



Thought of the day

Quantity is the enemy of Quality

National Die

Made In The USA

National Die: Made In The USA



A Jerry Grasso Visual Arts Publication

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What is it like for a product to state that it is “*Made in the USA*”? What does this really mean, especially in today’s economy? Is this just a cliché? Considering the state of the manufacturing industry, is it even worth discussing, since so many manufacturing jobs have disappeared to foreign shores? Answering these questions has become the essence of my project.

The manufacturing sector sustained heavy job losses over the last few decades. Competition from low-wage countries, such as China and Mexico, and the weak global growth since the 2008-2009 recession are events that have occurred leading to a sharp decline in activity in this sector.

Currently, however, the industry is beginning to regain some ground. Cutting costs and providing customers with the best products possible is the way these manufacturing companies are battling back. Small shop manufacturing has been a great way to cut costs and to reduce burden on original equipment manufacturers (OEMs), thus helping them to better compete on a global scale.

Tool and die makers are at the top of the ladder in the metalworking trades. Machinists and tool and die makers set up and operate a variety of computer-controlled and mechanically-controlled machine tools. They are very versatile in using their hands to create complicated eyelet tools, dies, and gauges where accurate application and a high degree of ability are required. With these skills, tool and die makers are a tremendous asset to any manufacturing facility.

The **National Die Company** is a world-class leader in the custom manufacturing of top quality, high volume, custom, deep drawn metal stampings such as eyelets, and is the subject of this photographic series. I will introduce you to the members of the Shop team. The photos will highlight their progression of producing eyelets for one of the Shop’s largest customers, **Ziggity** poultry watering systems.

The Shop’s capabilities allow them to serve clients in any industry and in any country. They have earned this valuable reputation because they have the ability to redesign parts made by more expensive methods. Millions of these products are sold each year to a variety of customers in the automotive, electrical, appliance, medical, and engine industries, just to name a few.

Everybody in the Shop contributes to the quality and integrity of the products they produce and is responsible for the success of the manufacturing process. These are people who have between seventeen years and over forty years experience of working at **National Die**. As I spoke with each member of the Shop team, their eyes lit up with excitement and pride as they described to me how they perform their duties with old-school craftsmanship. Clearly, these are not just jobs but rather careers. This is what it means to be “*Made In The USA*”!

Paul Cote, president and part owner, leans against the **National Die Company** sign. This Shop started in a Waterbury, CT, garage in 1940. Since then, it relocated to Wolcott, CT. They are a world-class leader in the custom manufacturing of top quality, high volume, deep drawn parts and components. As a high volume, eyelet manufacturer, they take pride in their commitment to providing the best product quality and service to their customers.



Each eyelet they produce, starts with the creation of sets of dies and punches. The raw material on the selves here is used by the toolmakers to create the dies and punches.



Dave Davino is the Toolroom tool maker. Here, he measures carbide stock to be selected to create the punches and dies to be used in the production process for the **Ziggity** eyelet.



Dave is cutting the carbide stock to the size he needs.



Part of the process of creating the tools necessary to run the press operations is grinding. Here are some of the grinding wheels used for these tools. 80 grit wheels are used for edge sharpening; 46 grit wheels for general purpose grinding; and diamond wheels for carbide dies and punches.



The toolroom is Dave's room since he is responsible for making any new or replacement punches, dies, or gauges as they wear or break.

The room is made up of a series of machines used for various stages of new/replacement die/punch production sets.

- * **Bridgeport EZtrack** used for milling the sizes of holes.
- * Grinders for grinding the part faces.
- * **Hardinage** speed lathes for round turning and boring for (inner diameter) and OD (outer diameter).
- * Indicator that indicates the flatness of the tested surface.
- * **Whirly Jig** for precision grinding of surfaces.
- * **Rockwell** tester for hardness testing.



These are speed lathes used for round turning and boring of ID (inner diameter) and OD (outer diameter) of the punches and dies used in each machine press.



This is the other side of the toolroom. Mike, one of the eyelet toolmakers, is making some adjustments to one of the tools.

With a complete in-house tool design, engineering staff and tool room, the **National Die Company** is capable of building 100% of production tooling for any project. The Shop maintains the tooling for the life of the part, eliminating any future tool charges to their customers.



Dave is operating one of the **Hardinage** speed lathes. He files, grinds, shims, and adjusts various parts to properly fit them together. He fits and assembles parts to make, repairs, or modify dies, jigs, gauges, and tools, using machine tools and hand tools. Dave also inspects finished dies for smoothness, contour conformity, and any defects.



Dave Davino has been with **National Die** for twenty seven years.
He loves motorcycles and rides a 1600cc Yamaha to work as often
as the New England weather will allow.

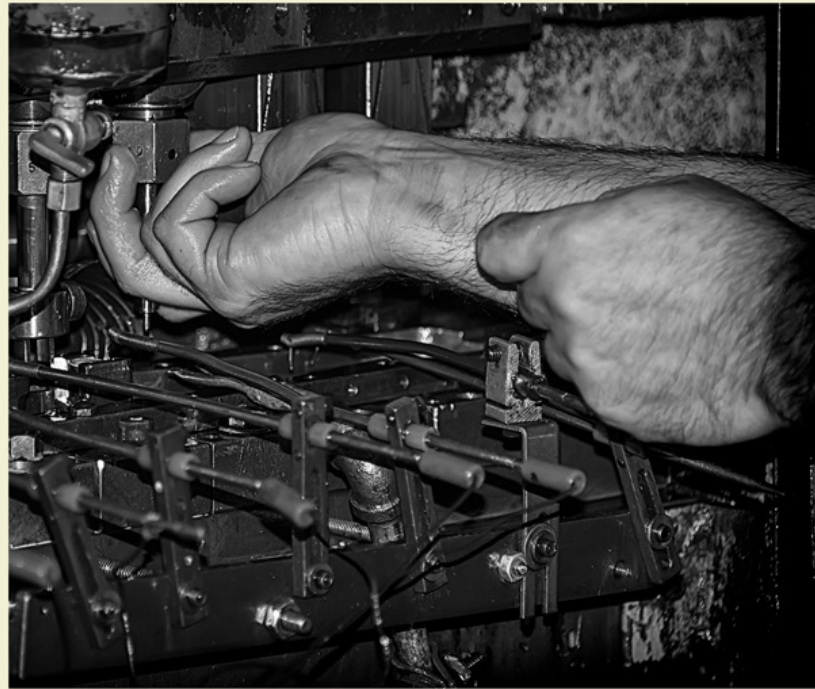
On the workbench is the complete toolset for the ten step, **Ziggity**
eyelet production.



Approximately eight million **Ziggity** eyelets are produced annually by **National Die**. Therefore, with such high volume, toolset wear and damage occurs.

The top image shows a fractured die surface. Even though the carbide die is very strong material, it still does not take much to damage the surface, perhaps the result of a misaligned punch, also made of carbide. The high speed of the presses can sometimes cause stray material or other results of wear to damage surfaces that are constantly in contact with one another. Approximately 180 to 250 pieces are made each minute.

The bottom images shows Mike making an adjustment to one of the punches in the press.



The **Transfer Fingers** of the press move material along its way from one station to the next. Here we see Mike's "*fingers in the fingers*" as he makes adjustments to the transfer process on the press.



Mike continues to make adjustments to the fingers, punches, dies, as he inspects the general operation of the press before the machine is allowed to resume production. He conducts test runs with completed tools or dies to ensure that parts meet specifications, making adjustments as necessary.



All production, including the **Ziggity** eyelet, begins with coils of flat strip metal. This provides the lowest level of scrap metal loss possible. These custom deep drawn parts are formed as completely as possible within the machine to eliminate and minimize the need for costly secondary operations. The **Ziggity** eyelet uses stainless steel.



Press operations start with the press control panel. The top photo shows Mike clutching machine operation. This causes the machine to inch its way through its production cycle and allows the toolmaker the chance to fine tune the run.



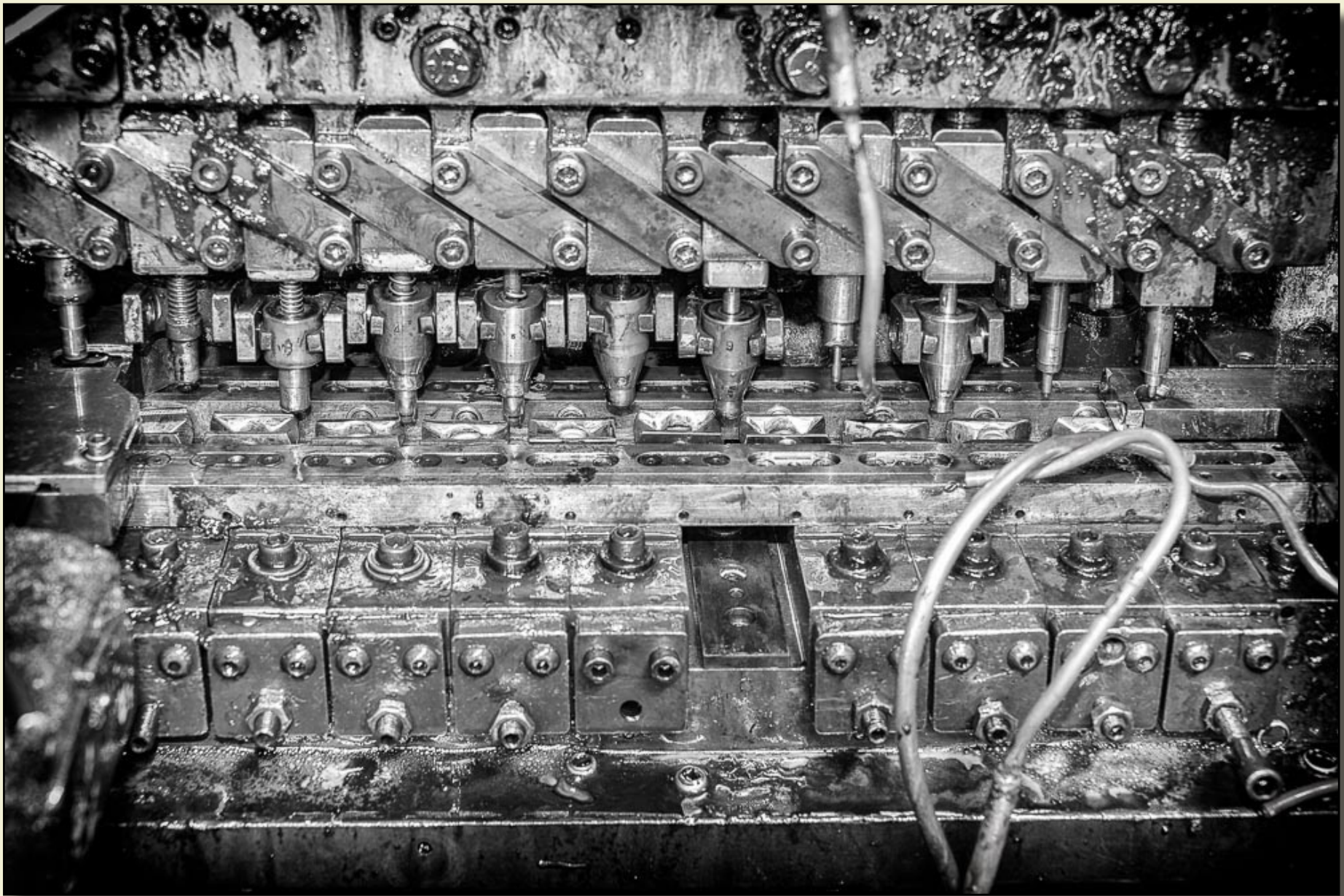
The presses are an interesting combination of motion, light and shapes. The ten-stage **Ziggity** poultry watering eyelet process is detailed here. From right to left, the toolsets document each stage that the cam-operated press performs.

- * Cut the blank from the raw material and form a cup.
- * Perform the first draw.
- * Perform the second draw.
- * Perform the third draw.
- * Perform the fourth draw.
- * Perform the finish draw.
- * Qualify the flange ID and radius.
- * Pierce the eyelet (make a hole at the bottom).
- * Make a flair over the pin.
- * Finish the flare.
- * Trim the final product.

The purpose of the draw stages above is to control the inner and outer diameters of the eyelet.



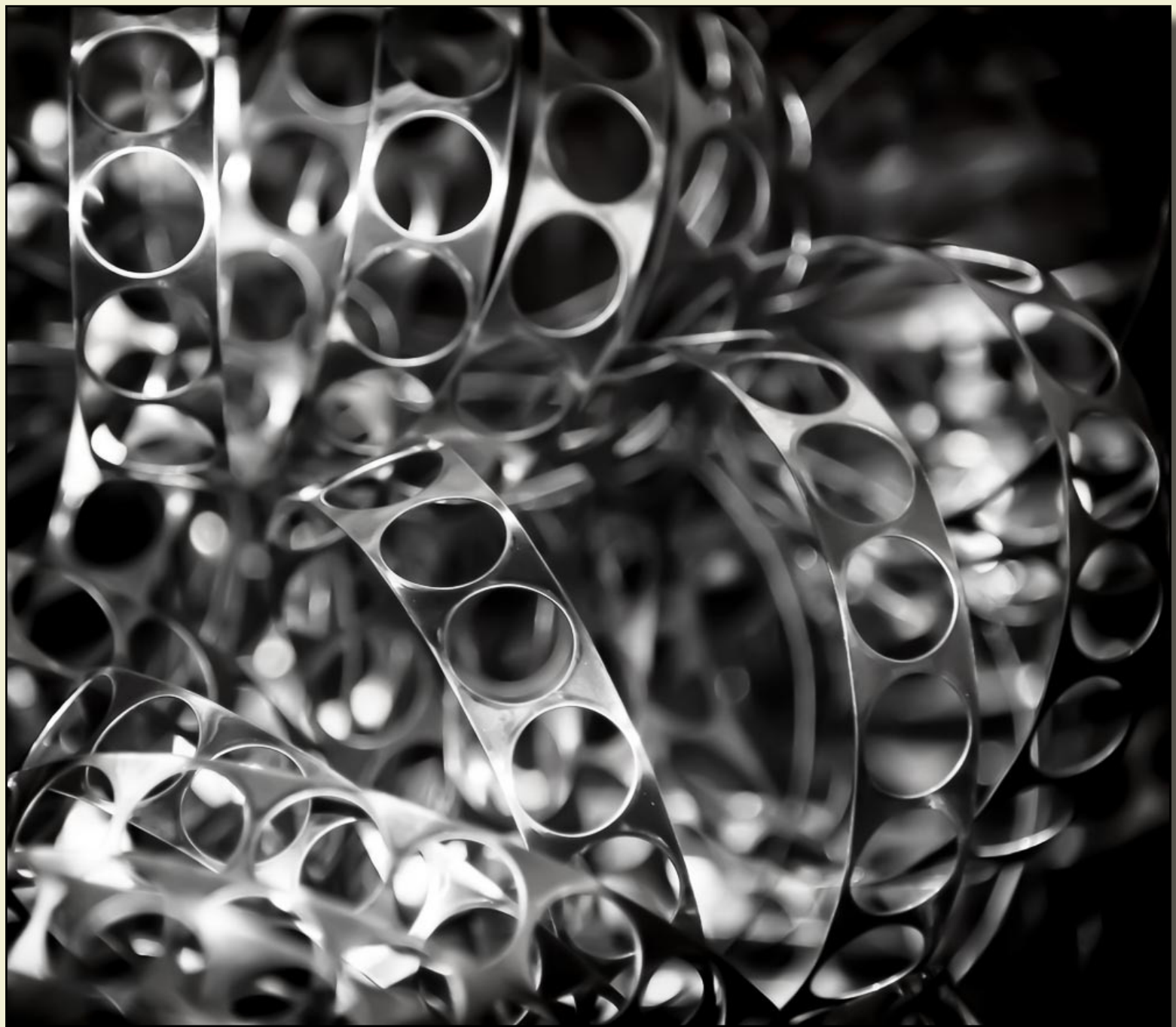
This is the **Ziggity** press, minus one of the die blocks. Notice the ten stages, or stations, of punch and die combinations as detailed on the previous page.



This press is in full operation. Notice the counter keeping score of the day's production run. Approximately 60,000 to 100,000 eyelets are manufactured per day.



Before the **Ziggity** eyelet begins its transfer journey from stage to stage in the press, the blanking process creates coin-shaped flat material as the starting point. Castoff, or excess material, is created and collected after the blanking to be sold to scrap metal dealers. This helps keep the price of production lower.



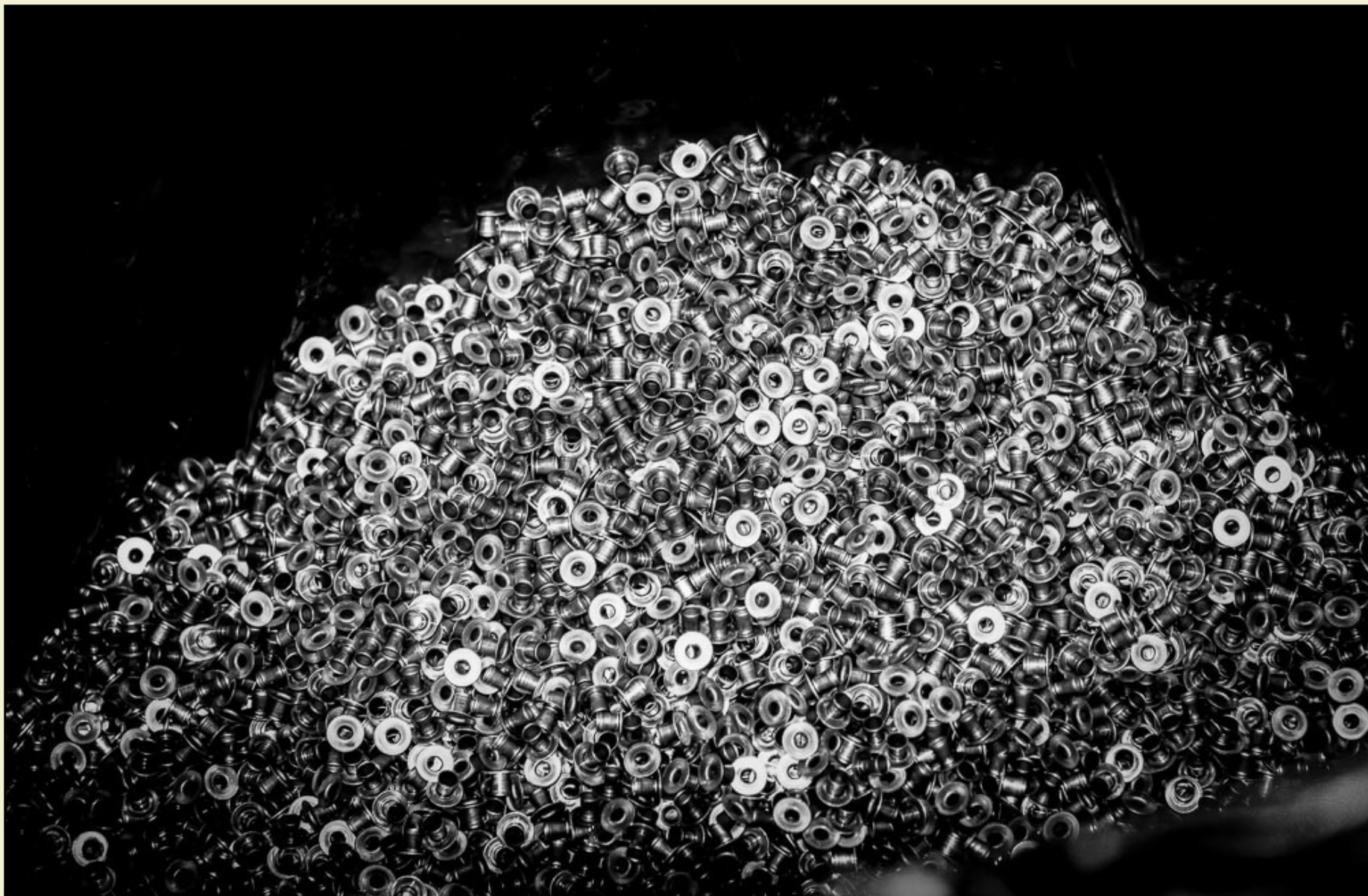
More castoff is created at the end of the press run. Each eyelet gets its final trimming to complete its customer specification requirements.



As each production run progresses, completed parts are put into holding buckets for a final visual inspection and is also recorded on inspection sheets. The press operator knows that the parts have met gauge specifications, but must be certain these are visually satisfactory before putting them in the process completed container.



Here is the process completed container for the **Ziggity** eyelet.
Ziggity Systems are poultry watering experts. The eyelet produced by **National Die** is used in their drinker systems.



This is the Shop's main floor. There are 34 presses scattered throughout the floor. Their manufacturing process uses multiple station transfer presses, which are high-speed and produce volume parts with less raw material scrap. Each individual part passes through a series of stations to ensure final product precision.



Press operator, Al Mustafi, cleans the surface of one of the active presses.



Left to right, Mike and Al Mustafi are brothers from Macedonia. Mike is one of the toolmakers and has been with the company for 17 years. Al, Mike's younger brother, is the main operator of the working presses. He has been there for 15 years.



Left to right, Dave and Pete are making corrective adjustments to one of the presses.



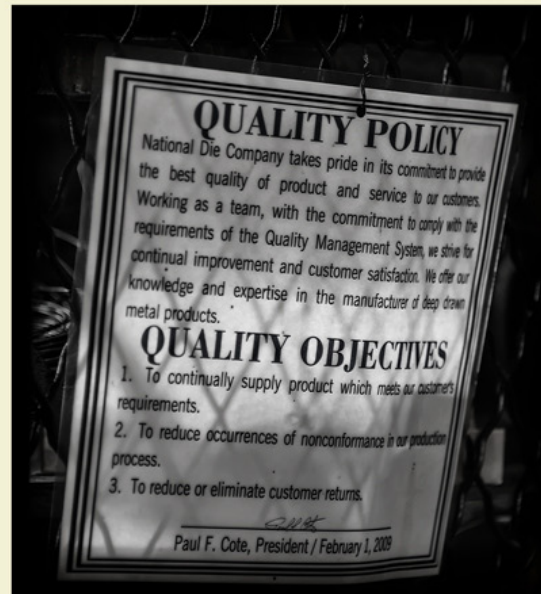
Pete, one of the toolmakers, is inspecting the punches and dies as he sets up one of the presses for another job.



Pete Ulinskas designs any new tool, punches or dies, that the shop may need. As a toolmaker, he works with Mike to maintain the working presses and is also responsible for the setup of any new jobs. He studies blueprints, sketches, models, or specifications to plan operation sequences for fabricating tools, dies, or assemblies; verifies dimensions, alignments, and clearances of finished parts using measuring instruments.



Both of these images illustrate the importance of production quality and care. The bottom photo represents one of the inspection sheets the press operator uses record the date and time he made a visual inspection of product quality during each run.



Quality is very important to the Shop, which is why they are “ISO 9001:2008” certified. This certification must be renewed every three years. Audits are conducted in-house by Dave and Warren. Annual audits by someone from ISO reviews the Shop’s manufacturing procedures and testing records. Warren says they are dedicated to following the policies, procedures, and customer specifications to create the highest quality deep drawn metal stampings available. Under Statistical Process Control (SPC) methods, their precision inspection equipment, calibrated and traceable to the **National Institute of Standards and Technology**, assists in the measurement of all dimensional requirements to tight tolerances.

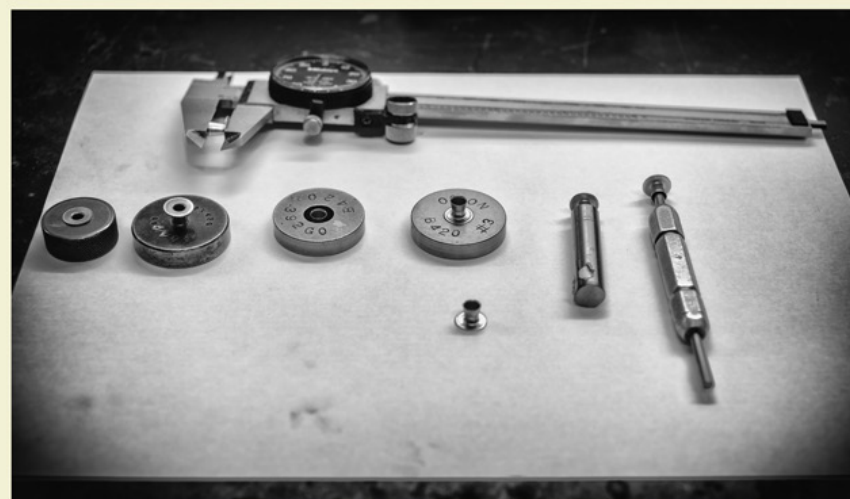
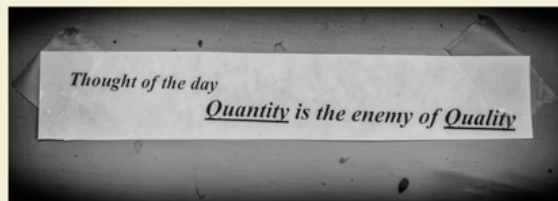
Within Warren’s office are shelves of stacked, numbered boxes that contain test samples or reference points for the next time that job is needed to be repeated.



A small piece of paper hangs on the wall in Warren's office which says "*Quantity is the enemy of quality*". During mass production, it becomes too easy to be distracted and not do the proper quality testing. There must be a balance in order to succeed.

The boxes from the previous picture also contain samples of the sets of gauges used to test customer specifications and tolerances to determine what is called the "Go/No-go" decision points. The bottom image shows the set of gauges used to determine product quality for the **Ziggity** watering eyelet.

From left to right, in the bottom photo, are two gauges to determine the diameters at the bottom of the flare; two gauges for the upper flare diameters with go/no-go indications; one eight degree angle gauge; and finally the plug gauge to determine overall go/no-go test results.



In addition to the gauges used for quality testing of each product, there are also two machines which help Warren do his job.

The first one is called the **Starrett Indicator** which, as the name implies, indicates the degree of surface flatness. This must match customer design specifications and tolerances.



The second machine is called the **Mitutoyo Comparator**. This precision tool is responsible for comparing the radius of various features of the final product to the actual customer order specifications.



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Here is a closer view of the **Comparator** in action. Warren is pointing to the angle on one of the products. The result is compared to the customer requirements and specifications to ensure that these tolerances are met and often exceeded.



Warren Adams, Quality Control manager, has been with the company since 1974. When he is not testing or measuring something, you may find him answering the phones during lunch, or teaching Karate as a fifth degree black belt after work.



John is at his desk in the Shipping/Receiving area, preparing the necessary shipping labels to complete a customer's order.



Here, a completed order is being wrapped for shipping to the customer.



Shipping labels are being applied to a completed order.
Following the development and production of precision
metal stampings, warehousing is available to stock metal
stampings made on blanket orders with weekly schedule
changes to be released at the customer's request.



Packaged products are then loaded by fork lift by John onto trucks. Sometimes, there are also semi-finished products that need to be sent out to other third party vendors for cleaning or nickel plating before these can be shipped as finished products.



John Ogolik, Jr. has been with the company for 25 years.
He started as a press operator. John is a successful Bass
Master fisherman.



The truck is about to leave with the fulfilled
order for the customer.



The **National Die** team is proud of their compliance with ISO standards “*ISO 9001:2008*”. They are dedicated to following the policies, procedures, and customer specifications to create the highest quality deep drawn metal stampings available. They maintain an excellent track record by delivering top quality parts within the time frame promised which keeps part costs low.

A highly competitive, global marketplace relies heavily on enhanced values in capability, product quality, timeliness, comprehensive service and competitively favorable pricing.



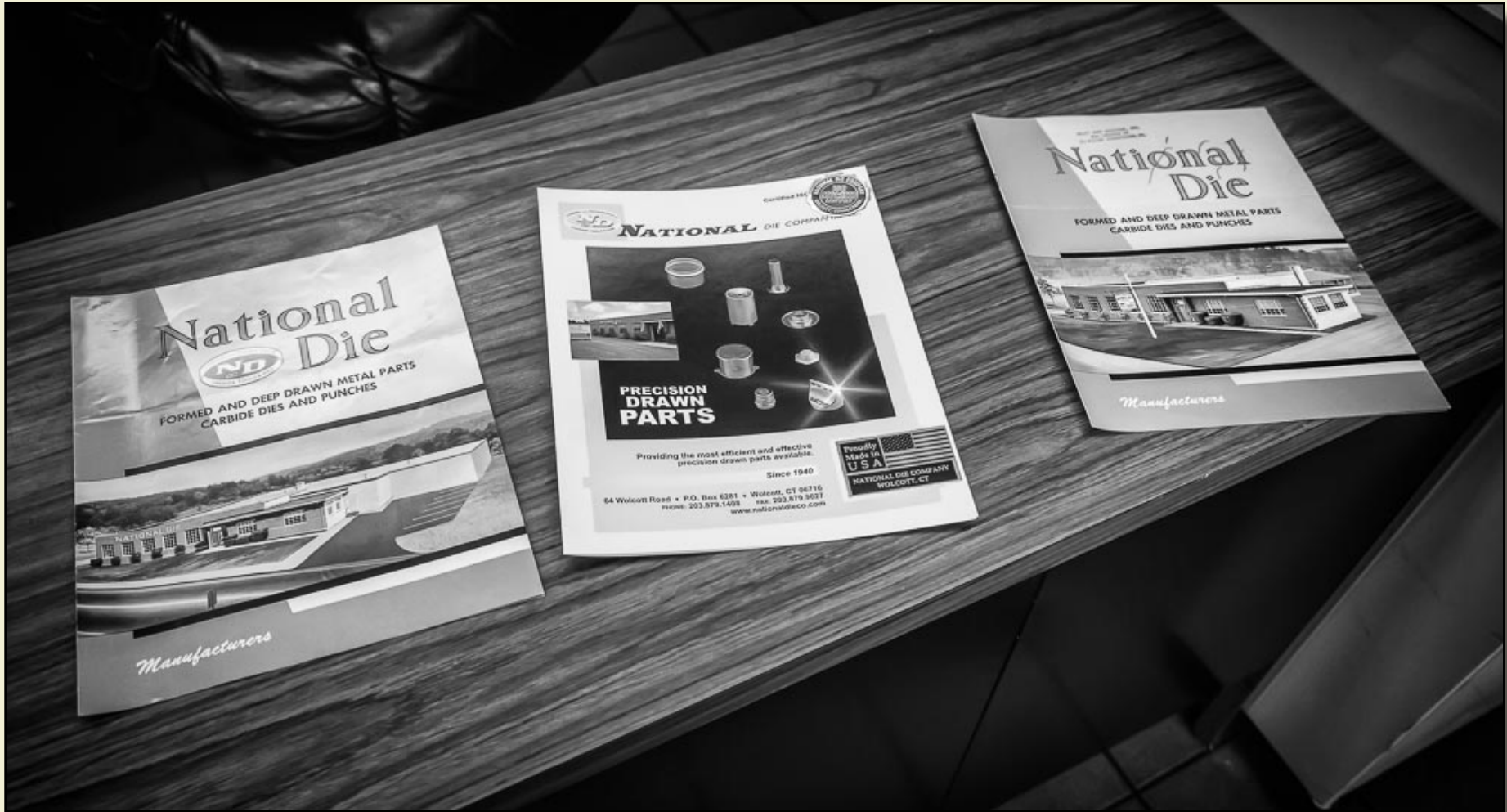
Michelle St. Mary has been the bookkeeper and office manager for 34 years. Among her many administrative duties, she is responsible for order record keeping and Shop payroll. She provides day to day operational activities like shipment notification, invoicing, and records payments received. She enjoys camping, and spending time with her family.



The framed 1997 newspaper article is published recognition of **National Die's** ISO commitment to product quality and excellence, a standard that is recognized globally. The company displays this fact with pride on the walls of their administrative office. It is their commitment and certification that formalizes what the company puts into daily practice. Yes, we are proudly "*Made in the USA*"!



These are the marketing brochures through the years that detail their products and commitment to product quality.



Paul Cote is the president of the company. He started there in 1975 in shipping. He became plant manager in 1983 and went into the office in 1986. Currently, he is responsible purchasing, sales, and oversees the day to day operations of the company. He is also a Beatle maniac and avid golfer.



This is their “*wall of fame*”. It proudly displays most of the products and some of the punches and dies they have used over the years they have been in operation.



This is the **National Die** team today!

- * Front row, left to right, Michelle St. Mary, Dave Davino, Mike Mustafi, Al Mustafi, John Ogolik, Jr.
- * Back row, left to right, Pete Ulinskas, Warren Adams, Paul Cote

“*Made In The USA*” is not just a catchy slogan but a serious, daily exercise for small shop manufacturers like **National Die**. The fact that global economies of scale demand competitively priced products without sacrificing quality is becoming more important now than ever before. With companies like **National Die**, when we purchase their products, we can all be proud of the quality and craftsmanship of what we have received.



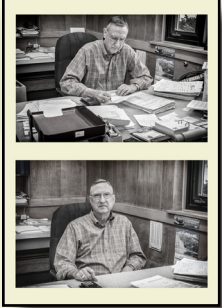
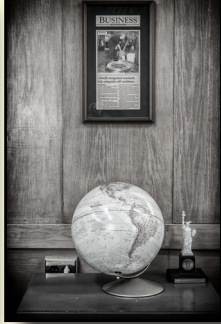
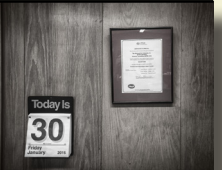
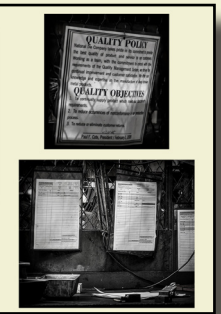
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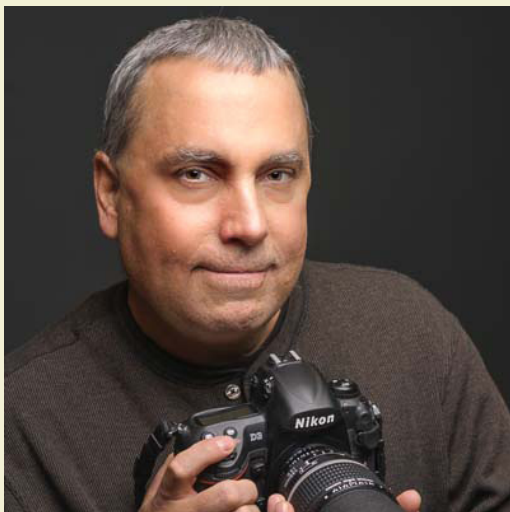
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148 Old Turnpike Road
Bristol, CT 06010 U.S.A.
USA 860-583-1470

Email:
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Jerry Grasso bought his first SLR camera in 1975 and taught himself how to use it during trips through the Orient and hiking the Appalachian trail in Maine and New Hampshire.

Although he got his first digital camera in 2002, it wasn't until 2004 that he became serious about his photographic art. That was the year he started his blog to document his artistic progress. In 2009, he hit a valley of frustration and self doubt. That was when he attended a creativity workshop with John Paul Caponigro. He taught Jerry how to make creativity a learned process. He also gave Jerry the courage to continuously push beyond the boundaries of his comfort zone in order to sustain growth as an artist.

Currently, his photography is only the starting point for his visual art. He experiments with compositing as a method of abstracting a story to present a theme of ideas.

Website: www.jerrygrasso.com



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