

SULZER

Sulzer Metco

1/2006

LAYER

Information from METAPLAS IONON



IONIT OX[®]

**The All-Purpose Coating –
For Use in Hydraulics and Other Industries**

**New Management
for Systems
Business
and Development**

**Simplify Logistics:
Pick Up and
Delivery Services**

**Available From:
Sulzer Metco**



| | |
|---|---------------|
| Editorial | Page 2 |
| New Information Magazine | |
| Services | Page 3 |
| Customer Consulting | |
| Pick Up and Delivery Service | |
| Processes/Applications | Page 4 |
| IONIT OX® | |
| The All-Purpose Coating – For Hydraulics and Other Industries | |
| Systems | Page 5 |
| Large-Scale Systems for Special Requirements | |
| R&D / Quality | Page 6 |
| Three Year Re-Audit | |
| System Control | |
| Internal & External News | Page 7 |
| New Management for Systems Business and Development | |
| A Short Portrait of Sulzer Metco | |

In-Depth Information

Layer

Dear Readers,

METAPLAS IONON is pleased to present the first edition of our new customer magazine, „Layer“. Through this magazine, you will gain extensive insight into our business with focused information about our surface technology services and processes focusing such as PVD coating, plasma supported heat treatment processes and the systems technology necessary for their successful application.

At METAPLAS IONON, we are constantly developing our processes and systems. Our innovations are intended to give our customers a competitive edge, as we state in our slogan, „The Secret of Staying Ahead“. Our words are supported by actions. Through „Layer“ we will present specific details of our developments.

How do our processes work? For what applications can they be used? On a regular basis, our magazine will provide answers as to how our customers can best utilize our know-how. Also, in each edition, we will include examples that demonstrate how we align our services to the requirements of our customers. Reports on our developments and information about our company will give you a clear and up-to-date picture of Sulzer Metco/METAPLAS IONON.

We welcome your feedback!

Wishing you informative reading, I remain,


Thomas Gutzwiller
Managing Director





Your Questions – Our Know-How!

The Germination of Successful Cooperation

In view of the multitude of possible surface treatments and surface coatings available, competent customer consultation is the decisive factor in the service business. The field staff of METAPLAS IONON analyzes at the customer's site to determine which solutions will help to optimize work processes and save costs.

Processing of modern materials is becoming ever more demanding; correspondingly, the stress imposed on tools and components increases. In view of this, it is all the more important to select a well-performing coating that matches specific requirements.

METAPLAS IONON maintains a close proximity to its customers so we

can analyze the specific situation at each site. After a precise review of the work processes, materials and tools, this information forms the basis for a coating proposal. At this point, the field staff collaborates with the product managers in our service centers, linking the information from the on-site analysis to the know-how of the respective process experts.

Proximity to the customer also ensures transparency as to the multitude of available solutions. Some manufacturers would prefer an all-purpose coating instead of having to apply a special coating for each tool. However, applications are highly specialized so that the surface treatment will be based on a customized concept.

The customers enjoy the advantage of a solution that specifically matches their requirements. METAPLAS IONON offers a broad range of technologies that were developed within the company itself. Thus, the field and service center staffs have at their disposal not only the broad experience of the company with different applications, but also a precise knowledge of the latest technologies. Newly developed processes can excel in that parameters like hardness, toughness and residual compressive strength can be defined as variables. These special conditions permit our staff to configure innovative solutions that optimize work processes and cut costs to create added value.

Safe, Just-In-Time Transportation

Pick Up and Return Service

Customer proximity can be taken literally in the case of METAPLAS IONON's pick up and return service. Our customers rest their products in trusted hands.

METAPLAS IONON's pick up and return service considerably simplifies the logistics involved with the com-

ponents to be coated. Without the need of having to involve a forwarding agent, the drivers of METAPLAS IONON collect the tools or components from the customer's site. The drivers have the necessary know-how and skills needed to handle the products, insuring safe transport. After the goods have been processed, they



One of our service vehicles

are delivered just in time so that the customer will not have to bear any additional warehousing costs. Owing to the care exercised and the individual route of transport, the customer's specific packaging can be used for his items.



The All-Purpose Coating — For Hydraulics and Other Industries

IONIT OX[®]

The IONIT OX[®] process successfully combines several surface treatment properties: wear, corrosion and environmental protection — an excellent substitute for chromium plating.

The patented IONIT OX[®] process is successfully being used on steel and cast alloys. It is a combination of gas nitro-carburization, plasma activation and oxidation thermo-

However, the properties of IONIT OX[®] are not only valued in the hydraulics industry, but also IONIT OX[®] is used universally by many industries, including many applications within the automotive and general machining industries. The process is particularly environmentally friendly. Neither during the treatment of the surface itself nor during subsequent waste disposal of the components are any substances produced that might endanger the environment. Thus IONIT OX[®] is an excellent substitute for chromium plating containing hazardous chromium VI.

A look at the individual processing steps explains how these properties come about. First, during the gas nitro-carburization step, a nitride layer is produced, introducing nitrogen and carbon into the surface in a highly controlled manner. Thus, a compound layer and a diffusion area exhibiting a defined structure and phase composition form. Depending on the material, the intermediate layer attains a hardness of up to 1100 HV. The diffusion area

exhibits residual compressive stress levels that have a positive effect on the fatigue life. This is particularly beneficial on components that are subjected to dynamic loads.

Up to this point, these partial results of the surface treatment are possible only through the chemical dissociation of ammonia and carbon dioxide, which are used as process gases. The IONIT OX[®] technology controls the nitriding potential, and thus, this dissociation reaction. Therefore, the nitriding hardness depth can be controlled to meet specific requirements.

Thereafter, the nitride surface is plasma activated, stabilizing it and providing the optimum adhesion properties for the final oxidation step. The dense oxide layer is approximately two μm thick and provides optimum protection against corrosion and wear. Also, galvanic corrosion with other metals, and in particular light metals, cannot occur when the IONIT OX[®] process is used.

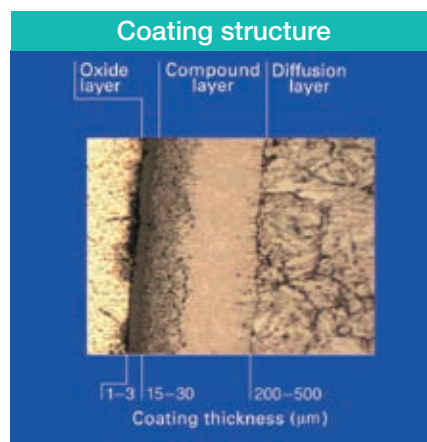
The combination of high hardness levels and optimized corrosion protection considerably increases the service life of the treated components. Changeover to the economical IONIT OX[®] process is unproblematic. Generally, no changes are necessary to the sealing materials used on hydraulic and pneumatic components.

PROCESSES/APPLICATIONS



Plasma nitriding process

chemical processes, resulting in the positive properties of the individual process steps. IONIT OX[®] offers excellent protection against corrosion and wear. In aggressive environments such as salt water, oil, lubricants and bio diesel fuel, IONIT OX[®] provides excellent corrosion protection. In addition, the specialized structure of the oxide coating ensures low coefficients of friction. Such properties are especially relevant in the hydraulics industry, where pumps or cylinders need specialized protection.



XXL-Sized Components Quickly Processed

Large Systems for Special Requirements

At METAPLAS IONON, there is almost no limit to the size of a component that can be processed with plasma surface engineering. Large tool sizes and quantities permit new applications and economic production.

In many areas, surface technology requirements are successfully realized using PVD and plasma nitriding; to date, usually in smaller systems. Up-scaling of systems and associated work processes requires a tremendous amount of experience and competence to implement. For over 25 years, METAPLAS IONON has developed innovative surface technologies and coating systems, and has at its disposal the necessary know-how to develop and engineer perfectly reliable large-scale systems.

forming tools can be utilized in the manufacture of car bodies, as can the large die casting tools used to manufacture the parts for the vehicle interiors. With PVD or PN surfaces, the service life of these tools is also increased.

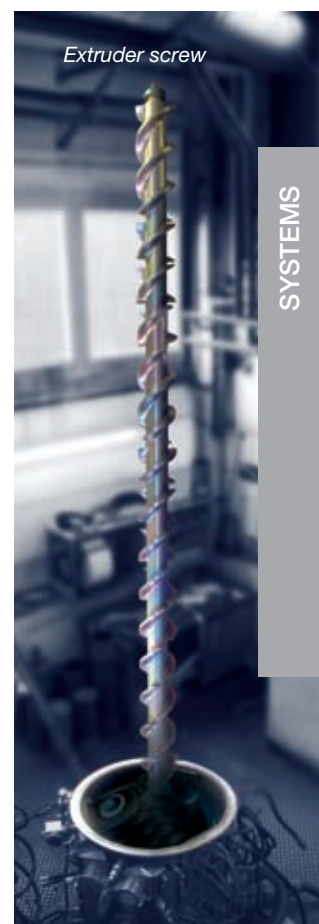
Besides offering new application possibilities, large-scale systems offer the benefit of being able to produce large quantities of parts more economically. For subcontract coating, this opens up much more attractive cost calculation options.

“... more attractive cost calculation options.”

The development of large size systems requires a lot of experience when it comes to handling process factors such as the behavior of gases in large chambers or the generation of a vacuum in such volumes. These factors do not linearly extrapolate with size. For example, new feed-in points must be set to control the behavior of process gases in large systems properly and uniformly. Also, the mechanical aspects must be considered. The frames must be capable of carrying heavy loads and new lifting facilities have to be designed for the correspondingly more complex loading process.

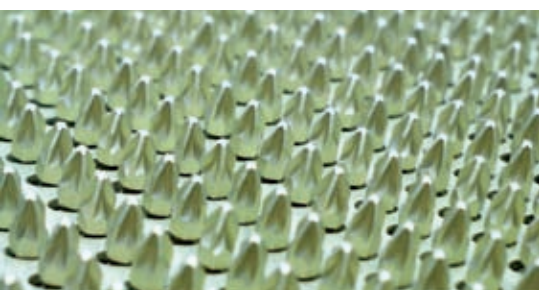
In the case of the PVD systems, METAPLAS IONON product portfolio spans from miniature, compact systems for research and laboratory operation to large systems that are suited for comprehensive coating processes involving mass produced and large parts. The systems can be designed to handle batch weights of up to 4,500 kg; maximum batch lengths of 4,000 mm, and maximum diameter of 1,600 mm.

Plasma heat treatment and plasma-combination treatment systems can be offered as single, tandem or multi-systems of any required size. To date, we have erected systems capable of a batch weight of up to 32 metric tons, a batch length of 22,000 mm and a diameter of 4,000 mm. Systems from METAPLAS IONON, including XXL formats, fulfill the highest expectations.



Extruder screw

SYSTEMS



Economical coating of mass produced parts

Large-scale systems open up new areas of application by using well-established technologies to be used on large components. For example, in the automotive industry high-performance coatings for re-



Quality Certification Retained

Three Year Re-Audit

Our first re-audit in three years for the new ISO/TS 16949:2002 standard was successfully concluded.

Since 1995, METAPLAS IONON has been certified in accordance with the DIN EN ISO 9001 Quality Management System. The conversion to the new ISO/TS 16949:2002 standard was performed in August of 2003 for the Bergisch Gladbach, Germany and Salzgitter, Germany locations.

This standard was developed specifically for subcontractors to the automotive industry and includes the QS 9000 (US standard, GM, Chrysler, Ford), the

VDA QA system of the German car manufacturers (VW, BMW, etc.) and ISO 9001:2000. The ISO/TS16949:2002 standard is a process-oriented quality management system aimed at constant optimization of processes and providing faultless quality.

In July of this year, the first reaudit by the German TÜV (Technical Inspection Agency) was run successfully. Also the Niederwürschnitz, Germany location has now been integrated in our QM system and certified according to this standard. Thus, METAPLAS IONON was able to prove once more that quality enjoys the highest priority

within the company. And this is not only confirmed through the certificate – the products we produce provide considerable evidence that all staff live up to these quality requirements on a daily basis.



New Software – New Possibilities!

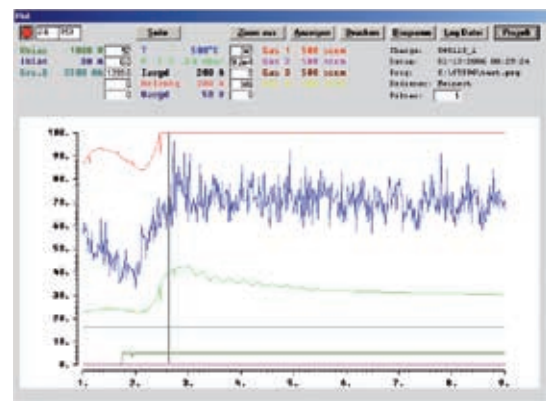
System Control

An update to the PVD system controller now allows better differentiation for process monitoring. Process parameters are now also displayed as plain text.

The PVD coating systems from METAPLAS IONON are equipped with an automatic process controller, which ensures the precise reproducibility of the coating processes. The controller administers, monitors and logs the various process

parameters. Also, remote monitoring through higher-level process planning systems (PPS) can be integrated.

The figure depicts the way in which the process data is evaluated by the revised software. The individual parameters, such as process pressure, substrate voltage, etc., are presented with their respective scales. In addition, the actual measured values are indicated in plain text in



a separate window. The individual values can be accessed and output via a cursor control, simplifying the evaluation of the data. Up to 50 channels can be recorded, offering a highly detailed picture of the process – this is an important element for quality assurance of the coating processes.



New Management for Systems Construction and Development

Succession Ensured



Dieter Cremer



Dr.-Ing. Georg Erkens

Dieter Cremer, the long serving head of systems business, will leave the company at the end of November. After having served Siemens/Interatom and METAPLAS IONON for 36 years, he will now begin his well-deserved retirement. His great commitment has significantly contributed to the success of the systems business and quality assurance.

On October 1, 2006, Dr. Ing. Georg Erkens will succeed Mr. Cremer. Dr. Erkens obtained his engineering diploma from RWTH Aachen where he also earned his doctorate degree. Based on his long-standing and comprehensive experience in the PVD industry, he is the ideal man to further expand the systems business and, with his team, give impetus to new innovations.

INTERNAL & EXTERNAL NEWS

The Secret of Staying Ahead – A Short Portrait

Sulzer Metco

Sulzer Metco is a global vendor for turnkey surface technology solutions and services. This growth-oriented division of Sulzer AG offers a broad line of surface technology systems, materials and services.

Sulzer Metco's customers can be found in the aircraft, power generation, automotive and other key industries. Because of improvements to coating material properties, improved system performance and surface technology refinements treated components benefit from longer service life.

Sulzer Metco has production, logistics and surface treatment / coating centers in Europe, the Americas, China and Japan. Their sales and service network is present in over 40 countries. This network guarantees their customers worldwide availability of products and services, including comprehensive engineering support services.

In 2001, Sulzer Metco integrated the company METAPLAS IONON into its group of companies, thereby expanding the coating process spectrum to include thin film technology.

Key figures

| In million CHF | 2005 | 2004 | ±% |
|--|------------|-------|---------|
| Order intake | 589.2 | 534.2 | +10.3 % |
| Sales revenue | 583.0 | 521.4 | +11.8 % |
| Operating profit, earnings before interest and taxes | EBITA 36.1 | 18.6 | +94.1 % |
| Number of employees on December 31 | 1,783 | 1,725 | +3.4 % |



EDITORIAL INFORMATION

Editor:

METAPLAS IONON Oberflächenveredelungstechnik GmbH
Am Böttcherberg 30-38
D-51427 Bergisch Gladbach, Germany

Editorial Office:

METAPLAS IONON Oberflächenveredelungstechnik GmbH
Mrs. Corinna Heinz
C&G: Strategische Kommunikation GmbH, Overath, Germany

Layout and Production:

C&G: Strategische Kommunikation GmbH, Overath, Germany

Editorial Office Address:

METAPLAS IONON Oberflächenveredelungstechnik GmbH
Am Böttcherberg 30-38
D-51427 Bergisch Gladbach, Germany

Phone: + 49 2204 299-0
Fax: + 49 2204 299-266
E-Mail: metaplas@sulzer.com
Web: www.metaplas.com

**METAPLAS IONON
Oberflächenveredelungstechnik GmbH
Headquarters**

Am Böttcherberg 30-38
D-51427 Bergisch Gladbach
Germany

Phone: + 49 2204 299-0
Fax: + 49 2204 299-266
E-Mail: metaplas@sulzer.com

**METAPLAS IONON
Oberflächenveredelungstechnik GmbH
Plasma nitriding processes and corrosion
protection service as well as classic
hardening processes**

John-F.-Kennedy-Straße 52
D-38226 Salzgitter
Germany

Phone: + 49 5341 8587-0
Fax: + 49 5341 8587-16
E-Mail: metaplas@sulzer.com

**Sulzer Metaplas (US) Inc.
222 Goldstein Drive
Woonsocket
RI 02895
U.S.A.**

Phone: +1 401 766 3353
Fax: +1 401 766 5646
E-Mail: sulzermetaplas@sulzer.com

**METAPLAS IONON
Oberflächenveredelungstechnik GmbH
Decorative coatings service**

Deutsch-Ordens-Straße 7
D-25551 Hohenlockstedt
Germany

Phone: + 49 4826 371-0
Fax: + 49 4826 371-11
E-Mail: metaplas@sulzer.com

**METAPLAS IONON
Oberflächenveredelungstechnik GmbH
Plasma nitriding process and corrosion
protection service**

Stollberger Straße 40
D-09399 Niederwürschnitz
Germany

Phone: + 49 3729 69324-0
Fax: + 49 3729 69324-119
E-Mail: metaplas@sulzer.com

**Sulzer Metco Surface Technology
(Shanghai) Co. Ltd.
666 Min Bei Road
Minhang, Shanghai 201107
P.R. China**

Phone: +86 (21) 5226 2000
Fax: +86 (21) 5226 4701
E-Mail: smcn.shanghai@sulzer.com

Web: www.metaplas.com

DEUTSCH / GERMAN