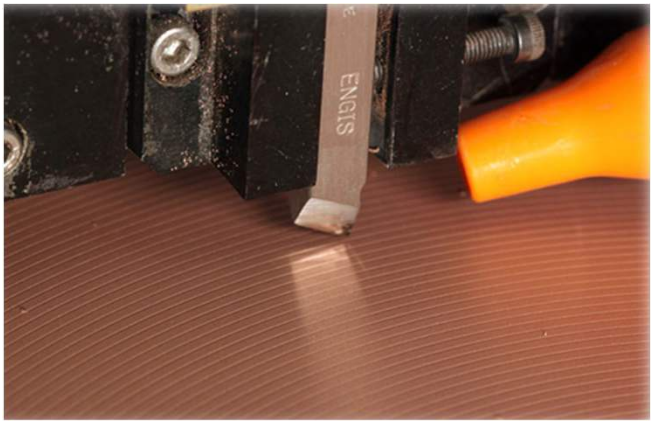
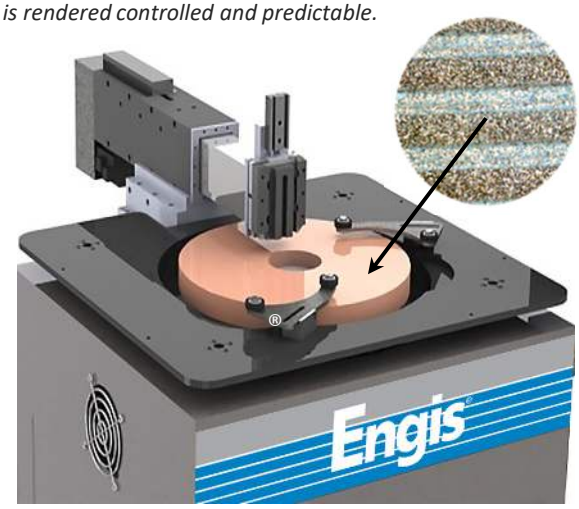
HYPREZ®
Engis Lapping & Polishing

FASTLAP™ LAPPING PLATE FACING DEVICE



By incorporating a single point turning tool, as opposed to conditioning rings or similar tools which require operator skill in their accurate positioning, the overall lapping environment is rendered controlled and predictable.



Your Key to Ultra Precision Lapping & Polishing

Maintaining the flatness of your lapping plate is critical to a stable process. Generally, this is achieved through the use of diamond plated conditioning rings and requires a high level of operator experience and skill. To reduce this challenge, Engis has engineered a solution that helps take the 'black art' out of lapping; the ***FastLap Facing Device***.

Using a diamond tool bit, this innovative Facing Device removes the top layer of the plate, flat to within microns, when reconditioning is necessary. Then a groove pattern is machined in a second pass. When the Device is not in use, it retracts out of the work zone.

The Facing Device, in combination with the pneumatic pressure heads of the FastLap machine, establishes a process that consistently achieves:

- *Accurate plate conditioning*
- *Controlled surface geometry and texture*
- *Fast, predictable stock removal*

With predictable plate surface topography, groove pattern and controlled velocity and pressure, the entire lapping process becomes easier to manage and your results are more repeatable. Also, this unit is operator-friendly and eliminates the strain of lifting conditioning rings onto the plate.

Standard Features:

- FastLap machines with Facing Device are available either as simple facers with micro-grooving capability or as fully programmable servo drive units for deep grooving after facing.
- The Facing Device control is integrated with the machine control.
- Machines are available in eight plate sizes: 15", 20", 24", 28", 36", 42", 48", 60"

A common method used to predict material removal rate is Preston's Equation which states the material removal rate is proportional to the load on the work piece and the velocity of the lapping plate.

R = K * P * V, where:

R = rate of material to be removed
P = the force per unit area (pressure/area)
V = velocity of the lap plate relative to the component
Preston's coefficient K allows for process specifics

As demonstrated in the equation, if the Force (cylinder pressure), Unit Contact Area (bearing area) and Velocity (plate speed) can be accurately controlled, material removal rate becomes predictable and consistent.

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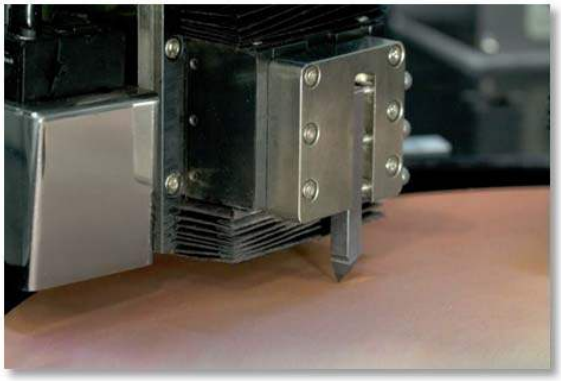
Having Problems with Variable Lapping Rates?

Control Plate Flatness and Texture

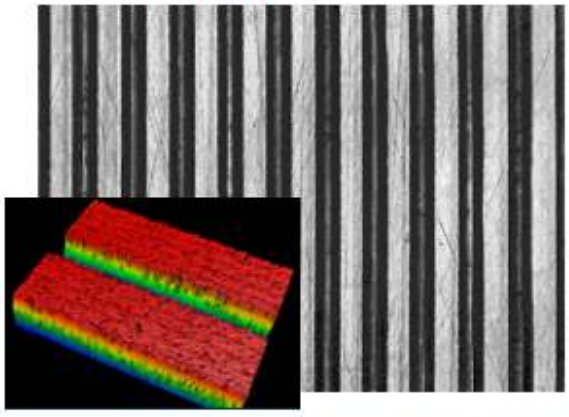
The lapping plate is a key component of any lapping system and is often overlooked as an important variable.

- The shape of the lapping plate influences the geometry of the parts being processed and contributes to achievable surface finish and lapping rates. *Plate flatness is key to part flatness.*
- Lapping plates provide support in applying abrasive to the surface of the work piece in fixed, semi-fixed or free lapping modes. *Predictable, repeatable plate texture is vital to abrasive action.*
- Controlling the groove pattern (macro texture) and lands (micro texture) of the plate surface allows for greater consistency in removal rates and surface finishes. *A consistent bearing ratio means consistent unit load.*



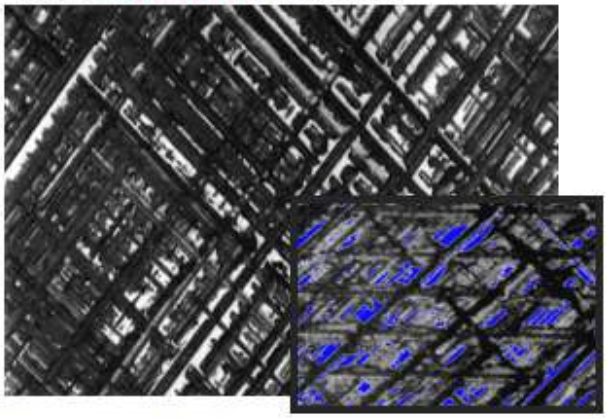
Using a programmable facing/grooving unit, integrated with the FastLap control system, a consistent, controllable bearing ratio is generated.

Result: CONSISTENT Lap Rate



Using conditioning rings and abrasives, a random, uncontrolled texture results in an unpredictable bearing ratio.

Result: INCONSISTENT Lap Rate



COLORED HIGHLIGHTS REPRESENT PLATE BEARING AREA

SMART MANUFACTING BEGINS WITH SMART PROCESSES

THE HYPREZ INDUSTRIAL MARKETS LAB CAN WORK SIDE-BY-SIDE WITH YOU TO DEVELOP NEW PRODUCTS AND PROCESSES THAT:

• IMPROVE PART QUALITY • REDUCE CYCLE TIMES • REDUCE THE NUMBER OF FINISHING STEPS • LOWER FINISHING COSTS

Engis

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