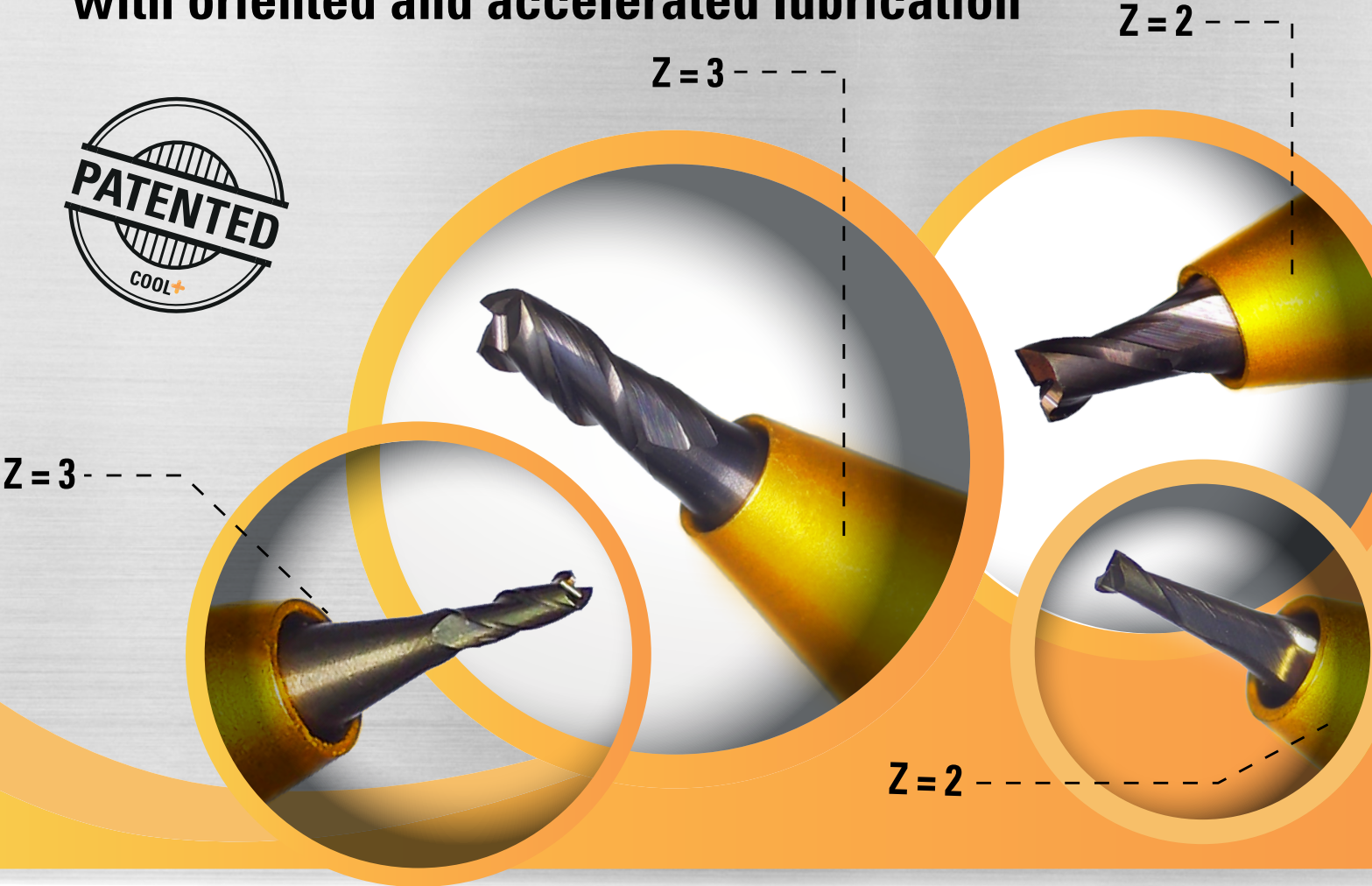


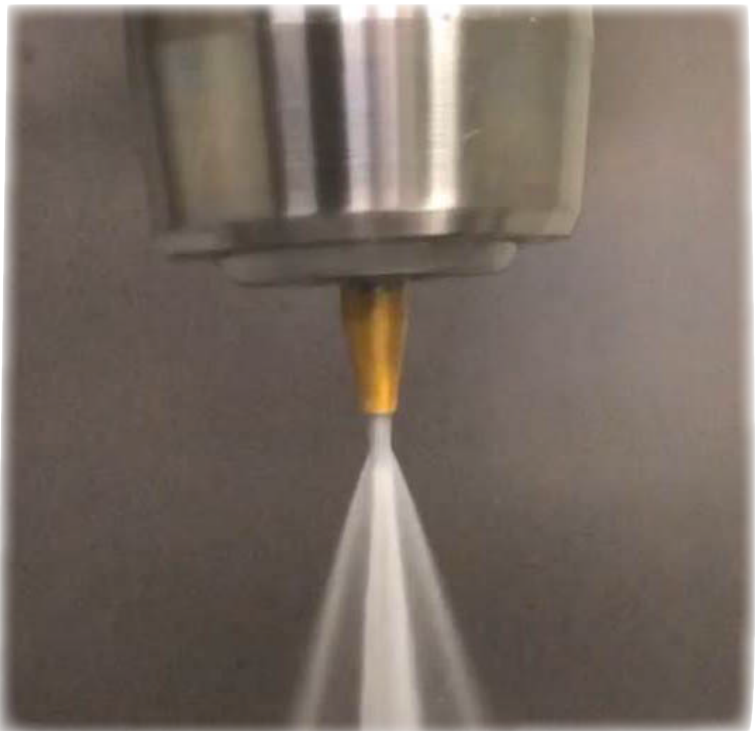
## End mills and micro end mills with oriented and accelerated lubrication



DIXI Polytool SA presents its innovative **DIXI COOL+®** concept for its high performance end mills and micro end mills.

This product series, with its pending patent, offers an oriented lubrication ring brings the lubricant nearest to the cutting zone and to accelerates its speed.

The products are available from Ø0.30 to Ø10.00mm  
with 2 teeth – DIXI 7442 COOL+  
with 3 teeth – DIXI 7443 COOL+



## DIXI COOL+® CONCEPT, THE LUBRICANT IS ORIENTED AND ACCELERATED !

### Thank to the DIXI COOL+® concept :

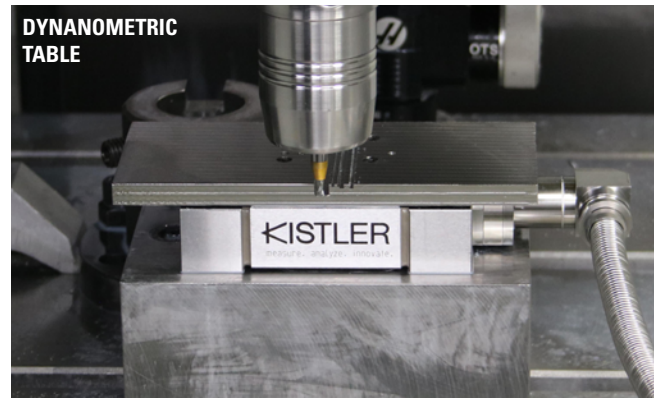
- The cutting forces on the tool are reduced between 20-50%.
- The temperature in the working zone is strongly reduced.
- Easy chip evacuation.

### This lubrication concept allows to increase :

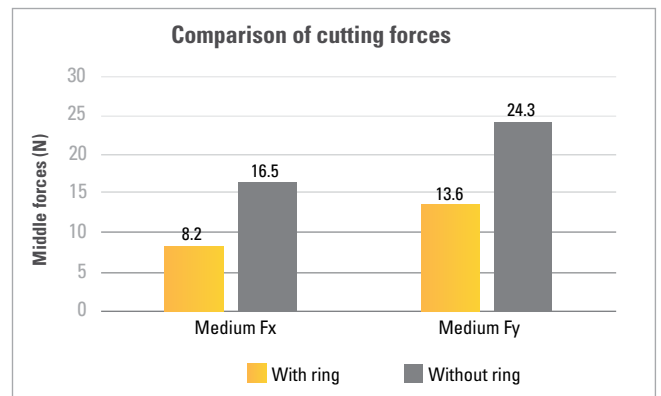
- $ap$  et  $ae$ .
- Cutting speed  $V_c$  and feed rate  $V_f$ .

During roughing, the chip volume is multiplied by 2 in comparison to traditional end mills.

The difficult to machine material as titanium, stainless steel, super alloys are machined efficiently.



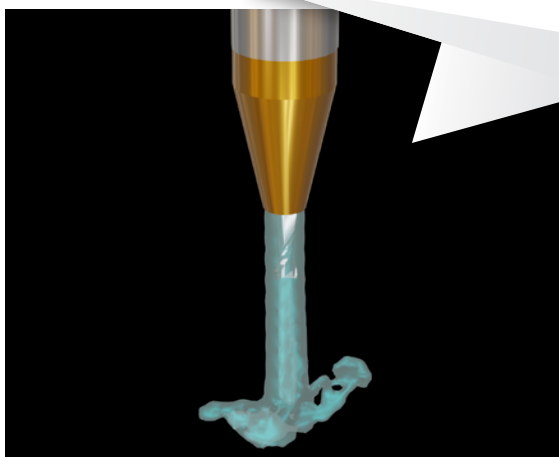
### TEST Ø1 - 1.4441 STAINLESS STEEL



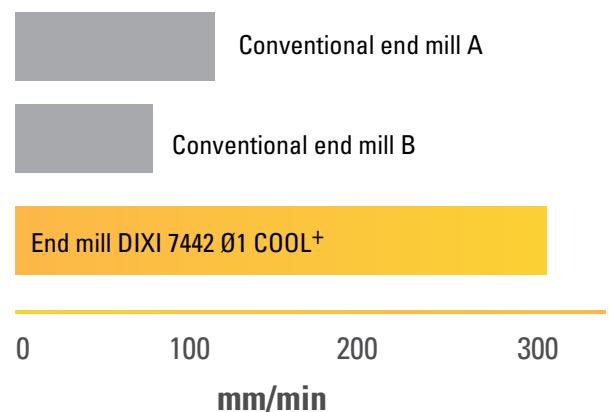
## CUTTING PERFORMANCE

Tests of maximal  $V_{f_{max}}$  in slotting for a Ø1 Z=2 DIXI 7442 COOL+ end mill

2 OR 3 TIMES QUICKER THAN CONVENTIONAL END MILL



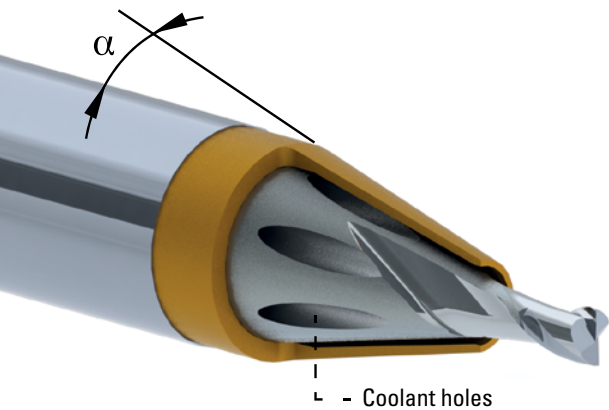
### Maximal $V_{f_{max}}$



Test realized in 1.4441 in stainless steel  
Rotation 15'000 rpm (cutting speed 50 m/min)  
 $ap$  and  $ae$  = 1 mm  
High pressure pump, 60 bars - 7% emulsion  
3 axis machining center

## DIXI COOL+® CONCEPT, THE LUBRICANT IS ORIENTED AND ACCELERATED !

THE INNOVATION COMBINES 3 CHARACTERISTICS UNIQUE TO DIXI COOL+® CONCEPT

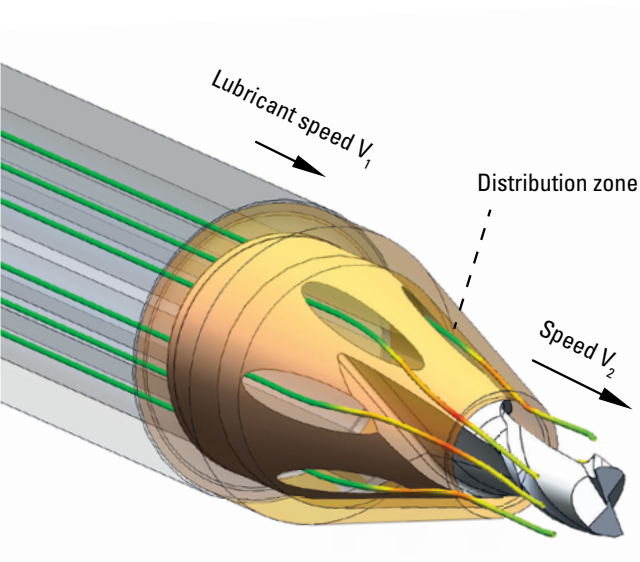


### 1 LUBRICANT IS ORIENTED

The lubricant crosses the tool in 2 steps :

- Through the multiple coolant holes integrated in the body of tool.
- Through the division zone of lubricant distribution between the directional ring and the tool.

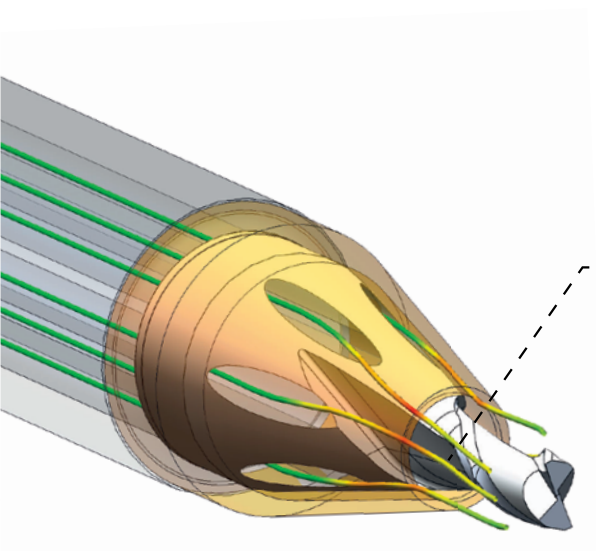
The  $\alpha$  angle of the cone orients the lubricant closest to the cutting zone end restrains inertia effect at the tip of the tool even with high rotation.



### 2 LUBRICANT IS ACCELERATED, ACCORDING TO VENTURI EFFECT - FLUID DYNAMICS

Under constant rate of flow, the exit speed  $V_2$  of the lubricant is increased due to the difference of section between the 6 exiting cooling holes and the circular exit ring.

In order to guarantee this  $V_2 > V_1$  speed increase, the entering surface of the lubricant is always larger than the one of the exiting circular ring.



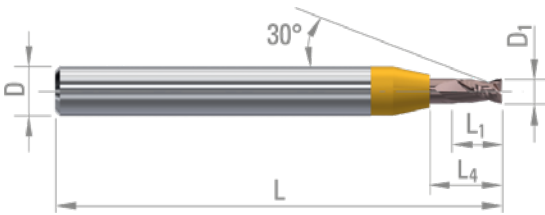
### 3 THE LUBRICANT REACHES THE CUTTING FACES

Part of the lubricant is guided in the flutes of the tool on the cutting faces.

# DIXI 7442 COOL+®

Z = 2

END MILLS, REINFORCED SHANK  
WITH ACCELERATED LUBRICATION



D<sub>1</sub> L<sub>1</sub> L<sub>4</sub> D<sub>hs</sub> L CARBIDE C-TOP

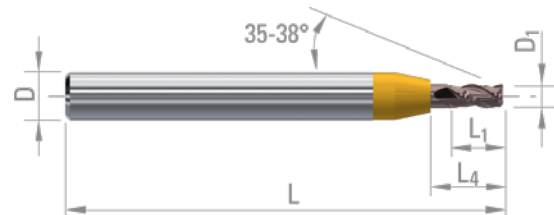
Ø ≤ 2.00 - 0/-0.01  
Ø < 6.00 - 0/-0.02

0.3	0.45	2.10	4	38	381928	381944
0.4	0.60	2.10	4	38	381929	381945
0.5	0.80	2.10	4	38	381930	381946
0.6	0.90	2.90	4	38	381931	381947
0.7	1.10	3.00	4	38	381932	381948
0.8	1.20	3.00	4	38	381933	381949
0.9	1.40	3.00	4	38	381934	381950
1.0	1.50	3.00	4	38	381935	381951
1.1	1.70	3.00	4	38	381936	381953
1.2	1.80	4.10	4	38	381937	381954
1.3	2.00	3.90	4	38	381938	381955
1.4	2.10	3.80	4	38	381939	381956
1.5	2.30	3.90	4	38	381940	381957
1.6	2.40	4.50	6	55	383393	384649
1.7	2.60	3.90	6	55	384641	384650
1.8	2.70	3.90	6	55	384642	384651
1.9	2.90	5.20	6	55	384644	384653
2.0	3.00	5.10	6	55	384645	384654
2.5	3.80	5.00	6	55	384646	384655
3.0	4.50	6.60	6	55	383394	384656
4.0	6.00	8.80	8	64	384648	384657
5.0	7.50	10.60	8	64	383396	384658

# DIXI 7443 COOL+®

Z = 3

END MILLS, REINFORCED SHANK  
WITH ACCELERATED LUBRICATION



D<sub>1</sub> L<sub>1</sub> L<sub>4</sub> D<sub>hs</sub> L CARBIDE C-TOP

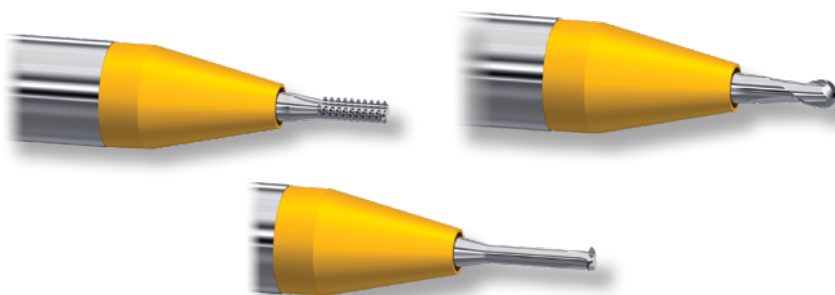
Ø ≤ 2.00 - 0/-0.01  
Ø < 6.00 - 0/-0.02  
Ø ≥ 6.00 - E8

0.3	0.70	1.80	4	38	388775	388797
0.4	0.90	1.90	4	38	388776	388798
0.5	1.10	2.80	4	38	388777	388799
0.6	1.40	2.80	4	38	388778	388800
0.7	1.60	2.90	4	38	388779	388801
0.8	1.80	3.00	4	38	388780	388802
0.9	2.00	3.00	4	38	388781	388803
1.0	2.20	3.10	4	38	388782	388804
1.1	2.40	3.20	4	38	388783	388805
1.2	2.60	4.30	4	38	388784	388806
1.3	2.80	4.40	4	38	388785	388807
1.4	3.00	4.50	4	38	388786	388808
1.5	3.20	4.50	4	38	388787	388809
1.6	3.40	5.20	6	55	388788	388810
1.7	3.60	5.20	6	55	388789	388811
1.8	3.80	5.30	6	55	388790	388812
1.9	4.00	6.70	6	55	388791	388813
2.0	4.30	6.70	6	55	388792	388814
2.5	5.30	7.10	6	55	388793	388815
3.0	6.30	9.20	6	55	388794	388816
4.0	8.30	12.00	8	55	425015	413887
			8	64	388795	388817
5.0	10.30	15.10	8	55	425016	413888
			8	64	388796	388818
6.00	13.00	16.90	8	60	423532	423535
8.00	18.00	21.90	10	70	423533	423536
10.00	22.00	26.90	12	79	423534	423537

## DIXI COOL+®, ONE CONCEPT, SEVERAL POSSIBILITIES

The DIXI COOL+® concept is not limited to z=2 end mills.  
The working part of the tool can be designed according  
to a ball nose end mill, a thread mill, a whirling tool or a reamer.

Below some examples of DIXI COOL+ designed tools.



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