



# SUBLIMATION -process®

By Phibo Industries

## Introduction

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# Phibo Industries

## Your all-round partner.

Pieter Haers  
Business Development Manager

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## Your allround supplier

### Products

<p>Machines &amp; processes</p> 	<p>Consumables &amp; spare</p> 	<p>Personal protective</p> 
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## Machines & processes

### Pre-treatment – Dry blasting


<p>blasting room</p> 	<p>mobile system</p> 
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**FREE BLASTING SYSTEMS AND STEP IN BLASTING ROOMS**

Have a coffee and a chat[www.phibo.be](http://www.phibo.be)

## Machines & processes

### Pre-treatment – Dry blasting



modular system

**INNOVATIVE HANDBLAST CABINETS**

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## Machines & processes

### Pre-treatment – Dry blasting



**DUST FREE AND MOBILE BLASTING SYSTEMS**

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## Machines & processes

### Pre-treatment – Wet blasting



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## Machines & processes

### Pre-treatment – Cleaning & degreasing



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## Machines & processes

### Post-treatment – Metallisation




flame spray technology

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## Machines & processes

### Post-treatment – Room temperature blacking



blacking cream

immersion process







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# Services

- (Re)Engineering 
- Laboratory & knowhōw 
- Training & seminars 
- Maintenance & intervention 














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# Our strengths

-  In-house R&D and engineering department
-  Network
-  Conformity
-  Sustainability
-  Advice & support
-  Since 1988

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## Industries & applications

 Aerospace	 Automotive	 Food	 Chemistry	 Metal processing
 Nuclear	 Navigation	 Rubber & plastics	 Pharma	 Decoration
 Off-shore	 Railway	 Machine building		


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## Stainless Steel Surface Finishing has always been a focus at Phibo Industries




**Conventional Bead Blasting versus SUBLIMATION-process®**


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Unique results and benefits of the SUBLIMATION-process® 

Some benefits for the machine user (e.g. food , pharmaceutical or cosmetic product manufacturer):


- **Optimal cleanable surfaces** (less sensitive surfaces for bacterial and soil adhesion, hydrophobic surfaces) and **optimal corrosion resistant surfaces** (no iron contamination, micro cleaning and peening, optimal passivation topography)
  - Risk reduction microbiological contamination, and thus **risk reduction for recalls, claims, image damage etc.**
  - More efficient and effective cleaning & less maintenance: less frequent and shorter production stops, **more production output**
- **No health risks following the surface treatment** (no use of dangerous or toxic chemicals)
- **Isotropic and visually uniform and appealing satin finishing**
- **Conformity with law and regulation**

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Unique results and benefits of the SUBLIMATION-process® 


Some benefits for the machine manufacturer :

- **Delivering a high-end product with proven added value**
  - Conformity with the applicable laws and regulations
  - Optimal cleanability
  - Optimal corrosion resistance
  - A non-chemically contaminated surface
  - Isotropic surface with uniform and appealing satin visual finishing
- **Better overall quality** image of the company and products
- **One efficient cleaning and conditioning process** achieving **very fine and uniform surface finishing** (Ra values < 0,5 µm), **even on irregularly shaped surfaces**
- The SUBLIMATION-process® is **safe for the operator** + the process is **ecological** and based on **sustainable technology (Green process)**
- **Conformity with law and regulation**

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The SUBLIMATION-process®





What is the SUBLIMATION-process® ?

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The SUBLIMATION-process®


A unique and patented process, developed by Phibo Industries


Projection of a specific colloidal suspension

Atomized and projected under specific parameters, at a specific flow rate using low pressure compressed air

Recollected, filtered and pumped back  
→ complete closed circuit

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The SUBLIMATION-process® 


**Meaning and origin of the name "SUBLIMATION-process®":**

- 'sublime' and 'motion'
- 'to sublimate' [raise to a higher status] < latin *sublimare* [to raise, elevate] (see *sublime*)



→ registered brand name

→ SUBLIMATION-process® itself: patented process


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The SUBLIMATION-process® 

What happens during the application of the SUBLIMATION-process® ?

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The SUBLIMATION-process®



Results after Sublimating:

1. Pure surface and improved topography

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1. Pure surface and improved topography



**Removal of surface contaminations:** welding discoloration, oil, grease, micro scratches...  
→ *unique surface purity*



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1. Pure surface and improved topography 



*Stainless steel surface treated with the SUBLIMATION-process®*

- No contaminations (e.g. micro scratches, cracks, holes...)
- Specific open topography with also a favourable Surface Roughness
- **Strongly improved hygienic characteristics and cleanability of the surface**

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1. Pure surface and improved topography 




*Stainless steel surface treated with the SUBLIMATION-process®*

- Risk reduction microbiological contamination (= no recalls, no risks, no image damage, longer product shelf life etc.)
- Faster cleaning and disinfection between batches
- Less maintenance
- Lower costs for cleaning, disinfection and maintenance
- Shorter production stops
- More production output

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The SUBLIMATION-process®




Results after Sublimating:

1. Pure surface and improved topography
2. Optimal corrosion resistance

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EHEDG

## 2. Optimal corrosion resistance



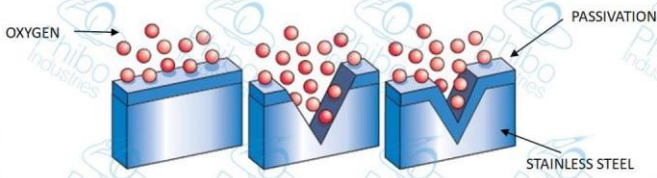
- Corrosion resistance due to **“passive” chromium-rich oxide layer**
- **Natural “auto-passivation”** if **clean surface** in **oxygen-rich** environment

→ The **SUBLIMATION-process®**:

- Ultra clean surface with a specific surface topography
- **Removal of contaminations and welding discolorations** (thin chromium-poor layers)

→ Auto-passivation, **restoring optimal corrosion resistance**


→ **long lasting corrosion resistance**



OXYGEN →      PASSIVATION      →

STAINLESS STEEL

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## The SUBLIMATION-process®



Results after Sublimating:

1. Pure surface and improved topography
2. Optimal corrosion resistance
3. Restrictive surface peening

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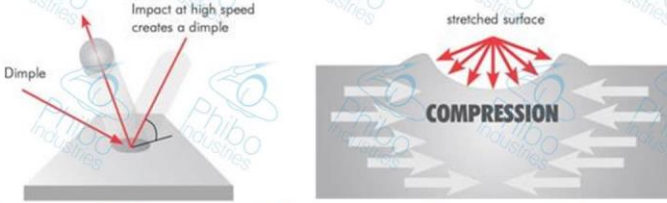
### 3. Restrictive surface peening

**SUBLIMATION-process®**

During **SUBLIMATION-process®**:

- compressive **residual stress in surface**
- specific peening intensities

→ beneficial for **durability and corrosion resistance**.



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**EHEDG** MEMBER SINCE 2014

### The SUBLIMATION-process®

**SUBLIMATION-process®**


Results after Sublimating:

1. Pure surface and improved topography
2. Optimal corrosion resistance
3. Restrictive surface peening
4. Hydrophobic surface

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**EHEDG** MEMBER SINCE 2014

### 4. Hydrophobic surface




- Little or **no tendency to absorb water**
- **Low wettability** and **high value of contact angles**
- **'Lotus effect'**: water will take away more contaminations from surface

→ **Much better cleanability of stainless steel**



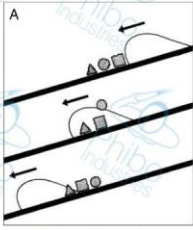
A

Hydrophilic Surface



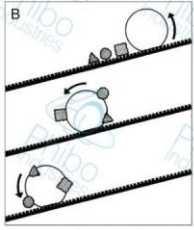
B

Hydrophobic Surface





A

Hydrophilic Surface




B

Hydrophobic Surface


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### The SUBLIMATION-process®





Results after Sublimating:

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4. Hydrophobic surface

→ **UNIQUE HYGIENIC CHARACTERISTICS & CLEANABILITY**

→ **IN A ONE-STEP-PROCESS**


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### Results and benefits of the SUBLIMATION-process®



Specifically conditioning & creating added value

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Specifically conditioning & creating added value


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Official nominations on national and international level for durability




**Finalist**  
*'Best Practice in Process'*



**Flanders Cleantech Internationalisation Awards 2016**  
Semifinalist *'Chemistry & Environment'*



**FCA**  
Flanders Cleantech Association

**FLANDERS INVESTMENT & TRADE**




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**Thank you for your attention!**



**Phibo Industries**

**Your all-round partner.**

Pieter Haers  
Business Development Manager

Contact: +32 (0)55 21 98 99 – [sales@phibo.be](mailto:sales@phibo.be)  
[www.sublimotion-process.com](http://www.sublimotion-process.com)  
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