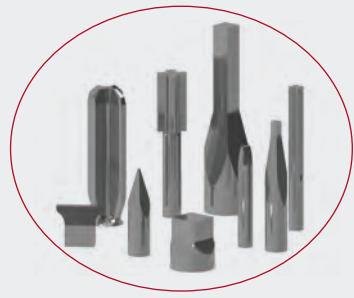


# SWAGERS

Efficient, low cost way to point,  
reduce and form rod, wire or tube

Custom solutions configured to your unique requirement





### Stationary Swagers

Complete parts can be made from entry rounds, squares, or rectangles – hot or cold. Types include simultaneous blows used to create fluted shapes, cross-circular sections, and alternate blows are used to create rectangular shapes, squares, and hexagons.

- **Capabilities:** Any cross-section other than a perfect circle.
- **Process:** The spindle assembly remains stationary, and the roller cage rotates.
- **Examples:** Aerospace tube components and fluid control tubes.



### Rotary Swagers

Pointing, sizing, and forming wire, rod, and tube.

- **Capabilities:** The swaged section is always circular.
- **Process:** Forming dies backed by hammer blocks revolve around the work. As the spindle revolves, centrifugal force throws the hammers and dies outwards against a series of rollers surrounding the spindle. Each time the hammer blocks strike opposed rollers, they are driven inward, causing the die halves to close and compress the metal being swaged (**Diagram 1**). Types include two die and four die (**Diagram 2**).
- **Examples:** Cartridge heaters, hypodermic tubing, piping, armaments, and logging industry applications.

Diagram 1

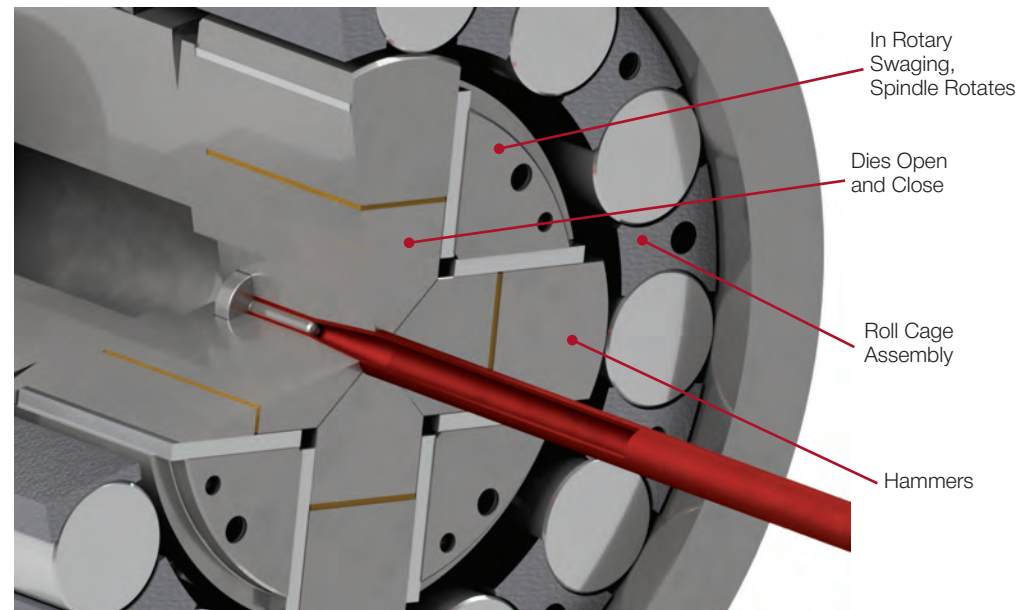
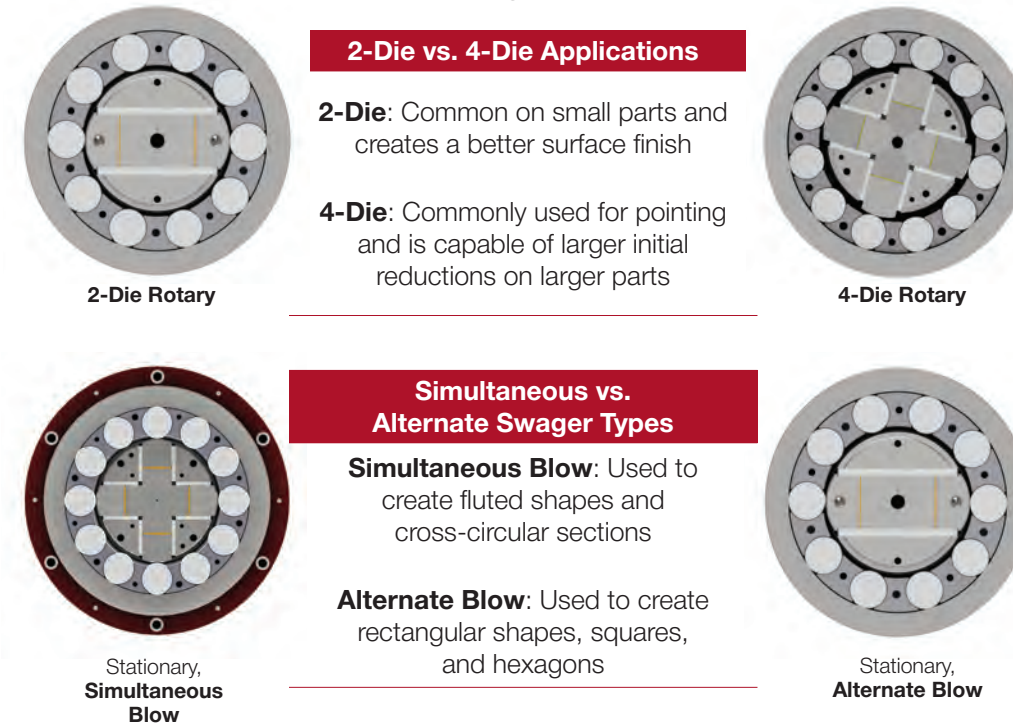


Diagram 2



### 2-Die vs. 4-Die Applications

- **2-Die:** Common on small parts and creates a better surface finish
- **4-Die:** Commonly used for pointing and is capable of larger initial reductions on larger parts

### Simultaneous vs. Alternate Swager Types

- **Simultaneous Blow:** Used to create fluted shapes and cross-circular sections
- **Alternate Blow:** Used to create rectangular shapes, squares, and hexagons



### Hydroformers

- **Capabilities:** For assembling parts, such as fittings to cable, and for making reductions between shoulders, such as on convoluted tubing.
- **Process:** Modification of the rotary swaging principle where wedges are used to open the dies while the spindle is rotating so the work can be inserted before and removed after swaging.
- **Examples:** Sailing rigging equipment, architectural cable railings, and recreational ropes course cables.



### Long Die Swagers

- Serves a variety of materials, including welded and seamless tubing made of either ferrous or nonferrous metals, from stainless steel to aluminum.
- **Capabilities:** Tapering tubing up to 24" long.
  - **Process:** When taper length exceeds standard die length on rotary swager.
  - **Examples:** Production of long, shallow tapers for items such as furniture legs, sporting goods, and aerospace products.

## Swager Sizing

Rotary Swaging Machines Capacities & Dimensions (inches)									
Machine Size	NF <sup>1</sup>	1F	2F	3F	4F	5F	6F	7F	8F
Capacity, Solid*	1/16	5/32	13/32	5/8	15/16	1 1/2	2 1/4	2 3/4	3 3/8
Capacity, Tubing**	1/4	7/16	1	1 3/4	2 1/4	3 3/8	4 1/2	5 1/2	6
2-DIE									
Die Width	0.437	3/4	1 5/8	2 1/4	3 1/8	4 1/2	6	7 1/8	8 1/2
Die Height	0.437	5/8	1 1/8	1 3/5	2 1/4	3 1/4	4	5	6
Die Length	0.75	1	1 7/8	2 1/2	3 1/2	5	6 1/2	7 3/4	9 1/2
Weight/Set (lbs.)	0.08	0.27	2.0	5.0	14.0	41.5	90.0	157.0	275.0
4-DIE									
Die Width	-	-	1 1/8	1 1/2	2 1/8	3 1/8	4	4 3/4	6 1/2
Die Height	-	-	1 1/8	1 3/5	2 1/4	3 1/4	4	5	6
Die Length	-	-	1 7/8	2 1/2	3 1/2	5	6 1/2	7 3/4	45 1/2
Weight/Set (lbs.)	-	-	2	5 1/4	14 1/2	43	88	160	305
Motor Horsepower	1/2**	1 1/2	3	5	10	15	25	30	40
Motor Speed	850	1800	1800	1800	900	900	900	600	600
Hgt. To Spindle C.L. Floor	-	35	35	35	35	35	35	35	35
Space R to L x F to B	19 x 10.5	34 x 21	36 x 34	34.5 x 39.5	40.5 x 45.5	46.5 x 52	54 x 57	70 x 59	73 x 67
Weight (lbs.)	100	625	1,600	2,100	4,500	8,000	11,500	20,000	25,350
Stationary Die									
Machine Size	Long Die			Hydroformers		Stationary Die			
	3 1/2F	4 1/2F	5 1/2F	2H	3H	4FS & 4FSA	5FS & 5FSA	6FS & 6FSA	8FS & 8FSA
Capacity, Solid*	-	-	-	15/16	2 1/4	15/16	1 1/2	2 1/4	3 3/8
Capacity, Tubing*	1 3/4	2 1/4	3 3/8	2	4 1/2	2 1/4	3 3/8	4 1/2	5
Die Length	10	15	24	3 1/2	6 1/2	3 1/2	5	6 1/2	9 1/8
Motor Horsepower	7 1/2	10	15	7 1/2	20	7 1/2	15	25	40
Weight (lbs.)	3,500	5,500	10,000	5,400	19,000	3,500	6,500	10,500	23,000

\*Swager capacities listed are maximums for 30% area of reductions on 60,000 PSI tensile material. Capacity must be reviewed for each specific application. \*\*110/220V, single phase motor. <sup>1</sup>Model NF is bench-mounted.



Optimize your swaging operation and increase operator safety with FENN feeders, automation, and sound enclosures.

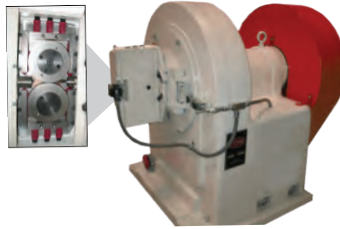
### Optional Swager Feeders



#### Custom Application Feeder

(shown, NF-2 Swager with fully automated feed)

FENN can design a customized feeder to meet your unique and demanding production needs. Available for unique shapes, varying sizes or high capacity products. Available for FENN Swagers, sizes NF-8F.



#### Door Mounted Feeder

DMSOO - DM1250

(shown, driven rolls feed material into a 5F Swager)

Mounts to the swager door and feeds material using hydraulically-powered pinch rolls. Engineered to work well for wire and rod customers to point material for drawbench use. Also ideal for continuous thru swaging of spool material such as high-tensile wire rope. Available for FENN Swagers 3F-8F; others as custom orders.



#### Hydraulic Table Feeder

25H, 45H & 60H

(shown, 5F Swager with 25H feed)

Table feeder uses a rigid base with a hydraulically-powered, accurate, sliding top for precision applications. Ideal for high accuracy products and high reduction applications, such as aerospace. Controlled by an HMI touchscreen with Allen Bradley or Siemens components. Available for FENN Swagers.

### Spare Parts



Every swager die, hammer or wear part is crafted in-house at FENN with your machine and application in mind. Our application specialists and spare parts department are available to assist you with a full range of stocked parts available for quick ship.

### Sound Enclosures

Reduce the sound of your swaging operation to below OSHA's permissible exposure limit for hearing protection with a custom-designed enclosure. Sound environments for multiple swagers, tandem swaging, and through swaging operations. Clamshell-style, two sections join to make one unit for a non-disruptive installation. Welded 14-gauge steel, paired with 2-3/8" of soundproofing foam. Access ports for exhaust fans, wiring in and out, through swaging and feeder tables.



### Coolant Slushing System

Self-contained system will help lubricate critical wear parts and keep the cage assembly free of foreign materials. Available for all FENN swagers.

### Turn-Key Automated Solutions



Maximize efficiency and ultimately reduce operating costs. Improve equipment safety and save time with collaborative robotics. In addition to designing brand-new systems, FENN can also retrofit an integrated system around an existing FENN equipment.

Integrated solutions for swaging machines, hydraulic feeders, robotics, sound enclosures. Secondary operations for laser engravers, cutters, buffering systems and welding systems.



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All FENN machinery is proudly designed and built in our USA headquarters. Contact us today to see how FENN can customize a metal forming machine that is best suited to your application requirements.

### A Trusted Leader in Custom Engineered Metal Forming Machinery

FENN has been designing and building rugged, dependable metal-forming machinery for more than a century. From initial design to manufacturing and equipment support, FENN has a full team of experts, including customer service technicians, product managers, and engineers, to ensure your project's success.

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