



INTERNATIONAL TOOL MACHINES

ADVANTAGE THROUGH KNOWLEDGE – VOLUME 58, V.2

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Your First Choice for High Precision & High Production Grinding

We value our customers at ITM and are constantly looking for ways to serve you better. We have found that many of our customers are inquiring about additional CNC machines. That is why I am writing you today.

We believe that we have a solution to your manufacturing problems. ITM is actively producing machines and want to offer our existing customers the first opportunity to select from the machines that are in our current production pipelines. The current production includes the Universal Flute Grinders (UFG-25), O.D. Peel Grinders (PPG-500), and AFS-8-200 Filtration Systems. ITM uses an effective staff with aggressive focus on productivity, cost and precision, to design and manufacture machines within a short time. Future machine pipelines include the Rotary Transfer Grinders (RTG) and Universal Flute/Gunnose Grinders (UFGG).

ITM's key to success is the accumulated grinding knowledge that has been gained by ITM personnel from diversified exposure to a large number of industry markets. Along with this expertise our machine development and design process are accomplished under temperature controlled facility and utilizing nano-precision laser interferometry systems. We set out to build machines that would take advantage of the latest in software technologies, reliable GE FANUC controls and expandable networking capabilities. These technologies allow users to operate our machines 24 hours a day, seven days a week, with minimal attendance.

I'll contact you shortly to discuss your production, parts or service needs. In the meantime, should you have any further questions or feedback, please contact us by email at info@itmfl.com or call us at (386) 446-0500. Its been a pleasure serving you in the past and we look forward to meeting your needs in the future.

Sincerely,



▷ Service Department

▷ Mechanical Engineers

▷ Electrical Engineers

▷ Parts Department

▷ Sales & Marketing

▷ Logistics

▷ Some of ITM's High Precision & High Production Machines

Sold to a large tool manufacturer!



In Pipeline!



In Stock!



Advanced 5µ Filtration



PEEL GRINDER, PPG

ROTARY TRANSFER, RTG

UNIVERSAL FLUTE, UFG

AFS-8-200, FILTRATION

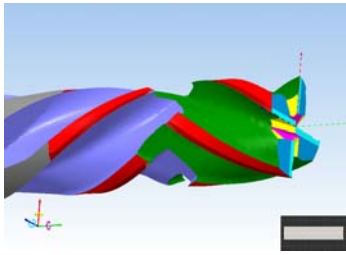
HSS, CARBIDE & STAINLESS
BLANKS GROUND TO
HIGH TOLERANCE

COMPLETE PRODUCTION
OF TOOLS & PARTS IN
UP TO 6 STATIONS

FLUTE GRINDING WITH
CONVENTIONAL OR
SUPERABRASIVE WHEELS

INTEGRATED SLUDGE DRYER
TO RECYCLE AND
PROLONG OIL USAGE

ITM holds over 30 patented machine designs.



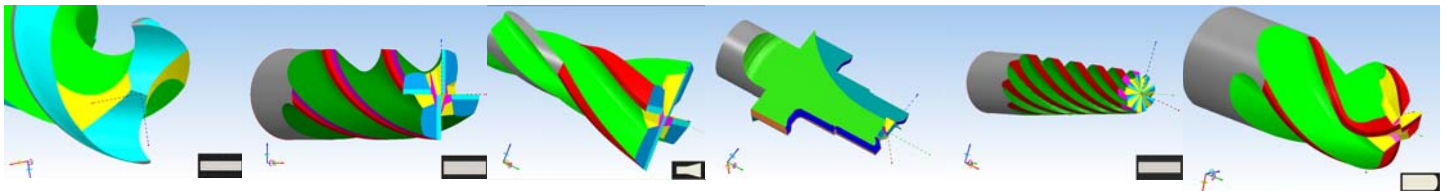
➤ ITM Virtual Tool Generator (VTG)

ITM “Virtual Tool Generator (VTG)” for Peel Grind and Rotary Transfer Grinder simulates the grinding of drills, endmills and form tools. The grinding process is presented in 3D graphic display. High level numeric models are the driving engine to precisely construct the most complex tools.

The operator is free to zoom and to view the finest detail of the tool and verify the simulated tool geometry before and after grinding. The new ITM virtual tool generator shows material removal and calculates the grind process cycle time automatically.

ITM’s VTG provides collision control as an option for the 3D simulation that quickly captures kinematics problems and prevents unnecessary machine crashes. The calculation time required for a multiple step drill with profile steps takes less than 2 seconds. The resolution of the simulation can be individually set and the machine-specific elements such as 3D touch probes, dynamic balancing heads, high pressure coolant manifolds, precision supports can be incorporated into the 3D simulation. The ITM VTG looks ahead for potential collisions of individual machine parts with each other and warns the operator. ITM provides a free simulator that generates 2D and 3D without material removal.

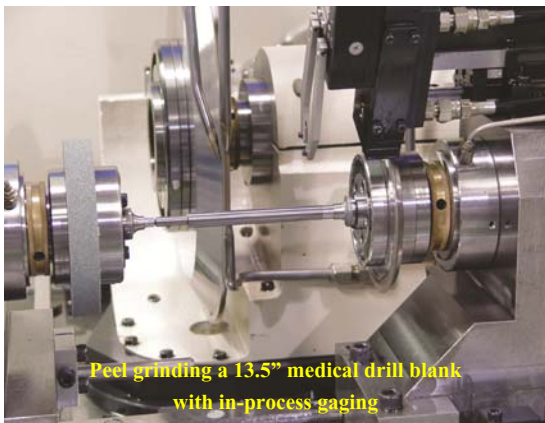
Some examples of 3D virtual generator includes:



➤ Technical Brief: High Speed Peel Grinding

High speed peel grinding represents the latest development in grinding technology. The concept behind peel grinding finds its roots in CNC turning centers. Turning centers are extremely powerful due to their flexibility. CNC turning center can produce a variety of tool geometry through the use of multi-axis interpolation. Grinding machines have been unable to simulate this turning concept due to the limitations of standard grinding wheels. Standard wheels are not suitable for the higher cutting speeds involved in peel grinding and would wear too quickly to maintain single line of contact between wheel and workpiece. However, advancements in wheel technology have brought the peel grinding concept to reality.

In peel grinding, a superabrasive wheel (CBN) or Diamond Wheel that is relatively narrow in width (3mm – 6mm) is arranged perpendicular to the workpiece. The line of contact between the wheel and workpiece is kept to a minimum. The small contact area reduces the cutting forces generated during grinding thus reducing deflection and heat generation. This in turn increases grinding accuracy and allows for higher cutting speeds (up to 23,600 sfm) without causing surface damage to the workpiece. The higher cutting speeds utilize the full potential of the superabrasive wheels and allow for high traverse rates. The creation of simple, as well as complex geometry is accomplished through interpolation of the machine axes. Listed below are the primary benefits realized through the use of peel grinding:



Increased Productivity: Peel grinding utilizes higher feed rates and high traverse rates to produce cycle times that are consistent with the needs of today’s tool producers. In addition, a peel grinder uses multi-axis interpolation to create tool geometry, a changeover to a new tool simply requires the new program to be retrieved on the control rather than a complete wheel change as would be needed with a plunge grinder. Superabrasive wheels have a longer lifecycle and require less dressing as compared to standard wheels used on plunge grinders. All of these factors result in a machine process that is more productive.

Increased Flexibility: Peel grinding utilizes the full potential of the machine through multi-axis interpolation. Production of workpieces with complex geometry often requires a piece to be ground in several steps on different machines. For example, plunge grinding on one machine, form grinding of tapers on another

machine, thread grinding on a third machine, etc. A peel grinder however would be capable of producing all of this geometry in a single setup. Not only is this process more flexible, it also ensures higher accuracy because the part was produced in one machine.

Reduced Cost: The advantages illustrated above ultimately result in a machine that produces parts at a lower cost.

- For more information about our products and services contact ITM at (386) 446-0500 or visit our website at www.itmfl.com -

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ITM Series Rotary Transfer Grinder (RTG) For Complete Drill Production

Tool	Flute	Flute / Clearance Separate Operation	Flute / Clearance Simult. Operation	Max. 3 Clamping Stations	Max. 6 Clamping Stations
Diameter	Length	Grinding [sec]	Grinding [sec]	Pieces per hour	[Seconds / Tool]
1/16" \cong 1.5mm	0.875" \cong 22.0mm	10.5	8	320 [11.25 sec.]	378 [09.52 sec.]
5/64" \cong 2.0mm	1.000" \cong 25.4mm	11.5	9	300 [12.00 sec.]	342 [10.52 sec.]
3/32" \cong 2.4mm	1.250" \cong 31.7mm	12	9.5	288 [12.50 sec.]	327 [11.01 sec.]
7/64" \cong 2.8mm	1.500" \cong 38.1mm	15	11	260 [13.84 sec.]	288 [12.50 sec.]
1/8" \cong 3.2mm	1.625" \cong 41.3mm	16	12	240 [15.00 sec.]	266 [13.53 sec.]
5/32" \cong 4.0mm	2.000" \cong 50.8mm	18	13	225 [16.00 sec.]	248 [14.51 sec.]
3/16" \cong 4.8mm	2.313" \cong 58.8mm	19	14	212 [16.98 sec.]	232 [15.51 sec.]
1/4" \cong 6.3mm	2.750" \cong 69.9mm	24	17	180 [20.00 sec.]	194 [18.55 sec.]
1/2" \cong 12.7mm	4.500" \cong 114 mm	37.5	26	124 [29.03 sec.]	130 [27.69 sec.]
5/8" \cong 15.8mm	5.1875" \cong 132 mm	43	31	105 [34.28 sec.]	110 [32.72 sec.]

The production rates are calculated based on simultaneous operation of Flute and Clearance Grinding and include 3 seconds indexing time for the 3 Collet Machine and 1.5 seconds indexing time for the 6 Collet Machine (equipped with the option of 3 additional Clamping Stations). The time for point grinding equals or is less than the time for Flute and Clearance grinding when grinding standard points and therefore does not increase the total production time. Cycle Times for Drills with different point configurations or Carbide Drills may vary from above figures.

ITM Series Precision Peel Grinder (PPG) For Step Drill / Multiple OD Peel Grinding

TOOL Type	Largest O.D.	Smallest O.D.	No. of Steps	Length	Cycle Time
Step Drill	9.7mm	5.0mm	4	40.4mm	55 sec
Step Drill	12.7mm	6.5mm	4	40.6mm	55 sec
Step Drill	12.7mm	4.7mm	6	80.5mm	1 min 25 sec
Step Drill	12.7mm	3.2mm	13	80.0mm	1 min 45 sec
Step Drill	22.2mm	6.4mm	9	55.1mm	1 min 45 sec
Step Drill	22.2mm	4.8mm	12	84.0mm	1 min 55 sec
Step Drill	30.5mm	6.5mm	14	88.9mm	2 min 45 sec
Step Drill	28.6mm	6.4mm	12	57.7mm	3 min 10 sec
Step Drill	32.5mm	6.5mm	15	78.8mm	3 min 25 sec
Step Drill	34.9mm	6.35mm	16	73.2mm	3 min 35 sec

ITM Series Universal Flute Grinder (UFG) For Taps/Flute Grinding

Straight Flutes	# Flutes	Form	# Passes	Flute length	Cycle time
M5	2	Gunnose	1	33mm	29 sec
5/16" (7.9mm)	3	Standard	1	38mm	39 sec
M8	3	Gunnose	1	40mm	53 sec
3/8" (9.5mm)	3	Gunnose	2	40mm	57 sec
5/8" (15.8mm)	3	Gunnose	2	45mm	1min, 33 sec
M16	3	Gunnose	2	45mm	1min, 33 sec
Spiral Flutes	# Flutes	Form	# Passes	Flute length	Cycle time
M 2*	3	38°	1	13mm	29 sec w/o load
M 8	3	38°	1	30mm	40 sec
7/16" (11.1mm)	3	10° left	3	38mm	63 sec
M 12	3	52°	3	50mm	48 sec
M 12	4	15°	3	35mm	57 sec
M 20	4	40°	3	50mm	1min, 59 sec

Cycle times achieved during various Grinding Tests. The times include the time for loading and dressing.

ITM Series Universal Flute & Gunnose Grinder (UFGG) For Fluting (Tests Performed @ Jarvis Tools)

Diameter	No. of flutes and form	Flute length	Passes per flute	No. of pieces	Cycle time
5/16" male center	3 straight flutes & Gunnose	38mm Gunnose 10mm	1	24	39 seconds
7/16" male center	3 spiral flutes 10° left hand	44mm	3	25	58 seconds
7/16" female center	3 spiral flutes 10° left hand	44mm	3	10	58 seconds

For grinding the straight fluted Tap two wheels were mounted on one flange, one for flute grinding one for Gunnose grinding. The built-in CNC dresser was used for dressing the required forms on each wheel. Dressing was done after each part during the loading cycle. The wheel shapes were dressed according to the limited information provided by Jarvis. To achieve the exact flute profile the complete flute geometry has to be provided to the machine operator.

Some of our references, we have over 400 machines in service worldwide



<u>COMPANY</u>	<u>COUNTRY</u>	<u>COMPANY</u>	<u>COUNTRY</u>
ALLIED MACHINE & ENG.	U.S.A.	SUTTON TOOLS	Australia
AMERICAN SAW (Now Lenox)	U.S.A.	INT'L MINICUT	Canada
AMERICAN TOOL, NE	U.S.A.	SHANGHAI CUTTING	China
AMERICAN TOOL, WI (Now Sandvik)	U.S.A.	CESKA ZBROJOVKA	Czech Republic
BALAX	U.S.A.	CLOU	Denmark
BORG WARNER DIVISION (Ithaca, NY)	U.S.A.	JANIN	France
CJ Winter	U.S.A.	BOSCH	France
DEPUY	U.S.A.	MAGAFOR	France
DORMER TOOLS (Now Sandvik)		BALTRUSCH U. MUETSCH	Germany
G.K.N.	U.S.A.	AUGUST BECK	Germany
GREENLEE TOOL	U.S.A.	BDS MASCHINEN	Germany
GUHRING	U.S.A.	BUDERUS	Germany
IMPLANT INNOVATIONS (Now Biomet3i)	U.S.A.	EUGEN DUERR	Germany
ITW	U.S.A.	FETTE	Germany
J.I. MORRIS	U.S.A.	GIESS U. QUANZ	Germany
JASCO TOOLS INC	U.S.A.	IFA	Germany
JORE CORPORATION	U.S.A.	LEITZ	Germany
KENNAMETAL, GA	U.S.A.	LINIG	Germany
KENNAMETAL, MA	U.S.A.	PROTOTYP (Now Sandvik)	Germany
KENNAMETAL, NC (Asheboro)	U.S.A.	RUKO	Germany
KENNAMETAL, NC (Weldon)	U.S.A.	SMAT	Germany
MAGNA DRIVETRAIN	U.S.A.	TITEX PLUS	Germany
MAGNA POWERTRAIN (MSM Ontario Canada)		WALTER GRINDER (ITM built machines under the name "Helimat")	Germany
MAGNA SUNGEAR (MSM New York)	U.S.A.	WALTER TUE	Germany
MASTERCUT TOOL CORP	U.S.A.	TITEX	India
NG INSTRUMENTS	U.S.A.	ROTHENBERGER	Ireland
NIAGARA	U.S.A.	SILMAX	Italy
ONSRUD	U.S.A.	DORMER TOOLS S.P.A.	Italy
OTHY INC	U.S.A.	F.I.U.M.	Italy
PFAUTER MAAG	U.S.A.	MASTER TOOLS S.P.A.	Italy
QUINCO	U.S.A.	VERGNANO	Italy
REED RICO (Now Precision Tool Group, PTG)	U.S.A.	OSG	Japan
ROBERT BOSCH TOOL CORP.	U.S.A.	NACHI	Japan
S.G.S.	U.S.A.	HITACHI	Japan
SOLAR TURBINES	U.S.A.	Y.G. 1 TOOL CO. LTD.	Korea
SOSSNER	U.S.A.	CABRE S.A.	Spain
TIVOLY INC	U.S.A.	IZAR	Spain
TRUMPF	U.S.A.	DORMER TOOLS AB	Sweden
TRW, OH	U.S.A.	WEBA	Switzerland
TRW, TN	U.S.A.	CHARPILLOZ SA	Switzerland
VIKING DRILL & TOOL	U.S.A.	HO HONG TOOL	Taiwan
UNION BUTTERFIELD	U.S.A.	HWA FENG	Taiwan
VERMONT AMERICAN	U.S.A.	SU'S PRECISION	Taiwan
VITRAMON	U.S.A.	MAKINA TAKIM	Turkey
WALTER, VA	U.S.A.	CLARKSON OSBORN	United Kingdom
WELDON (Now Talbot Holding Group)	U.S.A.	DORMER TOOLS HOLBROOK	United Kingdom
WILSON TOOL	U.S.A.	DORMER TOOLS WORKSOP	United Kingdom

