



**HOW  
SATISFIED  
ARE YOU WITH ...**

- ... your clamp load consistency**
- ... your re-usability**
- ... your torque lost to friction**
- ... fatigue strength**



**Kolsterising® of stainless steel is often a reliable alternative to:**

- Silver plating
- Thin film coatings
- Lubricants
- Waxes



**In the fastener industry, Kolsterising® of stainless steel is used in various applications including:**

- Bolt joints
- Special screws and nuts
- Pipe ferrules
- Washers
- Springs





S<sup>3</sup>P – Specialty Stainless Steel Processes

## INCREASED SATISFACTION IN THE FASTENER INDUSTRY THROUGH KOLSTERISING®

**We know that stainless steel fasteners are inherently prone to galling due to their soft properties.**

In addition, there are no traditional heat treatment processes to harden these materials to eliminate galling. Common solutions are to use lubricants, waxes or other compounds.

While these may be a fit for some applications, when it comes to sensitive environments such as semiconductor, food & beverage and the medical markets, contamination can be a concern.

Kolsterising® introduces no foreign materials into the fastener so there is no risk of contamination.

## YOUR ADVANTAGES THROUGH KOLSTERISING®



- Improved torque consistency/  
tension relationship
- Increase in reliable and repeatable  
fastener performance
- High clamp load consistency
- Increased fatigue strength

## WHAT IS KOLSTERISING®?

Kolsterising® is a low-temperature diffusion process that greatly improves the mechanical properties of corrosion resistant materials.

### ■ **Kolsterising® is NOT a coating**

Kolsterising® is a “surface hardening process” – the parts surface itself is hardened, therefore, delamination is avoided

### ■ **Compliance with legal requirements**

Kolsterising® meets the requirements of the EU directive 1935/2004, the US NSF51 and has an FDA masterfile ([www.bodycote.com/fastening-solutions](http://www.bodycote.com/fastening-solutions))

### ■ **Environmentally friendly process**

All S<sup>3</sup>P plants are certified according to ISO 50001 (energy management) and ISO 14001 (environmental management)

## WHAT CAN KOLSTERISING® ACHIEVE?

Kolsterising® offers many advantages and valuable properties for your material.

### ■ **Stainless remains stainless**

The corrosion resistance is maintained

### ■ **Surface hardness increased up to 8 times**

Surface hardness from 900 - 1300 HV<sub>0.05</sub> depending on material and surface condition while maintaining ductility

### ■ **Prevention of galling / fretting**

Increasing the resistance to galling / fretting by a factor of 20 to values beyond the material yield strength (in typical applications)

### ■ **Geometry independent**

Kolsterising® allows bulk treatments so all surfaces are treated equally, including internally threaded fasteners

### ■ **Toxicity is prevented**

The material remains non-toxic after treatment

# KOLSTERISING® IN USE:



## VBA EDELMANN GMBH

**Axel Steffen (Technical Manager):** “We produce closures for pressure vessels and apparatus engineering in accordance with the Pressure Equipment Directive. By Kolsterising® the components, work hardening of the threads (thread seizure) is significantly reduced for stainless steel and duplex components, therefore extending the service life of the closures.”

■ [www.vba-edelmann.com](http://www.vba-edelmann.com)



## AIM TESTING LABORATORY

**Carmen Vertullo:** “Kolsterising® got my attention when I saw a demonstration of its effectiveness in a high surface pressure bearing demonstration. I was blown away by the results. In every case the samples survived tightening to full tension in a bolt tension calibrator for multiple cycles with no evidence of galling, and they maintained a predictable torque-tension relationship. In one test we did 20 on-off cycles with no galling. Kolsterising® is undoubtedly the gold standard solution to many stainless steel fastener galling problems.”

■ [www.aimlaboratories.com](http://www.aimlaboratories.com)

**North Park Metalworkers, Rhinebeck, NY (USA):** “Since we have started Kolsterising® our stainless steel nuts, bolts, and screws, we are no longer concerned about hardware breaking or galling. Because of this, we have seen a rise in efficiency and productivity. Our assemblers love the ease of use and feel that it would be a benefit in every application.”

■ [www.northparkmetalworkers.com](http://www.northparkmetalworkers.com)

**Source: “A global leader in critical application bolting design”:** “Bodycote’s Kolsterising® process allowed us to solve a difficult high temperature application. The hardened material, as a result of the Kolsterising®, provided us with more consistent installation and removal torques. Their product helped us solve a customer issue and their service has been incredible supporting our company.”

**Bodycote is the worldwide leading service provider  
of thermal processing.**

**S<sup>3</sup>P is part of our Specialist Technologies division.**

Kolsterising® is a low-temperature process for surface hardening of stainless steel based on the diffusion of carbon into the steel. Carbon is already an element of stainless steel and therefore does not change the material composition – a significant advantage, especially in the fastener industry.

Through extensive laboratory testing and numerous customer applications we have developed trend setting solutions that are proving reliable in daily use worldwide.

Please contact us to benefit from the advantages of Kolsterising® for your application.

## Kolsterising® – Contacts

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