in the global market? Look at automating your stamping processes.

Robotics provides the ultimate in flexibility and up-time w/ low maintenance costs. Robotics provide quicker cycle times versus traditional linear systems and gives the advantage of being able to manipulate a part into a die in multiple directions.

ComTech can provide a simple solution that automates a single press or provide a system that automates multiple presses and takes care of handling stamping blanks and the finished product.

Some Highlights of Com Tech Built Systems:

- Line rates of 11 stamps per minute have been achieved.
- ComTech has worked with both ferrous and non-ferrous materials.
- Incorporate vision for blank location prior to pickup. Saves on scrap versus traditional locating devices.
- Automated part changeover time in less than 2 minutes.
- Conveyors to feed skids of incoming blanks to the robots.
- Conveyors to place finished parts onto.

Do you have a progressive stamping process where an operator places the parts into a basket or cart?

If so, ComTech can automate that process with press speeds of up to 70 stamps per minute.
Robotic Vision Inspection
How important is QUALITY to you???

It has been proven that the best performance a human can achieve doing QC inspection is approximately 85%.

Does your customer think 85% is good enough?

If not, look at ComTech’s Robotic Vision Inspection system. This system removes the human element from QC inspection by combining a camera and robot.

The robot will position the camera in multiple locations to inspect varying features of the part. A typical application will allow the robot to move to a location and perform an inspection in under 1 second.

Typical solutions we have provided have completed over 75 different inspections on a single part in under 30 seconds.

This solution is faster than an operator and provides 100% inspection.
So you reduce costs, increase productivity, and save money on stopping bad parts going out the door.

Standard Features:
• FANUC LR-Mate Robot
• PLC & Touchscreen Operator Interface (Allen-Bradley or Mitsubishi)
• FANUC iR Vision
• Lighting enclosure to eliminate ambient light
• Automated door on enclosure
• Good/Bad Part Marker
• 1 year warranty

Optional Features:
• Part fixture
• Vision Inspection Programming to your part
• On-Site training and startup support
• Cognex vision products versus FANUC iR Vision
• Part Marking inside enclosure
• LVDT’s to also test part flatness
ComTech can design and build a vision system fit to meet your needs. Systems that we have built range from turnkey machines with multiple cameras to as simple as mounting cameras inside an existing machine or on a conveyor line.

**Applications include:**

- Verifying assembled components are present and in their correct location
- Checking for cracks or defects in castings
- 2D barcode reading
- Measuring diameters and distances
- Verifying color of parts

Multiple cameras inspect part is not cracked.

Inspection setup software

Camera verifies (4) core holes are present

Camera verifies visor brackets have no flash in holes and also measures the hole diameters.
Material Handling Cells

Increased labor costs cutting your bottom line?

Everyday the cost of labor and benefits in the US increases. Looking for ways to stay competitive in the global market? Let ComTech assist you by concepting and building a robotic cell that reduces your material handling costs.

Robots improve your profitability by:
- Reducing Labor Costs
- Reduced injuries - robots do the heavy lifting
- Robots work at a constant pace so it is easier to manage your production schedule
- Robots will work thru breaks, show up on weekends, and do not call in sick
- Robots do not require health insurance, vacation, 401K’s, legacy costs, etc.

Typical applications include:
- Loading/Unloading Machines
- Palletizing of finished products onto shipping containers. Products can range from auto components, boxes of food, to bags of dog food.
- Unloading raw product from bins, carts, hoppers, etc.
- Component Assembly

Flexibility of Robotics
Robotics offers the ultimate in flexibility to your process. Robots typically have a life span of more than 15 years and can be simply retooled and redeployed as your product changes. Coupled with speed and maintenance free operation, a robotic solution is perfect for most applications.

System Expertise:
ComTech has much experience building material handling cells. A few of the peripheral items we’ve integrated into a robotic cell include:
- Vision to locate and inspect parts
- Conveyors to handle product flow
- Part Marking and barcode reading
- SQL database applications to monitor part flow throughout the process
- Assembly equipment such as vibratory feeders, blow tubes, nut runners, press equipment and more.

Whether you are looking to automate a single machine or automate an entire assembly line, let ComTech take a look at your application and provide some concepts.
Robotic Cell Accessories and Field Service

Robotic Cell Accessories

Being a complete source for your automation needs, ComTech also can provide accessories that go into an automated cell. Some of these include:

- Robot Risers
- Robot Handtools
- Robot Dressout (ship your robot to us and we’ll assemble it)
- Material Handling Components for your work cell

Field Service

ComTech offers Emergency Field Service as well as Scheduled Maintenance Services. Com-Tech supports all software versions and manipulator types for ABB, FANUC, MOTOMAN, and various other robotic manufactures. ComTech has an extensive background in Robotic Programming, Mechanical and Electrical troubleshooting of Robotic Systems, PLC Programming, Vision Systems and most anything related to Automation. ComTech also offers a wide variety of scheduled services such as: periodic / annual preventive maintenance, program modifications, safety inspections and teaching software or maintenance courses at customers facility.