

# POWER MEETS PRECISION



## High-speed 5-axis vertical machining centers

Breton offers a complete range of solutions dedicated to high-precision machining required by the aerospace, automotive and mould & die industries.

**breton**



# About Breton

Breton - a pioneer in the development of advanced technologies and materials - has been a world leader in the design and manufacture of state-of-the-art industrial machinery since 1963. Breton is active in different industrial sectors, which need products and services of excellence with high

technological content, combined with the need of high productivity and quality standards.

The Machine Tool Division was founded in the early '90s and Breton has firmly established itself as one of the most appreciated manufacturers of high-speed machines.



## A few numbers

**+280**

Revenue Mln

**+420**

Patented innovations

**+1000**

Employees

**44**

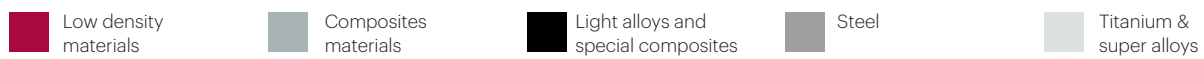
Service centers

# The right machine for every application

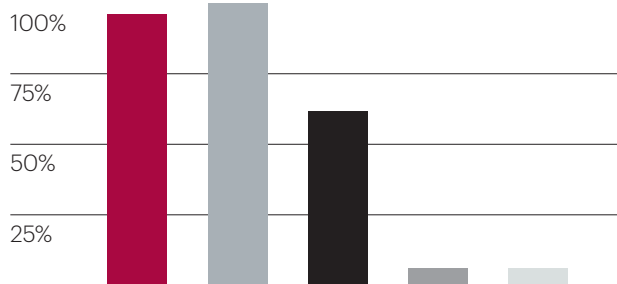
Breton's goal is to ensure the best relationship between the investment required and the working efficiency on multiple materials. Efficiency considers a number of parameters, including the volume that can be machined, the maximum precision and the speed

with which it can perform machining operations on a specific material. The graph shows the investment efficiency for the purchase of a specific Breton machining center in relation to the machined material.

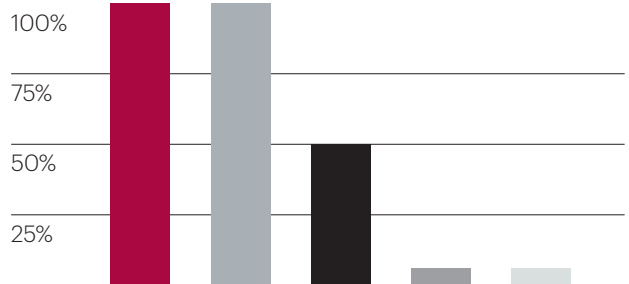
## Return of investment



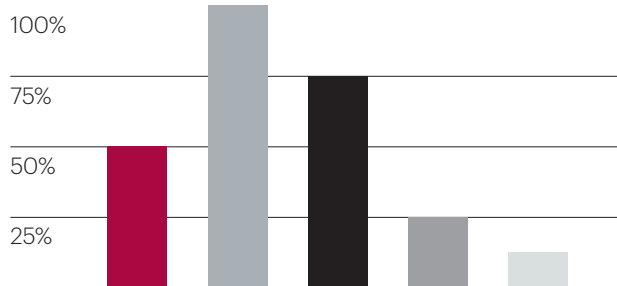
### breton hawk



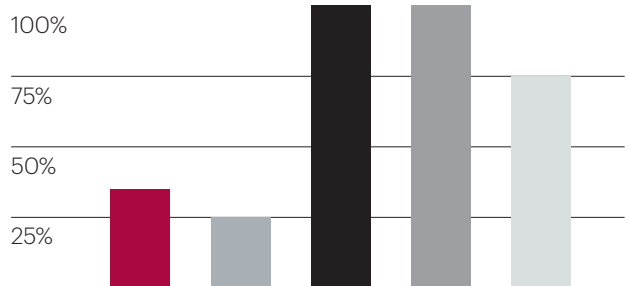
### breton raptor



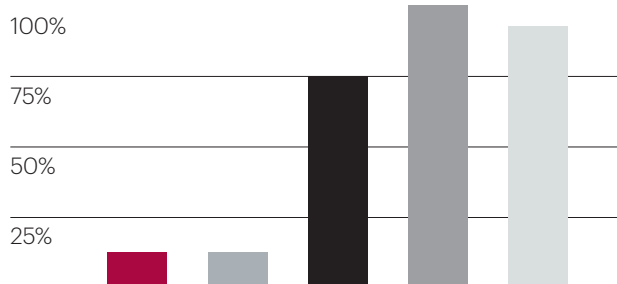
### breton eagle



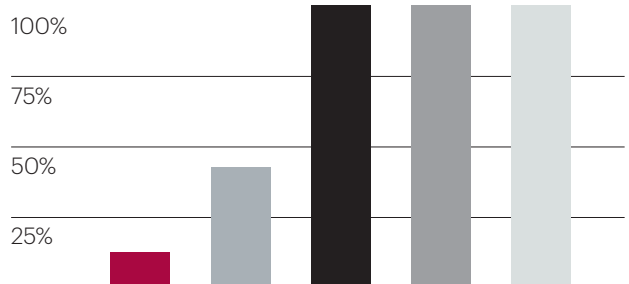
### breton matrix



### breton flymill



### breton ultrix



# Fields of application

Aerospace



Automotive



Mould & Die



General Engineering



Railway



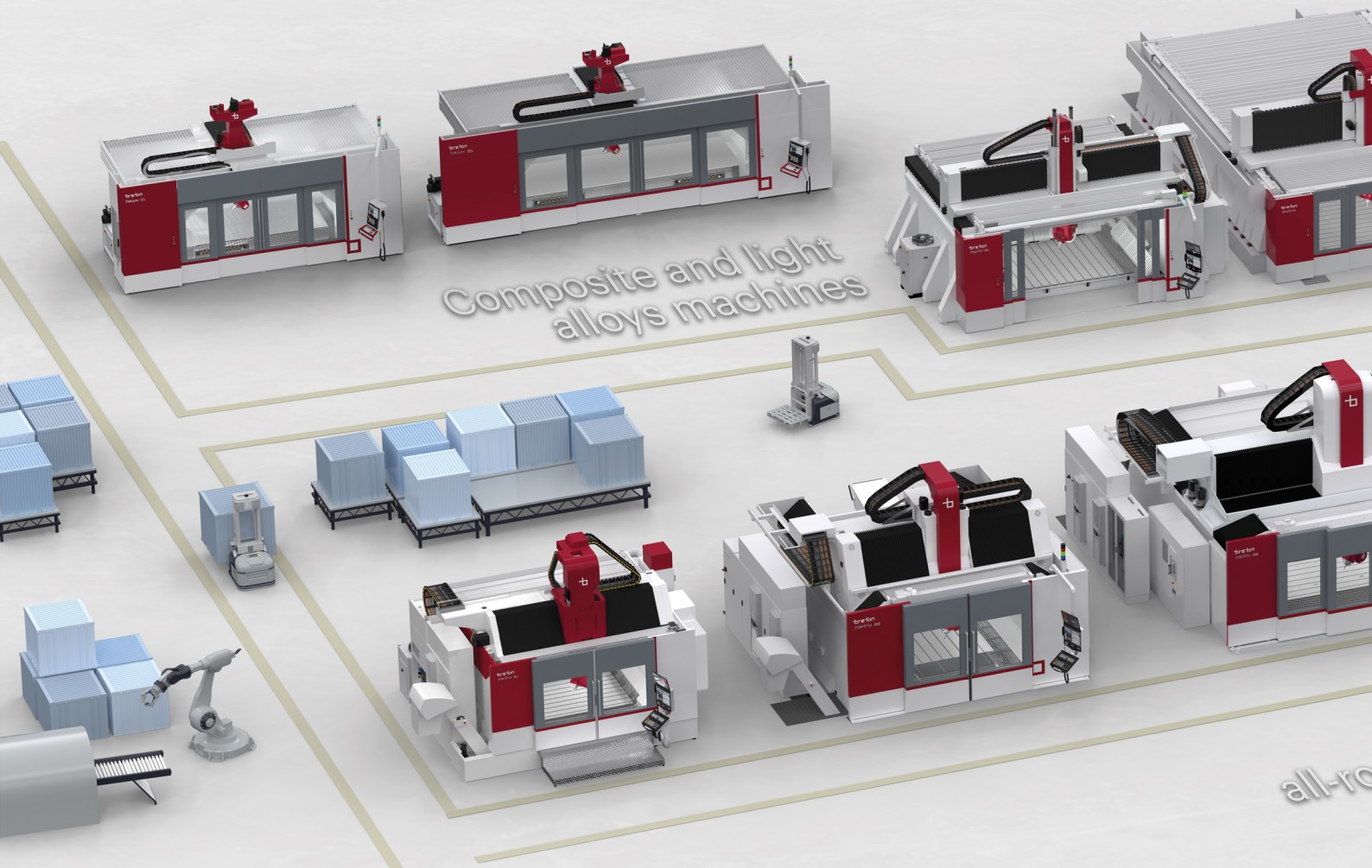
Defense



Energy



Naval



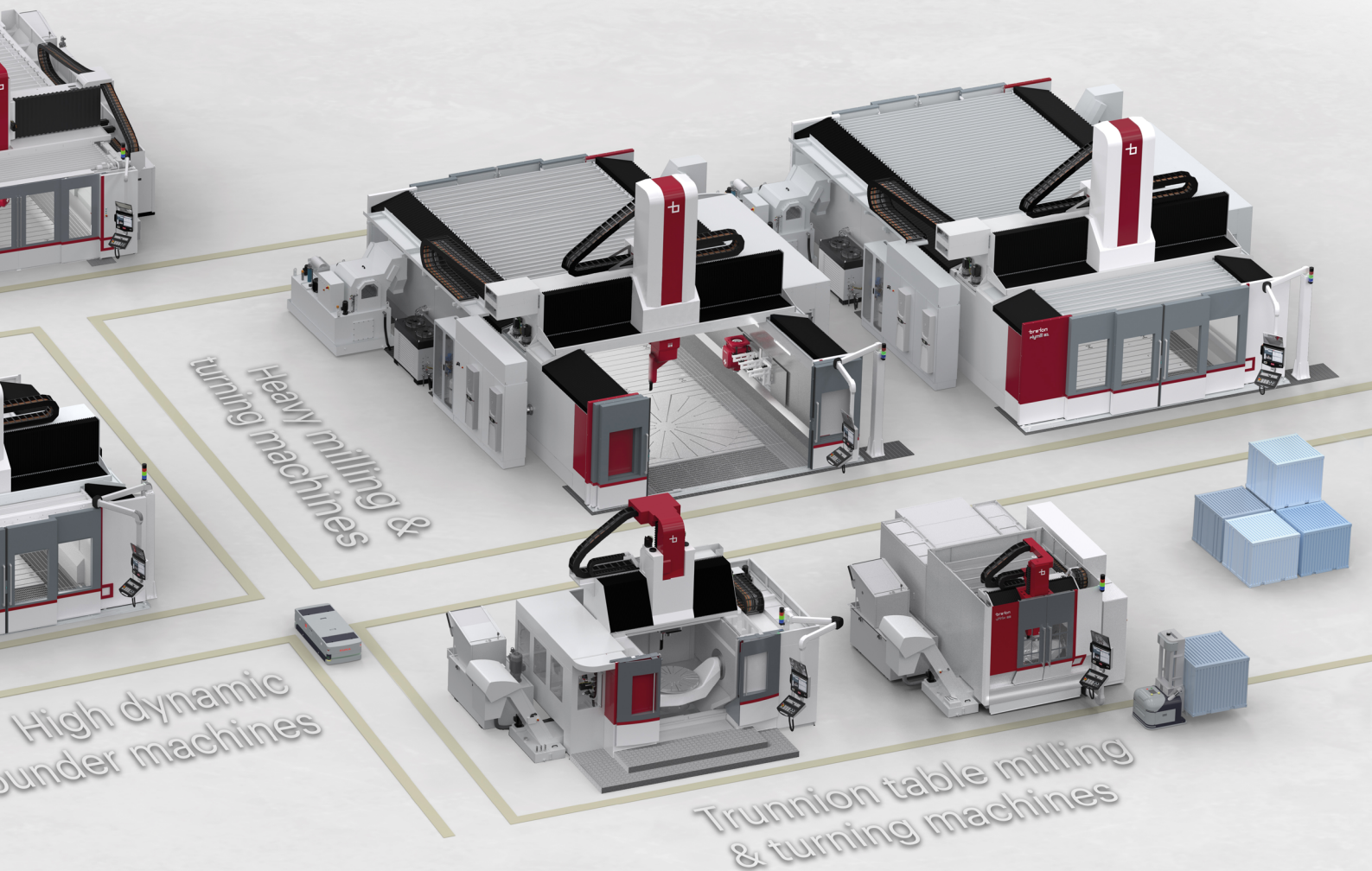


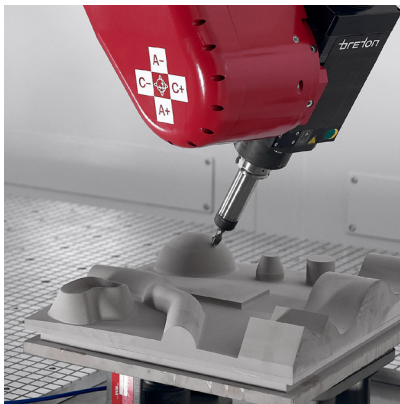
# High-speed 5-axis vertical machining centers

## Engineered on your needs

Breton offers a complete range of solutions dedicated to high-precision machining required by the aerospace, automotive and mould & die industries. Breton designs, manufactures and commissions high-speed machining

centers with gantry architecture that offer optimal performance on any type of material, from the strongest super alloys to composite materials, all the way through steel and light alloys.





	Hawx E1	Hawx E2
X axis travel	4.000 mm	6.000 mm
Y axis travel	1.900 mm	1.900 mm
Z axis travel	1.300 mm	1.300 mm
X/Y/Z axes rapid feedrate	85 / 85 / 60 m/min	85 / 85 / 60 m/min
A axis rotation	-105° +135°	-105° +135°
A axis rapid feedrate	30 rpm	30 rpm
C axis rotation	±270°	±270°
C axis rapid feedrate	30 rpm	30 rpm
Spindle power S6   S1	18 / 15 - 18 / 15 - 25 / 21 kW	18 / 15 - 18 / 15 - 25 / 21 kW
Spindle torque S6   S1	14.3 / 12 - 14.3 / 12 - 20 / 18 Nm	14.3 / 12 - 14.3 / 12 - 20 / 18 Nm
Spindle speed	18.000 - 24.000 - 24.000 rpm	18.000 - 24.000 - 24.000 rpm
Milling tool taper	HSK-A63 / HSK-F63	HSK-A63 / HSK-F63
Table dimensions	3.800 x 1.750 mm	5.800 x 1.750 mm

## High-dynamic 5-axis gantry vertical machining centre.

The right combination of strength and stability makes it ideal for high-speed milling and trimming operations on complex three-dimensional shaped parts made of light alloy, resin or composite materials. Thanks to its optimised design, Breton Hawx is not only more rigid and stable, but it also provides an excellent footprint-working area ratio. The electro-welded, monolithic, self-supporting structure is the core of the machine, providing strength and allowing easy handling.

The unique box-in-box architecture provides a significant increase in the rigidity of the bridge-carriage-RAM assembly and it combines with the high strength of the new Hornet head to achieve a significant increase in material removal and accuracy, all with the highest dynamics. The innovative offset geometry of the head also makes it possible to increase the volume that can be machined. Hawx arrives already assembled and tested and doesn't require special foundations.

## Technologies

High-speed milling



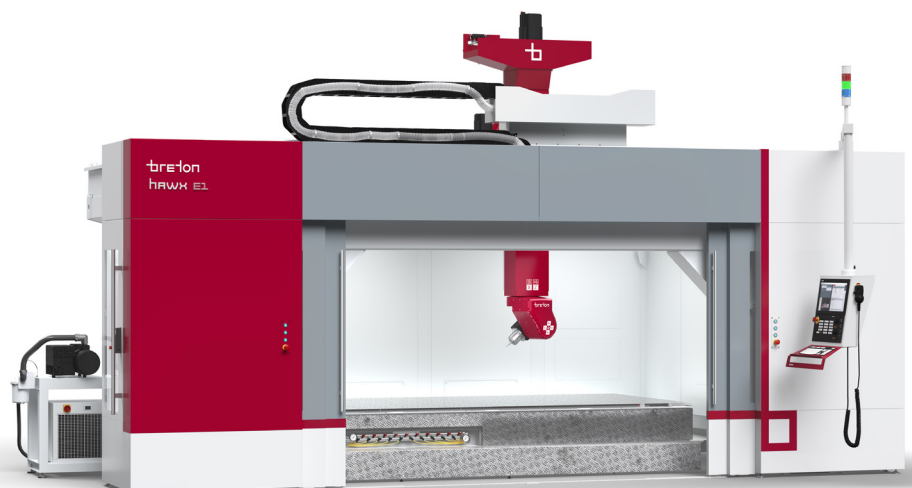
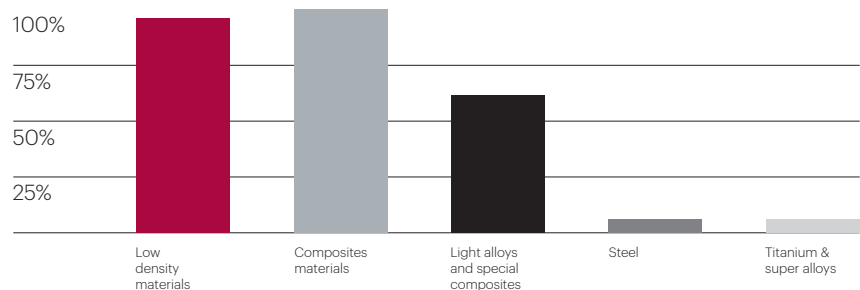
Box-in-Box



Monoblock



## Performance







	Raptor E1	Raptor E2
X axis travel	4.000 mm	5.500 / 8.000 mm
Y axis travel	2.800 - 5.500 mm	4.000 mm
Z axis travel	1.200 mm	2.000 mm
X/Y/Z axes rapid feedrate	80 / 80 / 40 m/min	40 / 40 / 15 m/min
A axis rotation	±115° / -105° +135°	±115° / -105° +135°
A axis rapid feedrate	12 / 30 rpm	12 / 30 rpm
C axis rotation	±200°	±200°
C axis rapid feedrate	18 / 30 rpm	18 / 30 rpm
Spindle power S6   S1	31 / 25 - 41 / 37 - 25 / 21 kW	31 / 25 - 41 / 37 - 25 / 21 kW
Spindle torque S6   S1	65 / 52 - 89 / 62 - 20 / 18 Nm	65 / 52 - 89 / 62 - 20 / 18 Nm
Spindle speed	16.000 - 28.000 - 24.000 rpm	16.000 - 28.000 - 24.000 rpm
Milling tool taper	HSK-A63	HSK-A63

## High-dynamic 5-axis gantry vertical machining center.

The design suitable for large workpieces, electrospindles up to 40 kW and the right degree of robustness, allow high-speed milling and trimming operations on elements with a complex 3D shape such as light alloys, resins, and composite materials.

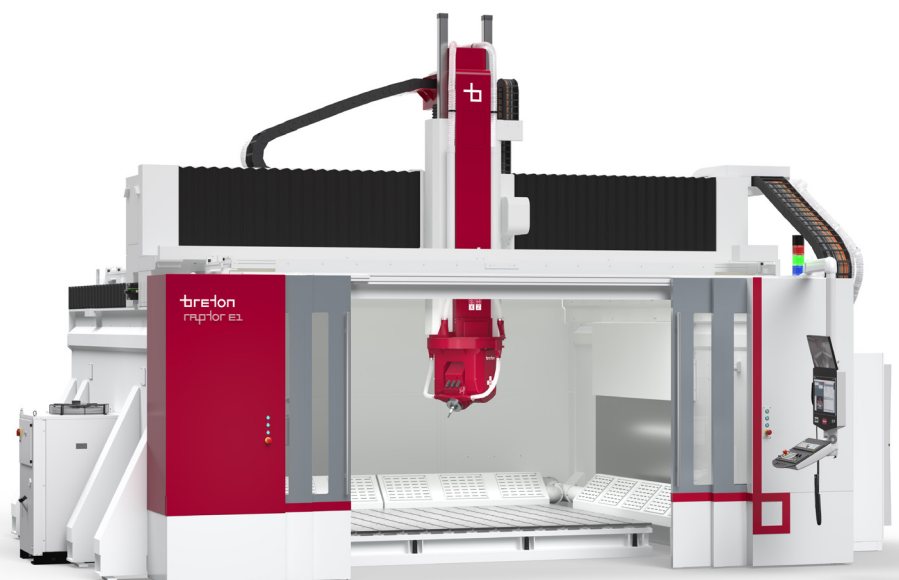
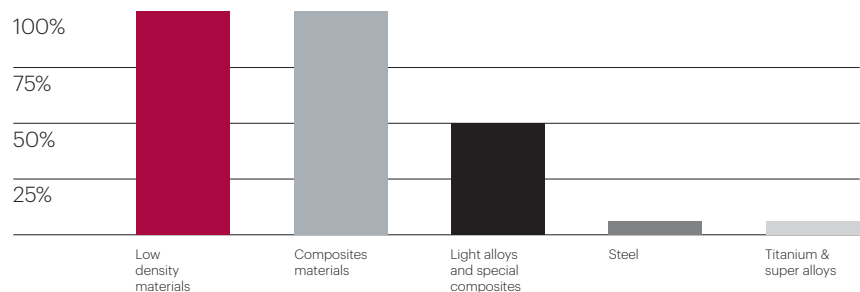
Thanks to the linear axis speed up to 80m/min and to the rotary tilting head with  $\pm 200^\circ$  rotation of the C-axis and  $0^\circ +115^\circ$  rotation of the A-axis, it shows excellent performances both for dynamics and precision in the execution of complex profiles. It allows the use of spindles with 40 kW of power and 28,000 rpm, giving the machine a considerable removal capacity. In its largest version it reaches a considerable machining volume, up to 8.000 x 4000 mm surface and 2000 mm height.

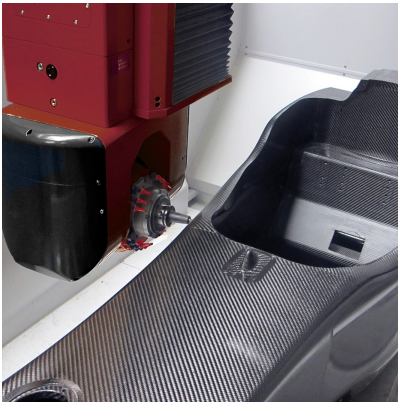
## Technologies

High-speed milling



## Performance





	Eagle E1	Eagle E2
X axis travel	2.000 - 30.000 mm	3.000 - 30.000 mm
Y axis travel	2.500 - 4.000 mm	3.000 - 4.000 mm
Z axis travel	1.000 - 1.500 mm	2.000 - 3.000 mm
X/Y/Z axes rapid feedrate	70 / 70 / 40 m/min	70 / 70 / 40 m/min
A axis rotation	±115° / -105° +135°	±115° / -105° +135°
A axis rapid feedrate	12 / 30 rpm	12 / 30 rpm
C axis rotation	±270° - continuo	±270° - continuo
C axis rapid feedrate	18 / 30 rpm	18 / 30 rpm
Spindle power S6   S1	31 / 25 - 41 / 37 - 25 / 21 kW	31 / 25 - 41 / 37 - 25 / 21 kW
Spindle torque S6   S1	65 / 52 - 89 / 62 - 20 / 18 Nm	65 / 52 - 89 / 62 - 20 / 18 Nm
Spindle speed	16.000 - 28.000 - 24.000 rpm	16.000 - 28.000 - 24.000 rpm
Milling tool taper	HSK-A63	HSK-A63

## High-dynamic 5-axis gantry vertical machining centre with modular structure.

The wide range of available structural combinations makes it possible to have a configuration tailored to the required work volumes. The technical equipment makes it ideal for high-speed precision machining of elements with complex three-dimensional shapes in light alloy, resin or composite materials. This machining center is positioned in an intermediate range to satisfy many market demands, for dynamics, precision and machinable volumes. Its high modularity in the strokes, with Z axis that can go from 1.000 mm to 2.500 mm, the multiple combinations of heads and electrospindles together with the various accessories available, allow Eagle to perform a wide range of machining in all sectors.

## Technologies

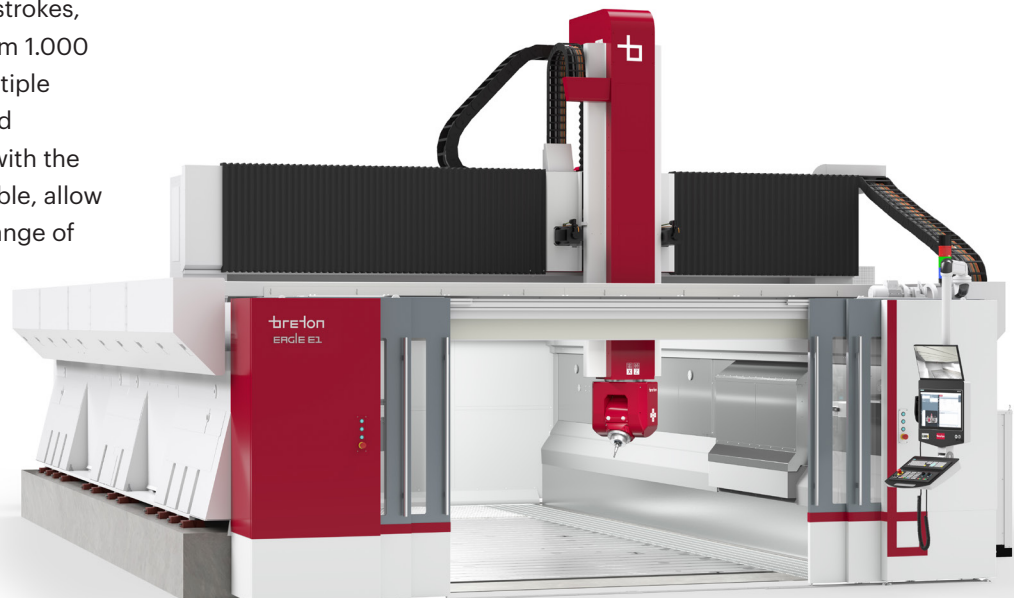
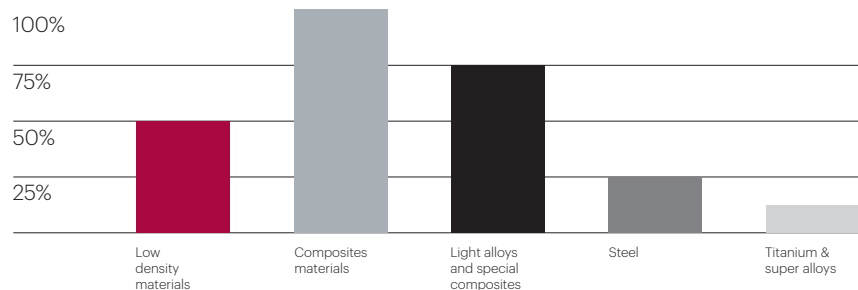
High-speed milling



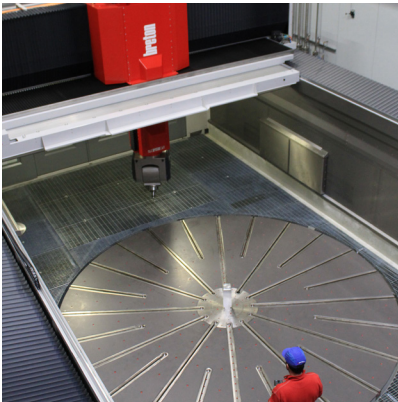
Thermostable



## Performance







	Flymill E1	Flymill MT
X axis travel	3.000 - 30.000 mm	3.000 - 30.000 mm
Y axis travel	3.000 - 4.000 mm	3.000 - 4.000 mm
Z axis travel	1.500 mm	1.500 mm
X/Y/Z axes rapid feedrate	50 / 50 / 40 m/min	50 / 50 / 40 m/min
A axis rotation	-105° +120° / ±115°	-105° +120° / ±115°
A axis rapid feedrate	30 rpm	30 rpm
C axis rotation	±305° / endless	±305° / endless
C axis rapid feedrate	30 rpm	30 rpm
Spindle power S6   S1	85 / 75 kW	85 / 75 kW
Spindle torque S6   S1	450 / 300 Nm	450 / 300 Nm
Spindle speed	14.000 rpm	14.000 rpm
Milling / Turning tool taper	HSK-A100 / -	HSK-A100 / CAPTO C8
Rotary table dimensions	-	2.000 - 5.000 mm

## Modular 5-axis gantry vertical machining center with high power and high precision.

A combination of strength and accuracy on large dimensions to obtain the maximum performance in roughing, semi-finishing and finishing operations on pieces made of tough material, steel or metal alloys. Available also in the Mill-Turn version (Flymill MT), it combines the functionalities of a vertical lathe with those of a continuous 5-axis milling machine, extending the range of tasks that can be achieved in a single setup. Flymill is the machining center designed to process parts on very large volume and to perform operations on tough materials where high power and torque are required. It stands out for its possibility to combine milling and turning operations in a single setup, exploiting the potential of the turning table and of the automatic head change, to automatically switch from the powerful milling head to the extremely rigid turning head.

## Technologies

High-speed milling



High Dynamics



Thermostable



Direct Drive heads



Turning



Automatic head change



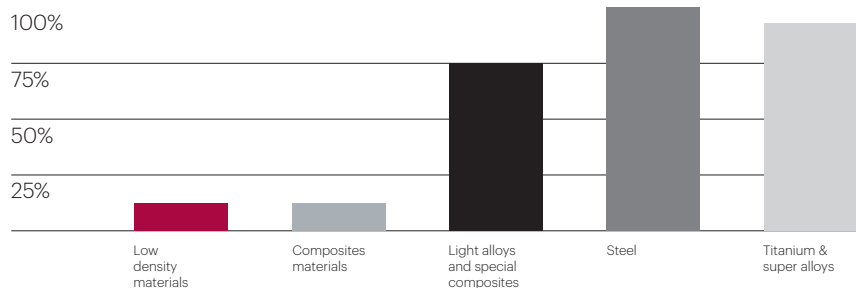
Thermal Shield



Dual Drive



## Performance





Matrix E1	
X axis travel	2.000 mm
Y axis travel	2.500 mm
Z axis travel	800 / 1.000 mm
X/Y/Z axes rapid feedrate	50 / 50 / 40 m/min
A axis rotation	-105° +120° / ±115°
A axis rapid feedrate	30 rpm
C axis rotation	±305° / endless
C axis rapid feedrate	30 rpm
Spindle power S6   S1	41 / 37 - 110 / 83 - 40 / 40 kW
Spindle torque S6   S1	89 / 62 - 115 / 87 - 137 / 100 Nm
Spindle speed	18.000 - 24.000 - 24.000 rpm
Milling tool taper	HSK-A63
Table dimensions	2.500 x 2.000 mm

## High-dynamic and high-precision 5-axis gantry vertical machining centre.

Available in different configurations to best meet the needs of specific applications including moulds, aerostructures and composite machining. It is particularly suitable for hi-feed roughing, semi-finishing and finishing operations on medium size parts made of steel, light alloys and special composites. The monoblock structure ensures greater machine stiffness. The direct motors on all linear axes increase precision and dynamics by eliminating backlash and vibrations caused by belts. The thermal expansions control is guaranteed by the thermo-symmetric structure along with the Thermalshield technology, increasing both precision and repeatability over time. Matrix E1 arrives already assembled and can be installed on flat foundations allowing to halve the time and cost of installation.

## Technologies

High-speed milling



Monoblock



Thermostable



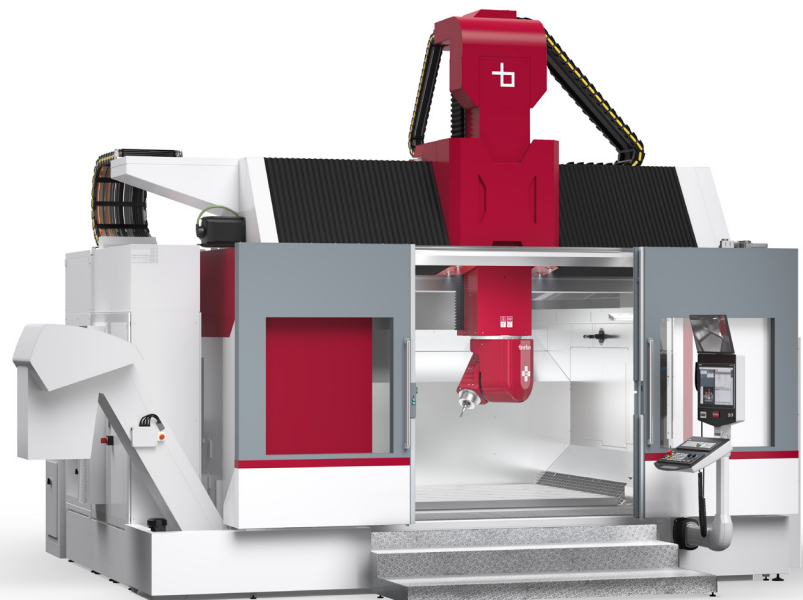
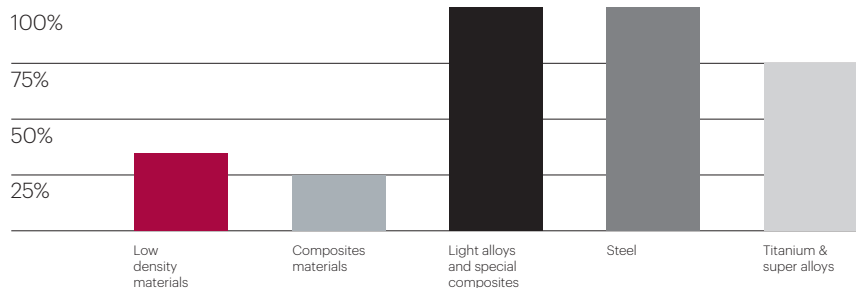
Direct Drive heads



Thermal Shield



## Performance







Matrix E2	
X axis travel	2.500 / 4.000 mm
Y axis travel	2.500 mm
Z axis travel	1.100 mm
X/Y/Z axes rapid feedrate	50 / 50 / 40 m/min
A axis rotation	-105° +120° / ±115°
A axis rapid feedrate	30 rpm
C axis rotation	±305° / endless
C axis rapid feedrate	30 rpm
Spindle power S6   S1	41 / 37 - 110 / 83 - 40 / 40 - 40 / 40 kW
Spindle torque S6   S1	89 / 62 - 115 / 87 - 137 / 100 - 180 / 150 Nm
Spindle speed	28.000 - 24.000 - 18.000 - 16.000 rpm
Milling tool taper	HSK-A63 / HSK-A100
Table dimensions	2.500 x 2.000 / 4.000 x 2.000 mm

## 5-axis gantry vertical machining center with high dynamics and high precision.

It is the result of careful technical choices that combine thrust and sturdiness with dynamics and precision to obtain the ideal performance in high-feed roughing, semi-finishing and finishing operations on medium-large size parts made of steel, light alloys, or special composites. Matrix E2 is the ideal solution in application fields where high precision and machining of medium-large size pieces is required, such as in the aerospace sector (machining of structures and equipment), in the construction of large moulds, in the automotive sector (extremely precise moulds and composite components) and in general precision engineering. To guarantee surfaces with a superior finish, Matrix E2 uses High Dynamics and Thermal Shield technologies, both developed by Breton.

## Technologies

High-speed milling



High Dynamics



Thermostable



Direct Drive heads



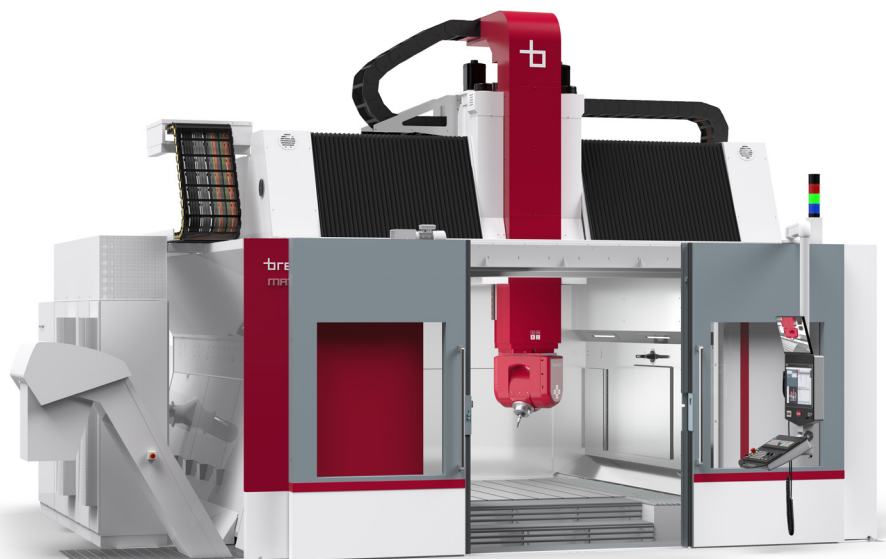
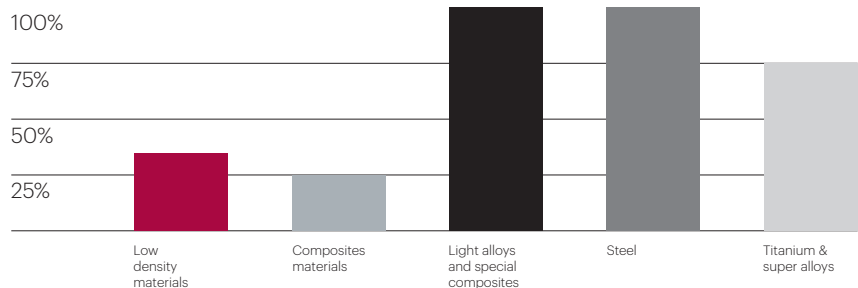
Thermal Shield



Dual Drive



## Performance





Matrix E3	
X axis travel	3.000 - 30.000 mm
Y axis travel	3.000 - 4.000 mm
Z axis travel	1.500 mm
X/Y/Z axes rapid feedrate	50 / 50 / 40 m/min
A axis rotation	-105° +120° / ±115°
A axis rapid feedrate	30 rpm
C axis rotation	±305° / endless
C axis rapid feedrate	30 rpm
Spindle power S6   S1	41 / 37 - 110 / 83 - 40 / 40 - 40 / 40 - 55 / 55 kW
Spindle torque S6   S1	89 / 62 - 115 / 87 - 137 / 100 - 180 / 150 - 235 / 200 Nm
Spindle speed	28.000 - 24.000 - 18.000 - 16.000 - 12.500 rpm
Milling tool taper	HSK-A63 / HSK-A100
Table dimensions	2.500 - 3.500 / 3.000 - 30.000 mm

## Modular 5-axis gantry vertical machining center with high dynamics and high precision.

Careful technical choices made it possible to combine thrust and strength with dynamics and precision, in order to obtain the ideal performance in hi-feed roughing, semi-finishing and finishing operations on large parts in steel, light alloy or special composites.

Matrix E3 is used in applications where high precision and large part machining is required, such as in the aerospace (structure and tool machining), automotive (high precision prototyping, moulds and composite structures), mould making and general precision engineering.

The Dual Drive motors guarantee power and precision; they move together to achieve maximum thrust when the machining requires significant effort, while working "in preload" when the machine is performing high precision machining.

Breton technologies such as High Dynamics and Thermal Shield provide a superior surface finish.

## Technologies

High-speed milling



High Dynamics



Thermostable



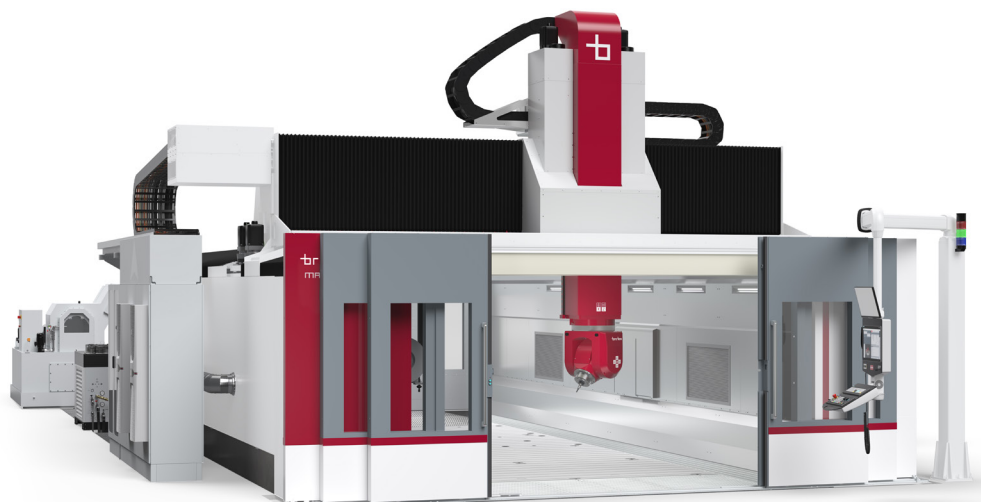
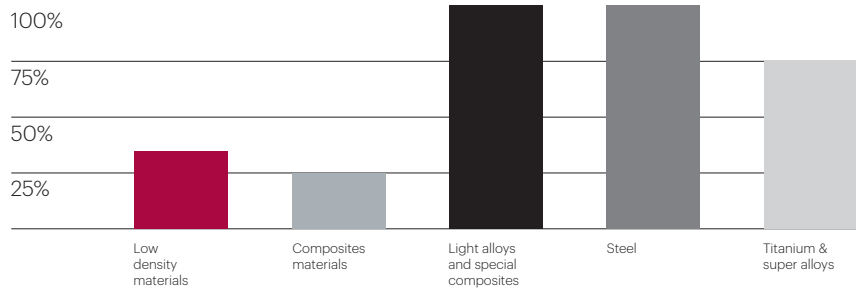
Direct Drive heads



Thermal Shield



## Performance





	Ultrix E1	Ultrix E2	Ultrix E3
X axis travel	900 mm	1150 mm	1700 mm
Y axis travel	900 mm	1000 mm	1700 mm
Z axis travel	600 mm	700 mm	1000 mm
X/Y/Z axes rapid feedrate	60 / 60 / 40 m/min	60 / 60 / 40 m/min	60 / 60 / 40 m/min
A axis rotation	-30° +110°	-30° +120°	±120°
A axis rapid feedrate	endless	endless	endless
C axis rotation	1.520 / 1.000 Nm	2.700 / 2.000 Nm	2.700 / 2.000 - 5.000 / 3.500 Nm
C axis rapid feedrate	1.000 / 800 rpm	500 / 400 rpm	450 / 350 rpm
Spindle power S6   S1	55 / 40 - 41 / 37 - 40 / 40 kW	55 / 40 - 41 / 37 - 40 / 40 kW	40 / 40 - 85 / 75 - 62 / 48 kW
Spindle torque S6   S1	22 / 16 - 89 / 62 - 137 / 100 Nm	89 / 62 - 137 / 100 - 480 / 300 Nm	137 / 100 - 480 / 300 - 730 / 600 Nm
Spindle speed	40.000 - 28.000 - 18.000 rpm	40.000 - 28.000 - 18.000 rpm	18.000 - 14.000 - 14.000 rpm
Milling tool tape	HSK-A63	HSK-A63	HSK-A63 / HSK-A100
Turning tool tape	Capto C6	Capto C8	Capto C8 / HSK-T100
Table dimensions	800 mm	1.200 mm	1.350 mm

## Multitasking vertical machining center with rotary table and independent turning bar.

It performs high-precision milling, turning and grinding operations, and provides the most efficient performance on light alloys, steel and super alloys. Designed to work with high dynamics (jerk, accelerations and speed) without using linear motors, it allows to obtain a considerable energy saving and to guarantee all the thrust necessary even in the heaviest operations.

The rigid monoblock structure made of Metalquartz ensures maximum rigidity and stability and allows comfortable and safe access for the operator while maintaining ergonomics and visibility of the workpiece.

The Ultrix range is composed of three models, the largest of which can process workpieces up to 1,600 mm in diameter.

## Technologies

High-speed milling



High Dynamics



Thermostable



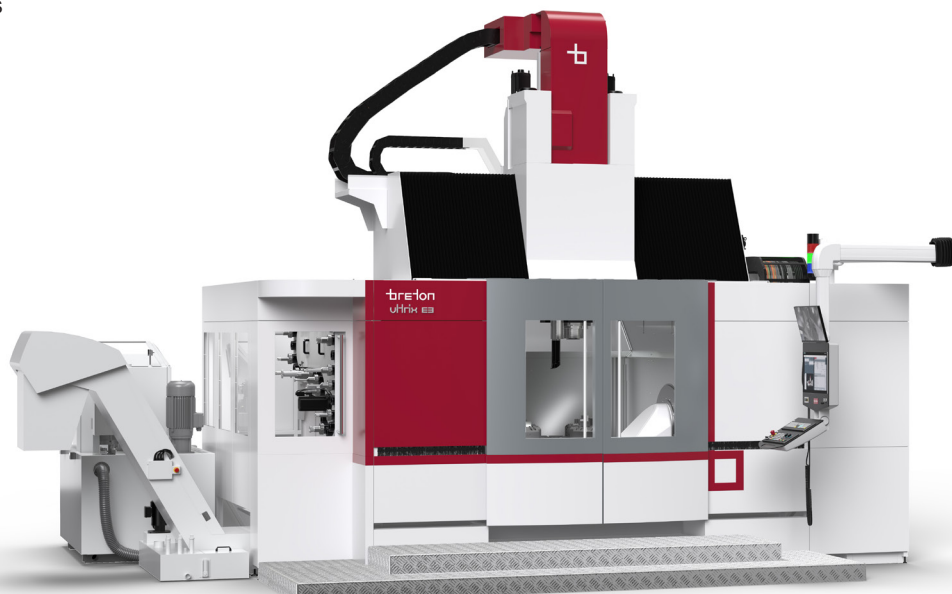
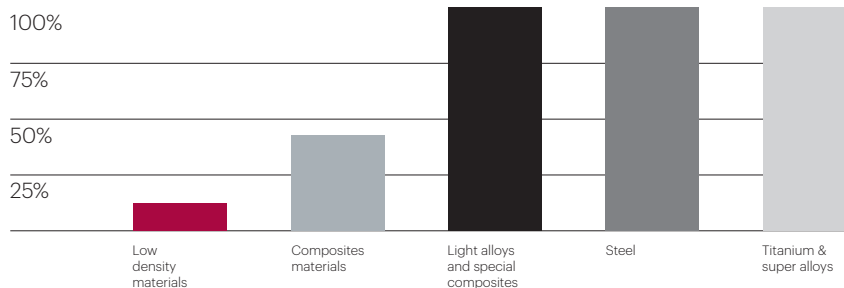
Direct Drive heads



Thermal Shield



## Performance





# Milling and turning heads

## hornet HEAD

For **Hawx**,  
**Raptor** and **Eagle**

Motor spindles:  
Torque  
from 12 to 18 Nm

Speed up to  
24.000 rpm



## ghibli HEAD

For **Eagle**,  
**Matrix E1**  
and **Raptor**

Motor spindles:  
Torque  
from 52 to 62 Nm

Speed up to  
28.000 rpm



## phoenix HEAD

Direct Drive head  
for **Matrix E1** and  
**Matrix E2**

Motor spindles:  
Torque  
from 63 to 83 Nm

Speed up to  
28.000 rpm



## tornado HEAD

Direct Drive head  
for **Matrix E1** and  
**Matrix E2**

Motor spindles:  
Torque  
from 62 to 200 Nm

Speed up to  
28.000 rpm



## typhoon HEAD

For **Matrix E1**,  
**Matrix E2** and  
**Matrix E3**

Motor spindles:  
Torque  
from 62 to 100 Nm

Speed up to  
28.000 rpm



# 100% made in breton

Breton mechanical milling heads offer a level of robustness that is unique on the market. Available in fork-style or single-sided solutions, rotary movements are provided by digital brushless motors or by thermally stabilised direct drive motors, while rotary axis positioning can be controlled via external encoders.

Equipped with a thermally stabilised milling motor spindle with chiller and with ducts for the passage of external and thru-tool taper cleaning air and cutting fluid; in the most demanding machining conditions the axes can be locked by pneumatic brakes. Breton milling heads can work with resins, composite materials, aluminium, steel, and superalloys.

## tornado hd head

Direct Drive head  
for Flymill

Motor spindles:  
Torque  
from 100 to 300 Nm

Speed up to  
18.000 rpm

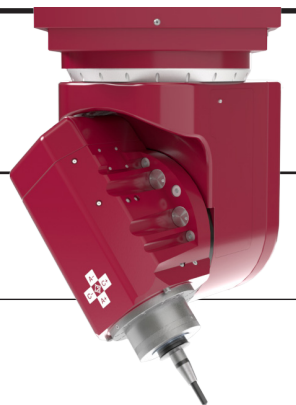


## typhoon hd head

For Matrix E2  
and Flymill

Motor spindles:  
Torque  
from 62 to 100 Nm

Speed up to  
28.000 rpm



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# SUCCESSFUL collaborations

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HEIDELBERG



dallara

■ Esistampi



HYS Group



BRIDGESTONE

■ Kale Aero



MDA



WFT

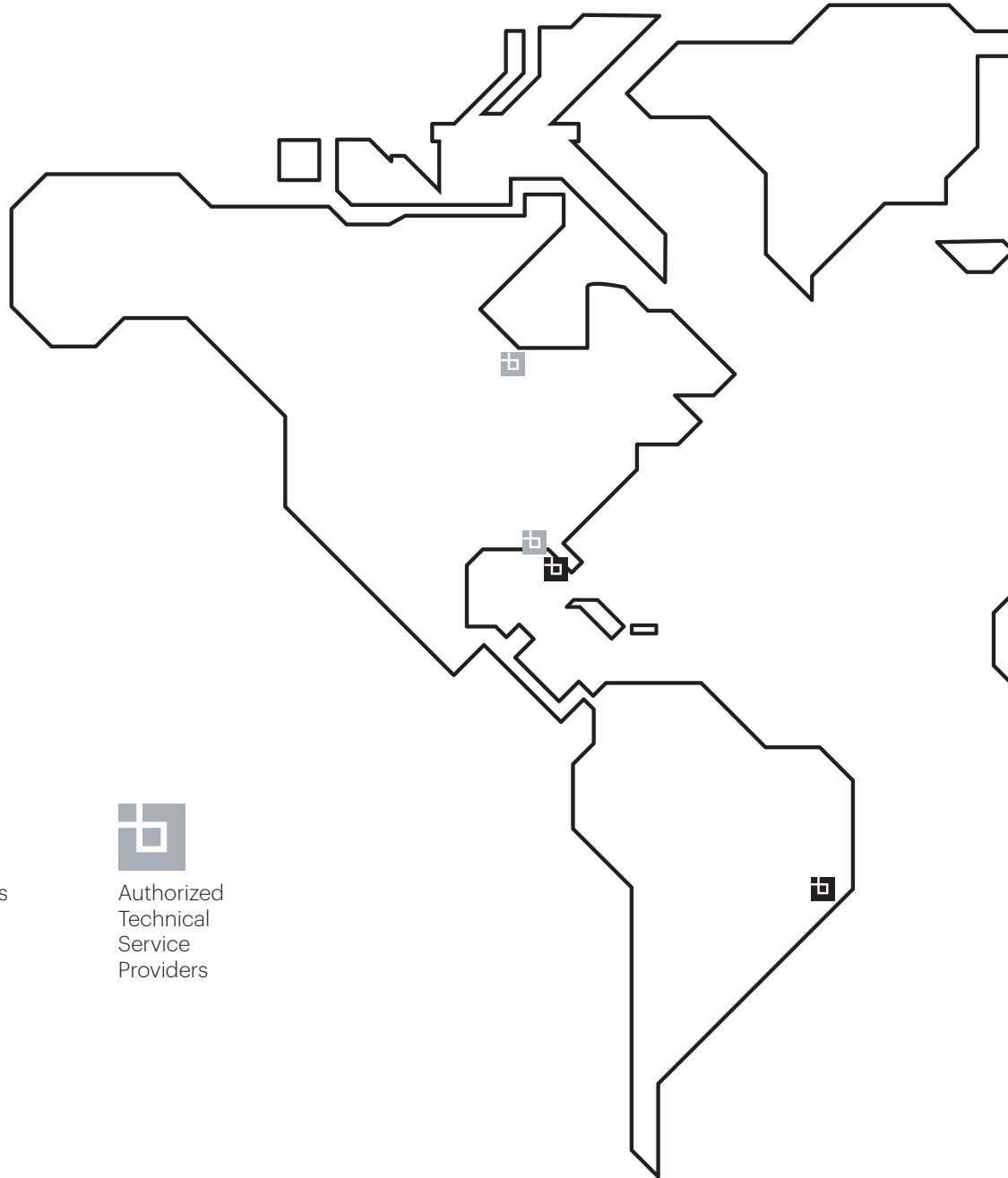


Ferra



MEGGITT





Headquarter



Branches



Authorized  
Technical  
Service  
Providers

## BRANCHES

### AUSTRALIEN

U4/8-20 Brock Street - Thomastown 3074  
Melbourne Victoria

### BRASIL

Av. Aristides Campos, 494 - Campo da Leopoldina  
Cachoeiro de Itapemirim

### CHINA

No.2 Zhonghuan South Road,  
Wangjing Chaoyang District, Beijing

### INDIA

No. SPL.16, 2nd Cross, KSSIDC Industrial Estate,  
Yarandahalli Village, Jigani Hobali, Anekal Taluk,  
Bommasandra, Bengaluru

302, 120 Feet Road, Adarsh Nagar Sector-4  
Hiran Magri, Udaipur, Rajasthan

### UNITED KINGDOOM

82 Osprey Drive,  
Cambridge CB29FU

### USA

1753 Northgate Boulevard  
Sarasota, Florida 34234

### GERMANY

Riether Str. 41A 48317 Drensteinfurt

## SERVICE CENTERS

### BELGIUM

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### ISRAEL

Kiryat Bialik

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Sarasota  
Los Angeles

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Cambridge

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Melbourne

### ITALY

Castello di Godego (TV)

### TURKEY

Denizli

### UKRAINE

Kiev

### NORWAY, SWEDEN,

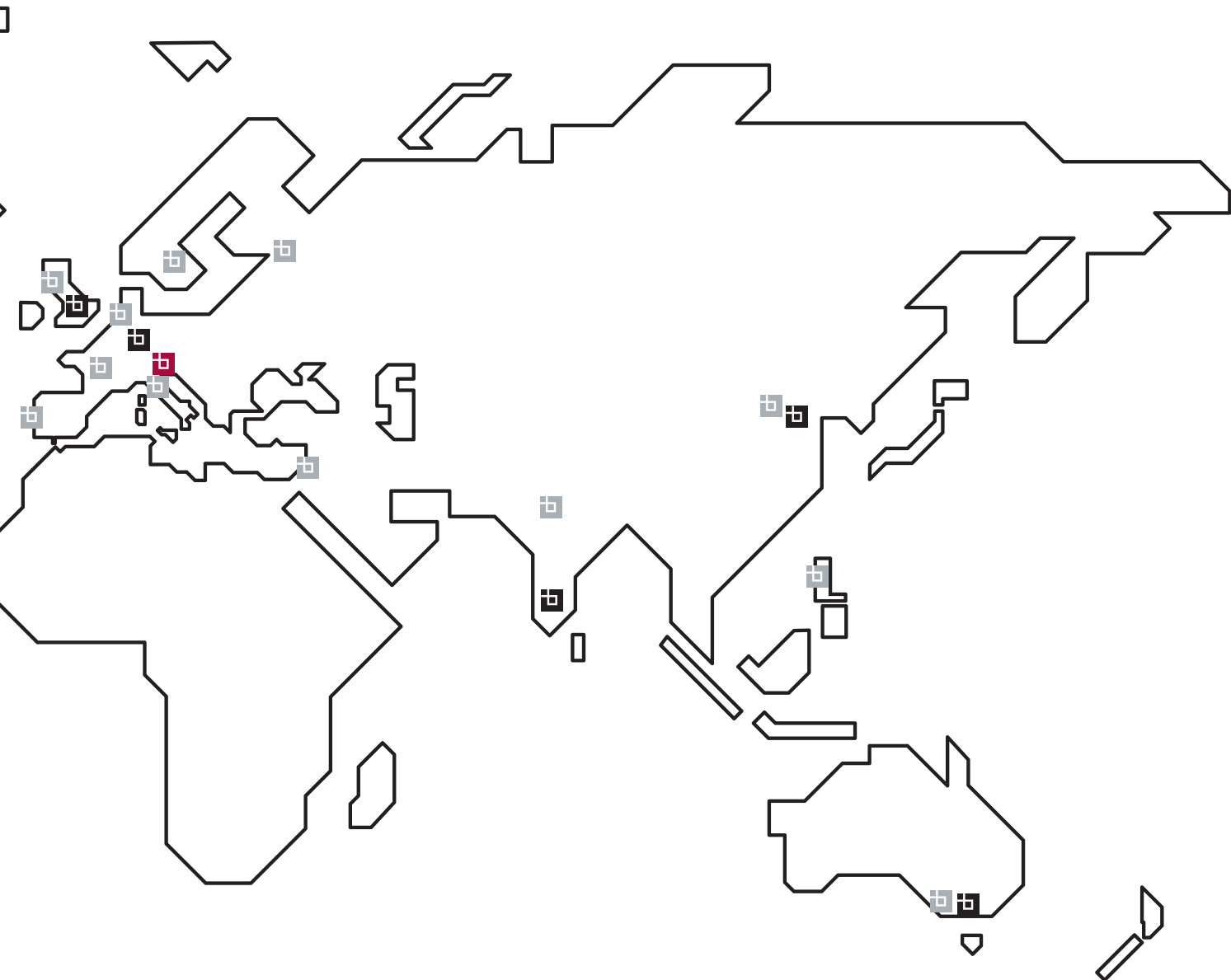
FINLAND  
Kelsinki

### SOUTH KOREA

Soul

### PORTUGAL

Batalha



## 360° support

### **Performance-oriented systems and custom solutions**

Breton provides a tailor-made analysis and strategy, the result of a know-how consolidated by an integrated approach. This activity exploits Breton's unique technical expertise to both assess the feasibility of an existing plan and develop optimized solutions to achieve Customers' goals.

## Customer service

### **Well-structured and comprehensive services**

Highly experienced technicians take care of installation, start-up and assistance on-site and remotely. Breton guarantees after-sales and spare parts services with worldwide coverage thanks to an extensive network of service centers. The Breton Customer Service team supports the customer with trainings and solves process and technological problems with the best specialized engineers.



GENESI E2  
k40

GENESI E2  
k60

GENESI E2  
+M

Version	print	print	print + milling
X - axis stroke	4.000 mm	6.000 mm	4.700 mm
Y - axis stroke	1.900 mm	1.900 mm	1.900 mm
Z - axis stroke	1.300 mm	1.300 mm	1.300 mm
Extrusion capacity (max)	60 kg/h	60 kg/h	60 kg/h
Milling spindle	-	-	18 / 24.000 rpm
Milling tool taper	-	-	HSK - A63
Width	3.200 mm	3.200 mm	3.200 mm
Length	7.070 mm	10.070 mm	10.070 mm
Height	5.650 mm	5.650 mm	5.650 mm

# YOUR NEXT ADDITIVE MANUFACTURING ECOSYSTEM



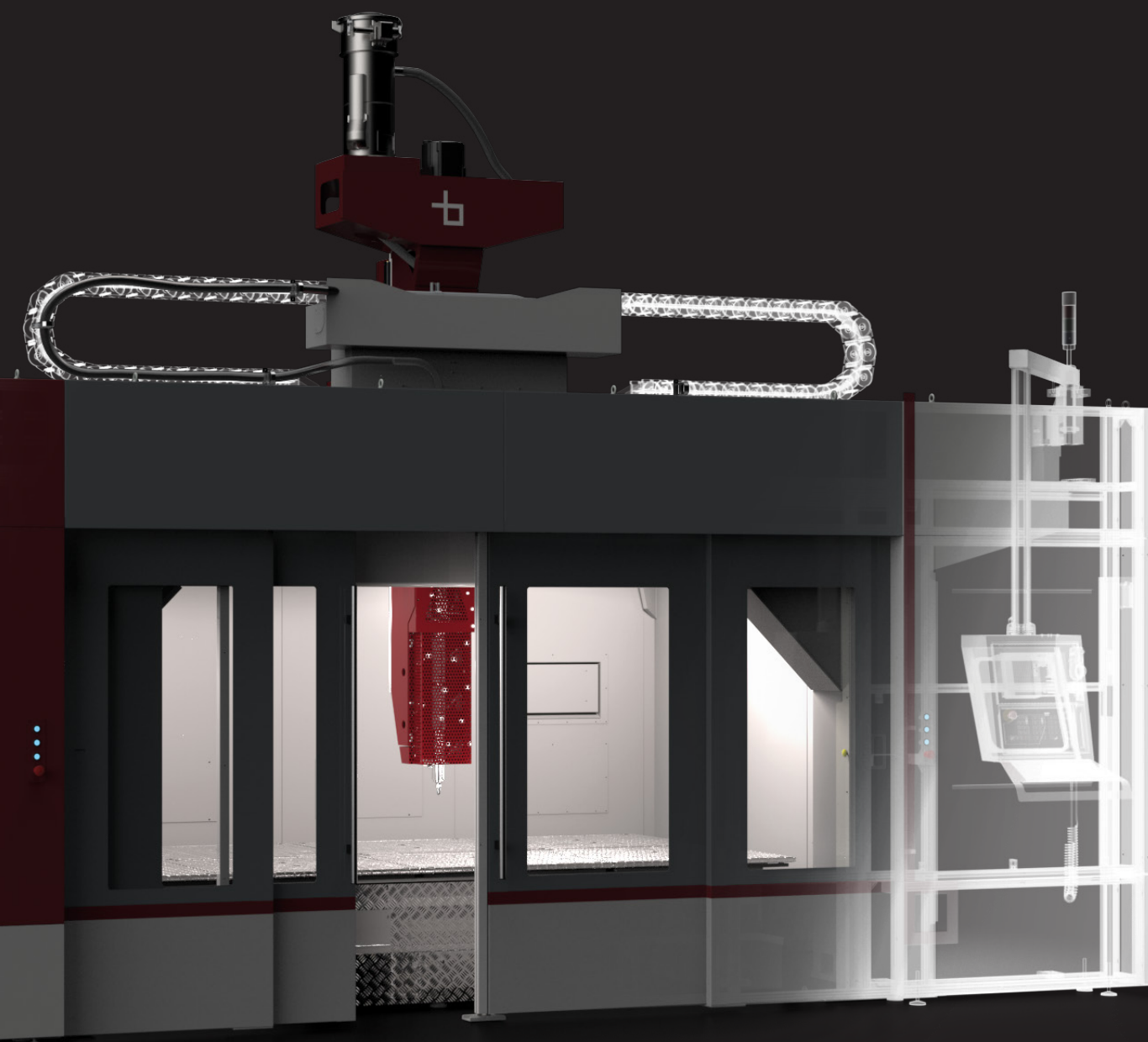
GENESI E3

GENESI E4

GENESI E3/E4

+M

Version	print	print	print + milling
X - axis stroke	4.000 - 30.000 mm	4.000 - 30.000 mm	4.000 - 30.000 mm
Y - axis stroke	4.000 mm	3.000 - 5.000 mm	3.000 - 5.000 mm
Z - axis stroke	1.200 - 2.000 mm	2.000 - 2.500 mm	1.200 - 2.500 mm
Extrusion capacity (max)	60 kg/h	60 - 200 kg/h	60 - 200 kg/h
Milling spindle	-	-	-
Milling tool taper	-	-	HSK - A63
Spindle power S6   S1	-	-	31 / 25 - 41 / 37 - 25 / 21 kW
Spindle torque S6   S1	-	-	65 / 52 - 89 / 62 - 20 / 18 Nm
Spindle speed	-	-	16.000 - 28.000 - 24.000 rpm



**Breton – a pioneering developer of advanced technologies and materials – is an international leader in the design and production of state-of-the-art industrial machinery and systems to create and transform natural stone, ceramics, metals and in the development of engineered stone plants.**

Founded in 1963 by Marcello Toncelli, with headquarters in Treviso (Castello di Godego), two other production sites in Italy and seven foreign branches (USA, Australia, India, Germany, China, UK, Brazil), the company is recognized worldwide thanks to its philosophy always aimed at research and innovation.



The Breton Institute of Technology, expression of Breton's DNA and pioneering attitude, is the department where new technologies are explored and created. Several teams devoted to research design and develop new sustainable materials and technologies for different industrial sectors.

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The Breton logo, consisting of the word 'breton' in a lowercase, bold, sans-serif font. The letter 'b' is stylized with a horizontal bar that extends to the left and then curves back to the right, forming a square-like shape.