

## *A BEAUTIFUL SATIN SHINE FINISH AND BETTER TO CLEAN BECAUSE OF A LOWER ROUGHNESS!*

### INTRODUCTION

The result after ceramic bead blasting is not comparable with the result after glass bead blasting. The technique of glass bead blasting is well known and often used in order to obtain a uniform finish after tooling stainless steel. Glass bead blasting of stainless steel, however, has a number of important disadvantages. In practice, most of the time material is blasted with a high percentage of broken beads because of the high break down rate of the glass beads, as a result of which a relatively high roughness (1.5-3.0 microns) is obtained. In practice it is proved that surfaces that have been blasted with glass beads show a high rate of dirt adhesion and are difficult to clean. As a result of contamination of the surface and a high roughness, combined with difficulties to clean and rinse, corrosion can occur even in a relatively mild (atmospheric) environment.

### ADVANTAGES OF CERAMIC BLASTING

Blasting with ceramic beads does not have the disadvantages mentioned above. The break down rate of ceramic beads is 50 times less than that of glass beads. Because of this, it can be guaranteed that purely round beads (approximately 100 microns) are used always. This immediately results in the visual effect of ceramic bead-blasted surfaces: a uniform satin shine finish. Depending on the roughness of the beginning material, a roughness less than 1.0 micron can be achieved.



*Before and after ceramic blasting*

### APPLICATIONS

Ceramic bead blasting is, therefore, very suitable for stainless steel products which have to have a high cosmetic value. Application areas are for instance stainless steel plating of facades, shop and office fronts, staircases, elevators and works for infrastructure such as furnishing of viaducts, traffic signs etc. The corrosion sensitivity under atmospheric conditions (outdoor application) is significantly reduced.



*Ceramic blasting of stainless steel bridge parts*

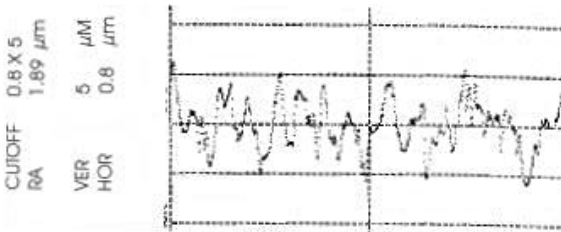
Ceramic bead blasting has proved to be very suitable for the treatment of stainless steel surfaces in for instance the food and pharmaceutical industry. Because of the lower roughness of the surface, it is much better and easier to clean compared with glass bead blasting. Especially industries where contaminants of a microbial nature are important, are served with this new method of metal surface treatment.

Vecom uses a special installation in which ceramic bead blasting can be carried out. With the use of permanent magnets, metallic iron is removed continuously. To avoid contamination of the blasting material with foreign iron, the stainless steel is pickled before blasting. When necessary, the material can be passivated chemically and rinsed with demineralised water after ceramic blasting in order to completely remove any remainders of blasting powder. By doing so, the sensitivity for stains (well known with glass bead blasting) is also reduced.

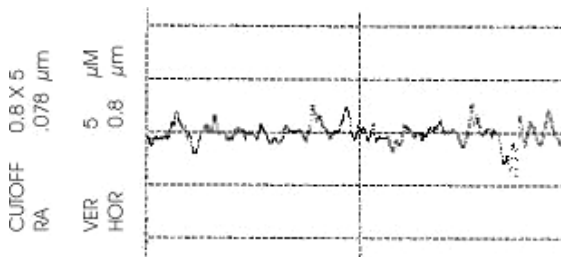
## Pickling

The possibility to do the pickling, ceramic bead blasting and chemical passivation of stainless steel on one location obviously has important advantages for price, quality and delivery time.

The main reason for pickling stainless steel is the removal of welding discolouring and the removal of foreign iron particles, so that the corrosion resistance is fully renewed. By subsequently ceramic bead blasting, also a uniform satin shine finish of the surface can be obtained.



*Roughness scan after glass bead blasting*



*Roughness scan after ceramic blasting*

Starting with a pre finished surface or cold rolled 2B, and depending on the surface treatment, the following roughness (Ra) can be achieved approximately:

Ceramic bead blasting:	2.0 - 0.8 μm
Glass bead blasting:	3.0 - 1.5 μm
Pickling:	~ 0.5 μm
Mechanical Polishing:	5.0 - 0.05 μm



*Specialists in  
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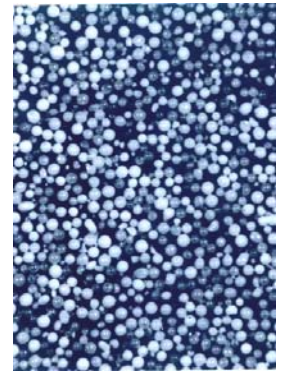
## TNO RESEARCH

Recently, a study was completed about the surface roughness and cleaning properties of stainless steel after different surface treatments. This research was performed by TNO -TPD and Vecom. The following surface treatments were investigated:

1. Ceramic bead blasting
2. Glass bead blasting
3. Pickling
4. Mechanical Polishing

### Conclusion:

Pickling gives the best surface properties from the investigated surface treatments, but ceramic bead blasting ends very close. The advantage of ceramic bead blasting is that the ceramic particles remain circular, whereas glass particles break easily. This results with glass bead blasting in a higher roughness than with ceramic bead blasting. REM photographs clearly shows differences. After glass bead blasting, the surface presents sharp edges, pits, micro cracks and small grooves due to sharp impacts of broken glass particles. Remarkable is the big difference in cleaning properties between the glass and ceramic bead blasted surfaces. Glass bead blasted surfaces presented a higher capacity to retain dirt particles than (smoother) ceramic bead blasted surfaces. Dirt adhesion can induce and accelerate the corrosion processes.



### An overview of all advantages:

- ▶ Because of the low break down rate, purely round beads are used.
- ▶ Completely iron free, so no risk of contamination.
- ▶ Beautiful uniform finish (satin shine).
- ▶ Depending on the beginning state of the material, a roughness of Ra < 1,0 μm is realizable.
- ▶ Pickling/passivation and ceramic blasting on one location saves time and money.
- ▶ Very suitable for the treatment of stainless steel products for the food and pharmaceutical industry.