

# FINN-POWER

- PUNCHING
- LASER CUTTING
- BENDING
- ▶ **INTEGRATED PUNCHING & SHEARING**
- INTEGRATED PUNCHING & LASER CUTTING
- FLEXIBLE MANUFACTURING SYSTEMS



**SHEAR GENIUS<sup>®</sup>**  
**BY FINN-POWER**



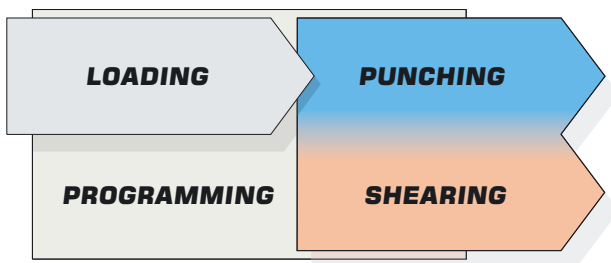
## ***SHEAR GENIUS<sup>®</sup> BY FINN-POWER***

*FINN-POWER's new Shear Genius<sup>®</sup> provides more capacity, quality and cost-efficiency for flexible sheet metal working than any comparable system.*

*Twenty years of experience in right angle shear technology combined with proven field performance in nearly 2,000 applications throughout the world has allowed FINN-POWER to provide a new Shear Genius<sup>®</sup> with these benefits:*

- flexible automated fabrication*
- savings in raw material*
- higher productivity*
- reduced manufacturing costs*
- faster return on investment*

*The Shear Genius<sup>®</sup> provides the competitive edge for today's demanding business environment.*



**The Shear Genius® philosophy**

The Shear Genius® philosophy is to provide one machine capable of transforming a full sized sheet into finished parts with scrap separated. These parts can be moved to final production stages without the need for secondary operations for costly material handling between loading, punching, shearing, sorting and unloading.

With Shear Genius® you can use pre-cut sheets, but normally standard size sheets are pro-

cessed while major savings are achieved through efficient nesting.

**Reliability & manufacturing economy based on experience**

No other manufacturer approaches FINN-POWER's expertise in integrated right angle shear technology. This core competence enabled us to engineer new, productive features into a proven concept for increased productivity and material savings.

By combining several work stages into an automated process, the Shear Genius® concept saves material, eliminates manual handling, decreases necessary floor space and investment in separate machine tools, tooling and energy.

Welcome to the new Shear Genius® benefits.

# THE COST CUTTING SOLUTION FOR HIGH-QUALITY FABRICATION



The vast majority of all fabricated sheet metal components are rectangular. Also, parts with two or three straight edges are perfect for fabrication with a right angle shear.

Today, right angle shear technology is used throughout the industrial world in most varied applications, as independent production cells, or as central units within automatic material handling systems up to a factory-wide FMS level.

Here are some of the reasons why:

## 1) Avoiding the cost of pre-shearing

Pre-shearing is a waste of time and money. Moreover, it is extremely difficult for a stand alone shear to achieve anything like the accuracy of components manufactured by an integrated right angle shear. FINN-POWER's right angle shear has two blades mounted at a 90° angle.

One stroke detaches one or several components.

## 2) Just the right edge quality

Micro jointed or nibbled components often require an additional work stage, such as deburring, to improve edge quality. A right angle shear produces sufficiently high edge quality for practically every purpose. The component is usually ready for the next work stage as it unloads from the machine. For example, there is no oxide layer on the edges to be removed before painting.

## 3) Practically no consumables

As for consumables, FINN-POWER's right angle shear technology uses only energy and compressed air. The blades have several cutting edges – enough for years of production with an occasional sharpening. Blades, like punching tools, can be sharpened numerous times.

#### 4) Don't pay for material you don't need

Modern production planning and automatic nesting software allow optimizing the use of raw material – a significant cost item in the production of sheet metal products. Compared with traditional methods, an integrated right angle shear can save significant raw material costs.

The Shear Genius® method makes maximum use of material and eliminates micro-jointed parts and further manual operations.

#### 5) Automated solution

Shear Genius® automates loading, punching & shearing with secondary work stages, as well as component exit. It eliminates manual separation of micro-jointed parts. The modular design of the Shear Genius® allows the addition of sorting and stacking equipment after the initial installation. With material handling equipment, sorting and stacking can be reliably automated.

The reliability of shearing and automatic component removal are inherent benefits of the right angle shear concept, and make Shear Genius® the optimum machine tool for high-level automation and unmanned operation.

#### Shear Genius®

FINN-POWER's basic Shear Genius® package consists of

- **Automatic loading equipment**
- **300 kN (33 US ton) hydraulic turret punch press with capacity up to 200 tools**
- **Integrated right angle shear**

There are two Shear Genius® models for standard size sheets (max.)

SG6: 3,074 mm x 1,565 mm (120" x 60")

SG8: 4,300 mm x 1,565 mm (170" x 60")

### Integrated right angle shear for

- ▶ **more parts**
- ▶ **better parts**
- ▶ **at a lower cost**



# FINN-POWER PUNCHING FEATURES



## Up to 200 tools

The turret layout is customer-specific. Various tool holder sizes can be changed or switched from station to station. Any major tooling style can be chosen, and you can often use your existing tooling. Additional index stations can be added up to 10 (optional).

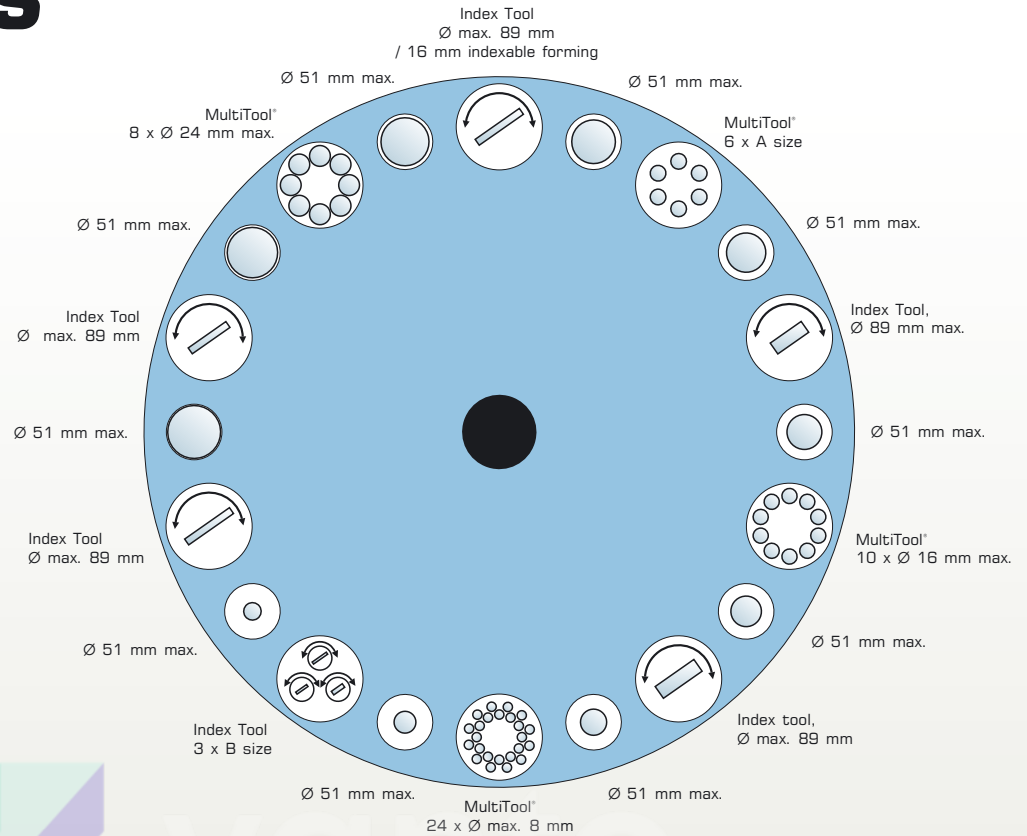
Multi-Tool® allows the astonishing versatility of 200 tools simultaneously in the turret, with both indexable and fixed Multi-Tools® available.

## Fast auto index system



Up to 10 large index stations (88.9 mm / 3.5") and even 80 indexable tools with R Multi-Tools® can be installed.

The fast auto-index system is based on an AC servo motor; the rotation mechanism of the punch and die is mechanically engaged and disengaged vertically. Tool rotation can be programmed in 0.001° increments and throughout the 360° rotation. The system automatically selects the shorter path to desired angle.



Example of a customer specific turret layout. This one includes 66 tools, of which seven index tools and one indexable high-forming station.

Full tonnage and punch speeds can be used in any station, with any tool size.

## Solid engineering

Both the turret punch press and the right angle shear frame have been redesigned for additional rigidity to accommodate the forces due to increased speed and performance.

## Hydraulics

A full 300 kN (33 US ton) punching force is available, with nibbling speed on 1 mm centers up to 1,100 hits per minute. Digitally-servo-controlled ram stroke speed is fully and individually adjustable in both directions. Other benefits include the availability of different punching modes (punch, slow punch, downforming and marking). For marking, punching speed up to 3,000 hpm can be achieved.

FINN-POWER's digital servo hydraulic punching system provides the greatest flexibility for all kinds of punching, forming and special applications, in one system.

### Automatic clamp setting and moving

FINN-POWER's patented programmable clamp setting (PCS) is a standard SG feature. It automatically positions sheet clamps via the NC program. The possibility of punching or shearing the clamps is eliminated and clamps are always optimally placed.

When part programs are changed in an automatic work queue, clamp settings change automatically.

Dead zones can be completely eliminated by using individual one clamp move while the other clamps hold the sheet. This allows 100 % utilization of the material without compromising accuracy. Better support for thin materials can be achieved with optional 4th clamp.

### Indexable upforming

The safe and natural solution for sheet metal forming is from below the sheet. Using a hydraulically actuated die holder and die movement, the common hazards caused by conventional, high forming dies – scratching of the sheet, collisions, bending of the components during punching etc. – are eliminated.

With indexing possibilities the sheet can be utilized more effectively, with reduced tooling cost, as readily available standard forming tools can be used.

With the optional upforming unit, versatile forms up to 16 mm (0.63") in height (incl. sheet thickness) can be made.

### Tapping

FINN-POWER options can be added to increase the number of work stages that Shear Genius® can perform, thus eliminating the need for separate machines and manual work stages.

A six-station servo driven tapping unit (option) can be installed for extensive threading capacity. Alternatively, a one-station unit utilizing the fast index system and accurate ram control is available.

### Part removal

Component exit up to size 500 mm x 500 mm (20" x 20") can also be arranged through a large work chute (option). For example, instead of destroying large rectangular cut-outs with a square tool, a much faster solution is to use a



slitting or shearing tool and remove the pieces through the chute. They can be slid into a small box or removed with a conveyor to a pallet.

# MORE THAN THE SUM OF ITS MODULES

FINN-POWER's new Shear Genius® is designed and built for maximum accuracy and manufacturing speed for optimum productivity.

The frame construction is extremely robust to meet the requirements of very high axis speeds and acceleration rates.

## Multi-function manufacturing solution

The combination of a 3,144 mm (123") long working area and the extremely high positioning speed allowed by rack and pinion drives means that more functions – punching, forming, tapping, bar coding, and shearing – can be performed flexibly as a single, multi-purpose work

stage and in a single setup. This means that the range of components that can be produced on one and the same equipment is truly vast.

The working area and X carriage allow punching or shearing of a full 3,000 mm (120") sheet with a single clamping. Working area for shearing is 4,144 mm (163").

A rack & pinion system actuates the X movement direct from the motor with a gear mechanism without belts. The solution allows high acceleration and speeds. To guarantee high position speed and acceleration, Y axis movement is made by double ball screw.

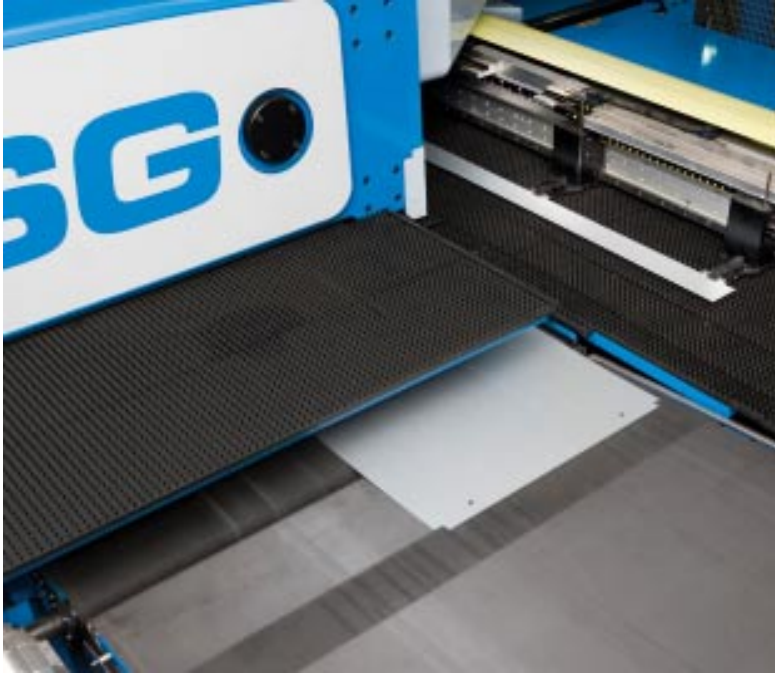


## Loading and squaring

Shear Genius® features fast, electric motor and inverter driven loading for sheets up to 200 kg (440 lbs). Double sheet checking and sheet measuring as well as squaring functions are integrated in the gripper mechanism. Squaring takes place on the machine table and can be selected on or off depending on stack quality.

FINN-POWER's design and the new up-and down clamp movement allow convenient manual loading of even small sheets. Manual unloading also takes place in the same position at the table edge.





### Outstanding, accuracy

Shear Genius® accuracy reaches new levels through a totally new actuation mechanism for X and Y movement of the coordinate table. All machines have to pass the FINN-POWER factory test before delivery.

### The intelligent right angle shear

FINN-POWER's new right angle shear is extremely fast in operation.

Programmable blade height and automatic stroke depth adjustment combine to allow shearing speed up to 110 m/min (72.16"/s). In the right angle shear, sheet holders are programmable, allowing shearing close to forms.

Blade speed is automatically selected for the maximum speed. Together with automatic shearing modes this optimizes operation speed.

The intelligent right angle shear always allows using the optimum solution for the stroke according to the part size to be made in each case, e.g.

- a single stroke for shearing a 1,000 mm x 1,500 mm (39.37" x 59.06")
- fast, multiple strokes in X direction up to maximum sheet length
- fast cut mode for shearing smaller components

Programmable, pneumatic sheet holders keep the sheet stationary during the shearing process. A sheet support mechanism ensures stability and accuracy when large components are sheared.

Blade clearance adjustment is automatic. The right angle shear can be used for 0.5...4 mm (0.02"...0.157") mild steel (aluminium up to 5 mm / 0.197") . For stainless steel max. thickness is 3 mm (0.12").

### Complete range of options

A well-known FINN-POWER strength is the wide range of optional equipment, using which a Shear Genius® can be customized to meet specific production requirements.

Only some of these options have been described in this publication. FINN-POWER sales engineers will give you detailed information on e.g.

- material storages
- loading and unloading table alternatives
- E-stations for cluster tools
- Indexable Multi-Tools®
- integrated inkjet marking
- scrap removal
- cooling solutions for high ambient temperatures
- CE safety
- Teleservice, etc.



# FEATURES FOR FLEXIBLE PRODUCTIVITY

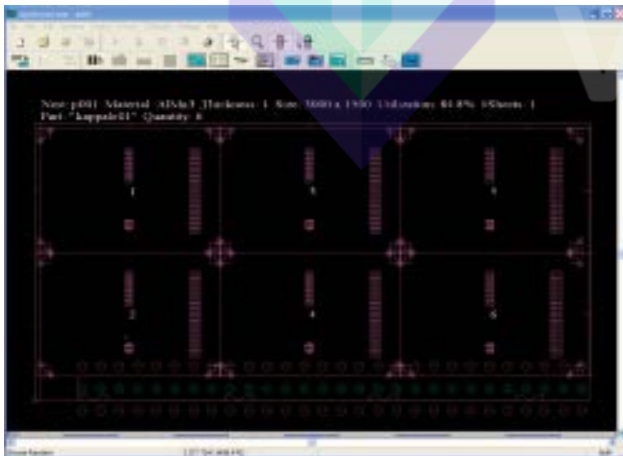
## Simple maintenance

All machine tools require maintenance. The search for compact constructions has often led to technical solutions where service points are hard to reach. Shear Genius® features fast, easy and safe access to service points, most of which are located in a single cabinet.

Shear Genius® is equipped with central lubrication system to reduce maintenance times.

## Sophisticated programming systems

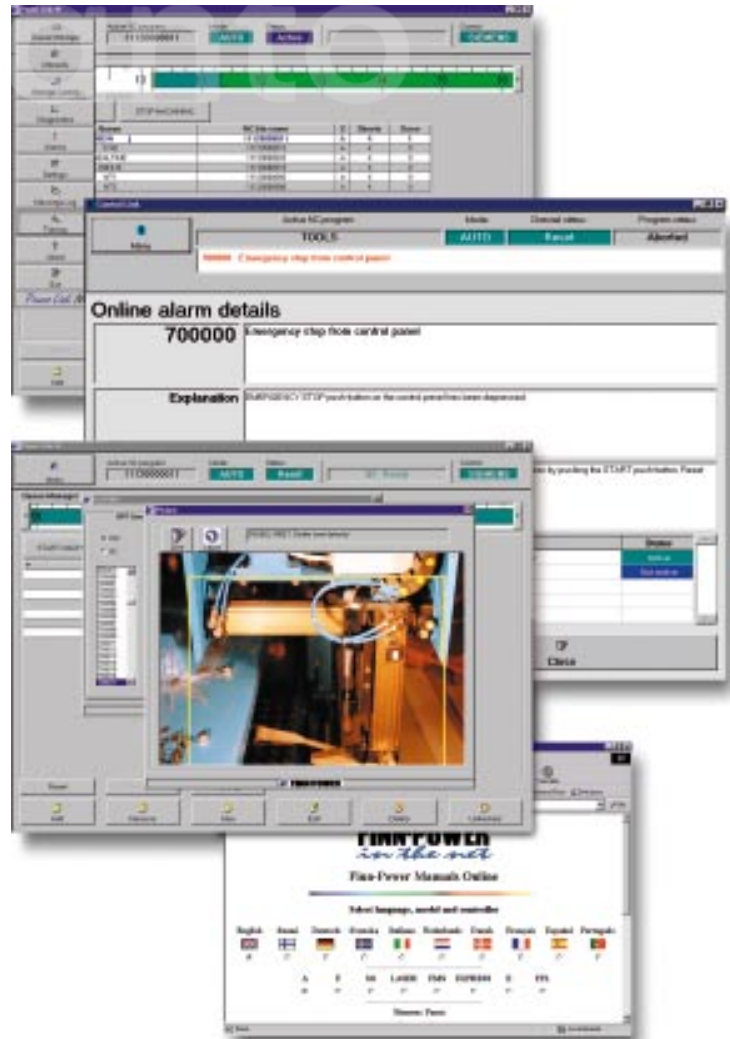
FINN-POWER's software range includes solutions up to every level, including the optional factory-wide software for production planning, control and supervision.

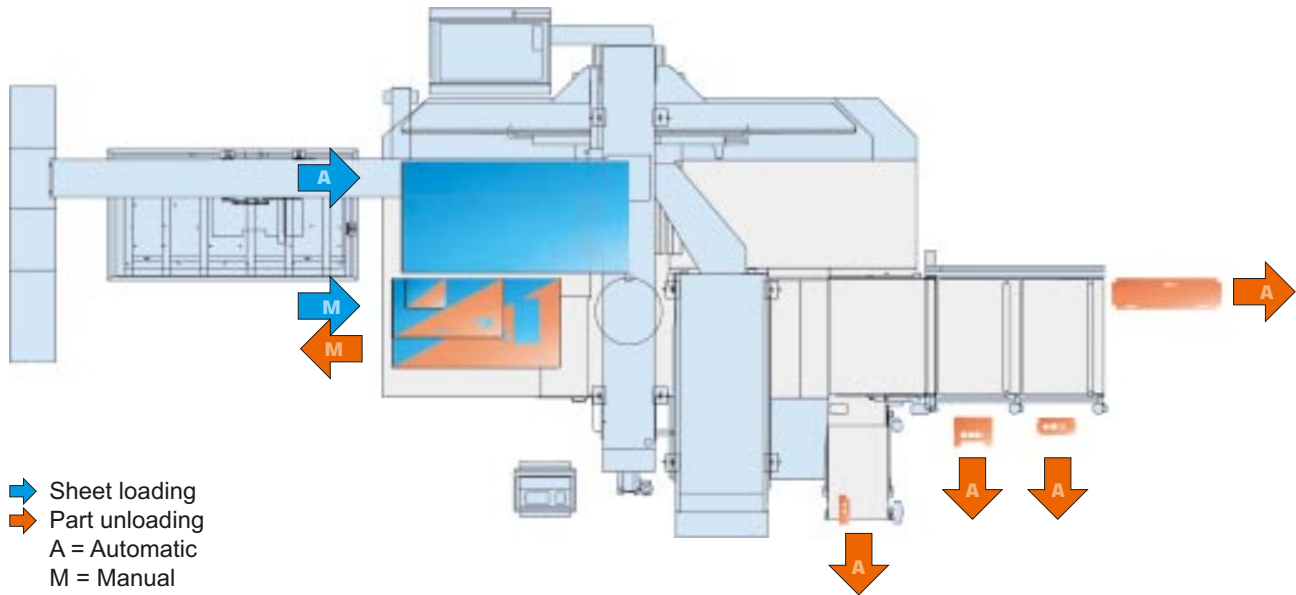


## Software for easy operation

FINN-POWER's Windows® based PowerLink cell control allows unattended running of an automatic work queues, even up to 24-hour unmanned operation.

FINN-POWER's ControlLink software is a user interface for operating all machine functions. It features user-friendly diagnostics, interactive electrical drawings, full machine manuals, spare part library, etc.





### Flexible material handling solutions – integration

The construction is compatible with the whole FINN-POWER range of optional modular material handling equipment for sorting and stacking. Thus Shear Genius® solutions can automate

- material storage with automatic feed
- loading with possibility of material change during machine operation
- component exit
- scrap removal (punching and shearing)
- sorting and stacking of components

Shear Genius® technology is optimal for integration with subsequent bending by an automatic FINN-POWER bending cell. FINN-POWER PSBB processes blank sheets into bent components on a compact line, while Night Train FMS® provides factory-wide solutions for fully automatic fabrication.



Flexibly yours®



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