oerlikon
balzers

INSPIRA carbon
Harder. Smoother. Smarter.
The coating platform of tomorrow

Equipment

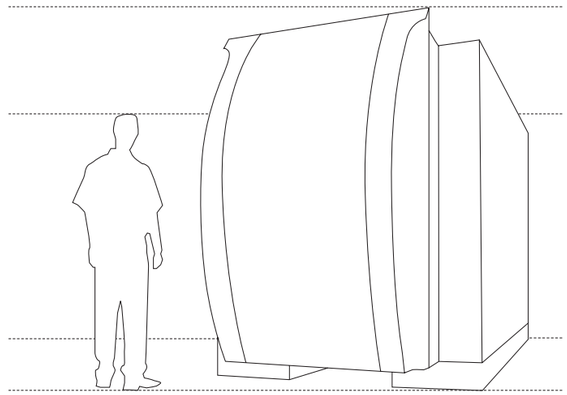
INSPIRA carbon
Proven today. Prepared for tomorrow.

INSPIRA carbon is an advanced carbon coating platform for precision components – designed to meet today's production demands while unlocking the full potential of tomorrow's coating technologies. It supports established BALINIT and BALIQ coatings, and opens the door to future solutions – powered by S3p technology. This means: you start with what you know – and grow into what's next.

The system offers precise pulse parameter control, enabling tailored carbon coatings with optimized hardness, smoothness, and friction properties. With INSPIRA carbon's advanced process design, it delivers coating consistency and flexibility across different part geometries – resulting in improved performance, efficiency, and extended component lifetime.

INSPIRA carbon combines proven design with next-generation process control to deliver high throughput, consistent quality, and lower cost per coated part. Optimized plasma performance and excellent process stability set new standards for productivity, coating quality, and energy-efficient operation – all in one system.

	INSPIRA carbon mega
Max. coatable diameter	975 mm
Max. coatable height	900 mm
Max. loading capacity	1400 kg
Technology	S3p, Sputter
Flange configuration	2 S3p Sputter flanges 2 Conventional Sputter flanges
Etching	Side-Etching Technology (SET)
Number of spindles	7



Dimensions

Length: 4728 mm
Width: 2339 mm
Height: 2904 mm
Footprint: 11 sqm
Weight: 7800 kg without loaded carousel

INSPIRA carbon mega
up to 5 batches per day (in 24 hs.) possible

Productivity.

- **25% higher volume capacity** compared to market standard. More parts per batch without extending cycle time.
- **S3p-enabled flexibility** – Allows mixed part types in a single batch without the need for uniform fixture spindle.
- **Optimized deposition rate** – Proven plasma process scaled for consistent coating quality and high throughput.

Efficiency.

- **Smart cooling design** – A single water loop cools the chamber, parts, and electronics —reducing energy consumption.
- **Robust sealing concept** – Minimizes potential leak points, ensures long-term operation with minimal maintenance.
- **Easy operation** - Built-in guidance, intuitive controls, and integrated safety interlocks ensure quick and reliable handling.

Quality.

- **Carbon coatings based on S3p** – Exceptionally smooth, dense coatings with outstanding hardness and wear resistance.
- **Stable plasma conditions** – Ensure uniform coating quality across diverse part geometries and batch configurations even at low temperatures.
- **BALIQ® CARBOS** – Coating with exceptional smoothness and hardness (up to ~40 Gpa) for maximum performance.
- **Durability through balanced performance** – hardness, wear resistance, and surface quality with excellent part compatibility.

High-Performance Low-Temperature Coatings
Efficient cooling for top-quality results — batch after batch.

Carbon coatings require a stable thermal environment to perform at their best. INSPIRA carbon supports this with a precisely controlled cooling system that maintains temperatures below 180 °C – ensuring that substrates retain their shape and chemical structure during the process.

The system's integrated cooling architecture supports effective temperature control across all critical areas. This helps to stabilize coating conditions, reduce thermal stress, and protect the integrity of coated parts.

A single water circuit cools the chamber, fixtures, and electronics, simplifying the setup while reducing energy consumption. The water-cooled electronics operate without fans or filters, helping to maintain clean conditions and minimize maintenance.

From thermal performance to process consistency, the coolingsystem is engineered to support the entire operation – efficiently and reliably.

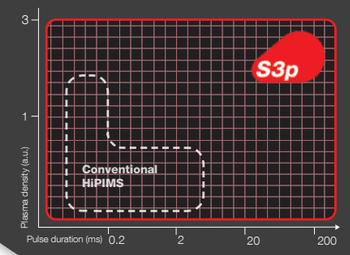
S3p Sources – Scalable Pulsed Power Plasma
Precision-Engineered for High-Performance Carbon Coatings

- High ionisation in the process without droplets
- Smooth coating surface
- Very high coating density and hardness
- Excellent adhesion

INSPIRA carbon mega
in action

Remarkable scalability

Thanks to precise and independent control of pulse duration, shape, and current density, customised coatings can be realised at various scales. This unique process window surpasses conventional HiPIMS, enabling higher deposition rates and improved process stability.



Tailored Carbon Coatings with Exceptional Properties –
Enabled by S3p Technology

Extraordinary coating design

The high precision in coating thickness distribution ensures uniform coverage and dimensional accuracy, which is critical for reliable friction behavior and component performance.

Excellent frictional properties

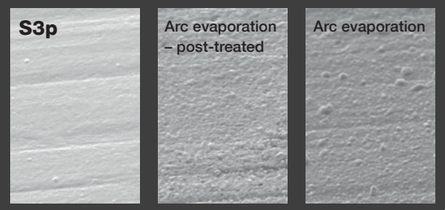
Carbon coatings offer an exceptionally low coefficient of friction, reducing wear and enhancing the operational reliability of precision components.

High density

Coatings based on S3p technology feature a density close to the theoretical maximum. Their high toughness and excellent resistance help prevent damage initiation and propagation during frictional contact.

Revolutionary smoothness

Exceptionally smooth surfaces eliminate the need for mechanical post-treatment. The result: low friction, excellent thermal stability and less heat generation in the tribological system.



Very good adhesion

Coatings based on S3p technology provide an exceptionally strong bond between coating and substrate, ensuring a long and reproducible component service life.

Exceptional precision

The high precision in coating thickness distribution ensures uniform coverage and dimensional accuracy, which is critical for reliable friction behavior and component performance.

Engineered for Industries That Move the World

Shaping industries for tomorrow with advanced carbon coatings

INSPIRA is more than a coating system — it's the gateway to long-lasting, low-friction carbon coatings that open new possibilities in many industries. With stable low-temperature processing and clean, efficient performance, it protects components wherever reliability and precision are essential. INSPIRA helps save energy and supports sustainable progress – by protecting the components that move our world and shape tomorrow's innovations.

Superior Carbon Coating Performance —

Powered by INSPIRA carbon

BALINIT and BALIQ carbon coatings that deliver today — and evolve with tomorrow

INSPIRA carbon applies reliable carbon coatings from the BALINIT and BALIQ families in the proven quality that customers around the world already rely on. And the system is built for more: its architecture supports future coating innovations, making it a forward-looking solution for the evolving needs of modern industry.

COATING	Coating material	Coating hardness H_{IT} [GPa]	Coefficient of friction (dry) vs. steel*	Max. service temperature [°C]	Coating temperature [°C]	Coating color
BALINIT® C	a-C:H:Me	10 - 15	0.1 - 0.2	300	< 250	anthracite
BALINIT® C STAR	CrN + a-C:H:Me	8-12 / 12-15	0.1 - 0.2	300	< 250	anthracite
BALIQ® CARBOS	a-C	30 - 40	0.1 - 0.2	350	< 200	black
BALIQ® CARBOS STAR	CrN / a-C	30 - 40	0.1 - 0.2	350	< 200	black
BALINIT® CNI	CrN	18 +/-3	~0.5	700	< 250	silver-grey
BALINIT® DLC	a-C:H	~15-25	0.1 - 0.2	300	< 250	black
BALINIT® DLC STAR	CrN / a-C:H	~15-25	0.1 - 0.2	300	< 250	black

*Determined by ball-on-disc test in dry condition with an Steel ball according to ASTM G99.
During run-in the given values may be exceeded.

Up and running!
Our global After Sales organization gives you services and products for every aspect of your coating equipment.

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