

ELECTROMILL® DIAMOND HYBRID TOOL



ElectroMill® - Producing High-Quality Flat Milled Surfaces



## ElectroMill® Diamond Milling Tool

Replace wearable, indexable tungsten carbide or PCD milling cutters in high volume production finishing applications.

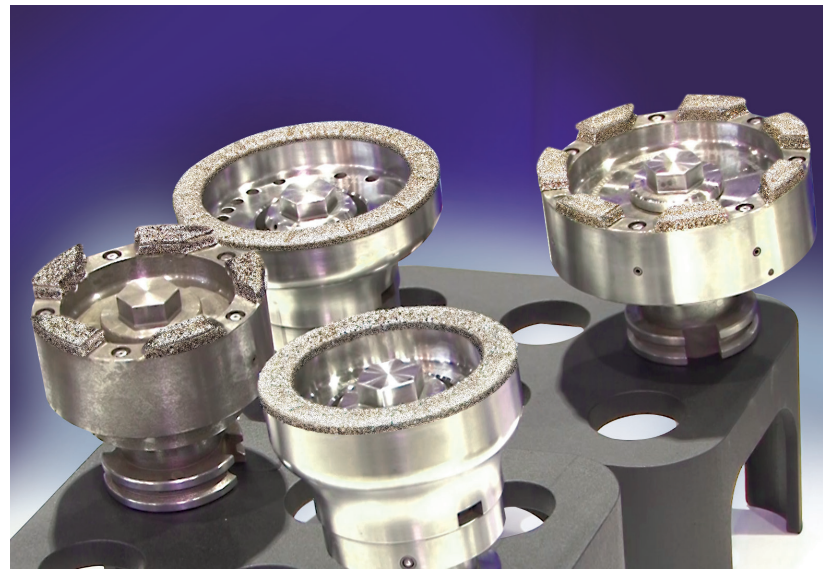
- High strength alloys
- Stainless steel
- Ceramics
- Cast iron
- Fiberglass
- Composite materials
- Aluminum Composites
- Powdered metals

The flat machining of bi-metal surfaces or milling applications involving an interrupted cut can present daunting challenges to PCD or carbide milling cutters.

The inserts may chip during the milling process, resulting in high machining costs and elevated levels of sub-standard or rejected parts.

The Engis ElectroMill is designed to produce high quality, flat milled surfaces, even if an interrupted cut is present or multiple materials need to be machined simultaneously.

The ElectroMill, combined with high pressure coolant, can machine these materials to an extremely accurate value of flatness with very low tooling costs. In some cases, customers have been able to reduce scrap and reworks significantly; this contributes to increased productivity and an improved bottom line.



## Industry's 1st Modular Grinding Tool Standardized for CNC Use

Coolant filters in CNC machines are typically built to capture large size chips produced during a regular machining process as compared to a grinding process. By simply having a filter which can capture up to 10 $\mu$ , chips and broken grit powder can be captured.



Use on any system with high pressure coolant and 10,000+ RPM

## ElectroMill Features & Benefits:

- Achieves high surface finishes and flatness in one step without grinding
- Reduce manufacturing time and cost through fewer operations, setups, inspections and outplant operations.
- Coolant flow rate optimized for system pump capacity
- High stock removal rates
- Low heat buildup
- Exceptional tool life at a lower cost
- Adaptable to all tool holders

Markets
Automotive transmission and powertrain
Gasoline engine and engine parts manufacturing
Other engine equipment manufacturing
Precision turned product manufacturing
Oil and gas field machinery and equipment manufacturing
Air and gas compressor manufacturing
Special die and tool, die set, jig and fixture manufacturing
Industrial mold manufacturing
Mechanical power transmission equipment manufacturing
Fluid power pump and motor manufacturing
Speed changer, drives and gear manufacturing

Target Applications
Iron and steel castings
Hydraulic Blocks
Housings
Steel bars, bar shapes, and plate
Forgings
Engine Blocks (Bi-metal)
Manifolds
Ceramic Substrates
HVOF Materials
Steel Bodies

Material	Depth of Cut (mm) Range	Feed Rate (mm/min)	Minimum Speed (m/s)	Stock Mtl Removal Rate (mm <sup>3</sup> /min)	Finish (Ra)
65-45-12 Nodular Iron	0.0254 - 0.254	1905 - 5175	22.86	8193 - 49161	15Ra - 80Ra
Grey Cast Iron	0.127 - 0.254	1270 - 5175	22.86	2458 - 49161	4Ra - 25Ra
Powdered Metal	0.0254 - 0.508	1270 - 5175	17.78	2458 - 49161	15Ra - 80Ra
Bi-Metal (Cast Iron/Aluminum)	0.0254 - 0.254	889 - 2540	22.86	8193 - 57354	15Ra - 80Ra
4140	0.00254 - 0.0508	1905 - 5175	33.02	819.3 - 40967	18Ra - 35Ra
Stainless Steel	0.00254 - 0.0127	1905 - 3810	33.02	819.3 - 8193	8Ra - 35 Ra

Grit Size Finish Range			
Grit	Target	Finish (short chipping materials)	Finish (long chipping materials)
20/30	Higher Stock Removal	40Ra-50Ra	50Ra-60Ra
40/50	General Purpose	25Ra-35Ra	35Ra-45Ra
60/80	For Best Finish	8Ra-16Ra	25Ra-35Ra

Size and Holder Availability			
Diameter	Through Spindle Coolant	Style	Finish (long chipping materials)
76.2mm (3")	Centered Nozzles	Cat BT HSK	40 30, 40 63
101.6mm (4")	Centered Nozzles Cutting Face Nozzles	Cat BT HSK	40, 50 30, 40, 50 63
127mm (5")	Centered Nozzles Cutting Face Nozzles	Cat BT HSK	40, 50 40, 50 63, 100
152.4mm (6")	Centered Nozzles Cutting Face Nozzles	Cat BT HSK	40, 50 40, 50 63, 100
203.2mm (8")	Centered Nozzles Cutting Face Nozzles	Cat BT HSK	50 50 100
254mm (10")	Centered Nozzles Cutting Face Nozzles	Cat BT HSK	50 50 100

Target	Formula
SMRR (Stock Material Removal Rate)	Feed Rate (mm/min) x Width of Cut (mm) x Depth of Cut (mm)
(RPM) Spindle Speed	Speed (m/s) / Diameter (m) / 0.05

## CASE STUDY #1

PART:	Engine Block
MATERIAL:	Aluminum Block, Cast Iron Cylinder Liner
WHEEL:	254mm (10") Diameter, HSK Tool Holder/Finishing Mill
GRIT:	40/50 Diamond
RPM	6000
FEED RATE:	1789.6 mm/min
COOLANT:	Water Soluble 2413 kPa
GRIT:	2.54mm (0.010") Per Pass
RPM / SFPM	40 Ra, Flatness .0002



## CASE STUDY #2

PART:	Hydraulic Valve Body
MATERIAL:	Ductile Iron (65-45-12)
WHEEL:	101.6mm (4") Diameter, Cat 40 Tool Holder
GRIT:	20/30 Diamond
RPM	5,000
FEED RATE:	5175 mm/min
COOLANT:	Water Soluble 6895 kPa
GRIT:	0.2413mm (0.0095") Per Pass
RPM / SFPM	30 Ra, Flatness .0005



## CASE STUDY #3

PART:	Transmission Covers, Clutch Covers
MATERIAL:	Grey Iron
WHEEL:	76.2mm (3") Diameter, Cat 40 Tool Holder
GRIT:	50/60 Diamond
RPM	10,000
FEED RATE:	1270 mm/min
COOLANT:	Water Soluble 689 kPa
GRIT:	0.0762mm (0.003") Per Pass
RPM / SFPM	32 Ra, Flatness .0005



*Significant advances in part quality, as well as cost savings, have been realized with the use of the ElectroMill in the final machining of cast iron hydraulic valve bodies and aluminum engine blocks fitted with cast iron cylinder inserts.*



*World Leader in Superabrasive Finishing Systems*

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 MANAGEMENT SYSTEM

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