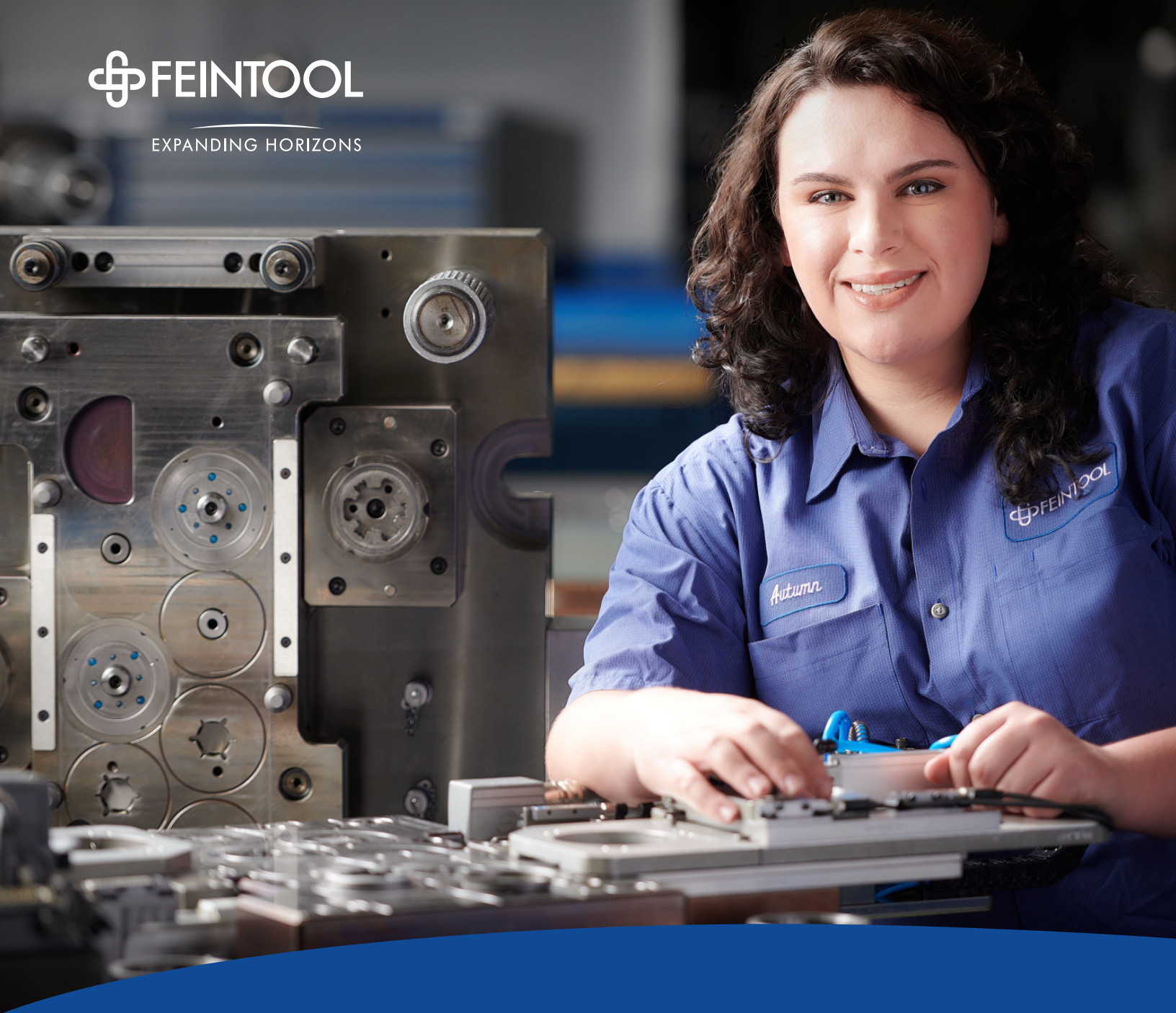




EXPANDING HORIZONS



INTERACTIVE WHITE PAPER

ACHIEVING HIGH QUALITY NET SHAPE PARTS AT LOWER COST THROUGH FINEBLANKING TECHNOLOGY

To stay competitive, manufacturers have to balance production speed, part quality, and manufacturing costs. Automotive manufacturers, in particular, are under tremendous pressure to increase volume and reduce costs—especially on high-volume and high-precision parts—which has them looking for ways to increase efficiencies without sacrificing quality.

v-ring into the stock, preventing movement away from the punch and ensuring a smooth edge.

Fineblanking provides the option of combining cutting and forming processes in progressive tools in a single press run. This ability allows cost-efficient high volume production of technically highly complex multi-functional parts.

“Modern fineblanking achieves the net shape tolerances of a machined process with the cost structure of a stamping process.”

First introduced in the 1920s in Switzerland, fineblanking produces high quality, precision parts with little-to-no secondary processing. Feintool has pioneered advances in fineblanking technology and turned it into the scalable and cost-effective production technology it is today.

Modern fineblanking achieves the net shape tolerances of a machined process with the cost structure of a stamping process.

Manufacturers that develop high-volume complex parts are taking a closer look at fineblanking because its speed and precision can reduce cycle times and produce a better product “off the line” compared to other methods, such as stamping and milling.

WHAT IS FINEBLANKING?

The fineblanking process is a hybrid way to form metal by combining stamping and cold extrusion technologies.

Here is how it works. As the tool closes, pressure embeds the impingement

ADVANTAGES OF FINEBLANKING

Fineblanking yields parts with the following characteristics:

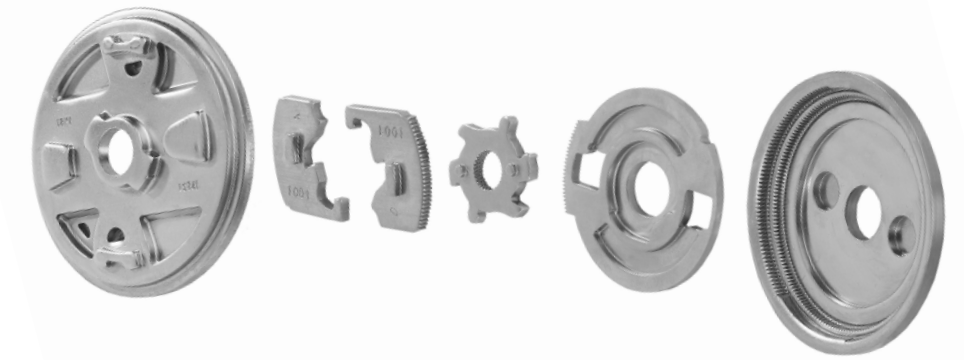
- Precise, smooth, crack- and tear-free surfaces
- Excellent flatness to 0.001/inch
- Forming and deburring (if needed) in the same process
- Tight tolerances on positional and dimensional accuracy (which can

be held to +/- 0.001 inch on parts up to ½-inch thick)

- Hardly any finishing required (net shape)
- High cost-efficiency
- Perpendicularity/edge squareness and minimal taper of the walls in top and bottom surfaces. This characteristic is essential if the walls are functional bearing surfaces or fine teeth need to engage over the full material thickness to reach required strengths.

FINEBLANKING BENEFITS

Fineblanking offers manufacturers a variety of benefits compared to other manufacturing methods, including greater cost-efficiency, better quality, and improved productivity. Specifically, manufacturers can experience:



Fineblanking is integral in producing the fine teeth and tight tolerances required for these state-of-the-art double row seat recliners. Fineblanking is used to produce 30 million of these units each year in North America.

Reduce costs by eliminating secondary operations:

Fineblanked parts come off the press with smooth edges, eliminating the need for costly shaving, milling, reaming, or grinding to eliminate diebreak. Fineblanking presses can also pierce small holes and create thin web sections while stroking the original part. This ability eliminates

the need for secondary drilling and machining operations and produces more consistent parts.

Faster cycle times:

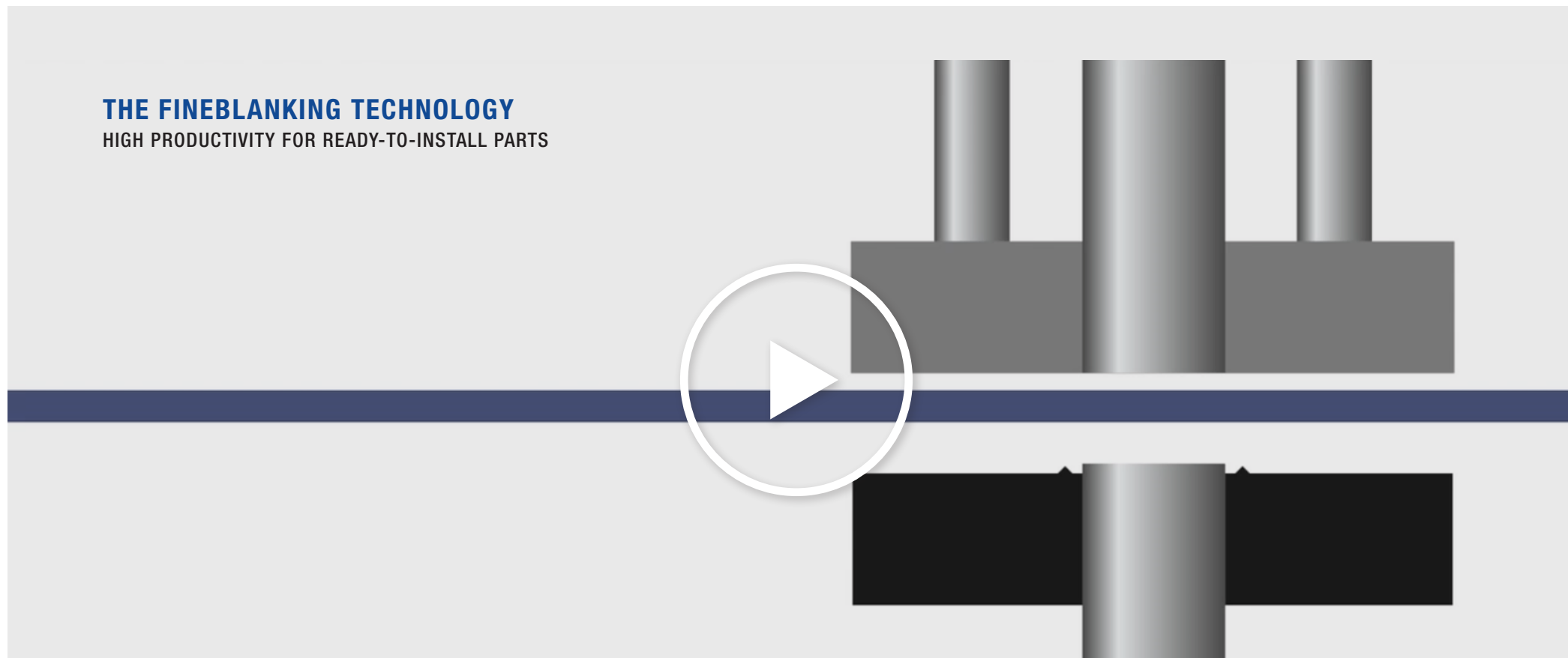
Manufacturers can add identification marks and surface imprints, coined sections, self-rivets or contact points, countersinks, counter-bores, semi-pierces, cam tracks, and other features in the same stroke that blanks a finished part. With no additional machining required, manufacturers can produce more parts faster.

Produce more consistent part runs:

In fineblanking, tool punches and die plates are straight-sided. Resharpenering of the tools never changes the part size, so clearances and tolerances remain the same on the first part to the millionth part. Fineblanking parts maintain tight accuracy across the entire production run.

Material flexibility and stronger parts:

Manufacturers can fineblank parts from a variety of materials, including carbon, alloy, stainless steel, aluminum, brass, bronze, and copper alloys,



giving them more material flexibility. Parts fineblanked using rolled stock are stronger than those produced via casting and powdered metal. Multi-cavity solutions (several parts per stroke) and smart nesting provide the most economical material usage with minimal scrap.

PRACTICAL FINEBLANKING APPLICATIONS

Fineblanking opens up virtually unlimited possibilities in parts designed for use in industrial production. This results in intelligent solutions with bends, counterbores, semi-pierces, coined recesses, perpendicular bends, and deep drawing. These sorts of high-quality components can be manufactured cost-effectively and are a significant factor in reducing part diversity and cutting assembly costs.

The automotive industry is a significant market for fineblanking, where it is

“Fineblanking parts maintain tight accuracy across the entire production run.”

used to manufacture over 200 different components for traditional vehicles. Aside from the automotive sector, fineblanking is also used for medical devices, tools, capital goods and power generation.

HOW FINEBLANKING CLUTCH PLATES HELPS AUTOMOTIVE OEMS BALANCE SPEED AND QUALITY

To meet automotive manufacturers' growing need for lightweight and ready-to-install drivetrain components, Feintool implemented a fully integrated, flexible manufacturing cell to produce clutch plates for automotive transmissions. The

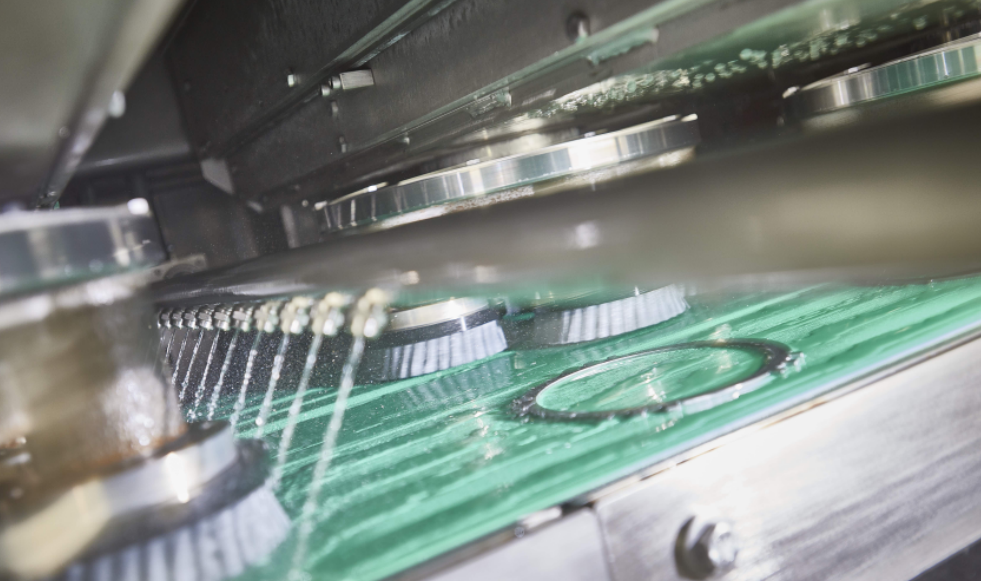
high-volume system runs from the coil to finished, ready-to-assemble products in one continuous operation.

The production system can produce high-precision clutch plates at a speed of 40 to 60 strokes, or up to 120 parts per minute. This process generates significant savings on the individual component cost compared to a regular fineblanking process, due to the increased output.

This integrated system optimizes material usage but also creates parts with perfect flatness, tighter tolerances, and repeatable Ra finish quality. The ability to go from a fineblanked clutch plate to a finished product on one continuous operation, with minimal manual labor, speeds up production and reduces component costs by 20%-40%.

CONSIDERATIONS WHEN SELECTING A FINEBLANKING PARTNER

Not every fineblanking manufacturer has



Automated mechanical deburring of a fineblanked clutch plate.

the same capabilities or expertise, and while working with the right partner can shorten lead times, enhance part quality, and reduce costs, working with the wrong partner can have the opposite effect.

When evaluating potential fineblanking partners, be sure to consider the following factors, as they can have a significant impact on your success.

Have they invested in the right tooling?

Explore whether a potential partner has made investments in the most advanced technology to ensure the highest quality parts and best value.

Do they use the latest, most advanced fineblanking presses? Are their cells vertically integrated, and do they offer automated secondary operations, such as CNC machining and double-disc grinding?

What is their manufacturing environment like?

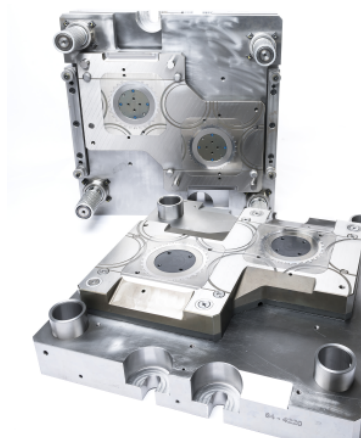
A fineblanking press can only perform to its full potential in the right environment. Evaluate any potential partner's manufacturing environment and inquire

about feeding lines, tool changing capabilities, parts and slug handling, and part finishing capabilities.

What resources do they provide beyond tooling?

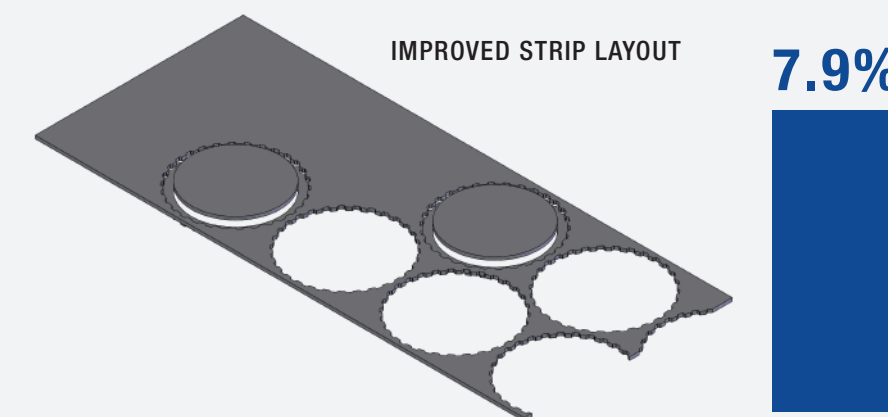
Having the right tooling is one thing, but the other resources your partner provides can have a significant impact on your time and cost savings. Evaluate your partner's capabilities beyond tooling, including design, engineering, simulation, prototyping, part production, and quality management.

“The cost of fineblanking is more economical today than ever before. On average, fineblanking becomes cost-effective at an annual output of about 30,000 parts.”



Latest generation 8800-ton fineblanking press running two-out clutch plates with up to 60 strokes per minute.

IMPROVED STRIP LAYOUT DELIVERS 7.9% MATERIAL SAVINGS.



A WORLD OF POSSIBILITIES



2
SEATING MECHANISM
Toothplate



3
TRANSMISSION PROPULSION
*Parking Pawl
12mm thick*
[▶ PLAY VIDEO](#)



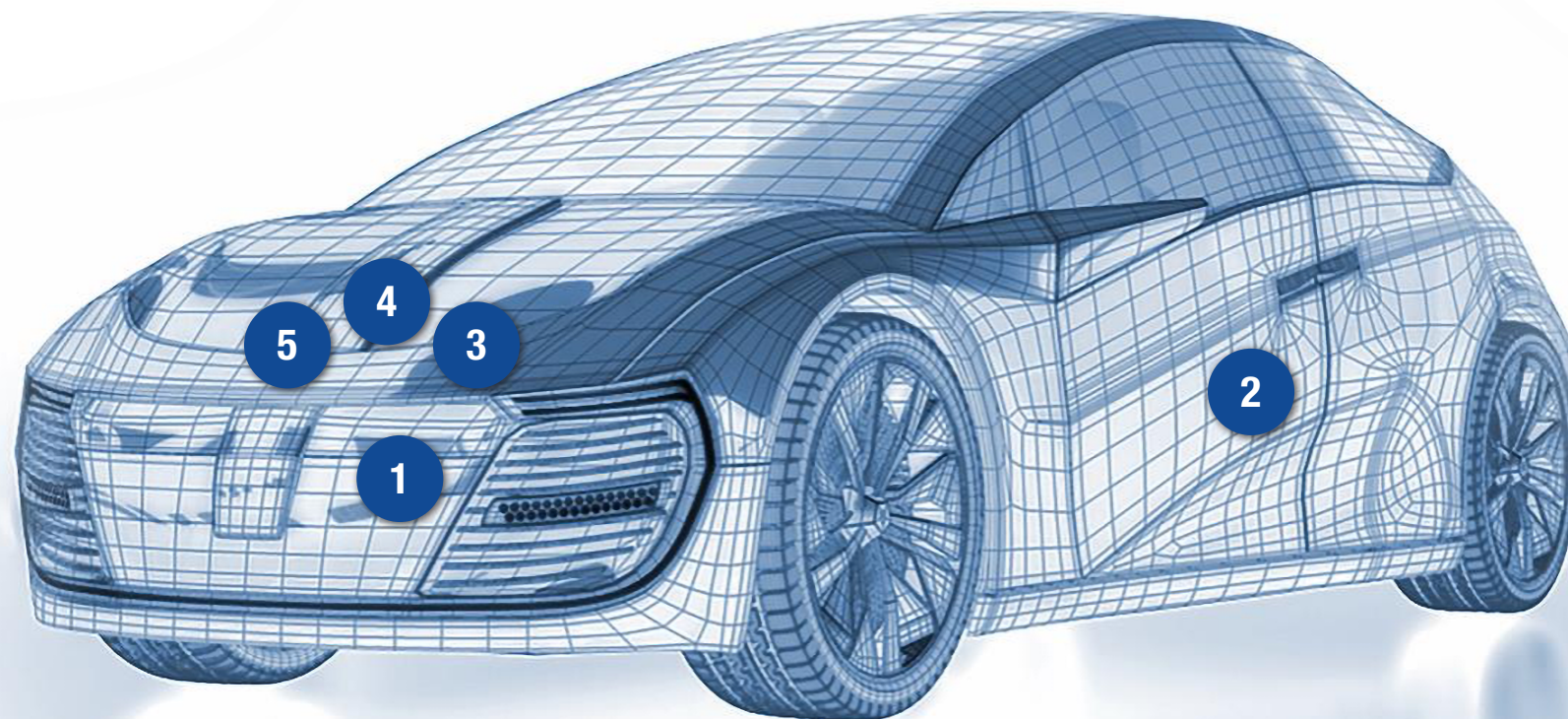
1
ELECTRIC DRIVE
Endplate Ring



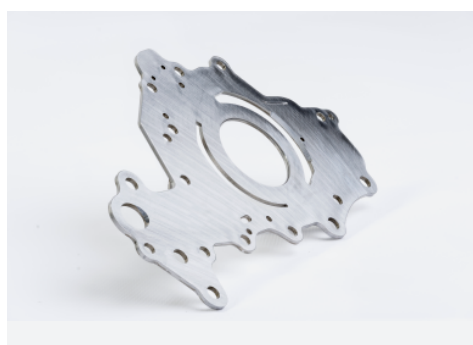
2
SEATING ADJUSTER
Toothplate



2
SEATING MECHANISM
*Seat Recliner –
Guide Plate*
[▶ PLAY VIDEO](#)



4
THERMAL HEAT EXCHANGER
Heat Exchanger Header



2
SEATING MECHANISM
Seat Recliner – Pawl
[▶ PLAY VIDEO](#)



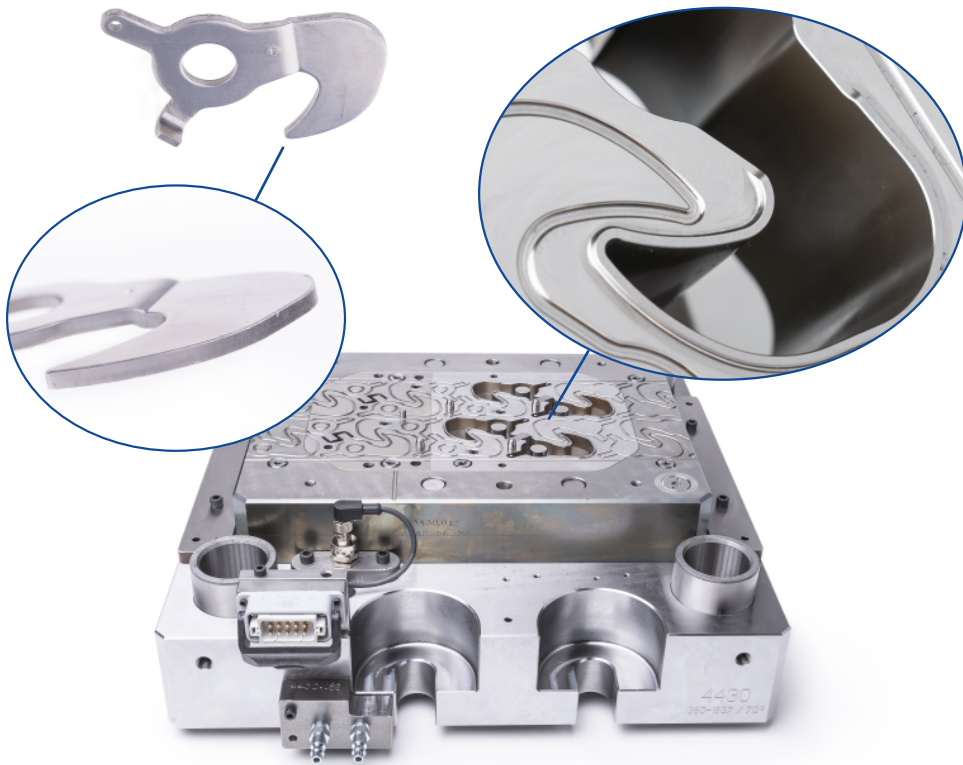
5
ENGINE VARIABLE VALVE TIMING
WT Sealing Cover



2
SEATING HEIGHT ADJUSTER
Height Adjuster and Strip



3
TRANSMISSION PROPULSION
Clutch Plates
[▶ PLAY VIDEO](#)



TOP RIGHT: High-speed CNC hard-milling v-ring (stinger) in “function critical” areas achieve a fineblanked finish and minimize die roll. Hard-milled cutting edge preparation shown in an M4 powder metal steel 62-64 HRC die insert.

TOP LEFT: Fineblanked “latch” with 100% fineblanked finish in a “function critical” area.

BOTTOM: Lower half of a 4-out progressive latch fineblanking tool used to manufacture a seating application.

What technical expertise do they bring to the table?

How well does your manufacturer know your business, and do they have a strong track record of producing parts for your market? Evaluate any potential partner’s research and development efforts to understand how knowledgeable they are about your industry, press technology, tool material and coating technology, production materials, and lubricants. All of these factors will have an impact on cost and quality.

CONCLUSION

Manufacturers are looking for ways to reduce production times and costs while still keeping quality high. Fineblanking delivers the speed of conventional stamping and the accuracy of a machining process, but with increased quality and lower costs. With advances in tooling and technology, fineblanking is an ideal solution for companies that have ambitious targets for the series production of complex parts.

THE PEOPLE OF FEINTOOL

