



WIEGEL *Solutions
Manufactured*



WIEGEL HIGHLIGHTS



30 - 450 TON PRESS
Capable Range

CERTIFICATIONS
IATF 16949:2016 &
ISO 14001

OPEN CAPACITY

**VALUE-ADD
CAPABILITIES**

EV PORTFOLIO

ANNUAL INVESTMENTS
Technology, Equipment &
Acquisitions

82 YEARS
3rd Generation Leadership

CONTINUED GROWTH
Financial Stability

**SOPHISTICATED
QUALITY CONTROLS**

COMPANY OVERVIEW

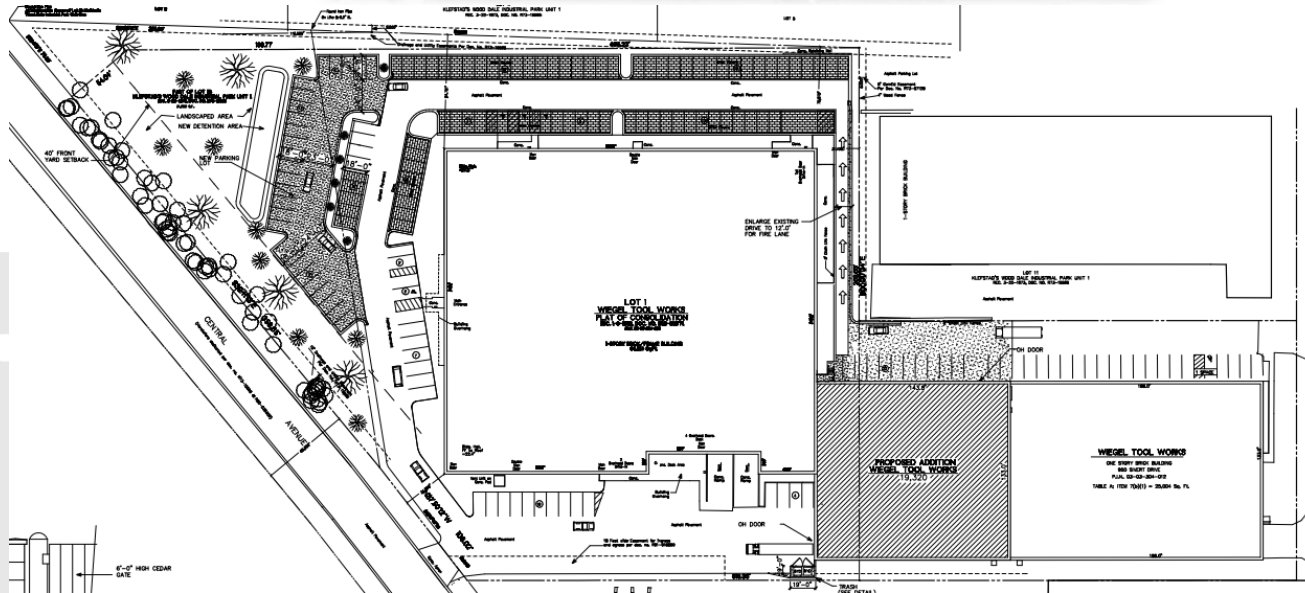
Wiegel is a leading North American-based progressive die metal stamper, product assembler and battery component manufacturer supplying OEMs and tier manufacturers across with globe with custom product solutions for over 81 years.

- **2022 Revenue: \$80MM** (37% increase from 2021)
- **2023 Revenue: \$90MM**
- **250+ Employees**
- **207,000+ SF Operation with 4 Locations**
 - **Wiegel HQ - Wood Dale, IL (68,000 SF)**
 - **Manufacturing Plant - Wood Dale, IL (25,000 SF)**
 - **Manufacturing Plant - Bensenville, IL (52,000 SF)**
 - **Warehouse & Distribution - Elk Grove Village, IL (62,000 SF)**
 - **Wiegel Mexico - operational Q4 2024 (64,861 SF)**
- **44 Stamping Machines**
 - **26 Presses at Wood Dale, IL Ops**
 - **18 Presses at Bensenville, IL Ops**
 - **Includes progressive high-speed and heavy stamping presses, automation line transfer stamping presses and welding line stamping presses**



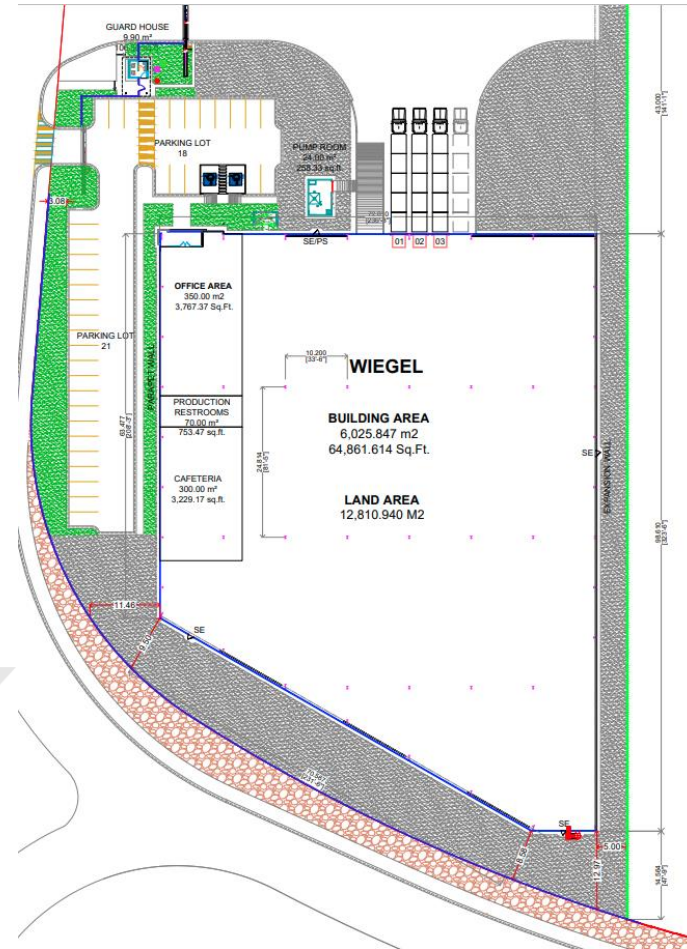
Building Expansion Summer 2024

- Adding 19,320 Sq Ft. of Production Space
- Combining Buildings
- Additional Parking

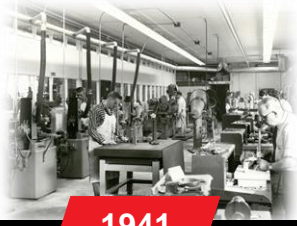


Wiegel de Mexico Q4 2024

- Puerto Interior, Silao, Guanajuato, MX
- 64,861 sq ft of Production Space
- Option to 3X



WIEGEL HISTORY & PLANT EXPANSION



1941

December 6, 1941 Industrial Tool Works is founded by Otto and Kathie Wiegel in Chicago, IL as a tool and die shop



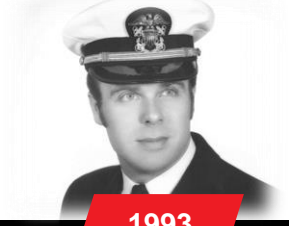
1954

The company is relocated to Franklin Park, IL and later changed it's name to Wiegel Tool Works in 1958



1978

Purchased land in Wood Dale, IL and built a new **25,000 sq-ft** building for expansion and relocation of business operations



1993

Martin Wiegel, son of Otto and Kathie Wiegel assumes ownership of Wiegel Tool Works.



1994

Wiegel Tool Works shifts business focus from tool and die manufacturing to metal stamping production. In 1997, WTW invests in a **23,000 sq-ft** building addition.



2010

Martin Wiegel's three children, Aaron Wiegel, Erica Wiegel and Ryan Wiegel take over the family business.



2011

Invested in a **20,000 sq-ft** building addition to house additional stamping equipment.

WIEGEL HISTORY & PLANT EXPANSION



2011

Acquired a 25,000 sq-ft building.



2017

Purchased a 52,000 sq-ft building in Bensenville, IL to expand production space.



2019

Wiegel Tool Works introduces its first production automation line with 17 FANUC robots



2021

Expanded operations to a new 62,000 sq-ft facility in Elk Grove Village, IL for warehousing and distribution.



2022

Wiegel Tool Works rebrands the company identity assuming the DBA name, Wiegel, and launching a new logo



2024

Wiegel expands operations to Mexico.

INDUSTRIES SERVED



Aerospace



Appliance



Automotive



Electric Vehicles



Electrical



Electronics



**Insert &
Injection
Molding**



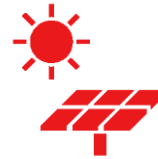
Lighting



Medical



**Military &
Defense**



Solar



**Structural
Building
Components**



Telecom

METAL STAMPINGS

**BATTERY
COMPONENTS**



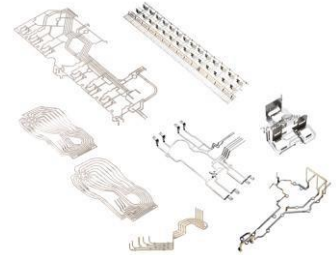
BRACKETS



BUSBARS



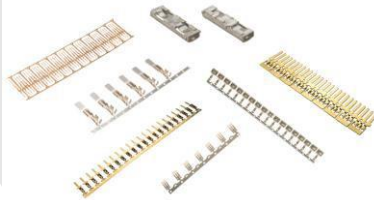
LEAD FRAMES



SHIELDS



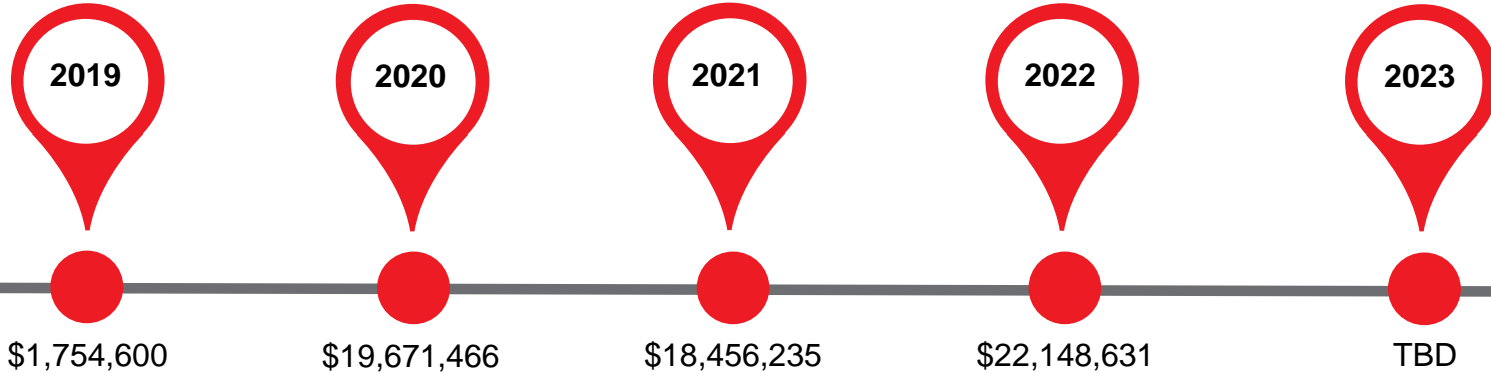
TERMINALS



**WIRE & CABLE
CONNECTORS**



CAPITAL INVESTMENTS



2019

- Okuma Horizontal Machining Center
- Hole Popper (EDM Drill)
- Zeiss Contura X700 CMM
- 300-ton Minster 120" bed
- Rebuild Existing 400-ton Minster
- Air Compressors
- (2) Roll Welders
- Automation line with (17) Fanuc Robots

2020

- 60-ton Bruderer Press
- Assembly Line
- (3) Komatsu Presses
- (2) Roll Welders
- Minster 400-ton Press
- Progressive/Transfer Dies
- In-line Washer
- (2) Bruderer Lines
- WTW Assembly Line
- Tapping Lines

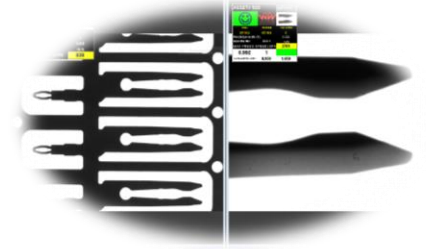
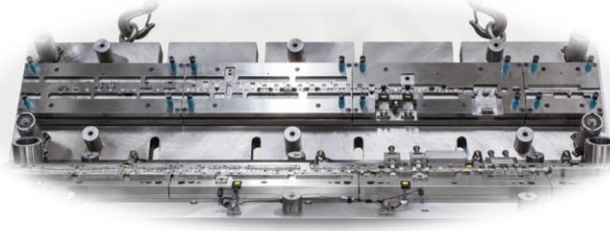
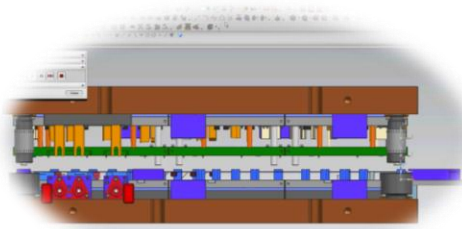
2021

- Welding Systems
- Automation Lines (Robotics)
- Vision Systems
- Laser Markers
- Presses
- Washing Equipment

2022

- Welding Systems
- Automation Lines (Robotics)
- Vision Systems
- Laser Markers
- Presses
- (3) Wire EDMs

OUR PROCESS



ENGINEERING ⇒ PROTOTYPING ⇒ TOOLING ⇒ PRODUCTION ⇒ INSPECTION



WIEGEL PRODUCTION CAPABILITIES

MINSTER PROGRESSIVE DIE HEAVY STAMPING



Part Specifications:

- **Minimum Part Length/Width:** 0.25 in (6.35 mm)
- **Maximum Part Length/Width:** 24 in (609.6 mm)
- **Part Diameter:** 0.25 in (6.35 mm) to 24 in (609.6 mm)
- **Part Thickness:** .008 in (.2 mm) to .375 in (9 mm)
- **Tolerance:** +/- .001 in (+/- .025 mm)

Equipment Capabilities Include:

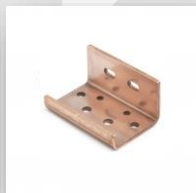
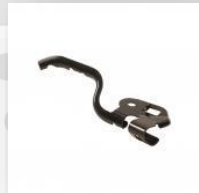
- **Press Rating:** 100 to 450 tons
- **Press Speed:** up to 140 strokes/min (spm) on conventional presses, up to 250 spm on servo and up to 400 spm on hybrid presses
- **Maximum Press Stroke:** 8.5 in (215 mm)
- **Maximum Press Bed Length:** 120 in (3,048 mm)
- **Maximum Press Bed Width:** 55 in (1,397 mm)

Camera Detection and Inspection of Parts:

- **In-process and post-process camera vision systems (2-D and 3-D camera detection and inspection)**
- **Safe launch procedures**



Appropriate for large/thick material components: busbars, lead frames, brackets, housings, etc.



BRUDERER PROGRESSIVE DIE HIGH-SPEED STAMPING



Part Specifications:

- Minimum Part Length/Width: 0.25 in (6.35 mm)
- Maximum Part Length/Width: 7 in (177.8 mm)
- Part Diameter: 0.25 in (6.35 mm) to 7 in (177.8 mm)
- Part Thickness: .002 in (.051 mm) to .090 in (2.2 mm)
- Tolerance: +/- .001 in (+/- .025 mm)

Equipment Capabilities Include:

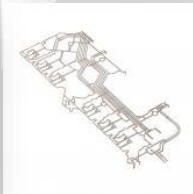
- Press Rating: 30 to 90 tons
- Press Speed: Up to 1,500 strokes/min
- Maximum Press Stroke: 3 in (76.20 mm)
- Maximum Press Bed Length: 57 in (1447.8 mm)
- Maximum Press Bed Width: 33 in (838.20 mm)

Camera Detection and Inspection of Parts:

- In-process and post-process camera vision systems (2-D and 3-D camera detection and inspection)
- Safe launch procedures



Appropriate for delicate/thin material components: reel-reel or loose piece terminals, pins, shields, contacts, etc.



BRUDERER HIGH-SPEED STAMPING VIDEO



Bruderer press running at 1,300+ strokes per min (SPM) with an automatic take-up winder and camera vision system and sensors for 100% quality assurance.

ASSEMBLY & MANUFACTURING



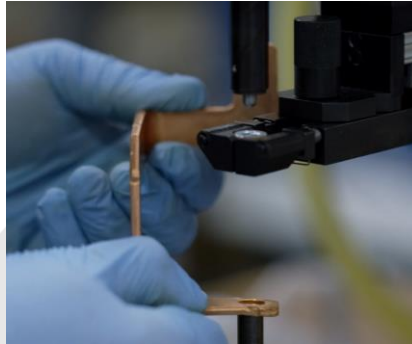
Assembly Hardware:

- Plastic Pieces
- Metal Inserts
- Fasteners
- Screw Machine Parts
- PEMserts
- Bushings
- Nuts / Studs



Assembly Processes:

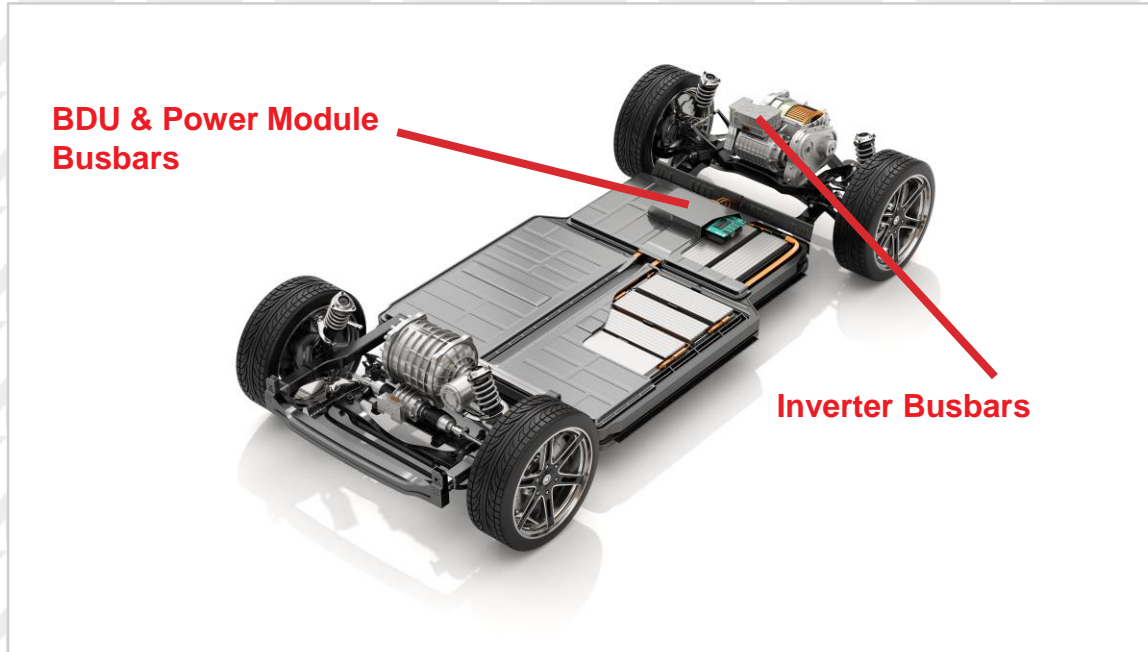
- Automated In-Die Assembly
- Automated Robotic Assembly
- Secondary Semi-Automated Assembly
- Threading
- Staking
- Tapping
- Stacking
- Joining
- Welding
- Riveting



Camera Detection and Inspection of Parts:

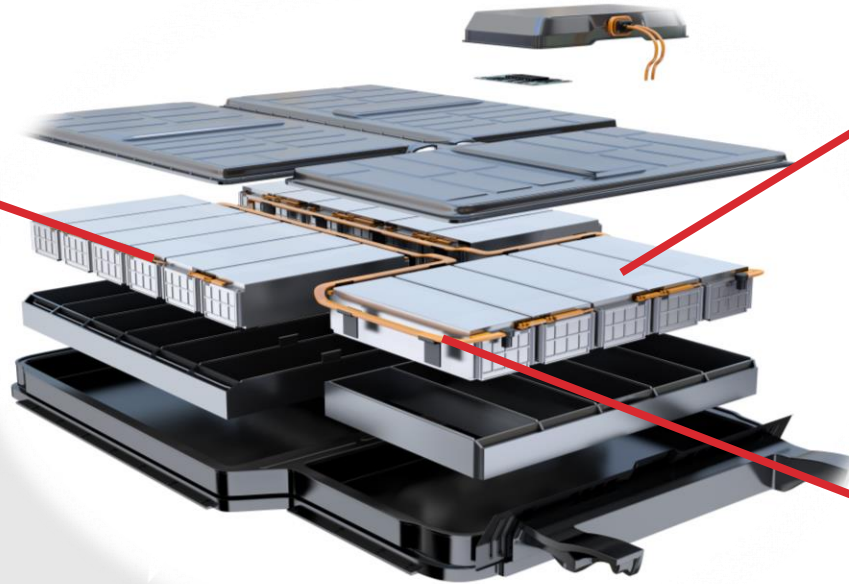
- In-process and post-process camera vision systems (2-D and 3-D camera detection and inspection)
- Safe launch procedures

EV BATTERY PACK AND BATTERY COMPONENT MANUFACTURING



BATTERY PACK MODULE & SUB-MODULE PRODUCTION FOR EV BATTERIES

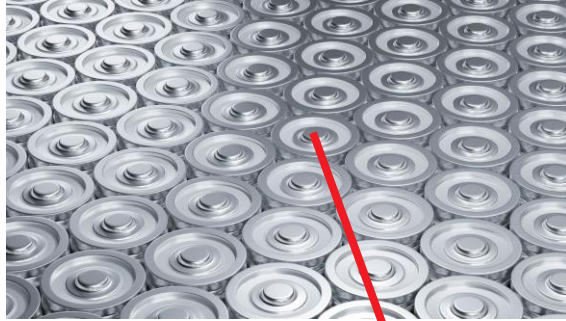
**SERIES AND
TERMINAL BUSBARS**



**CURRENT COLLECTOR
ASSEMBLIES**

**CNC Bent Busbars
(w/ isolation)**

BATTERY CELL COMPONENT PRODUCTION



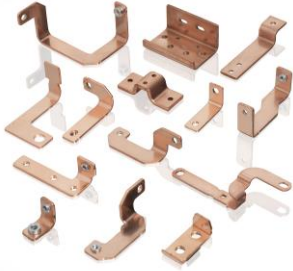
- CATHODE COLLECTORS
- ANODE COLLECTORS
- BATTERY CAN LIDS / VENTS

BATTERY PRODUCTION OPERATIONS



- **Stamping and forming of parts**
 - Progressive-die heavy and high-speed stamping systems
 - Transfer stamping systems
- **Plating and surface coating of parts**
- **Robotic joining and assembly of parts**
 - Welding systems
 - Bonding systems
 - Glue stations
 - UV Curing systems
 - Rollout stations
- **Automated material stacking and layering processes**
- **Camera Detection and Inspection of Parts**
 - In-process and post-process camera vision systems (2-D and 3-D camera detection and inspection)
 - Safe launch procedures
- **Automated cleaning of parts**
- **Automated packaging and laser marking of parts**

EMOBILITY AND EV BATTERY TECH COMPONENTS



High current, thick copper battery busbars with PEMnut fasteners



Copper busbars with Dielectric insulated materials (epoxy powder coating and heat shrink tubing) with PEMnut fasteners



Battery eyelet terminals and wire cable connectors



Power pack terminals and contact inserts



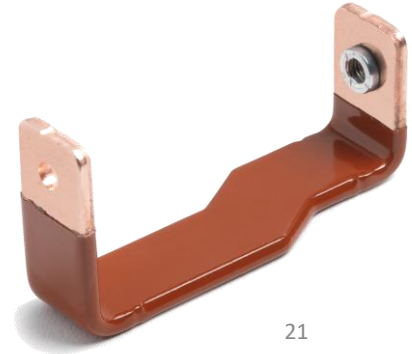
Shields and terminals for electric connector plugs



High current, thick copper battery busbars with tin plating and PEMnut fasteners



Terminals, tabs and connector contacts

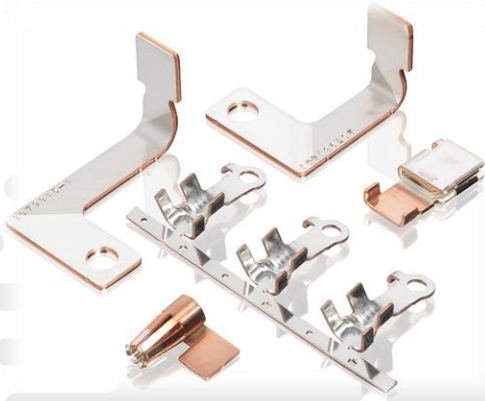


VALUE-ADD CAPABILITIES

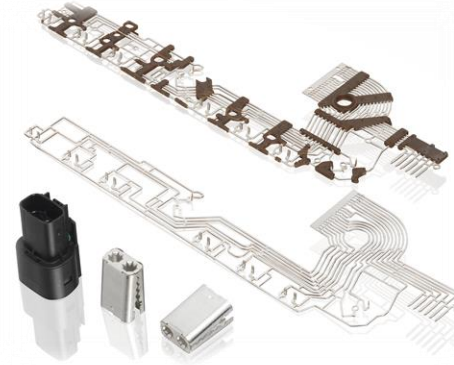
PRE- AND POST-PRODUCTION PROCESSES

Precious Metal Plating:

We offer a range of pre- and post-plating options for metal stamping assemblies to allow for corrosion protection, electrical conduction, decorative use, wear resistance, coloring, bonding, and lubricity.



Insert Molding, Injection Molding and Overmolding:



Surface Coating Applications:

Stampings may require a surface coating for dielectric insulation, application environment protection, heat and extreme temperature protection, abrasion protection and corrosion protection in various electrical applications.



PRE-PRODUCTION SERVICES

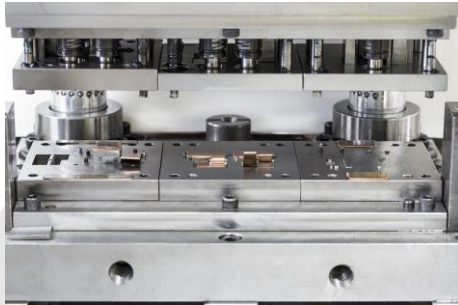
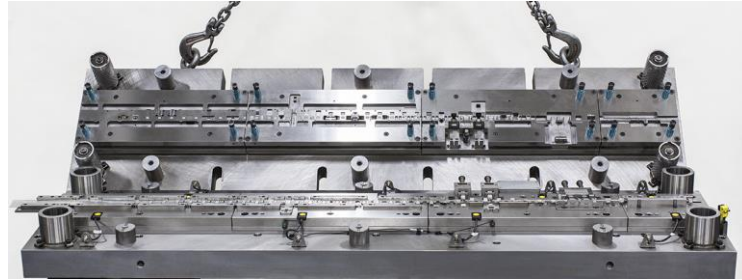
Tool & Die Design and Manufacturing

Die Design

- We utilize the most sophisticated 3D CAD modeling system in the industry, Siemens NX, to design and debug progressive dies on screen.

Die Manufacturing

- We produce our tools in-house using top technology such as wire EDM, CNC machining, optical profile grinding and waterjet cutting.



Rapid Prototyping

Part Development and Testing

- We test design concepts at early phases of part development to perfect part designs and prevent mass production issues.
- We determine feasibility of manufacturing part designs
- We offer recommendations on best suited materials, appropriate manufacturing technology and design modifications for parts and tools

WATERJET

Waterjet Cutting

Tooling Applications

- We utilize waterjet for efficiently cutting custom die sets and blocks for in-house tool making

Production Applications

- We have invested in waterjet cutting technology as an alternative manufacturing method that produces quick and cost-effective parts for many applications without the need for tooling design and production.

Prototype Applications

- We can cut out prototype parts with thicker materials using waterjet



QUALITY ASSURANCE & EFFICIENCY

WIEGEL: A REPUTATION BUILT ON QUALITY

Our Quality:

- Engineers can design and run tools in a virtual production simulation to debug the production process
- Tooling Department integrates quality detection sensors into the tools that ensure quality during tool try-out and final production
- Camera vision systems incorporated at the press
- We conduct in-process inspection, capability studies, quality lab tests and safe launch procedures



QC Equipment:

- Zeiss CMM
- OGP Smart Scopes
- Keyence Vision Systems
- ATOS Laser Measuring System
- In-Die Sensors and Camera Vision Systems

Predictable Production:

- Feasibility study at the beginning of every production program
- Process failure mode and effects analysis (PFMEA) conducted to prevent failures and ensure error-free production process

Strict Supplier and Partner Selection:

- All material suppliers and subcontracted vendors go through a strict supplier qualifying and approval process.

Packaging & Delivery:

- Follow specific packaging instructions provided by our customers
- All packaging options are properly secured onto skids or pallets and edge protected on all sides. Packages are banded and stretch wrapped to make sure parts adhere to the skid to prevent movement from the skid or damage during transit.

SOPHISTICATED QUALITY CONTROLS & EFFICIENCY

Automated Inspection

In-Line/Off-Line Vision Systems

- 100% quality off the press

Die simulation software

- Reduces debug and die try out.

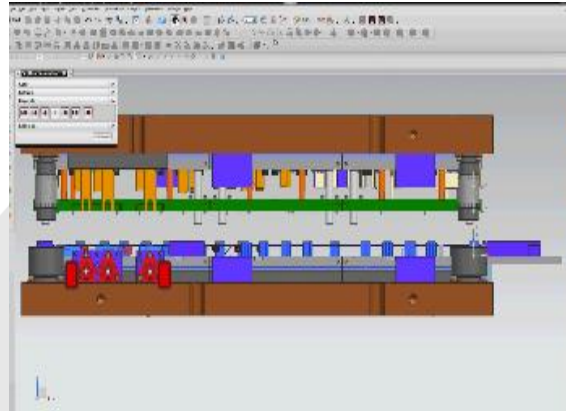
Press Monitoring System

Shop Floor Connect

- Real-time Production Monitoring

In-Tool Monitoring

- Sensors
- Tonnage meters
- SPM control

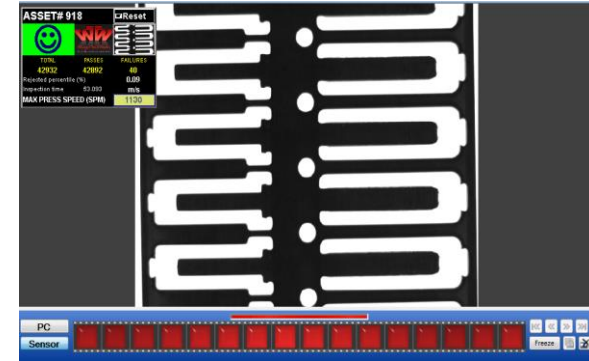


100 Ton Minster (123) Running @ 115 SPM (00:14:00) Tool Number = 494 Part Number = 28529898 Est Complete = 37:58:07	100 Ton Minster (45) Running @ 81 SPM (00:18:45) Tool Number = 819 Part Number = 8100-5145 Est Complete = 10:01:51	100 Ton Minster (8) Running @ 95 SPM (00:14:01) Tool Number = 878 Part Number = 9001 Est Complete = 03:31:00
160 Ton Minster (86) Running @ 60 PPM (00:15:55) Tool Number = 910 Part Number = R61005203 Est Complete = 06:00:35	200 Bliss (47) Planned Downtime (00:14:01) Tool Number = 784 Part Number = 13523156 - 01 Est Complete = 05:05:45	30 Ton Bruderer (4) Running @ 349 SPM (00:14:01) Tool Number = 769 Part Number = 7791 Est Complete = 43:31:00
30 Ton Bruderer (98) Coil Change (00:05:08) Tool Number = 870 Part Number = RPO301-SINGULATE Est Complete = 22:58:58	400 Ton Minster (51) Running @ 27 SPM (00:19:02) Tool Number = 841 Part Number = 33233416 Est Complete = N/A	45 Ton Bruderer (4) Planned Downtime (00:14:01) Tool Number = 706 Part Number = I-006 Est Complete = 08:11:00
60 Ton Bruderer (111) Planned Downtime (21:48:50) Tool Number = 490 Part Number = 4004665600 - 02 Est Complete = 36:46:25	60 Ton Longbed (48) Batch counter preset 1 (00:00:08) Tool Number = 901 Part Number = INS2540-1-2 Est Complete = 131:11:00	60 Ton Longbed (8) Running @ 601 SPM (00:14:01) Tool Number = 918 Part Number = 3111 Est Complete = 03:31:00
60 Ton Shortbed (40) Tool Maintenance (00:46:52) Tool Number = 726 Part Number = 023-0022-000 Est Complete = 32:09:35	75 Ton Bruderer (41) Running @ 236 SPM (00:26:29) Tool Number = 834 Part Number = 9042320-T Est Complete = 10:21:31	75 Ton Bruderer (5) Planned Downtime (00:14:01) Tool Number = 537 Part Number = L-84 Est Complete = 110:11:00

MOBILE VISION SYSTEM (MVS)

MVS Capabilities:

- Capable of inspecting flat and/or formed parts
- Precise measurement and inspection at very high speed
- Data collection
- Low angle light enabled for greater detection of surface imperfections
- Back-lit to enhance contour (missing features, extra features, slivers)



450 strokes per min (SPM)



1300 strokes per min (SPM)

QUALITY CERTIFICATIONS



ABS Quality Evaluations
Certificate Of Conformance
This is to certify that the Quality Management System of:
Wiegel Tool Works, Inc.
935 North Central Avenue
Wood Dale, IL 60191
U.S.A.

(WITH ADDITIONAL FACILITIES LISTED ON ATTACHED ANNEX)
 has been assessed by ABS Quality Evaluations, Inc. and found to be in conformance with the requirements set forth by:
IATF 16949:2016
 The Quality Management System is applicable to:

**MANUFACTURE OF METAL PROTOTYPES, STAMPINGS AND PRODUCTION ASSEMBLY
 EXCLUDING PRODUCT DESIGN - IATF 16949:2016, CLAUSE 8.3**

Certificate No:	38104	 Dominic Townsend, President
Effective Date:	11 June 2021	
Expiration Date:	10 June 2024	
Revision Date:	19 August 2022	
IATF No:	0404563	

Validity of this certificate is based on the successful completion of the periodic surveillance audits of the management system defined by the above scope and is contingent upon prompt written notification to ABS Quality Evaluations, Inc. of significant changes to the management system or components thereof.
 ABS Quality Evaluations, Inc. 1701 City Plaza Drive, Spring, TX 77389, U.S.A.
 Validity of this certificate may be confirmed at www.abs-qe.com/cert_validation.

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ABS Quality Evaluations
Certificate Of Conformance
This is to certify that the Environment Management System of:
Wiegel Tool Works, Inc.
935 North Central Avenue, HQ
Wood Dale, IL 60191
U.S.A.

(WITH ADDITIONAL FACILITIES LISTED ON ATTACHED ANNEX)
 has been assessed by ABS Quality Evaluations, Inc. and found to be in conformance with the requirements set forth by:
ISO 14001:2015
 The Environment Management System is applicable to:

MANUFACTURE OF METAL PROTOTYPES, STAMPINGS AND COMPONENTS

This certificate may be found on the ABS QE Website (www.abs-qe.com). For certificates issued in the People's Republic of China information may also be verified on the CNCA website (www.cnca.gov.cn).

Certificate No:	47388	 Dominic Townsend, President
Certification Date:	27 September 2018	
Effective Date:	17 March 2022	
Expiration Date:	18 March 2025	
Revision Date:	17 March 2022	

Validity of this certificate is based on the successful completion of the periodic surveillance audits of the management system defined by the above scope and is contingent upon prompt written notification to ABS Quality Evaluations, Inc. of significant changes to the management system or components thereof.
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WIEGEL Solutions
Manufactured

THANK YOU!

WIEGEL
935 N. CENTRAL AVE.
WOOD DALE, IL 60191

Phone: (630) 595-6550

Email: info@wiegel.com

wiegel.com

