

DLyte



**THE METAL SURFACE
FINISHING REVOLUTION**



GPAINNOVA, among Europe's 4 fastest-growing companies in the industrial goods sector, according to the Financial Times 1000 Europe's Fastest Growing Companies 2022.



Founded in Barcelona in 2013 and settled in Sunrise (Florida, USA), Hong Kong and Shenzhen (Mainland China), GPAINNOVA is specializing in surface finishing solutions for metal and alloy parts. The group develops, manufactures and markets advanced surface finishing machinery, accessories and consumables based on the patented, disruptive dry electropolishing technology (DryLyte) for customers around the world.

Through its brand DLyte, GPAINNOVA is reinventing the way to automate high-quality metal surface finishing, from the medical device field to mass production in industrial sectors, launching customized, affordable and cost-effective solutions to meet the real needs of the market.

THE RISE OF A NEW TECHNOLOGY FOR THE INDUSTRY

After years of research, GPAINNOVA launched DryLyte. Based on the use of solid particles instead of liquid for the electropolishing of metal and alloy parts, this patented technology has reinvented high-quality metal surface finishing, it improves the results of existing treatments. This solution combines the advantages of an electrolytic polishing system and an abrasive system, enhancing the surface quality while preserving the geometry of the piece and increasing corrosion resistance at the same time in a single treatment.

The DLyte system reduces the number of surface finishing processes and therefore the space required for manufacturing, as well as significantly cutting the carbon footprint and waste generation linked to traditional metal treatments. In order to meet all kinds of needs GPAINNOVA counts on a wide range of dry electropolishing machinery specially designed for surface treatment. This equipment provides high-quality, automated metal surface finishing for industries such as dentistry, healthcare, automotive, aerospace, other industrial fields, jewelry and fashion.

Since DryLyte was launched, the main goal has been to revolutionize the finishing industry thanks to cost-effective, resource-efficient and timely-production technologies. DLyte offers a wide range of support and consultancy services such as: engineering services for the development of surface finishing processes to training, on-site consulting, machine set up, polishing line set up technical service.

-  10 years of expertise in surface finishing processes
-  More than 800 machines installed
-  55 distributors around the globe
-  200 workers and 3 surface finishing centers

DISRUPTIVE SURFACE FINISHING TECHNOLOGY

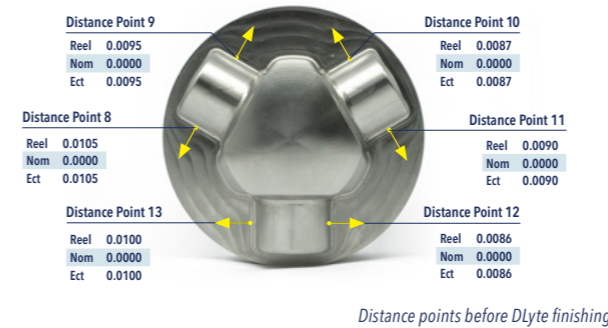
DLyte is a polishing system for metal parts requiring high performance or superior finishing. DryLyte brings significant technical advantages over competing technologies, such as abrasive finishing, robotic grinding and polishing, mechanical brush and grinding systems. In addition, it allows the user to obtain a quality equivalent to manual grinding and polishing fast and cost-effectively.

Unlike traditional polishing systems, the DLyte system obtains consistent finish, avoiding any marks on the surface, patterns and is able to process complex geometries without generating micro scratches on the surface. DLyte respects the tolerances of the piece, delivering a mirror finish.

DLYTE. TECHNICAL BENEFITS

01. HOMOGENEOUS RESULTS

Achieves homogeneous results across the surface and eliminates micro scratches, as opposed to abrasive polishing. The system works efficiently at a micro and macroscopic level.



RANGE OF MATERIALS

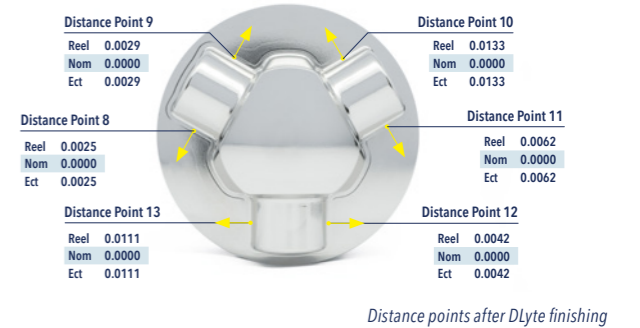
- + Cobalt Chrome
- + Stainless Steel
- + Carbon Steel
- + Carbides
- + Nickel Alloys
- + Aluminium Alloys
- + Copper Alloys
- + Titanium Alloys

FINISHING PROCESSES

- + Precision finishing
- + Polishing
- + Smoothing
- + Deburring
- + Mirror finishing
- + Corrosion resistance
- + AM post-processing

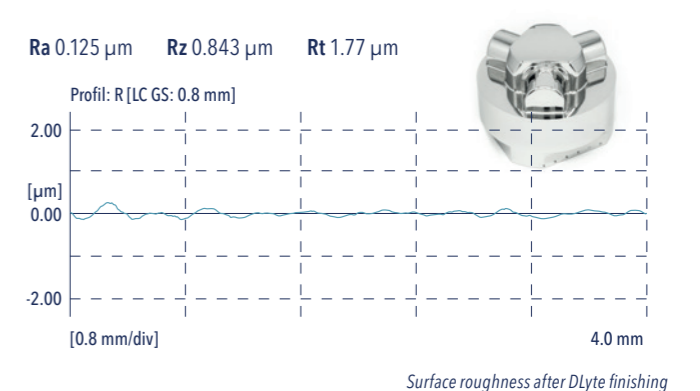
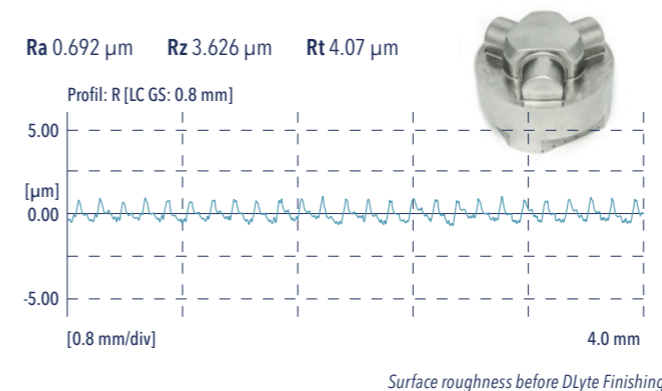
02. GEOMETRY PRESERVATION

It respects the tolerances and preserves the initial shape, even the cutting edges. It does not round the edges as there is no mechanical abrasion of the surface.



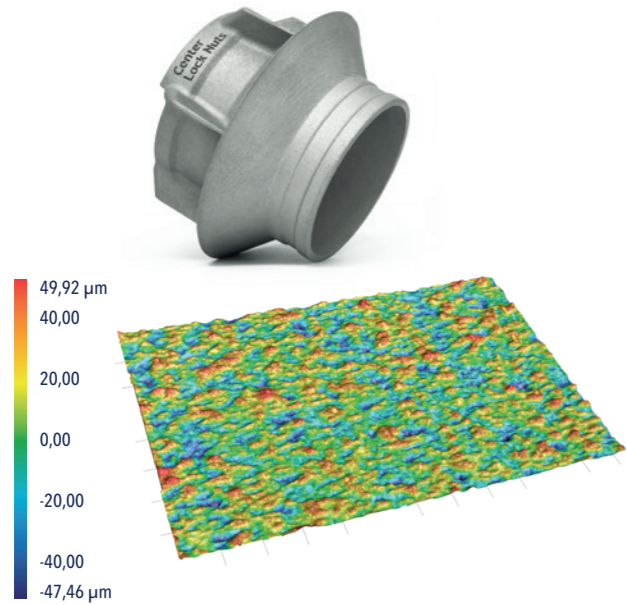
03. BEST-IN-CLASS SURFACE ROUGHNESS

DLyte is able to reduce the roughness over 80% avoiding undesired effects. Liquid electropolishing process is not able to reduce the roughness more than 50% versus initial roughness without generating side effects like orange peel or pitting.



04. LOW MATERIAL REMOVAL IN COMPARISON TO OTHER POLISHING PROCESSES

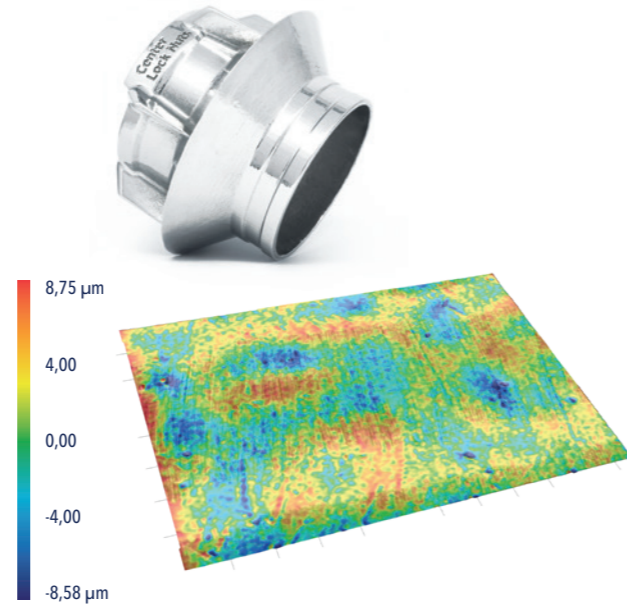
The DLyte process removes material only from roughness peaks as the diameter of the particles is bigger than the roughness profile.



Roughness measurement before DLyte Finishing

05. CONSISTANT REPEATABILITY

The DryLyte Technology ensures stable results among various batches along the electrolyte media lifespan. There is no physical wear, as would typically occur with abrasive particles.



Roughness measurement after DLyte Finishing

06. ENHANCES NEGATIVE SURFACE SKEWNESS (RSK)

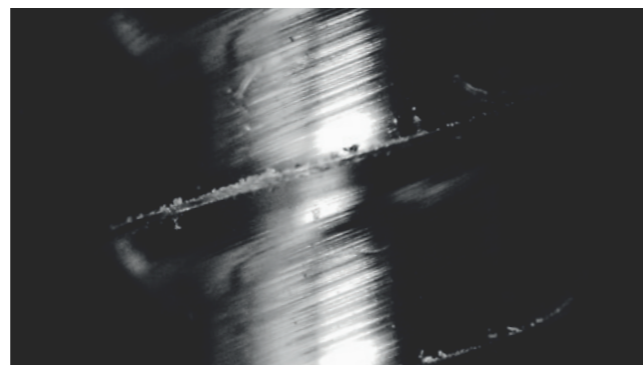
It increase the surface bearing contact area (allowing uniform lubricant film distribution) improving the bearing ratio and reducing the friction between the pieces.

07. AVOIDS GRINDING TEXTURE PATTERNS

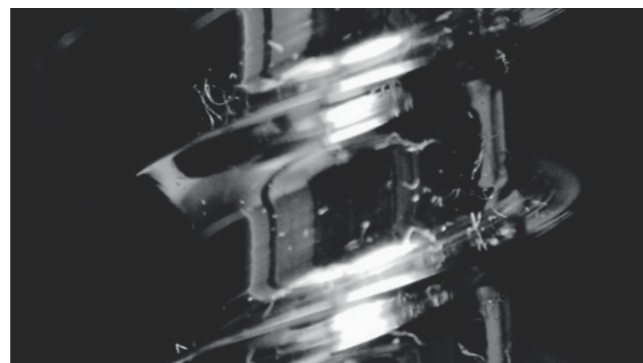
Reduce wear and improving resistance to fracture and fatigue.

08. BIOCOMPATIBILITY PROVEN

DLyte is only using polymeric particles with acids to improve surfaces. DLyte has proven the biocompatibility of the products processed with its technology.



Machining patterns before DLyte finishing (500x Lens)



Uniform surface after DLyte finishing (500x Lens)



Biocompatibility of the Process Test Study
DLyte has proven the Biocompatibility of the products processed with DLyte System. The product can be considered non-cytotoxic. The study has been made according to the specifications of standard UNE-EN-ISO 10993-5:2009.

QR - Download the Cytotoxicity Study

09. IMPROVE THE CORROSION RESISTANCE

This is the only technology that allows to **remove roughness and improve the corrosion resistance** of the metal pieces while reducing the number of processes required in the manufacturing process.



Corrosion Resistance Test Study
The results of the study show that DLyte achieves better corrosion resistance than liquid electropolishing. The dry EP sample corrodes slower than the traditional EP sample.

QR - Download the Corrosion Resistance Study

DLYTE. OPERATIONAL BENEFITS

10. NO NEED FOR OUTSOURCING OR MULTISTEP PROCESSES

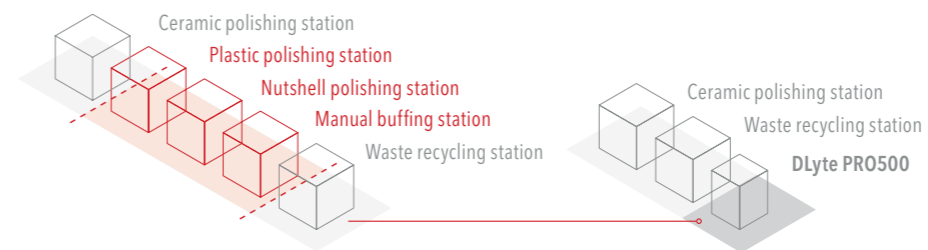
DLyte replaces several finishing steps and the need of outsourcing processes requiring special environmental licenses as liquid electropolishing. Lead time reduction, improved quality and internal process control.

11. COST REDUCTION

Supposes a production cost reduction over 50%, including process, logistics, improved quality, etc.

12. REDUCED FOOTPRINT

The DLyte process has a high output in a very compact design. There is no need for peripheral devices as wastewater or sludge treatment machinery.



Comparison between a traditional industrial process and an industrial process with DLyte for knee implant surface finishing



13. EASY WASTE MANAGEMENT & LOW WATER CONSUMPTION

The DLyte system does not require a closed-up system to recycle water and sludge waste treatment machinery decreasing space, labor, water and environmental license costs savings.

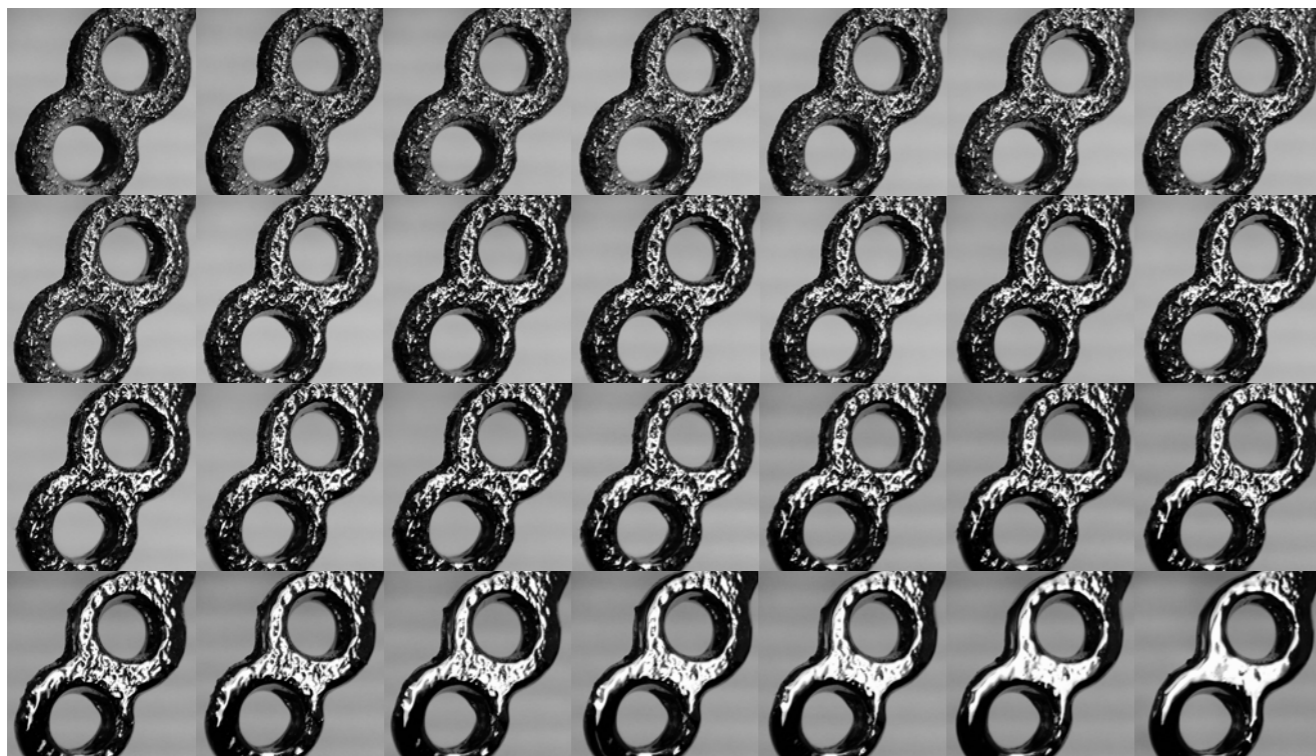
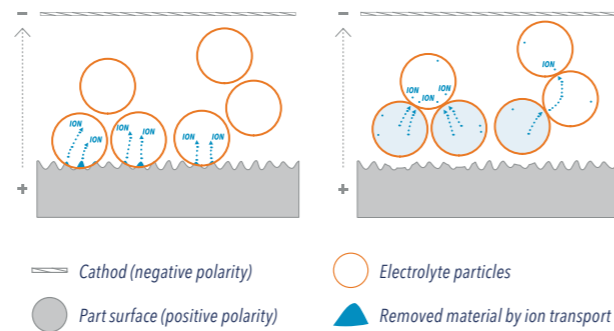


14. IMPROVEMENT OF THE WORKING ENVIRONMENT

Clean, non-hazardous and easy waste management. Alternative abrasive processes lead to an extremely dusty and noisy environment.

DRYLYTE TECHNOLOGY PROCESS

DryLyte is a patented technology for grinding and polishing metals by ion transport using free solid bodies. The DryLyte Technology works by combining the electrical flow created by high-precision rectifier with the movement of the pieces through the electropolishing media. This results in an ion exchange, **removing material only from the peaks of roughness. The process does not round edges and can access corners that are not easily accessed mechanically.**



DLyte polishing process by ion transport

DLYTE SOLUTIONS

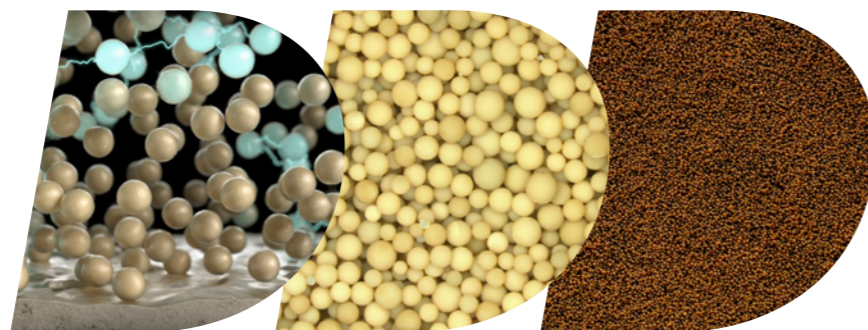
There are three different typologies based on the DryLyte Technology differentiated into two types of systems.

IMMERSION SYSTEMS

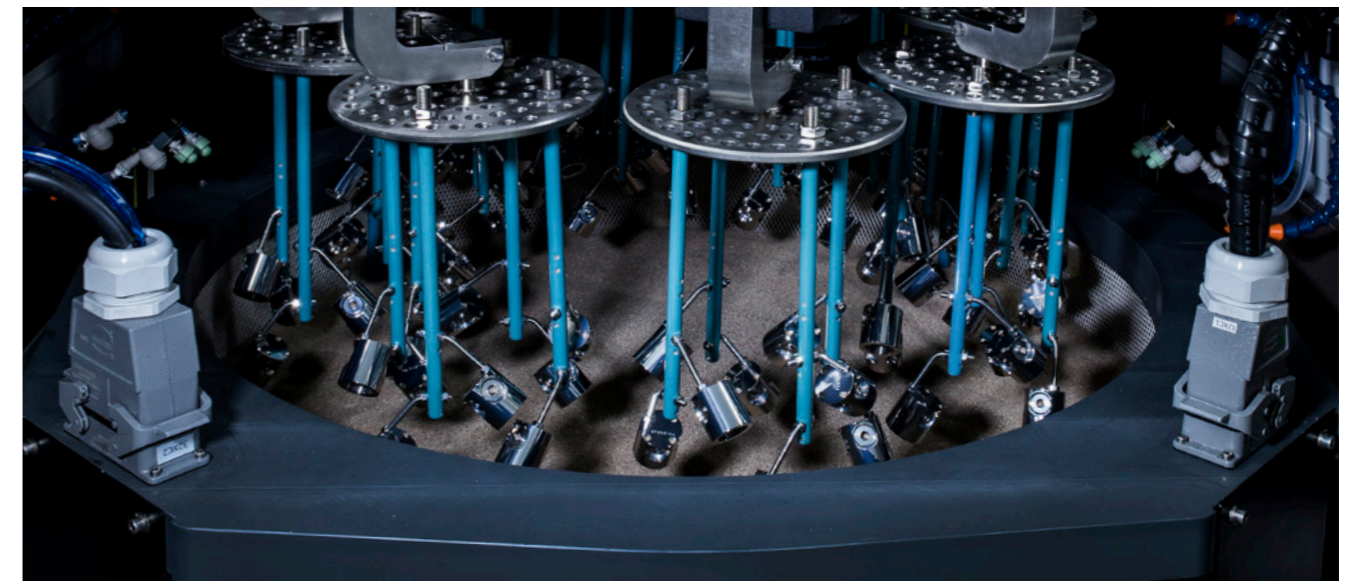
- 01. DRY
- 02. DRY SUSPENSION

PROJECTION SYSTEMS

- 03. ELECTRO-BLASTING



DLYTE SOLUTIONS. IMMERSION SYSTEMS



Example of PRO500 with full load

01. DRY

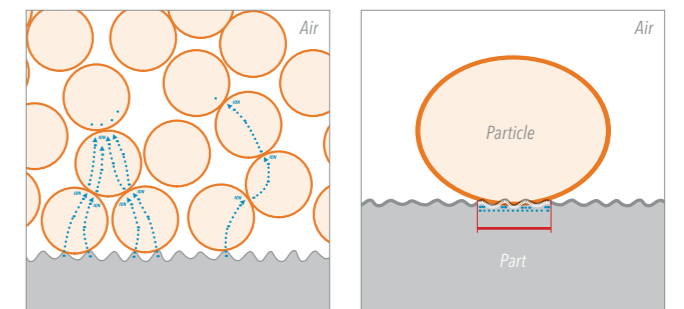
DryLyte is a patented technology for grinding and polishing metals by ion transport using free solid bodies. The revolutionary dry electropolishing is based on solid media. The DryLyte Technology works by combining the electrical flow created by the high-precision rectifier with the movement of the pieces through the electropolishing media. This results in an ion exchange, removing material only from the peaks of roughness.

DRY BENEFITS

- + Faster polishing processes.
- + Easiest to manage.
- + For simpler geometries.

HOW IT WORKS

Solid particles for immersion systems. Particles communicate among them.



02. DRY SUSPENSION

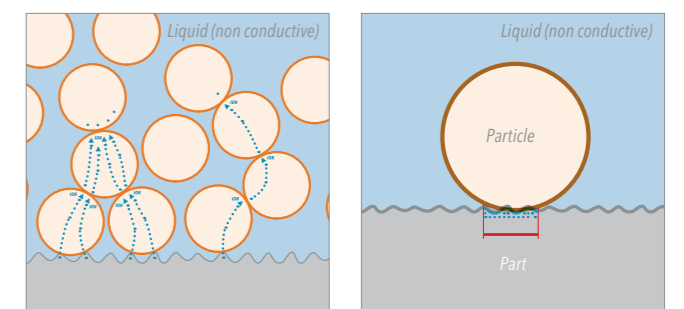
The Dry Suspension Technology, launched in 2022, is a revolutionary solution **based on a new electrolyte that combines polymer particles and a non-conductive liquid**, especially designed to improve the results of conventional dry electropolishing processes.

DRY SUSPENSION'S BENEFITS

- + For complex geometries.
- + Shiniest results.
- + Part protected by the liquid: minimizes undesired oxidation and reduces the contact surface.

HOW IT WORKS

Mixture of solid particles and liquid for immersion systems. Particles communicate among them.



DLYTE SOLUTIONS. PROJECTION SYSTEM



Projection system - eBlast working by electro-blasting solution

03. ELECTRO-BLASTING

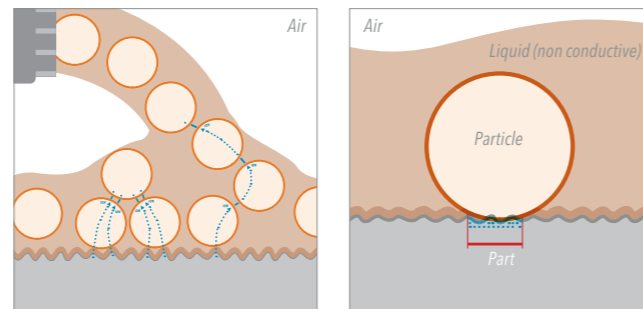
The Dry Projection technology, released in 2021 to be used in the Dlyte eBlast machine, is a new solution that provides a stream of solid-electrolyte particles propelled by a non-conductive liquid media to improve the surface quality. The media is projected towards a localized area of the piece. Dlyte eBlast **overcomes part size and weight limitations which are present in abrasive and electropolishing systems by immersion**, as the piece can be treated locally and without the need of motion.

In comparison to liquid electropolishing, this non-electrically conductive liquid is not directly involved in the polishing process. Its main function is carrying the particles, its specifically developed composition contributes to maintain the connectivity and conductivity between particles during the process. Additionally, **this liquid forms a protective layer over the metallic surface, accumulating especially in roughness valleys**, thus protecting the surface from pitting.

This new projected electropolishing opens up a wide range of possibilities for the treatment of metal surfaces with non-homogeneous roughness or complex geometries (the current main obstacle of AM parts), as well as large, heavy pieces. This feature can provide finishing solutions in sectors such as 3D printing, automobile industry, railway and specially injection molds.

HOW IT WORKS

Mixture of solid particles and liquid for projection systems. Particles communicate to each other through the liquid emulsion which, when agitated, becomes conductive.



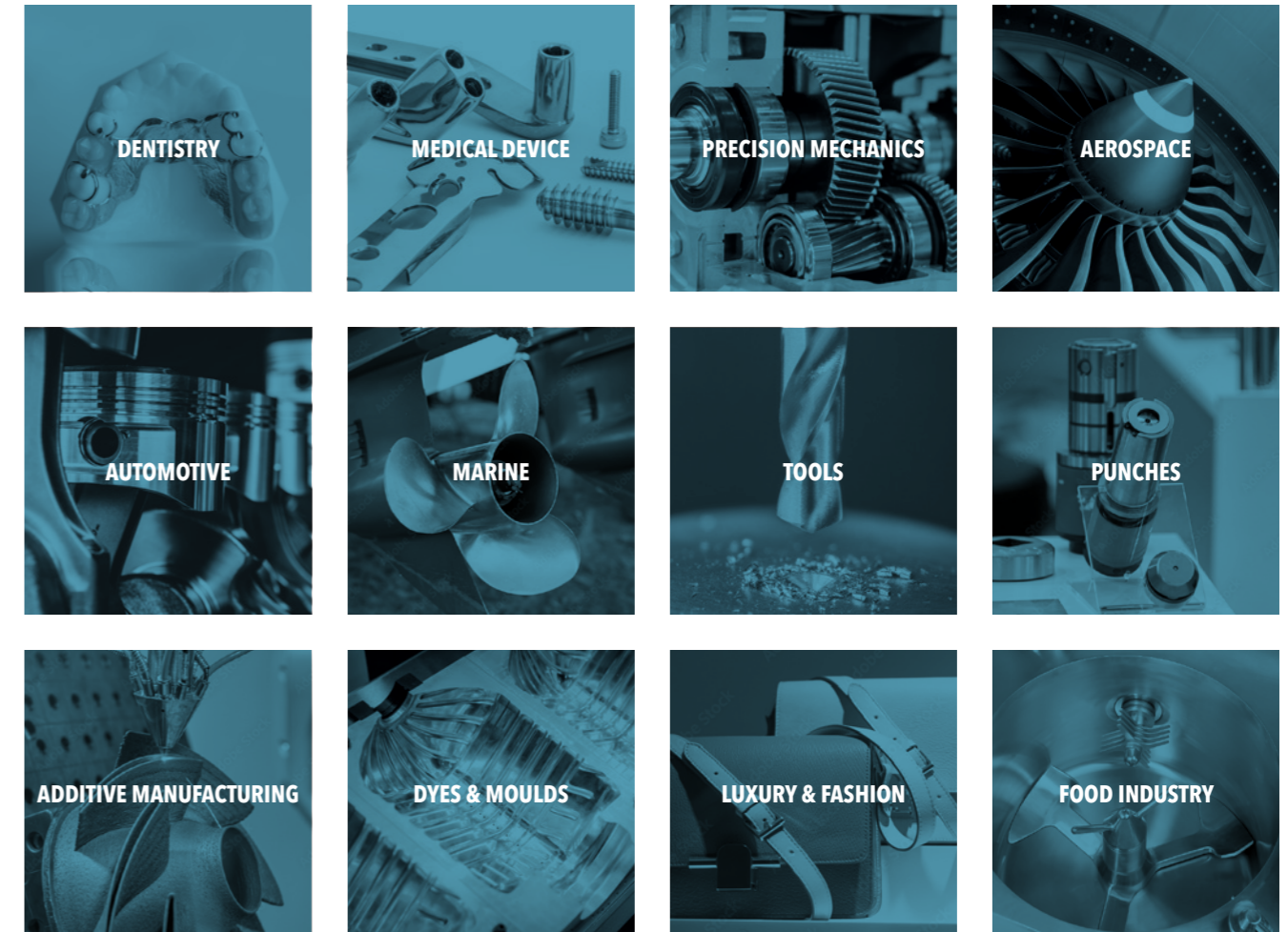
ELECTRO-BLASTING BENEFITS

- + Higher adaptability and customization.
- + For complex geometries.
- + Part protected by the liquid.



FIELDS OF APPLICATION

Any efficient and accurate metal part in manufacturing requires the greatest possible surface finish. The DryLyte Technology is applicable in many different industries for a wide range of parts.



HOW TO KNOW WHICH TECHNOLOGY MEETS YOUR NEEDS

We provide a tailored assistance to all our users during all Dlyte journey. Our engineers offer a customized solution for any kind of surface finishing processes, ensuring a proper production performance in terms of target cost, lead time and quality.

There are three key factors to define best technology may be the most appropriate solution to consider. These are the parameters to be taken into account for a successful choice:

01. MATERIAL

The process needs to be customized for different materials. The formulation of the electrolyte and process parameters play a key role in the results achieved.

02. INITIAL ROUGHNESS, REQUIRED FINISHING AND MANUFACTURING PROCESS

The process uses different parameters, time of process and media size based on the initial roughness, final roughness required and its manufacturing process.

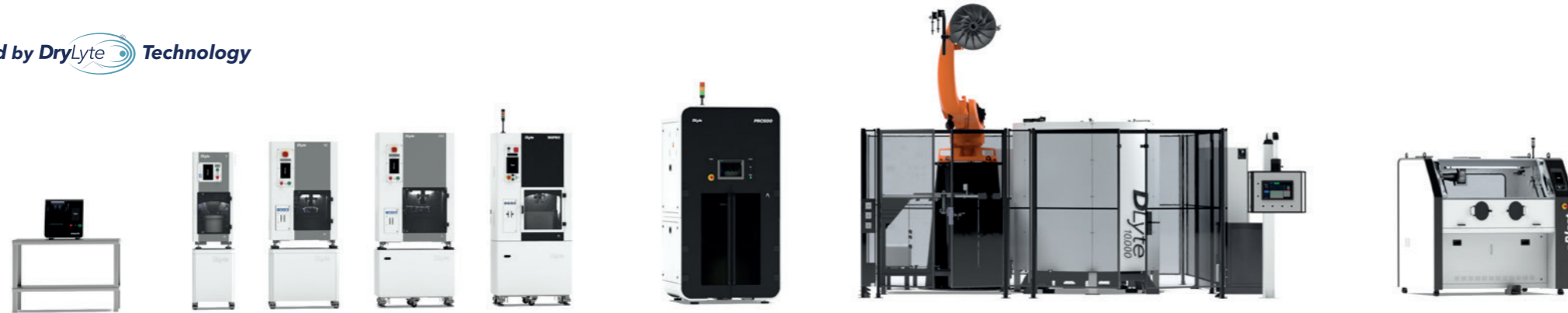
03. SHAPE, COMPLEXITY AND SIZE OF THE PIECE

Different geometries, shapes and sizes of the piece require different movements and parameters to allow an optimal flow of the media and electricity through the surface, while achieving homogeneity over the piece.

SURFACE FINISHING SYSTEMS FROM SMALL TO LARGE PRODUCTIONS

According to polishing needs, production quantities or piece dimensions, DLyte offers a comprehensive range of solutions to meet the needs of the industry. The entire product range ensures a highly scalable production.

Powered by  **Technology**



Visual description of the maximum working volumes of each machine

	MACHINE DIMENSIONS	MACHINE WEIGHT	POWER	WORKING VOLUMES AND WEIGHTS PIECES ^(*)
ULTRA-COMPACT SERIES				
01. DLyte Desktop PRO	450 x 521 x 471 mm	43 kg	1.7 kW	80 Ø mm x 60 mm - Up to 0.5 kg (work piece/s)
COMPACT SERIES				
02. DLyte 1	510 x 1,893 x 702 mm	143 kg	2 kW	90 Ø mm x 70 mm - Up to 1.5 kg (work piece/s)
03. DLyte 10	820 x 1,960 x 680 mm	260.5 kg	3 kW	140 Ø mm x 75 mm - Up to 2.5 kg (work piece/s)
04. DLyte 100	950 x 2,110 x 740 mm	317.5 kg	5 kW	180 Ø mm x 80 mm - Up to 5 kg (work piece/s)
05. DLyte 100PRO	950 x 2,394 x 889 mm	334 Kg	5 kW	180 Ø mm x 80 mm - Up to 5 kg (work piece/s)
PRO SERIES				
06. DLyte PRO500	1,300 x 2,770 x 1,380 mm	1,600 kg	25 kW	500 Ø mm x 250 mm (x1) - Up to 50 kg (work piece + holder) 200 Ø mm x 200 mm (x8) - Up to 20 kg (work piece/s + holder)
MODULAR SOLUTIONS				
07. DLyte 10,000	5,718 x 4,507 mm (footprint) 4,500 mm (Operating height)	C20/25 according to DIN EN 206-1:2001/DIN 1045- 2:2001	55 kW (125A)	750 Ø mm x 600 mm - Up to 100 kg
PROJECTION SOLUTIONS				
08. DLyte eBlast	2,040 x 1,209 x 1,863 mm	ca. 1,000 kg	7.78 kW	1,000 mm x 500 mm x 500 mm - Up to 200 kg

^(*) Measurements are provided as a guideline only, since they could vary depending on geometry, movement and finishing requirements.

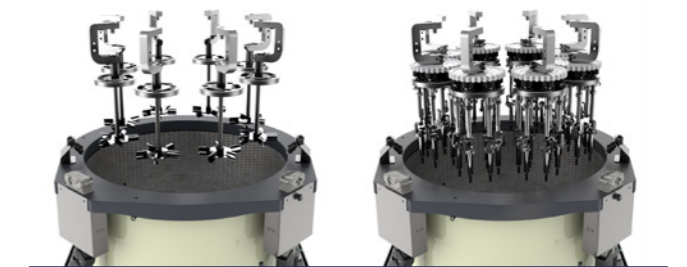
CONSUMABLES RANGE

The DryLyte Technology offers a wide range of finishing media. The consumables, designed and developed in our test lab, allow us to precisely meet our customers' requirements. In addition, the technology does not require wastewater or sludge treatment machinery, since the dry electrolyte can be easily handled by standard waste management services.



CUSTOMIZED FIXTURINGS

In order to offer the most accurate customization of the projects, the DLyte Engineering and R&D teams work to create fixturing solutions that adapt to every kind of production and surface finishing need.



Example of different fixturings for PRO500 (8 Holders per cycle)

DLYTE SERVICES

A personalized assistance is assured during all the DLyte journey by our multidisciplinary teams.



DLyte

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DESIGN

ADDITIVE MANUFACTURING

METROLOGY



Toronto, ON
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