



Located 50 miles south of Fargo, N.D., ComDel Innovation provides contract development and manufacturing services on a 95 acre manufacturing campus in Wahpeton, ND.

ComDel Innovation has a team and facility focused on delivering high quality products for customers that require injection molding, metal stamping, automated assembly, precision machining and tooling capabilities.

Technologies

- Product and Mold Design
- Precision Machining
- Equipment and Mold Fabrication
- Plastic Injection Molding
- Metal Stamping
- Automated Assembly
- Metal Finishing (anodizing & zinc plating)
- Thread rolling
- Wire forming
- ROCTOOL Molding Technologies

Plant Site

- 240,000 sq. ft of Manufacturing Space (2 buildings)
- 10,000 sq. ft. Fabrication Service Center

Clean Room

- Class 100,000 (42,000 sq. ft.)
- Class 10,000 (26,000 sq. ft.)
- Class 1,000 (5,000 sq. ft.)

Registrations

- ISO 9001
- ISO 14001
- ISO 13485
- AS 9100
- Nadcap Chemical Processing
- Nadcap Non-Destructive Testing

Manufacturing Capabilities



Engineering Resources

- Manufacturing technology development
- Consulting engineering services
- Computer-aided engineering
- Designed experiment methodology
- Process instrumentation
- Continuous improvement

Injection Molding

- 60 presses (16 ton to 500 ton)
- Automated part handling cells
- Part removal/robot systems
- Resin handling capabilities - bags to railcar quantities

Metal Stamping

- 2 – Bihler multi-slide presses (30T)
- 1 – Bruderer BSTA60 (75T)
- 1 – 3-stage aqueous cleaning line
- 1 – Metal parts finishing rock tumbler

Production Machining

- 2 – Mazak 5-axis machining centers
- 3 – Mazak 4-axis machining centers
- 3 – Mazak CNC Lathe
- 1 – Haas VF3 – YT machining center

Assembly

- Operations ranging from manual to high-speed continuous motion automation
- Automated in-line Quality Control testing
- Automated packaging/labeling
- Ultrasonic welding
- Ink printing, hot stamping, silk screening and plating operations

Quality Systems

- ISO 9001, 13485, and AS9100 Certification
- Nadcap certification for Anodizing and Non-Destructive Testing
- Full resin supplier management/test capability
- Supplier surveys, supplier certification, Six Sigma suppliers
- Statistical process control and control charting with full production responsibility
- Closed loop process control
- Statistical application tools - measurement system analysis, DOE regression analysis, response surface analysis and correlation studies
- Failure mode effect analysis (FMEA)
- Quality function deployment
- Tooling and component qualification procedures and methodology
- Inspection capability up to and including CMM programmable tools accurate to .00040"
- FADA - Failure analysis/defect analysis resource and practices
- On-going reliability study practices

Environment

- ISO14001:2004 certification
- Controlled environment (particle contamination, temperature and humidity)
- Particulate count routinely measured/monitored
- Environmental chambers/ovens



Fabrication Services



1 - Jung CNC High Precision Surface And Contour Grinding Machine

- Measuring system Resolution: 0.0000078"
- Work Area: 31.5" x 15.7"
- CNC Profile Dressing

1 - Jones & Shipman CNC Surface Grinder

- XZ Position Accuracy: 0.00004"
- XZ Repeatability: 0.00002"
- Automatic Part Locating
- Work Area: 24" x 8" x 16.5"
- Minimum Programmable Increment: 0.00001"

1 - Studer CNC Cylinder Grinder

- XZ Positioning Accuracy: 0.000040"
- XZ Repeatability: 0.000020"
- Spindle TIR: 0.000012"
- Maximum Work-piece: 13.5" dia x 42.0" long
- Surface Finish Attainable: .4 micro inch RMS

1 - Okamoto Automatic Surface Grinder

- Work Area: 12" x 24" x 13.6"
- Minimum Programmable Increment: 0.00001"

1 - Brand Automatic Surface Grinder

- Work Area: 12" x 38"

1 - Zygo Laser Interferometer

- 6" GPI Laser Interferometer System
- Grazing Incidence Measurements
- System Accuracy of 30 Nanometers

2 - Yasda CNC High Speed Mill

- XYZ Positioning Accuracy: 0.000078
- XYZ Repeatability: 0.000039
- 20,000 RPM Spindle
- 35.4" x 19.6" x 13.7" XYZ Travel
- 23.6" x 15.7" x 13.7" XYZ Travel
- Thermal Distortion Stabilized System +/- 0.2 C
- Speeder Head 60,000 RPM

2 - Niigata CNC Horizontal Milling Centers

- XYZ Positioning Accuracy: +/- 0.0005
- XYZ Repeatability: +/- 0.0002
- 31.5" x 27.5" x 22.8" WYZ Travel
- 10 Pallet Work Holding System

1 - Haas VM-3 Mold Maker

- XYZ Positioning +/- 0.0002
- XYZ Repeatability +/- 0.0001
- 12,000 RPM Spindle
- 40" x 26" x 25" W,Y,Z Travel

1 - Tsugami CNC Turning Center

- XYZ Positioning Accuracy: 0.000060"
- XYZ Repeatability: 0.000040"
- 6" Max Work Piece Diameter
- CNC 6-Axis Control

3 - Micro-Vu Inspection Systems

1 - Automation Area - Fabrication of Assembly Equipment

1 - Laser Engraving System

- Part Traceability

1 - Zeiss CMM

- Linear Accuracy: 0.000047"
- Resolution: 0.000008"
- XYZ Range: 33" x 47" x 24"
- Software Thermal Compensation
- Reverse Engineering Software

12 - CAD/CAM Work Stations

- Design/Program for UGII 3D Solids
- Delcam Software
- Esprit Software

1 - Agie CNC Wire EDM

- Challenge 3 eCut
- XYZ Positioning - 0.000008"
- XYZ Repeatability - 0.000004"
- XYZ Travel 19.7" x 13.7" x 10.0"
- Surface Finish - 4 Micro Inches

1 - Sodick CNC Wire EDM

- XYZ Positioning Accuracy: 0.000080"
- XYZ Repeatability: 0.000040"
- XYZ Travel: 17.7" x 11.8" x 5.9"

1 - Makino CNC Sink EDM

- XYZ Positioning Accuracy: 0.000080"
- XYZ Repeatability: 0.000040"
- XYZ Travel: 17.7" x 13.8" x 13.8"

2 - Sodick CNC Sink EDM

- XYZ Positioning Accuracy: 0.000080"
- XYZ Repeatability: 0.000040"
- XYZ Travel: 25.6" x 17.7" x 13.8"



Molding Process Development Center

Process Equipment

- 30 Ton Sumitomo
- 100 Ton Sumitomo
- 245 Ton JSW
- Yushin VA200S Top-Entry Part Removal
- Sterlco & AEC Water Temperature Controllers
- Variety of Hot Runner Temperature Controllers
- Extensive Material Handling and Drying Equipment

Auxiliary Equipment

- Complete Molding Data Acquisition and Control Systems
- Complete Selection of Process Monitoring Sensors (pressure, temperature, position, flow, piezoelectric, fiber optic, strain)
- Modular Test Molds
- Haake Rheocord 90 Twin Screw Compounder with Pelletizer
- Infrared Camera
- High Speed Camera
- Mold Flow Injection Molding Simulation Software
- Complete Selection of Quality Control Measuring Equipment



Materials Laboratory

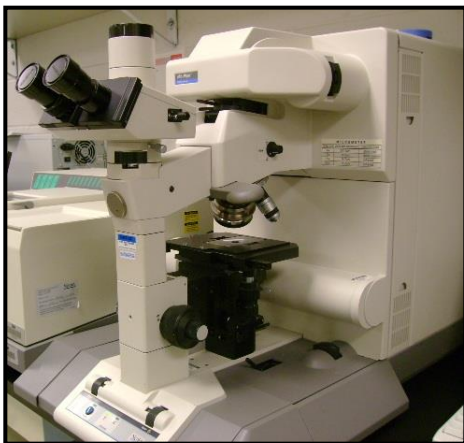


FTIR – Fourier Transform Infrared Spectroscopy

- Material identification
- Library with over 3500 materials

TGA – Thermo Gravimetric Analysis

- Thermal stability
- Carbon black level
- Glass content



Differential Scanning Calorimetry (DSC)

- Thermal transition measurements
- Melting and glass transition temperature
- Additive detection
- Crystallinity of semi-crystalline polymers
- Purity

Gel Permeation Chromatography (GPC)

- Molecular weight/distribution
- Material degradation

Plastometer

- Melt flow index
- Melt density

Instron Universal Tester

- 0.5 to 1000 pound tension/compression capability
- Stress-strain or load-deflection behavior
- Tensile and flexural modulus/strength

Capillary Viscometer

- Viscosity versus shear rate behavior

Moisture Analyzer

- Moisture content

High Temperature Furnace

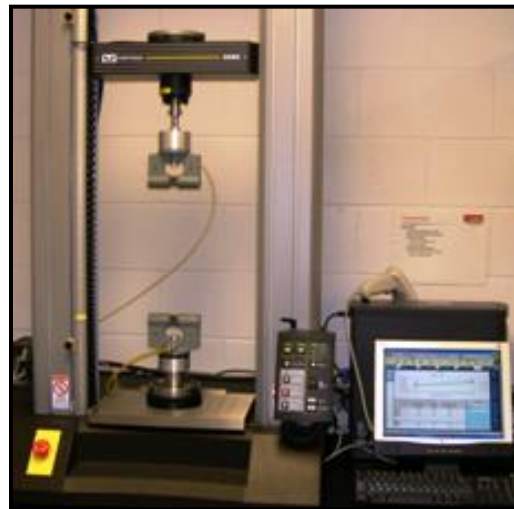
- Ash content
- Glass content

Microtome

- Optical microscopy of thin samples (5-50 mm)

Centrifuge

- Sample preparation for GPC



Twin Screw Compounder/Extruder

- Compounding
- Extrusion
- Custom blended materials

Optical Microscopy

- Digital camera system
- Static decay properties

Ion Chromatography

- Anions: Chloride, Fluoride, Bromide, Nitrite and Nitrates
- Sensitive to 0.05 ppm

Buehler Precision Saw and Polisher

- Sample prep for optical microscopy

UV-Vis Spectrometer

Static Decay Properties

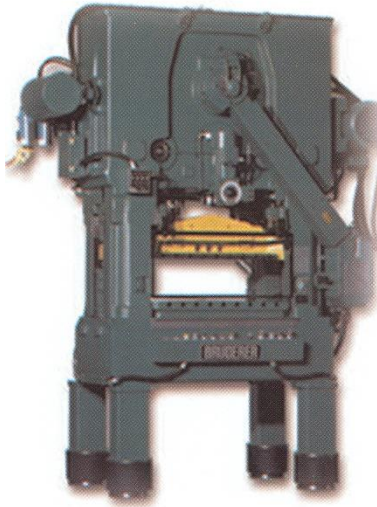
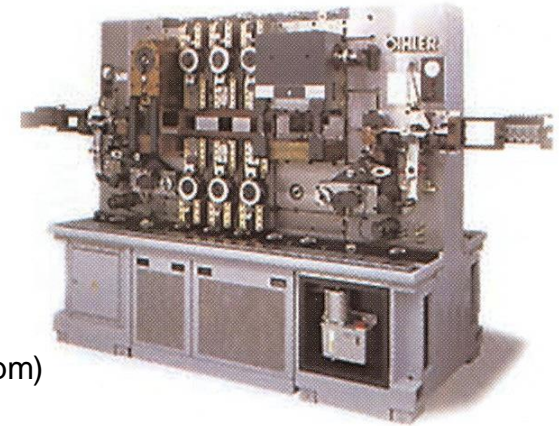


Metal Stamping Capabilities



Bihler BZ-2 Processing Centers

- High Speed integrated stamping and assembly
- 30 Ton press rams for die stamping applications
- Complex forming capability with individual slide cam motion
- Cross-feed capability for integrating multiple strips
- In-line machining or welding
- Press controls offer variety of tool safety and in-die measurement
- Equipment modified for vanishing oil applications



Bruderer BSTA 60 (60 ton)

- High speed press and feed (91100 spm)
- Variable stroke length (5/8" to 2")
- Press controls for tool safety and in-die measurement
- Tonnage waveform monitoring capability

Prototype and Scale-Up

- Product and tooling design utilizing CAE (Sheet Metal, Ansys[®] and Unigraphics[®])
- 2-10 ton presses for prototype die sets
- Various hand presses and forming arbors for small part forming operations
- Radial welding, precision pin presses and mechanical assembly equipment
- Integrated debug with internal tool fabrication center
- Small load deburring equipment

Manufacturing Capabilities

- Experience with low & high volume, short & long run components
- Full SPC system with a variety of vision, laser and contact programmable machines
- Incoming material testing available (mechanical/cleanliness)
- Deburring and cleaning system

Production Machining Capabilities



Mazak H-630 Machining Centers

- 5- axis machining capability
- 39"x31"x30" XYZ travel
- 540 work piece weight



Mazak Ultra 550 Machining Center

- 4- axis machining capability
- 28"x25"x25" XYZ travel
- 1,000 work piece weight
- Pallet system for unattended operation

Mazak FH480 Machining Center

- 4- axis machining capability
- 22"x22"x22" XYZ travel



Mazak Quick Turn 200M CNC Lathe

- 11.8" Maximum turning diameter
- 20.8" Maximum turning length
- Live spindle capability



Manufacturing Capabilities

- Liquid Penetrant Inspection
- Anodizing process (MIL-A-8625 Type IC)
- AS 9100c:2009 certified
- Nadcap certification on Liquid Penetrant Inspection and Anodizing
- Incoming material testing available (mechanical/cleanliness)
- Deburring and cleaning systems