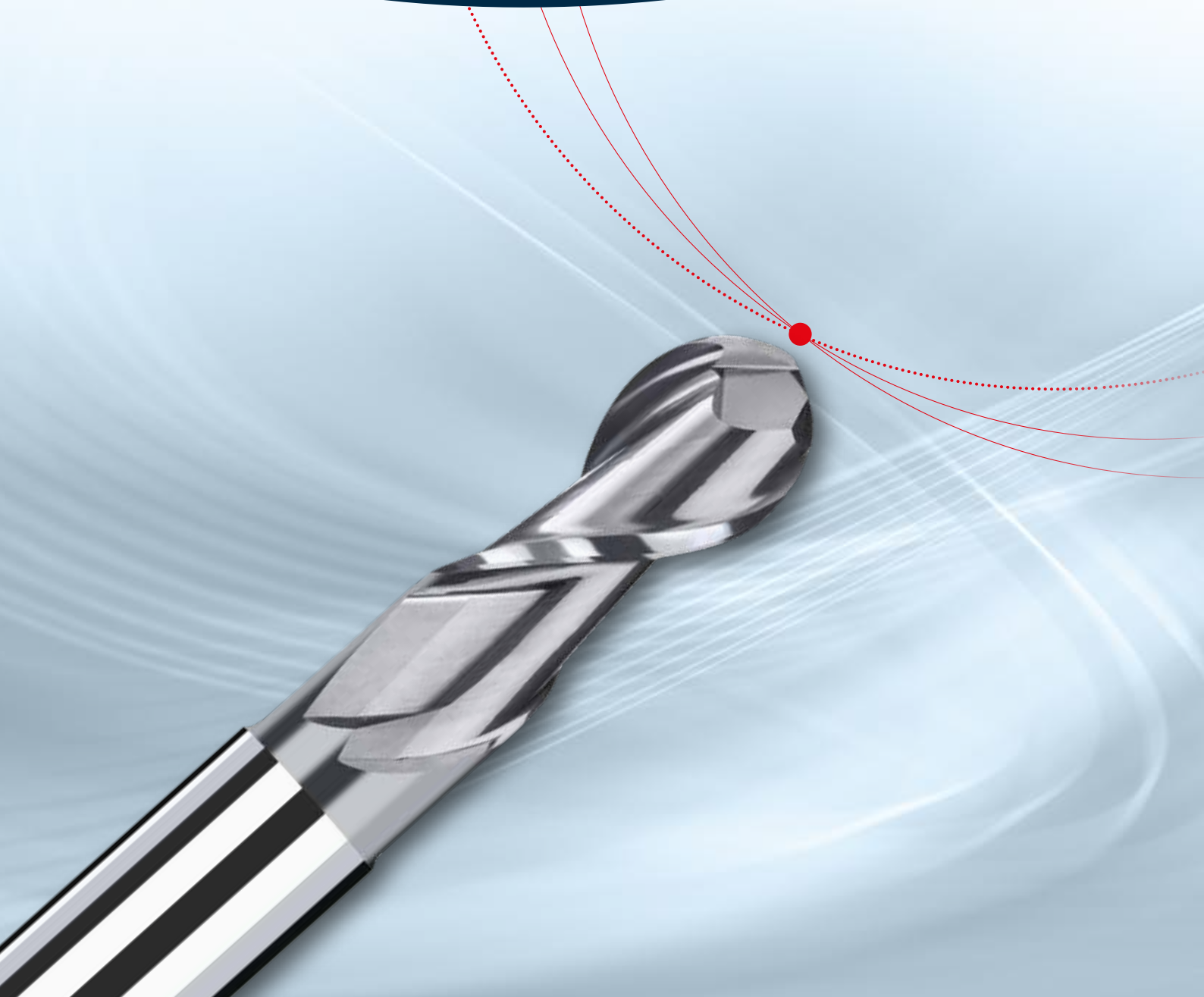


passion  
for precision



**Sphero-Alu –**  
precision & performance in aluminum



# Productivity and quality for high-precision milling of aluminum

Well equipped for all milling operations that can be applied to aluminum: The new **Sphero-Alu** ball nose end mill confidently combines roughing and finishing of aluminum alloys.

The polished surfaces in the flute ensure perfect chip removal – and that at maximum feed rates and infeeds.

By using **Sphero-Alu**, you benefit from a whole host of advantages: The mirror-finish flanks on the ball produce an excellent surface quality due to minimal chipping. Furthermore, the extreme precision of the ball, in combination with the high-precision shank, facilitates high component accuracy.

## **ToolExpert – the innovative online tool**

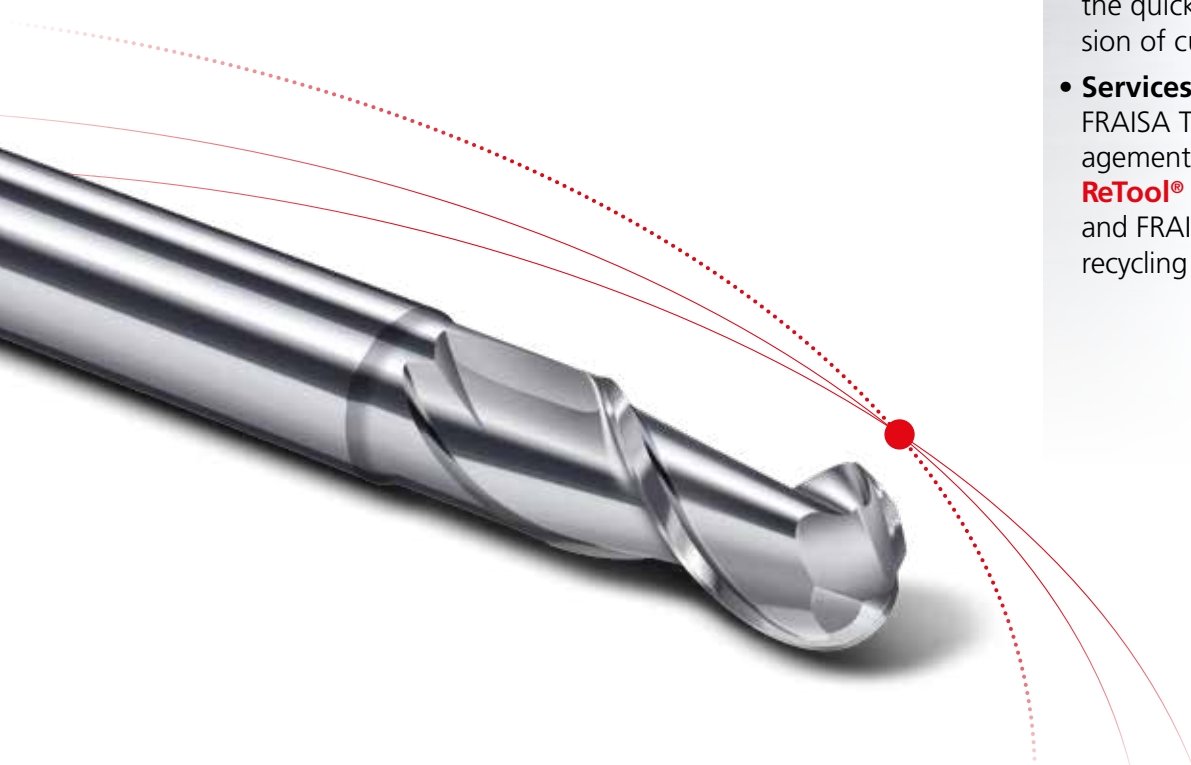
FRAISA's cutting data calculator **ToolExpert** provides tool- and material-specific cutting data for production – and is the basis for precision use of the new **Sphero-Alu** milling tool.

This innovative software solution is simple and user-friendly: Simply select the material, application, and tool and the software provides you with the right cutting data.

**Fast, safe, and reliable.**

## **The benefits:**

- **Reduced tool costs** thanks to the ability to carry out roughing and finishing with just one tool
- **High component quality** without having to rework thanks to the high-precision shank
- **Improved surface quality** due to the precisely ground and highly polished ball
- **Increased productivity** thanks to fewer subsequent finishing operations
- **ToolExpert cutting data calculator** for the quick and easy provision of cutting data
- **Services tools available** FRAISA ToolCare® tool management system, **FRAISA ReTool®** tool reconditioning, and FRAISA ReToolBlue tool recycling



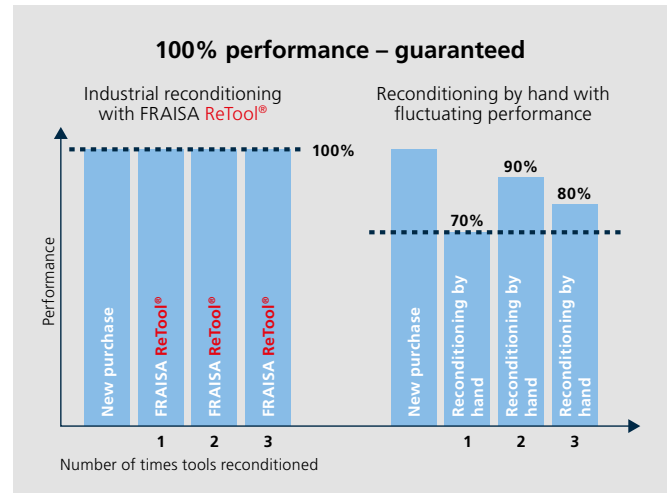
# FRAISA ReTool® – Industrial tool reconditioning with performance guarantee

FRAISA ReTool® offers an all-round service that restores your used tools to their original performance level and optimizes your processes. FRAISA and third-party tools are reconditioned using the very latest technology – and in a resource-friendly way. The outcome: mint-condition tools as productive as they were the first day they were used. And to make things even better, your level of investment is lower than if you were to buy new tools, you increase your productivity and you save costs.

## FRAISA ReTool® – a performance guarantee founded on integrated development of the tools and the reconditioning process

We guarantee that following their reconditioning with FRAISA ReTool®, your used tools will be restored to the original performance level they had when new. Our ability to provide this performance guarantee is a priority of our team of experts right from very early on in product development.

That's why the development of the reconditioning process is an integral part of the development phase, alongside the actual product tests and calculating the cutting data. Strict rules apply: the FRAISA ReTool® process is approved only if we are able to fulfil our performance guarantee 100%.

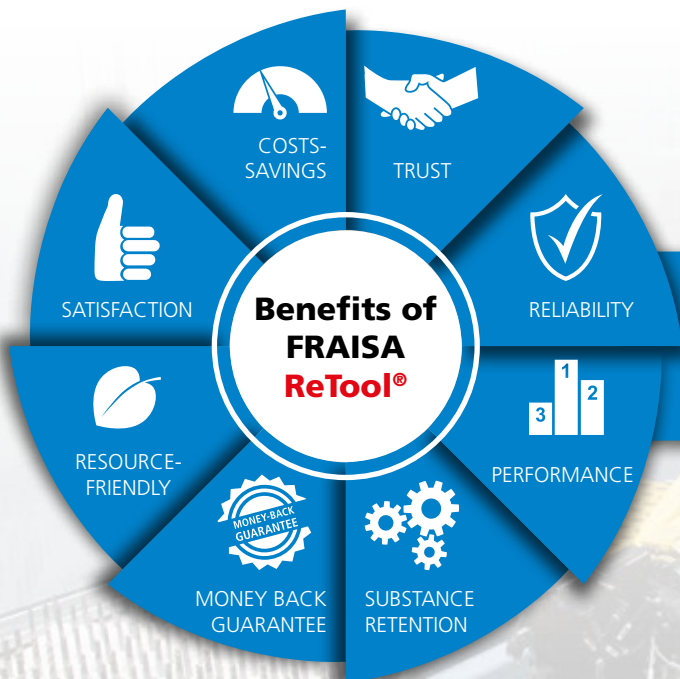


[ 3 ]

## FRAISA ReToolBlue – recycle rather than throw away

With our FRAISA ReToolBlue service, we recycle the valuable carbide from tools that can no longer be reconditioned.

FRAISA ReTool® makes economic sense for you, too: After reconditioning them, we return your tools to you in mint condition. We restore them to their original performance level at a price that's more cost-effective for you than purchasing new ones or reconditioning them by hand.



Over 30 years' experience in tool reconditioning:

Our competence center in Germany is Europe's largest service center for carbide milling tools.



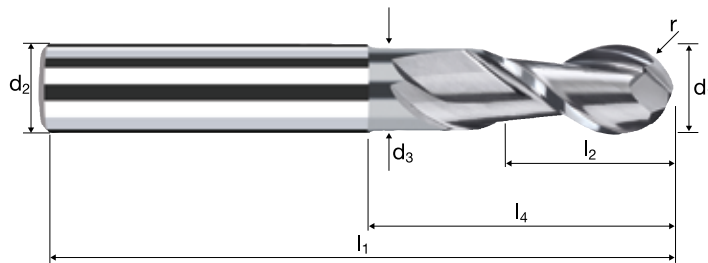
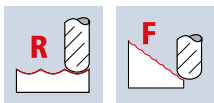
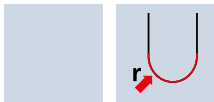
Video on our service product: FRAISA ReTool®

# Ball nose end mills Sphero-Alu

Tolerance r  $\pm 0.005$ , 3xd



HM  
MG10      $\lambda$  40°  
                   $\gamma$  20°



			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	
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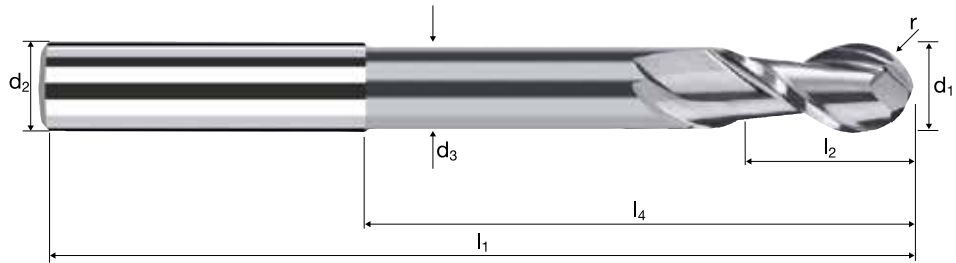
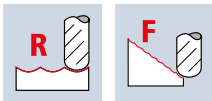
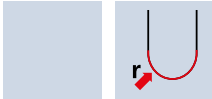
Example: Order-N°.												Coating		Article-N°.		ø-Code					
												7550		140						7550	
Ø Code	d <sub>1</sub>	d <sub>2</sub> h4	d <sub>3</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	r ±0.005	α	z											
140	2.00	6.00	1.90	57	4.00	6.00	14.31	1.000	8.2°	2			●								
180	3.00	6.00	2.80	57	6.00	9.00	15.63	1.500	5.7°	2			●								
220	4.00	6.00	3.70	57	8.00	12.00	16.95	2.000	3.6°	2			●								
260	5.00	6.00	4.60	57	10.00	15.00	18.27	2.500	1.8°	2			●								
300	6.00	6.00	5.50	57	12.00	19.34	20.00	3.000	0.0°	2			●								
391	8.00	8.00	7.40	63	16.00	25.29	26.00	4.000	0.0°	2			●								
450	10.00	10.00	9.20	72	20.00	30.20	31.00	5.000	0.0°	2			●								
501	12.00	12.00	11.00	83	24.00	36.13	37.00	6.000	0.0°	2			●								
610	16.00	16.00	15.00	92	32.00	42.13	43.00	8.000	0.0°	2			●								
682	20.00	20.00	19.00	104	40.00	52.13	53.00	10.000	0.0°	2			●								

# Ball nose end mills Sphero-Alu

Tolerance r ±0.005, 6xd



HM  
MG10     λ 40°  
                  γ 20°



			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	
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Ø Code	Example: Order-N°.		Coating	Article-N°.	Ø-Code								
	d <sub>1</sub>	d <sub>2</sub> h4	d <sub>3</sub>	7554	180	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	r ±0.005	α	z	7554
180	3.00	6.00	2.80			66	6.00	18.00	24.63	1.500	3.7°	2	●
220	4.00	6.00	3.70			69	8.00	24.00	28.95	2.000	2.2°	2	●
260	5.00	6.00	4.60			75	10.00	30.00	33.27	2.500	1.1°	2	●
300	6.00	6.00	5.50			80	12.00	42.34	43.00	3.000	0.0°	2	●
391	8.00	8.00	7.40			90	16.00	52.29	53.00	4.000	0.0°	2	●
450	10.00	10.00	9.20			105	20.00	63.20	64.00	5.000	0.0°	2	●
501	12.00	12.00	11.00			120	24.00	73.13	74.00	6.000	0.0°	2	●
610	16.00	16.00	15.00			135	32.00	85.13	86.00	8.000	0.0°	2	●

[ 5 ]

# High surface quality and component accuracy thanks to innovative technologies

Sphero-Alu with mirror-finish technology

## Sphero-Alu



### High-precision radius tolerance of +/-0.005 mm

- Specially configured position tolerances simplify programming and guaranteed completion of the final contour
- High-precision tolerance zone for excellent dimensional accuracy

### Chip space geometry

- The chip space geometry also allows roughing operations with high process parameters



### Milling tool with H4 shank

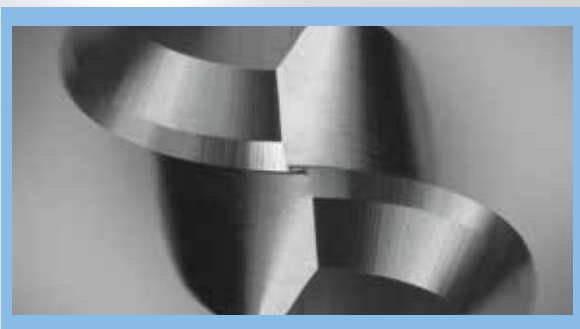
- High concentricity and accuracy of eccentricity
- Higher clamping force in nonpositive chucks (hot shrinking, hydraulic expansion chuck)
- **Important:** Degrease the tool and chucking device before assembly in order to increase the holding force and prevent tool slippage!



### Mirror-finish technology

- Polished cutting faces and flanks as well as flutes reduce the tendency to stick and improve the surface qualities of the component

### Suitability as roughing ball

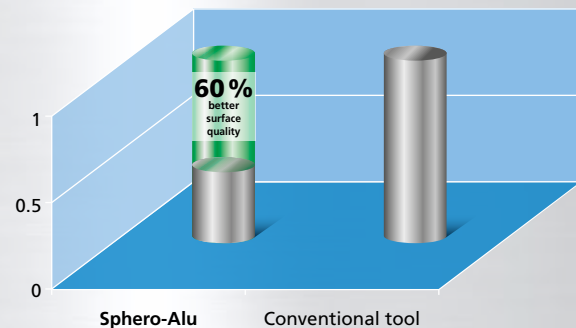


Sphero-Alu (with polished finish)

**Material:**  $n = 35,000$  rpm,  $v_f = 6,300$  mm/min  
 $a_p = a_e = 1.5$  mm (0.25xd1), AISiMg1, tool  $\varnothing$  6mm  
 $Q = 14.1$  cm<sup>3</sup>/min (dia. 6 mm) + 150% comp. to Sphericut-Alu

### Surface quality Ra achieved with 30° angle [n = 2]

Surface quality [ $\mu$ m]



**Material:**  $n = 35,000$  rpm,  $v_f = 3,150$  mm/min  
 $a_p = a_e = 0.1$  mm, AISiMg1



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