

////CYCLON X

# CYCLON X

*Next-generation cutting tools  
with internal coolant*



////TOOL  
Collection

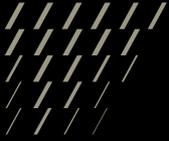
**LB** LOUIS BELET®  
Swiss Cutting tools

# /// CYCLON X

*Your expertise meets  
new challenges*



/// Ref. 336H  
Cyclon X Pilot Drill



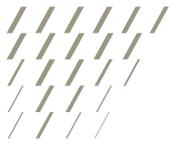
## **FASTER, FURTHER**

*//// In the demanding world of high-precision machining, some follow the trends... while others set them. Cyclon X customers from Louis Bélet are among the pioneers.*

Whether you're an experienced engineer, a passionate technician, or an ambitious shop manager, you are not looking for just another tool: you demand performance, reliability, and complete control over your process. You work in aerospace, medical, watchmaking or any sector where precision and process stability are non-negotiable. You don't settle for compromises or approximations. When you choose a tool, it's because you know every detail has been considered, every geo-

metry optimized, every carbide grade rigorously selected. With the Cyclon X range, you push machining speeds to the limit while maintaining perfect surface quality, extended tool life, and process stability. You value versatility as much as ultra-specialization: drilling, milling, and facing - even in the toughest stainless steels - are no challenge for you. You drive the creation of exceptional components. And with Cyclon X, you'll go further than ever.





# MORE PRODUCTIVITY... WITHOUT COMPROMISING QUALITY

*//// In your shop, there's no room for approximation.  
Each day brings three major challenges:*

Short tool life, pressure on productivity, processes instability. Every machine stop is costly. A prematurely worn tool slows down production. The slightest variation can jeopardize your part quality. And when machining demanding materials – stainless steel, titanium, nickel alloys – your tools are under extreme stress.

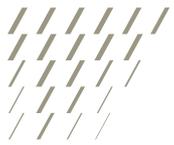
But you're not looking for excuses.

**You want concrete, reliable, and long-lasting solutions.**

*//// Ref. 117H  
Cyclon X T-Slot*



**//// CYCLON X**



# LOUIS BÉLET, YOUR MICRO-MACHINING PARTNER

*//// For decades, Louis Bélet has been a benchmark in developing cutting tools for high-precision microtechnology.*

Our commitment is built on two essential pillars: Consistent, uncompromising quality and a close attention to the needs of our most demanding customers.

We don't just manufacture tools. We design custom-made solutions built to your production realities.

Our strength lies in a strong synergy between our R&D department - our innovation engine - and our manufacturing facility, renowned for its expertise and state-of-the-art equipment.



*//// Ref. 336H  
Pilot drill*

**//// CYCLON X**



ULTRAVIOLET BEAM  
LASER LIGHTBEAM

ID No. AA017714

LASER 2  
L-9992.2  
1.2 mW (max) 650 nm, 635 nm, 670 nm  
Safety Class II  
ENTREPRENEUR, INC., BOSTON, MA

# ////CYCLON X

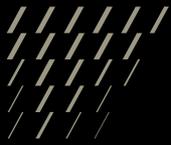


//// Ref. 336H  
Cyclon X Pilot Drill

//// Ref. 376H-10  
Cyclon X Drill

//// Ref. 1620H  
Cyclon X End mill

//// Ref. 1520H  
Cyclon X End mill



# CYCLON X, THE HIGH-PRESSURE SOLUTION BY BÉLET

*//// To overcome machining challenges, Louis Bélet SA has developed innovative solutions, starting with optimization of coolant channels, a strategic lever for improving tool life, machining quality and cutting speeds.*

We designed specific channel geometries for each type of tool to ensure effective, controlled, and perfectly tailored lubrication.

- **Drills:** Internal channels optimized to deliver coolant directly to the cutting zone, even in deep drilling — drastically reducing heat and wear.
- **End Mills:** Precisely positioned channels ensure optimal heat evacuation, even at high speeds.

- **T-Slot Cutters:** Custom designs enable coolant delivery to hard-to-reach areas, ensuring consistent cutting across the entire periphery.

- **Engraving Tools:** Maximum coolant preserves a sharp edge, minimizes burrs and ensures superior surface finish.

Each Cyclon X tool features an internal coolant solution engineered for real-world challenges, rigorously tested and validated by our most demanding customers.

### ***Compression Chamber***

Reduces pressure loss in the coolant flow.

### ***Carbide***

New micro-grain carbide, specifically developed for stainless steels.



### ***Coolant Channels***

Increased surface area and optimized shape, tripling the flow rate compared to conventional drills.

### ***Cutting Edges***

Innovative edge preparation for improved durability and optimal coating adhesion.

# CYCLON X

## **Coating**

High-performance TISI PRO coating - reducing friction and built-up edge.



## **Coolant Specs**

Coolant viscosity  $\leq 15 \text{ mm}^2/\text{s}$  at  $40^\circ\text{C}$

Filtration 0.01 mm to 0.02 mm

Pressure: 50 to 100 bar

//// Ref. 376H-10  
Cyclon X Drill

////CYCLON X

///CYCLON X

Hervé Koechler  
Creator of Cyclon X





# A 100% BÉLET TOOL, BORN FROM THE FIELD EXPERIENCE AND EXPERTISE

//// « *The development of this tool was driven by specific industrial needs: **improving final part quality and accelerating manufacturing processes.***

Few suppliers offer high-performance drills for micro-drilling complex materials. Louis Bélet rose to the challenge by providing specific dimensions. Mastering the entire production process is in our DNA.

The main challenge? Mastering cutting edge radii. A feature that's invisible to the naked eye, yet crucial for quality machining. This drill stands out for its adaptability to every situation. We offer custom dimensions tailored to highly specific client requirements. And the results speak for themselves: Superior surface finish ; reduced cycle times ; enhanced process stability.

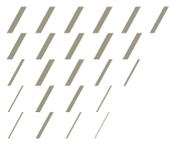
This project emerged from the synergy of expertise in coating technologies, metrology, and materials science. This multidisciplinary approach

allowed us to explore, adapt, and fully integrate new technologies into our tools. Initial feedback was enthusiastic. Significant improvement in productivity and tool life quickly led to widespread adoption.

What's next? The demand for custom dimensions will grow. Parts are becoming more complex. Tools must keep up, and we'll be there to meet the need.

Our pride? Everything was developed 100% in-house. We integrated advanced technologies into our cutting tools while maintaining our quality standards. This drill is the result of our know-how and commitment. Now it's your turn to discover its full potential».





## TRY IT AND EXPERIENCE THE DIFFERENCE!

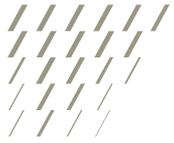
*//// Cyclon X tools have been developed, tested, and validated under real-world conditions at our partners' sites - in environments as demanding as yours.*

When it comes to tool life, stability, and productivity, the results have not only been convincing but sometimes spectacular:

significantly longer tool life, fewer machine stops, more stable and predictable processes, fewer burrs and more consistent surface finishes.

Shorter production cycles, fewer interventions, greater efficiency!

**Integrate Cyclon X and let it change the game.**



# MASTER THE ENTIRE CYCLON X CHAIN

*//// Fully adopt Cyclon X by developing your in-house expertise. Cutting speeds, feed per tooth, coolant pressure, oil viscosity, filtration level...*

As a close partner, Louis Bélet SA provides you with all the recommended machining values and strategies. This support helps you avoid usage issues and drives your continuous improvement efforts.

Everything is in place for a successful integration of Louis Bélet's high-pressure solution: Cyclon X.



*//// Ref. 337-2H*



 CYCLON X

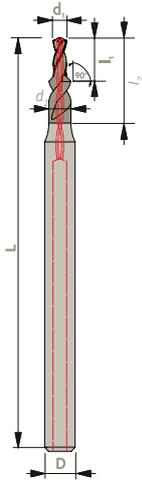


////CYCLON X



336H

# EXPERT Pilot drill for stainless steel with internal coolant



Ø drill	f [mm/rotation]	Vc [m/min]
Ø 0.70-Ø 1.00	0.012-0.030	70-90
Ø 1.00-Ø 1.50	0.020-0.045	70-90
Ø 1.50-Ø 2.00	0.030-0.060	70-90
Ø 2.00-Ø 3.00	0.040-0.090	70-90

Tolerances  $d_1: +0.002/+0.004$   $l_1: +0.1/0$   
 $D: h5$

Oil pressure in bar: **minimum 50 bar**  
 Oil viscosity: **less than 15 mm<sup>2</sup>/s at 40°C**  
 Filtration level: **maximum 0.02 mm**

**137°**

**Z2**

**CARB**

Art. n°	d <sub>1</sub>	l <sub>1</sub>	d <sub>2</sub>	l <sub>2</sub>	D	L	Art. n°	d <sub>1</sub>	l <sub>1</sub>	d <sub>2</sub>	l <sub>2</sub>	D	L
336Hd0.80BW	0.80	2.00	1.50	4.9	3	50	336Hd1.10BW	1.10	2.75	2.20	6.5	4	50
336Hd0.81BW	0.81	2.03	1.50	4.9	3	50	336Hd1.11BW	1.11	2.78	2.20	6.6	4	50
336Hd0.82BW	0.82	2.05	1.50	5.0	3	50	336Hd1.12BW	1.12	2.80	2.20	6.7	4	50
336Hd0.83BW	0.83	2.08	1.50	5.1	3	50	336Hd1.13BW	1.13	2.83	2.20	6.7	4	50
336Hd0.84BW	0.84	2.10	1.50	5.1	3	50	336Hd1.14BW	1.14	2.85	2.20	6.8	4	50
336Hd0.85BW	0.85	2.13	1.50	5.2	3	50	336Hd1.15BW	1.15	2.88	2.20	6.8	4	50
336Hd0.86BW	0.86	2.15	1.60	5.2	3	50	336Hd1.16BW	1.16	2.90	2.30	6.9	4	50
336Hd0.87BW	0.87	2.18	1.60	5.3	3	50	336Hd1.17BW	1.17	2.93	2.30	6.9	4	50
336Hd0.88BW	0.88	2.20	1.60	5.3	3	50	336Hd1.18BW	1.18	2.95	2.30	7.0	4	50
336Hd0.89BW	0.89	2.23	1.60	5.4	3	50	336Hd1.19BW	1.19	2.98	2.30	7.0	4	50
336Hd0.90BW	0.90	2.25	1.60	5.4	3	50	336Hd1.20BW	1.20	3.00	2.30	7.1	4	50
336Hd0.91BW	0.91	2.28	1.65	5.5	3	50	336Hd1.21BW	1.21	3.03	2.30	7.1	4	50
336Hd0.92BW	0.92	2.30	1.70	5.6	3	50	336Hd1.22BW	1.22	3.05	2.30	7.2	4	50
336Hd0.93BW	0.93	2.33	1.75	5.6	3	50	336Hd1.23BW	1.23	3.08	2.30	7.3	4	50
336Hd0.94BW	0.94	2.35	1.80	5.7	3	50	336Hd1.24BW	1.24	3.10	2.30	7.3	4	50
336Hd0.95BW	0.95	2.38	1.85	5.7	3	50	336Hd1.25BW	1.25	3.13	2.30	7.4	4	50
336Hd0.96BW	0.96	2.40	1.90	5.8	3	50	336Hd1.26BW	1.26	3.15	2.30	7.4	4	50
336Hd0.97BW	0.97	2.43	1.95	5.8	3	50	336Hd1.27BW	1.27	3.18	2.30	7.5	4	50
336Hd0.98BW	0.98	2.45	2.00	5.9	3	50	336Hd1.28BW	1.28	3.20	2.30	7.5	4	50
336Hd0.99BW	0.99	2.48	2.00	6.0	3	50	336Hd1.29BW	1.29	3.23	2.40	7.6	4	55
336Hd1.00BW	1.00	2.50	2.00	6.0	3	50	336Hd1.30BW	1.30	3.25	2.40	7.6	4	55
336Hd1.01BW	1.01	2.53	2.05	6.1	3	50	336Hd1.31BW	1.31	3.28	2.40	7.7	4	55
336Hd1.02BW	1.02	2.55	2.10	6.1	3	50	336Hd1.32BW	1.32	3.30	2.40	7.7	4	55
336Hd1.03BW	1.03	2.58	2.15	6.2	3	50	336Hd1.33BW	1.33	3.33	2.40	7.8	4	55
336Hd1.04BW	1.04	2.60	2.20	6.2	3	50	336Hd1.34BW	1.34	3.35	2.40	7.8	4	55
336Hd1.05BW	1.05	2.63	2.20	6.3	3	50	336Hd1.35BW	1.35	3.38	2.40	7.9	4	55
336Hd1.06BW	1.06	2.65	2.20	6.3	3	50	336Hd1.36BW	1.36	3.40	2.40	7.9	4	55
336Hd1.07BW	1.07	2.68	2.20	6.4	3	50	336Hd1.37BW	1.37	3.43	2.40	8.0	4	55
336Hd1.08BW	1.08	2.70	2.20	6.4	3	50	336Hd1.38BW	1.38	3.45	2.40	8.0	4	55
336Hd1.09BW	1.09	2.73	2.20	6.5	3	50	336Hd1.39BW	1.39	3.48	2.40	8.1	4	55



# EXPERT Pilot drill for stainless steel with internal coolant

336H



Art. n°	d <sub>1</sub>	l <sub>1</sub>	d <sub>2</sub>	l <sub>2</sub>	D	L
336Hd1.40BW	1.40	3.50	2.40	8.1	4	55
336Hd1.41BW	1.41	3.53	2.40	8.2	4	55
336Hd1.42BW	1.42	3.55	2.40	8.2	4	55
336Hd1.43BW	1.43	3.58	2.40	8.3	4	55
336Hd1.44BW	1.44	3.60	2.40	8.3	4	55
336Hd1.45BW	1.45	3.63	2.40	8.4	4	55
336Hd1.46BW	1.46	3.65	2.40	8.4	4	55
336Hd1.47BW	1.47	3.68	2.40	8.5	4	55
336Hd1.48BW	1.48	3.70	2.40	8.5	4	55
336Hd1.49BW	1.49	3.73	2.40	8.6	4	55
336Hd1.50BW	1.50	3.75	2.40	8.6	4	55
336Hd1.60BW	1.60	4.00	2.50	9.1	4	57
336Hd1.65BW	1.65	4.13	2.75	9.4	4	57
336Hd1.70BW	1.70	4.25	2.90	9.6	4	57
336Hd1.75BW	1.75	4.38	2.90	9.9	4	57
336Hd1.80BW	1.80	4.50	3.00	10.1	4	57
336Hd1.85BW	1.85	4.63	3.00	10.3	4	57
336Hd1.90BW	1.90	4.75	3.00	10.5	4	57
336Hd2.00BW	2.00	5.00	3.00	11.0	4	57
336Hd2.05BW	2.05	5.13	3.00	11.2	4	57
336Hd2.50BW	2.50	6.25	4.20	13.1	6	65
336Hd3.00BW	3.00	7.50	5.00	15.0	6	65

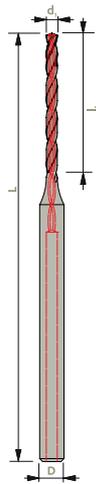
137°

Z2

CARB

# 376H-10

## EXPERT drill for stainless steel with internal coolant



Ø drill	f [mm/rotation]	Vc [m/min]
Ø 0.70 - Ø 1.00	0.012 - 0.030	70-90
Ø 1.00 - Ø 1.50	0.020 - 0.045	70-90
Ø 1.50 - Ø 2.00	0.030 - 0.060	70-90
Ø 2.00 - Ø 3.00	0.040 - 0.090	70-90

Tolerances  $d_1$ : -0.002/-0.004  
D: h5

$l_1$ : +0.1/0

Oil pressure in bar: **minimum 50 bar**  
Oil viscosity: **less than 15 mm<sup>2</sup>/s at 40°C**  
Filtration level: **maximum 0.02 mm**

**135°**

**Z2**

**CARB**

Art. n°	d <sub>1</sub>	l <sub>1</sub>	D	L
376H-10d0.80BW	0.80	8.00	3	57
376H-10d0.81BW	0.81	8.10	3	57
376H-10d0.82BW	0.82	8.20	3	57
376H-10d0.83BW	0.83	8.30	3	57
376H-10d0.84BW	0.84	8.40	3	57
376H-10d0.85BW	0.85	8.50	3	57
376H-10d0.86BW	0.86	8.60	3	57
376H-10d0.87BW	0.87	8.70	3	57
376H-10d0.88BW	0.88	8.80	3	57
376H-10d0.89BW	0.89	8.90	3	57
376H-10d0.90BW	0.90	9.00	3	57
376H-10d0.91BW	0.91	9.10	3	57
376H-10d0.92BW	0.92	9.20	3	57
376H-10d0.93BW	0.93	9.30	3	57
376H-10d0.94BW	0.94	9.40	3	59
376H-10d0.95BW	0.95	9.50	3	59
376H-10d0.96BW	0.96	9.60	3	59
376H-10d0.97BW	0.97	9.70	3	59
376H-10d0.98BW	0.98	9.80	3	59
376H-10d0.99BW	0.99	9.90	3	59
376H-10d1.00BW	1.00	10.00	3	59
376H-10d1.01BW	1.01	10.10	3	59
376H-10d1.02BW	1.02	10.20	3	59
376H-10d1.03BW	1.03	10.30	3	59
376H-10d1.04BW	1.04	10.40	3	59
376H-10d1.05BW	1.05	10.50	3	59
376H-10d1.06BW	1.06	10.60	3	59
376H-10d1.07BW	1.07	10.70	3	59
376H-10d1.08BW	1.08	10.80	3	59
376H-10d1.09BW	1.09	10.90	3	59

Art. n°	d <sub>1</sub>	l <sub>1</sub>	D	L
376H-10d1.10BW	1.10	11.00	4	62
376H-10d1.11BW	1.11	11.10	4	62
376H-10d1.12BW	1.12	11.20	4	62
376H-10d1.13BW	1.13	11.30	4	62
376H-10d1.14BW	1.14	11.40	4	62
376H-10d1.15BW	1.15	11.50	4	62
376H-10d1.16BW	1.16	11.60	4	62
376H-10d1.17BW	1.17	11.70	4	62
376H-10d1.18BW	1.18	11.80	4	62
376H-10d1.19BW	1.19	11.90	4	62
376H-10d1.20BW	1.20	12.00	4	62
376H-10d1.21BW	1.21	12.10	4	62
376H-10d1.22BW	1.22	12.20	4	62
376H-10d1.23BW	1.23	12.30	4	62
376H-10d1.24BW	1.24	12.40	4	62
376H-10d1.25BW	1.25	12.50	4	62
376H-10d1.26BW	1.26	12.60	4	62
376H-10d1.27BW	1.27	12.70	4	62
376H-10d1.28BW	1.28	12.80	4	62
376H-10d1.29BW	1.29	12.90	4	64
376H-10d1.30BW	1.30	13.00	4	64
376H-10d1.31BW	1.31	13.10	4	64
376H-10d1.32BW	1.32	13.20	4	64
376H-10d1.33BW	1.33	13.30	4	64
376H-10d1.34BW	1.34	13.40	4	64
376H-10d1.35BW	1.35	13.50	4	64
376H-10d1.36BW	1.36	13.60	4	64
376H-10d1.37BW	1.37	13.70	4	64
376H-10d1.38BW	1.38	13.80	4	64
376H-10d1.39BW	1.39	13.90	4	64

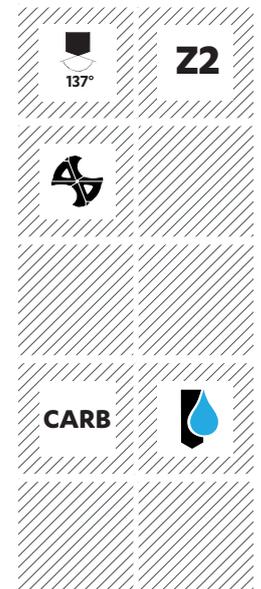


# EXPERT drill for stainless steel with internal coolant

376H-10



Art. n°	d <sub>1</sub>	l <sub>1</sub>	D	L
376H-10d1.40BW	1.40	14.00	4	64
376H-10d1.41BW	1.41	14.10	4	64
376H-10d1.42BW	1.42	14.20	4	64
376H-10d1.43BW	1.43	14.30	4	64
376H-10d1.44BW	1.44	14.40	4	64
376H-10d1.45BW	1.45	14.50	4	64
376H-10d1.46BW	1.46	14.60	4	64
376H-10d1.47BW	1.47	14.70	4	64
376H-10d1.48BW	1.48	14.80	4	64
376H-10d1.49BW	1.49	14.90	4	64
376H-10d1.50BW	1.50	15.00	4	64
376H-10d1.60BW	1.60	16.00	4	67
376H-10d1.65BW	1.65	16.50	4	67
376H-10d1.70BW	1.70	17.00	4	67
376H-10d1.75BW	1.75	17.50	4	67
376H-10d1.80BW	1.80	18.00	4	71
376H-10d1.85BW	1.85	18.50	4	71
376H-10d1.90BW	1.90	19.00	4	71
376H-10d2.00BW	2.00	20.00	4	71
376H-10d2.05BW	2.05	20.50	4	71
376H-10d2.50BW	2.50	25.00	4	82
376H-10d3.00BW	3.00	30.00	4	82

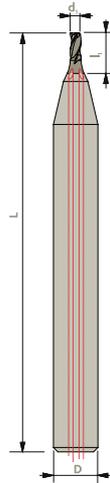


# 1520H

## End mill Z3 $l_1=2xd_1$ with internal coolant



not adapted - adapted  highly adapted



Material	Vc uncoated [m/min]	Vc coated [m/min]	Uncoated	Coated
Steel < 700 N/mm <sup>2</sup>	80	100	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steel > 700 N/mm <sup>2</sup>	60	80	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Stainless steel	60	80	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cast iron	50	70	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Copper	80	100	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Brass - Bronze	120	150	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Aluminium	150	190	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Gold - Silver	120	150	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Platinum - Palladium	-	55	-	<input type="checkbox"/>
Superalloys	-	40	-	<input checked="" type="checkbox"/>
Titanium	40	60	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Tolerances  $d_1 \leq 1 \text{ mm} \rightarrow 0/-0.01$   $D: h5$  Oil pressure in bar: **minimum 20 bar**  
 $d_1 > 1 \text{ mm} \rightarrow 0/-0.02$   $L: \pm 0.5$  Oil viscosity: **less than 20 mm<sup>2</sup>/s at 40°C**  
 $d_1 = D \rightarrow d_1: e8$   $L_1: +0.1/0$  Filtration level: **maximum 0.02 mm**

Available uncoated or coated

**Z3**

**λ 30°** **γ 8°**

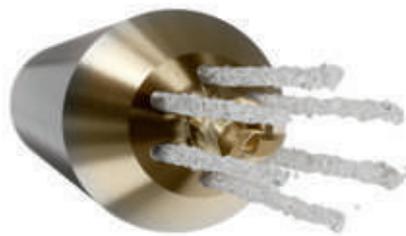
**CARB**

**ap** **ae**

Art. n°	d <sub>1</sub>	l <sub>1</sub>	D	L
1520Hd0.30	0.30	0.60	4	38
1520Hd0.40	0.40	0.80	4	38
1520Hd0.50	0.50	1.00	4	38
1520Hd0.60	0.60	1.20	4	38
1520Hd0.70	0.70	1.40	4	38
1520Hd0.80	0.80	1.60	4	38
1520Hd0.90	0.90	1.80	4	38
1520Hd1.00	1.00	2.00	4	38
1520Hd1.10	1.10	2.20	4	38
1520Hd1.20	1.20	2.40	4	38
1520Hd1.30	1.30	2.60	6	50
1520Hd1.40	1.40	2.80	6	50
1520Hd1.50	1.50	3.00	6	50
1520Hd1.60	1.60	3.20	6	50
1520Hd1.70	1.70	3.40	6	50
1520Hd1.80	1.80	3.60	6	50

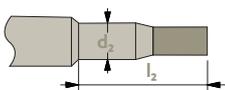
Art. n°	d <sub>1</sub>	l <sub>1</sub>	D	L
1520Hd1.90	1.90	3.80	6	50
1520Hd2.00	2.00	4.00	6	50
1520Hd2.10	2.10	4.20	6	50
1520Hd2.20	2.20	4.40	6	50
1520Hd2.30	2.30	4.60	6	50
1520Hd2.40	2.40	4.80	6	50
1520Hd2.50	2.50	5.00	6	50
1520Hd2.60	2.60	5.20	6	50
1520Hd2.70	2.70	5.40	6	50
1520Hd2.80	2.80	5.60	6	50
1520Hd2.90	2.90	5.80	6	50
1520Hd3.00	3.00	6.00	6	50
1520Hd4.00	4.00	8.00	6	50
1520Hd5.00	5.00	10.00	6	50
1520Hd6.00	6.00	12.00	6	50

$ap=0.25xd_1$   $ap= l_1 \text{ max.}$   
 $ae= \frac{d_1^2}{4xAp}$



Recommendations / coating	< Ø1	> Ø1
	Steel / Stainless Steel	BY
Copper alloys / Brass	DA	DA
Platinum / CFRP	DC	DC
Titanium	ME	ME

Upon request



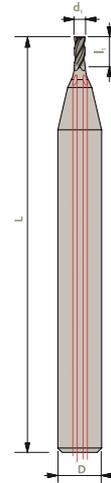


# EXPERT end mill for stainless steel Z4 with internal coolant

1620H

not adapted - adapted  highly adapted

Material	Vc uncoated [m/min]	Vc coated [m/min]	Uncoated	Coated
Steel < 700 N/mm <sup>2</sup>	-	180	-	■
Steel > 700 N/mm <sup>2</sup>	-	160	-	■
Stainless steel	-	200	-	■ ■
Cast iron	-	200	-	■
Copper	-	250	-	■
Brass - Bronze	-	190	-	□
Aluminium	-	350	-	■
Gold - Silver	-	180	-	■
Platinum - Palladium	-	60	-	□
Superalloys	-	100	-	■
Titanium	60	100	□	■



Tolerances  $d_1 \leq 1 \text{ mm}$  ▶ 0/-0.01  $d_1 > 1 \text{ mm}$  ▶ 0/-0.02  $d_1 = D$  ▶  $d_1 : e8$    
 D: h5 L: ±0.5  $L_1 : +0.1/0$    
 Oil pressure in bar: **minimum 20 bar**   
 Oil viscosity: **less than 20 mm<sup>2</sup>/s at 40°C**   
 Filtration level: **maximum 0.02 mm**

Recommendations / coating		< Ø1	> Ø1
	Steel / Stainless Steel	BY	BW
	Copper alloys / Brass	DA	DA
	Platinum / CFRP	DC	DC
	Titanium	ME	ME

Art. n°	d <sub>1</sub>	l <sub>1</sub>	J	D	L
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1620Hd1.00	1.0	2	0.02	4	38
1620Hd1.50	1.5	3	0.02	6	50
1620Hd2.00	2.0	4	0.02	6	50
1620Hd2.50	2.5	5	0.02	6	50
1620Hd3.00	3.0	6	0.02	6	50
1620Hd3.50	3.5	7	0.03	6	50
1620Hd4.00	4.0	8	0.03	6	50
1620Hd5.00	5.0	10	0.04	6	50
1620Hd6.00	6.0	12	0.05	6	50
1620Hd8.00	8.0	16	0.05	8	61
1620Hd10.00	10.0	20	0.05	10	72
1620Hd12.00	12.0	24	0.05	12	83

Available uncoated or coated

**Z4**

**λ 36-39°**

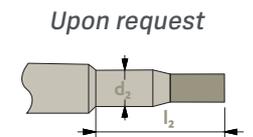
**γ 8°**

**CARB**

$ap = 0.25 \times d_1$

$ap = l_1 \text{ max.}$

$ae = \frac{d_1^2}{4 \times Ap}$



not adapted - adapted  highly adapted

Steel < 700 N/mm <sup>2</sup>	Steel > 700 N/mm <sup>2</sup>	Stainless steel	Hardened steel	Cast iron	Copper	Brass - Bronze	Aluminum	Gold - Silver	Platinum - Palladium	Super-alloys	Cobalt - chrome	Titanium	Composite
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**Endmills**

Ref. 1430H

				$\lambda$ 45°	-	-	<input checked="" type="checkbox"/>	-	-	-	-	-	<input checked="" type="checkbox"/>	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	-
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Ref. 1450H

				$\lambda$ 45°	-	-	<input checked="" type="checkbox"/>	-	-	-	-	-	<input checked="" type="checkbox"/>	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	-
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Ref. 119-3H

				$\lambda$ 0°	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	-				
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Ref. 119-3RH

				$\lambda$ 0°	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	-				
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Ref. 117H

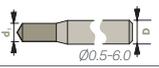
				$\lambda$ 0°	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	-				
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Ref. 117-1H

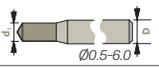
				$\lambda$ ALT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	-				
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**Drills**

Ref. 337H

				$\lambda$ 24°	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	-				
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Ref. 337-2H

				$\lambda$ 24°	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	-				
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# OUR TECHNICAL ADVISORS



**LOÏC YERLY**  
*Head of Sales  
Southern Europe*  
Tél.: +41 (0)79 445 53 07  
lyerly@louisbelet.ch



**RAPHAËL DUBAIL**  
*Technical Advisor for  
Western Switzerland*  
Tél.: +41 79 511 98 83  
rdubail@louisbelet.ch



**SINAN AKYOL**  
*Technical Advisor for  
German-speaking Markets*  
Tél.: +41 (0)79 859 33 57  
sakyol@louisbelet.ch



**MARKUS ACKERMANN**  
*Technical Advisor for  
German-speaking Switzerland*  
Tél.: +41 (0)79 358 42 84  
mackermann@louisbelet.ch



**HERVÉ BAOUR**  
*Head of International Sales*  
Tél.: + 41 (0)78 646 94 18  
hbaour@louisbelet.ch



**FABRICE BERCHE**  
*Technical Advisor for France*  
Tél.: +33 (0)6 3017 32 87  
fberche@louisbelet.ch



**RÉMY FAVARD**  
*Technical Advisor for France  
(Arve Valley)*  
Tél.: +33 (0)6 45 06 50 61  
rfavard@louisbelet.fr



**LUIGINO GAMBA**  
*Technical Advisor for  
Italian-speaking Markets*  
Tél.: + 41 (0)79 362 86 09  
lgamba@louisbelet.ch

**LOUIS BELET S.A**  
Les Gasses 11  
2943 Vendlincourt  
SWITZERLAND  
TEL.: +41 (0)32 474 04 10  
FAX: +41 (0)32 474 45 42  
www.louisbelet.ch  
info@louisbelet.ch



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