NOVEL SURFACE TREATMENTS

Surface Technology Products

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# *TECHNOLOGICAL BREAKTHROUGH IN INDIA*

## *PRODUCT APPROVED BY I.I.T. (BOMBAY) UNDER ASTM - A380*

VK®

## UNIQUE FEATURES OF "VK" ' FUMELESS ' PICKLING AND PASSIVATION ON STAINLESS STEEL & HIGH NICKEL ALLOYS

1. VK *removes built in corrosion from stainless steel & high nickel alloys.*
2. VK *removes scales, discolouration, burn spots and ferritic contamination without wire brushing or grinding.*
3. VK *prevents corrosion & restores full corrosion resistance.*
4. VK *removes metallic contaminants, oxide scales, rust spots & annealing colours.*
5. VK *retains mill finish.*
6. VK *gives a uniform, smooth, contamination and sterile particle free, passive surface.*

" **VK** " *Pickling & Passivation completed Stainless Steel equipment on Job work Contract basis. Inspected & Approved by Third Party Inspection Agency for Europe export as per International Standards.*

## IMPORTANCE OF PICKLING & PASSIVATION STAINLESS STEEL

**Pickling & Passivation process removes free iron contamination left behind on the surface of the stainless steel from machining and fabricating. These contaminants are potential corrosion sites that result in premature corrosion and ultimately result in deterioration of the component if not removed. In addition, the passivation process facilitates the formation of a thin, transparent oxide film that protects the stainless steel from selective oxidation ( corrosion ).**

**The failure of stainless steel components due to corrosion can reach catastrophic proportions. The cost in time, materials, rectification and lost production can be tremendous. If passivation is not carried out stainless steel can rust due to surface free iron, and since chlorides are also often absorbed from the atmosphere, some ferric chloride will be produced. Prolonged contact with ferric chloride will eventually initiate pitting and crevice corrosion on the stainless steel surface. Proper passivation will assist in the optimal restoration of the chrome oxide passive layer.**

**Any mechanical treatment damages top protective chromium oxide layer of stainless steel components. It damages by,**

- **Ferritic contamination matter.**
- **Structural changes in top layers of stainless steel.**
- **Inbuilt stress development.**
- **Chromium content reduction on top layer of stainless steel.**

**Even high temperature applications like welding & annealing makes surface of stainless steel discoloured and oxide scally. This makes value of stainless steel to reduce not only by appearance but also with lower corrosion resistance due to ferric oxide. Due to these contaminations protective layer of chromium oxide can not form at that spot and corrosive stain builds up on insufficiently passivated stainless steel.**

**Properly pickled & passivated stainless steel and welding seams offers following qualities,**

1. **Smooth surface, which is metallically pure & free from any discolouration and scale.**
2. **High level of corrosion resistance of the S.S. component.**
3. **Good appearance.**

## PRODUCTS

**VK ® is available in THREE different physical forms for pickling and then a single form ( liquid ) for passivation.**

### ( A-1 ) VK ® Jelly ® ( Gel form )


Before and After look of weld seam – **VK Jelly** ® applied on & near weld seam with brush

**VK Jelly is used to clean weld seams and surrounding areas with brush. It is used to remove heavy scales, discolouration, annealing colours, rust particles near weld and welding affected area by heat. It helps to detect pinholes after welding.**


**- VK Jelly ®**

**VK Jelly does not give Black or Yellow marks on surface after washing with water.**

***Coverage / kg : Approx. 100 meters of weld seam.***

*Application Steps*

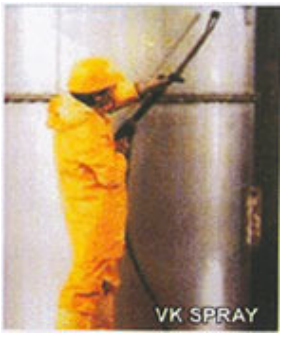
**1. VK Jelly is applied on weld seam & surrounding areas with a nylon bristled plastic brush.**

**Application Temp. = between 5 – 40 °C**

**2. Keep VK Jelly for 5 to 30 minutes depending on contamination, temp. & grade of Stainless Steel.**

**3. Use pressurised water jet spray OR wipe the weld seam lightly with plastic brush or cloth & wash with water thoroughly.**

## ( A-2 ) VK ® Spray ( Semi - Gel form )



*External application of* **VK Spray** *with special pressurized plastic spray bottle*

**VK Spray is used for large surface areas with plastic spray pump or pressurised spray bottle. It simultaneously removes annealing colours, ferritic contamination & weld burns. VK Spray is very safe & easy to use for cleaning of large equipments like S.S. vessels, dryers, agitators, dairy machinery, fermentators, internals as well as externals of pipes by pressurised spray bottle or pump.**
***Coverage / kg : Approx. 40 sq. ft.***

## ( A-3 ) VK ® Dip ( Liquid form )

**VK Dip is used for immersion (dipping) application & non-reachable areas of S.S. components like internal & external of pipes, wire rolls, internal recessed areas of machinery etc. Heavy parts are dipped in a huge tank with the help of a chain pully.**

**For cleaning & descaling of pipelines, VK Dip is circulated inside pipelines with the help of pump.**
***Coverage / kg : Approx. 40 sq. ft.***

## ( B ) VK PASSIVATION

**VK Passivation should be used after the application of VK Jelly, VK Spray or VK Dip as it is a must to passivate S.S. surface after pickling. VK Passivation products helps in the formation of a thin passive film on Stainless Steel surface which will protect it from further corrosion and contamination.**

**There are TWO types of passivation products depending on the end use of S.S. equipments / pipelines / parts.**

## ( B-1 ) VK ® Pass-1


**VK Pass-1**

**VK Pass-1 is used for general industrial purpose S.S. equipments & pipings to be used in industries like chemical, paper etc. non-hygenic industries.**
***Coverage / kg : Approx. 40 sq. ft.***

## ( B-2 ) VK ® Pass-2 NEW PATHBREAKING CONCEPT FROM THE MAKERS OF "VK" CHEMICALS

**VK Pass-2 is biodegradable, non-toxic, non-hazardous chelant passivation used for S.S. equipments & pipings specially for industries like Pharmaceutical, Dairy, Food, Beverages, Cosmetics etc.**
***Coverage / kg : Approx. 40 sq. ft.***

## Benefits of VK Pass-2

1. **Improved and faster removal of free iron from the surfaces.**
2. **Optimum corrosion resistance of process piping and equipments.**
3. **An ideal depth improvement of the passive layer optimising chrome iron ratio on the surfaces.**
4. **Provides a clean and non-rusting surface.**
5. **Useful for cleaning in pre-operational maintenance and post-operational stainless steel process systems.**
6. **Increases corrosion resistance when applied on pickled and electropolished surfaces.**
7. **An absolutely environmentally safe chemistry that also offers ease of disposal in the sewage system.**
8. **Does not affect epoxy flooring.**

## ( C ) NST - 100

NST-100 is a new advanced degreaser for removing oil, grease , mid rust , soil etc. at room temperature. NST-100 is a sulphur free degreaser so it can be used in hygenic industries like pharmaceutical, cosmetics, food etc. Room Temp. = 25 – 40 °C

## ( D ) VK ® Neutralizer

VK Neutralizer is an advanced neutralizing aid for VK chemical products. After using this product, the water solution of spent VK chemicals can be discarded in municipal sewage system without any environmental pollution.

**The unique feature of "VK "is that without damaging the parent metal it does the function of descalement, oxide & rust removal plus gives a passive film which avoids further corrosion.**

## HOW TO APPLY ?

1. Remove oil, dirt, buffing compounds etc. with "NST 100" - degreaser.
   Add 50 - 75 gm/lit. in water ( 1 kg NST-100 in 15 – 20 Lit. water ) & stir to dissolve.
   Wipe S.S. surface with cotton cloth or soak for 10 min. Wash with water properly.

   For using in pressurized spray system, make water solution of only 10 – 20 gm/lit.
   Contact time = 2 - 5 min. for pressurized spray system.

   If surface is not having any dirt, oil, grease etc. then don't use NST-100.

2. VK Jelly is applied on weld seam & surrounding areas with a nylon bristled plastic brush OR
   VK Spray is sprayed on S.S. surface with plastic pressurized spray bottle or pump OR
   VK Dip is used to dip S.S. components in a plastic tank or circulated in pipeline with pump.

   Application Temp. = between 5 – 40 °C

3. Keep VK product for 10 - 45 minutes depending on contamination, temp. & grade of Stainless Steel.

   ( VK Jelly generally kept for 10 - 30 min. and VK Spray generally kept for 30 - 45 min.
   VK Dip is kept for 5 to 20 min. depending on SS grade and initial condition of SS parts )

   The above approximate contact time given is for temp. between 25 – 30 °C.
   The process time doubles with every 10 °C decrease in temperature. Same way, process time reduces by half with every 10 °C increase in temperature.

   If temp. is less than 25 °C , then more time than above mentioned may be required and if temperature is more than 35 - 40 °C , then uneven processing may result. So, cool SS equipment by keeping it in shade & not directly under the sun.

The application contact time depends on grade, thickness and temperature of Stainless Steel.

4. Use pressurised water jet spray OR wipe the weld seam lightly with plastic brush or cloth & wash with water thoroughly.

5. Spray or Dip or Brush VK Pass - 1 or VK Pass - 2 & leave it for 20- 30 minutes. Rinse with water thoroughly.

## For passivating Mirror Bright Buffed / Polished SS Areas ,

**THE BELOW STEPS WILL NOT AFFECT SHINE OF MIRROR BRIGHT BUFFED / ELECTROPOLISHED SS AREAS AND PROVIDE CONTAMINATION & STERILE PARTICLE FREE PASSIVATED SS SURFACE.**

1) **First apply VK Jelly on weld seam & surrounding areas with a nylon bristled plastic brush. After 10 to 30 min. wipe with cloth or plastic brush & wash with water thoroughly.**

**( Application of VK Jelly ensures that black & red spots do not come on & near weld seams area as generally observed some days after bright buffing. )**

2) **Complete usual mirror bright buffing / electropolishing procedure to make surface mirror bright & shiny. ( If SS eqpt. or pipe is already bright buffed or polished then discard Steps 1 & 2 and start directly with Step 3 )**

3) **Remove oil, dirt, buffing compounds etc. with "NST 100" - sulphur free degreaser. Add 50 - 75 gm/lit. in water ( 1 kg NST-100 in 15 – 20 Lit. water ) & stir to dissolve. Wipe S.S. surface with cotton cloth or pressurised spray for 2 - 5 min. or soak small parts for 10 min. Wash with water properly.**

4) **Spray or Dip or Brush VK Pass - 1 or VK Pass - 2 & leave it for 20 - 30 minutes. Then, rinse with Water thoroughly.**

## For pickling & passivating High Nickel Alloys

**For High Nickel alloys like Inconel , Monel etc. contact time for VK Jelly , VK Spray or VK Dip will be 2 to 5 minutes only. All other products' contact time will be same as mentioned above.**

*NOTE :*
*1. It is strongly advised to rinse SS surface with 10 gm/lit NST-100 solution ( 1 kg NST-100 in 100 Lit. water ) as the last step to ensure complete removal of previously applied `VK ' products and then rinse again with water.*
*2. Always use soft municipal water having chloride less than 50 ppm or De-mineralized ( DM ) water.*

**"NOVEL" PROVIDES EQUIPMENTS & ACCESSARIES FOR SAFE, IN-HOUSE PICKLING & PASSIVATION FOR ALL TYPES OF JOBS.**

**PRODUCT APPROVED BY I.I.T. (BOMBAY) UNDER ASTM – A380**
***ASTM = American Standards of Testing Materials***

| ADVANTAGES OF VK ® | FIELD OF APPLICATION |
|---|---|
| 1. Controlled metal removal.<br>2. Very easily welding scales are removed.<br>3. Negligible Fuming.<br>4. Improved finish with uniform smooth, satin look.<br>5. Stops corrosion & gives full corrosion resistance to treated surface. | VK is effectively & widely used in the following industries / products.<br>**Industries** : Pharmaceuticals, Chemicals, Dairy, Food , Beverages , Cosmetics etc.<br>**Products** : S.S. vessels, pressure vessels, filters, mixers, heat exchangers, pipe lines / tubes, fermentators, agitators etc. |

## WE UNDERTAKE JOBWORK AT SITE

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