



IFST Hygienic Design
Conference

February 25th 2016

Eastwood Park, Glous, UK

The Hygienic Design of Manual Cleaning Equipment

Deb Smith
Global Hygiene Specialist



Who are Vikan?

- Danish based manufacturer of manual cleaning equipment for the food industry
- Established: 1898
- Majority owned by The Vissing Foundation, charitable trust
 - Majority of profits go back into sustaining the business and supporting medical and technical research
- Deb Smith, Global Hygiene Specialist



Background

- European Hygienic Engineering Design Group (EHEDG)

- *'..promotion of safe food by improving hygienic engineering and design in all aspects of food manufacture.'*

- guidance

- training

- certification



- Focus to date on food production equipment



Benefits...

- ...of using equipment of good hygienic design
 - quicker and easier to clean
 - minimises the risk of product cross-contamination (microbes, allergens, foreign bodies, food residues)
 - maximises food safety and quality
 - reduced risk of expensive product rejection or recall
 - minimises food waste
 - cost benefits

A few things you might not know about cleaning equipment

- Cleaning equipment has been shown to be a major source and vector of cross-contamination
 - *47% of cleaning equipment tested was positive for Listeria* (Holah, pers. comm.)
- The importance of hygienic design of cleaning equipment has recently been recognised by BRC
 - Issue 7 of their Global Standard for Food Safety newly states that *'cleaning equipment should be hygienically designed'* - Section 4.11.6
- There is *little guidance* on hygienically designed cleaning equipment and *very few cleaning equipment manufacturers produce hygienically designed tools.*



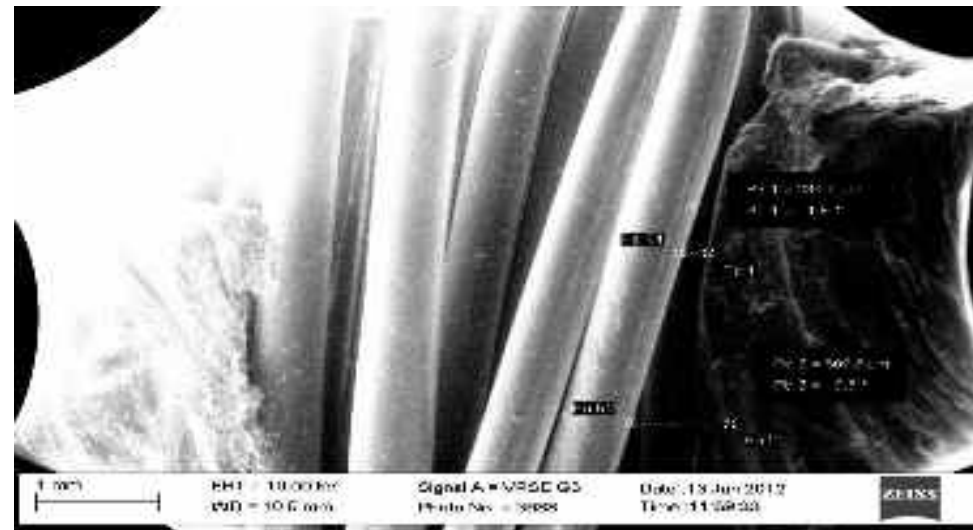
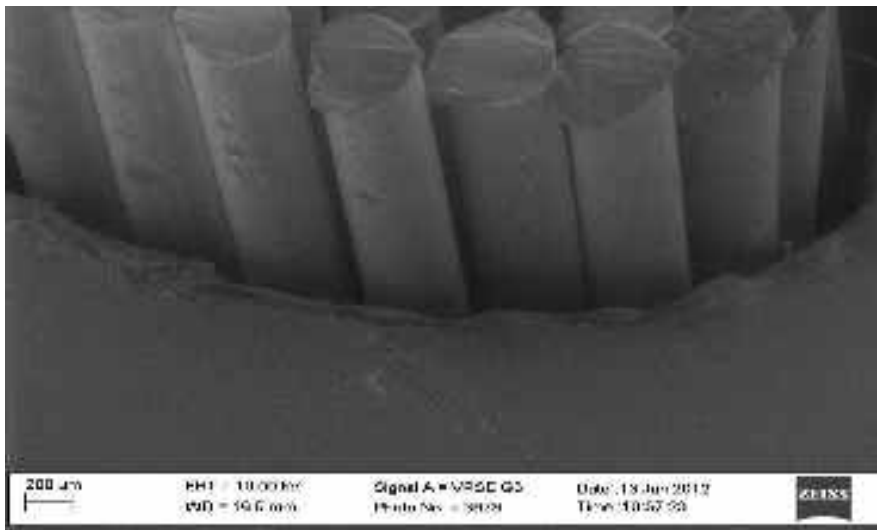
Brushware investigation

- Drilled and stapled
- Resin set
- Resin set & drilled and stapled
- Fused filament

Assessment Methods



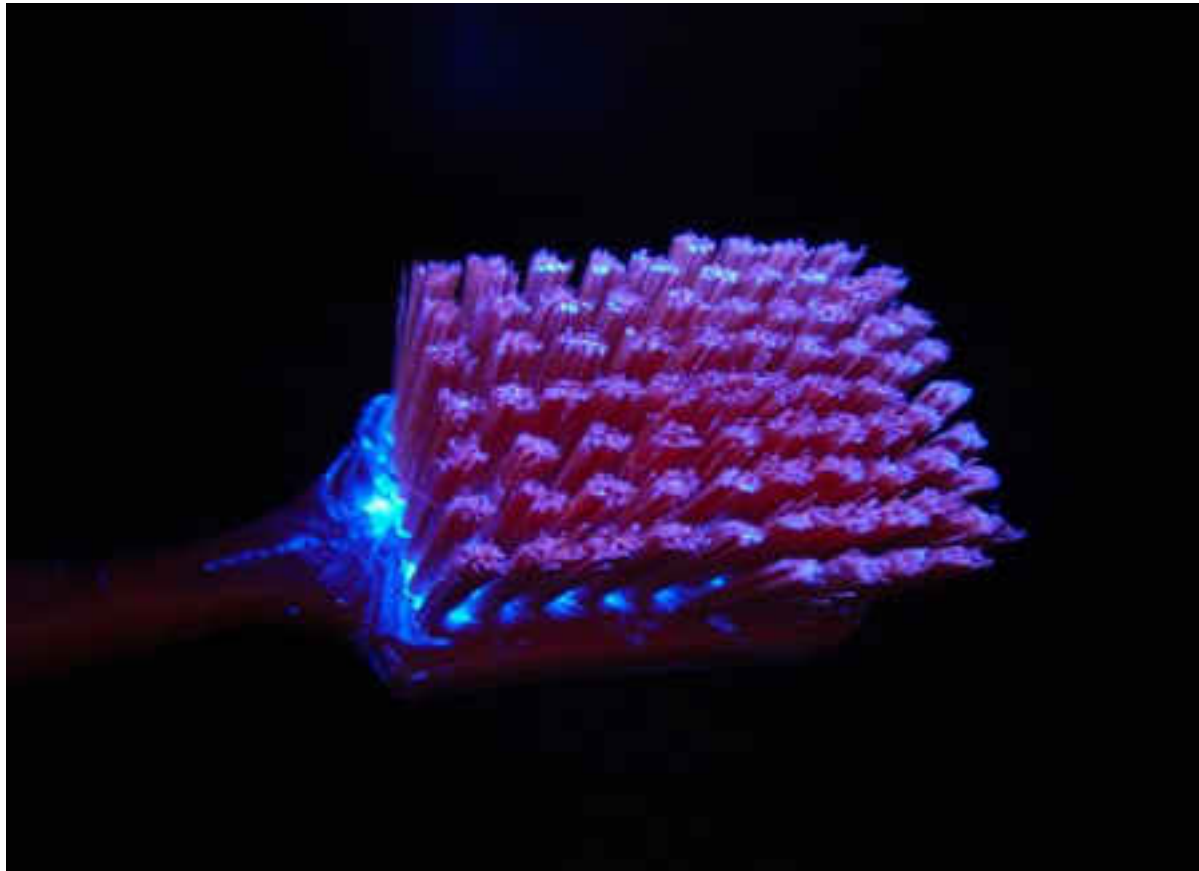
Hygienic design – drilled & stapled products



Assesment method



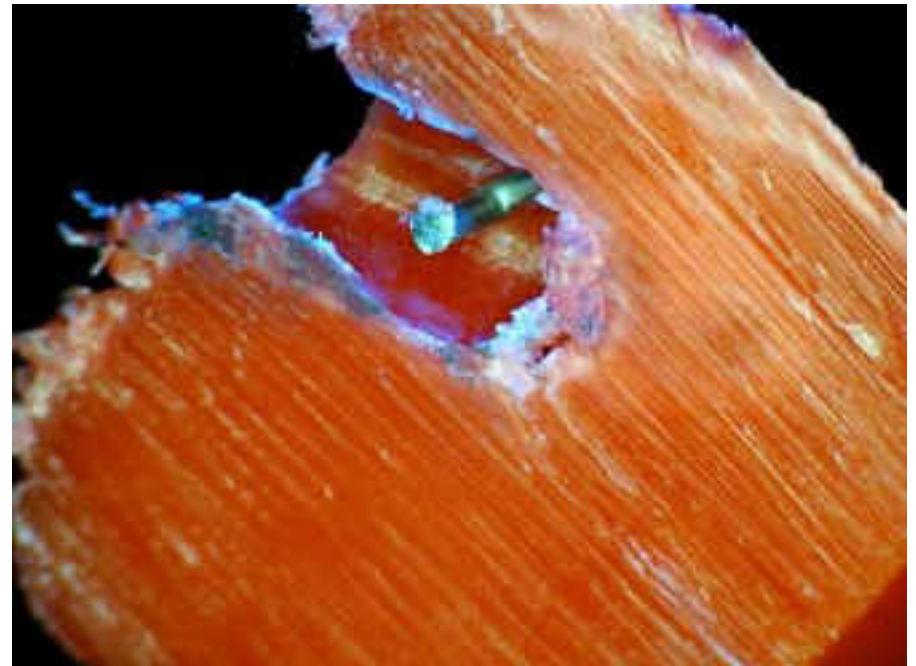
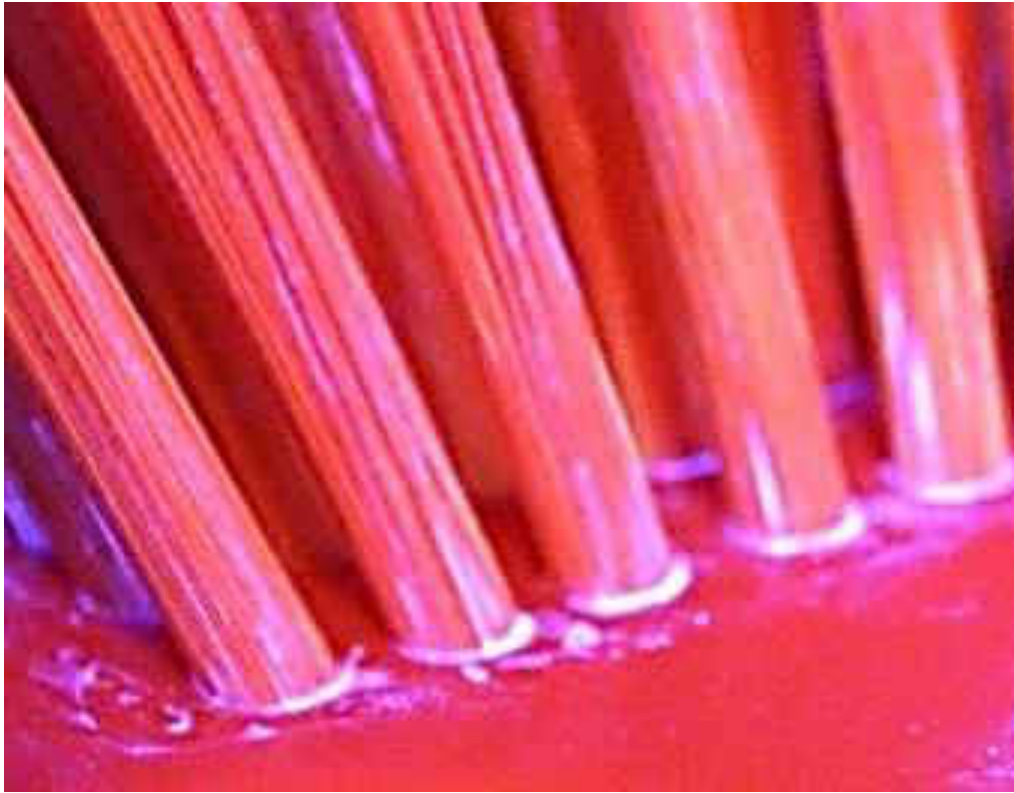
'Contamination' as seen under UV light



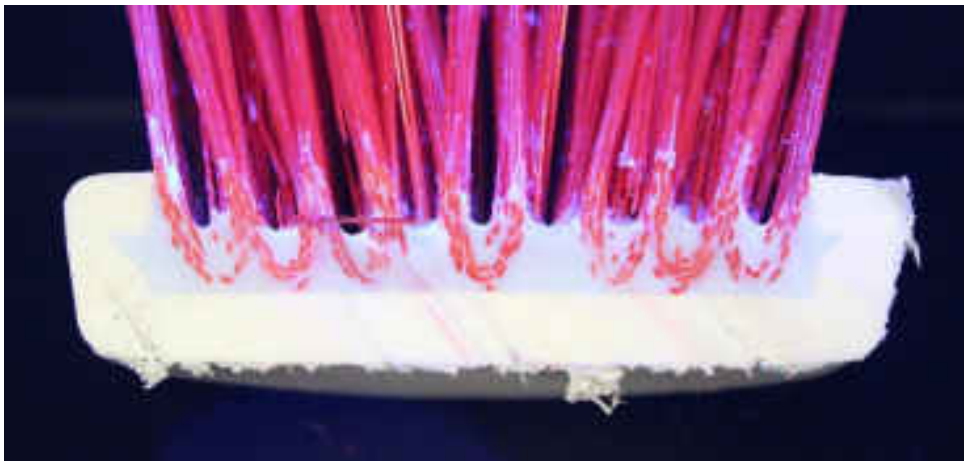
Decontamination procedure



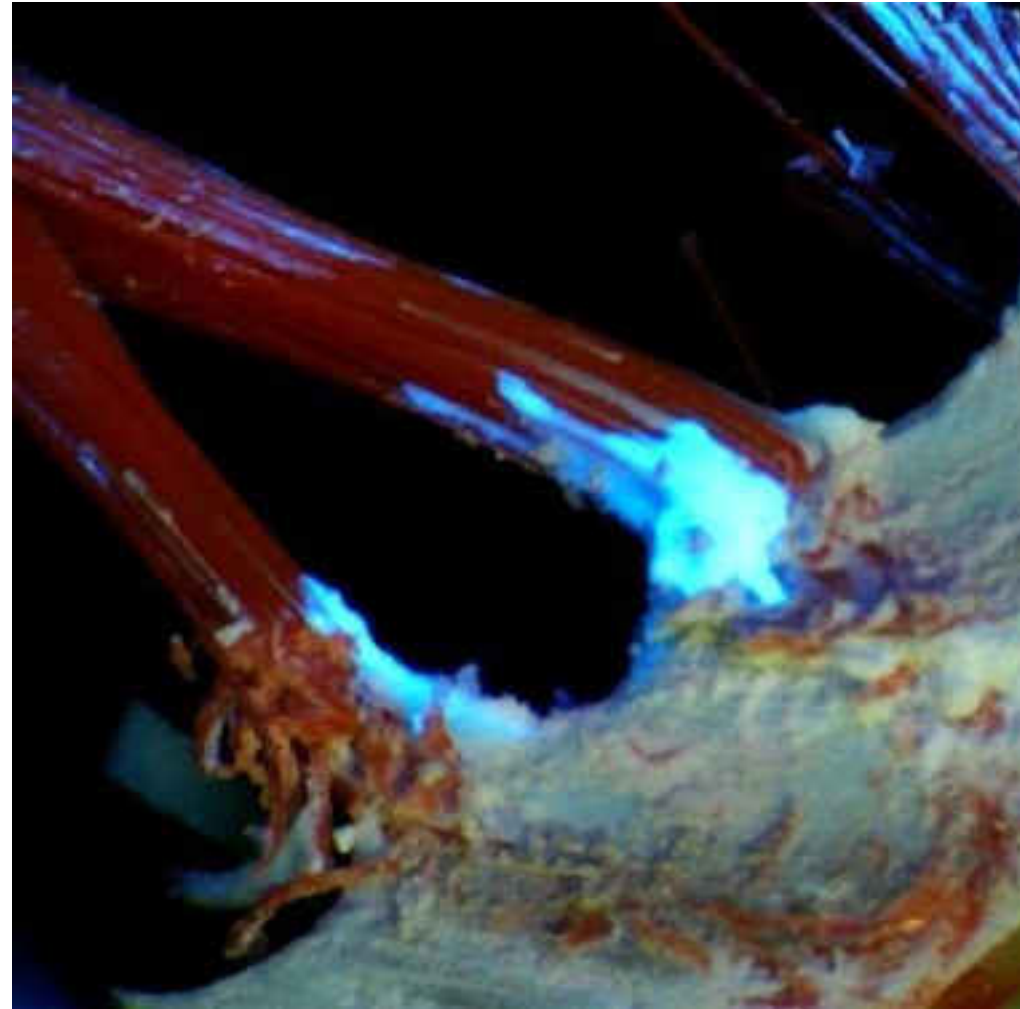
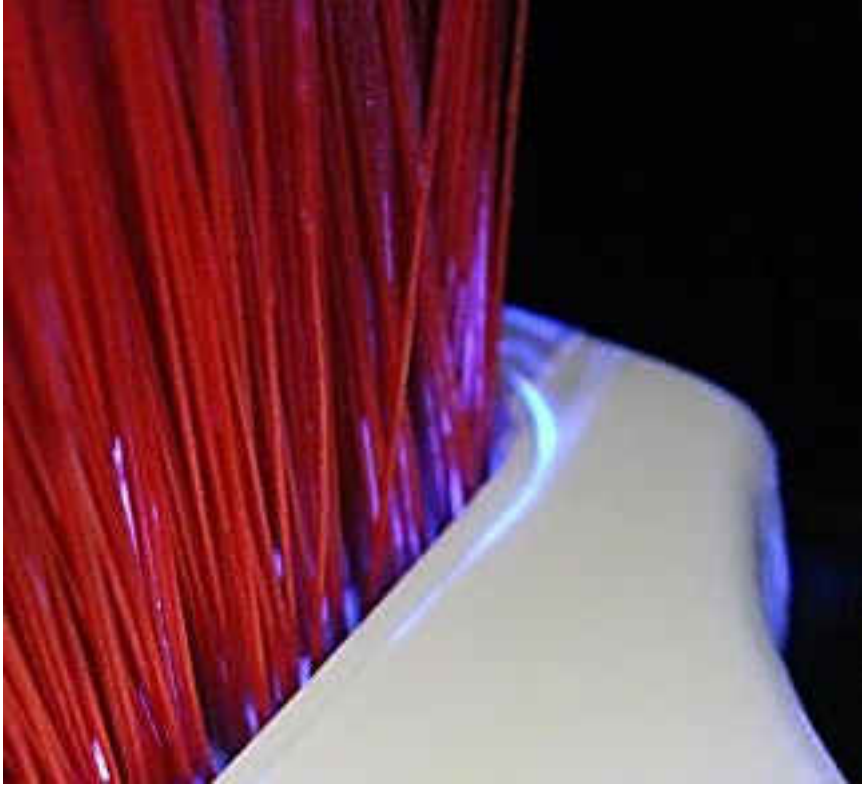
Contamination remaining



Hygienic design – resin products

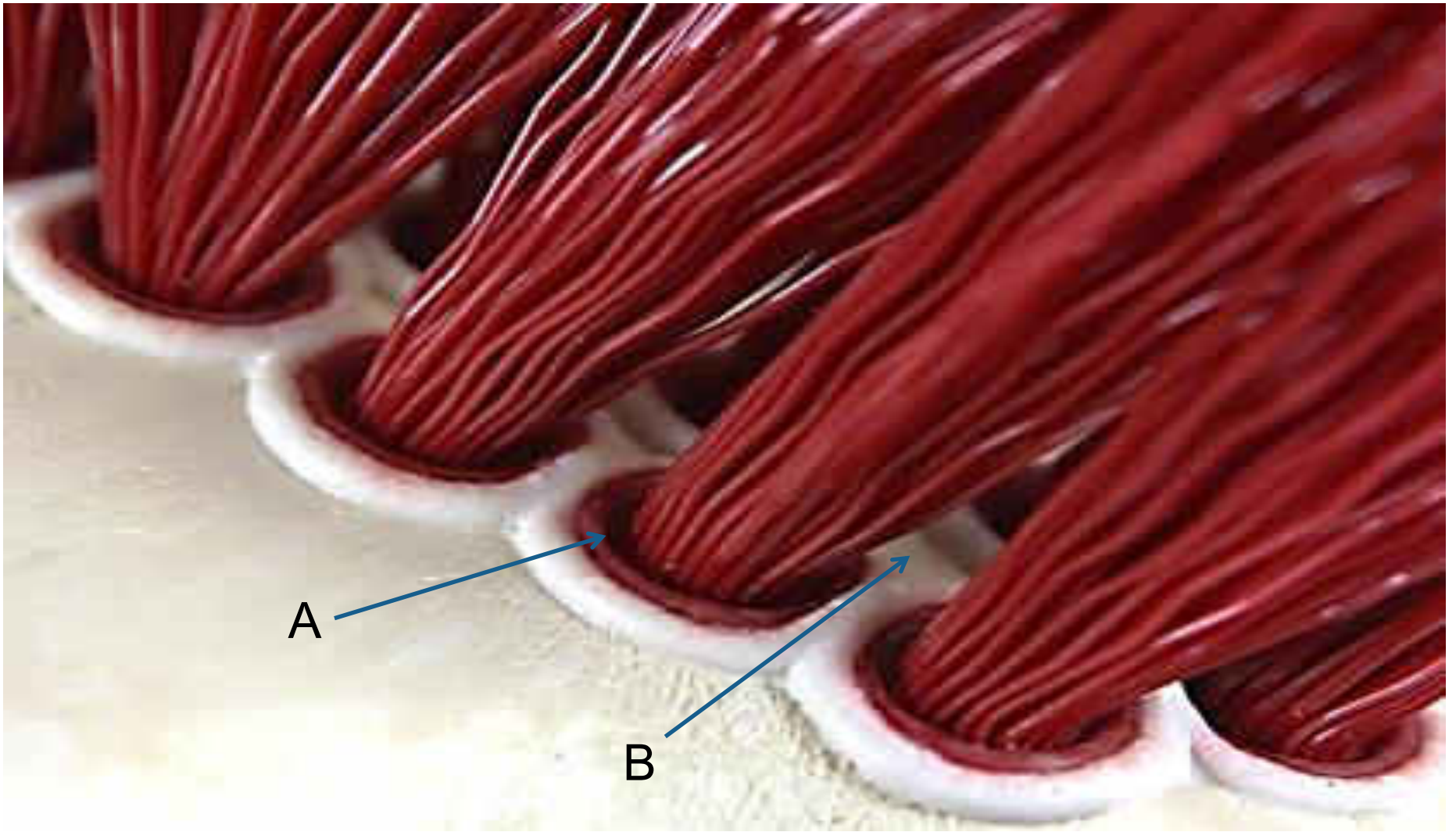


Contamination remaining



Hygienic design – fused bristle products





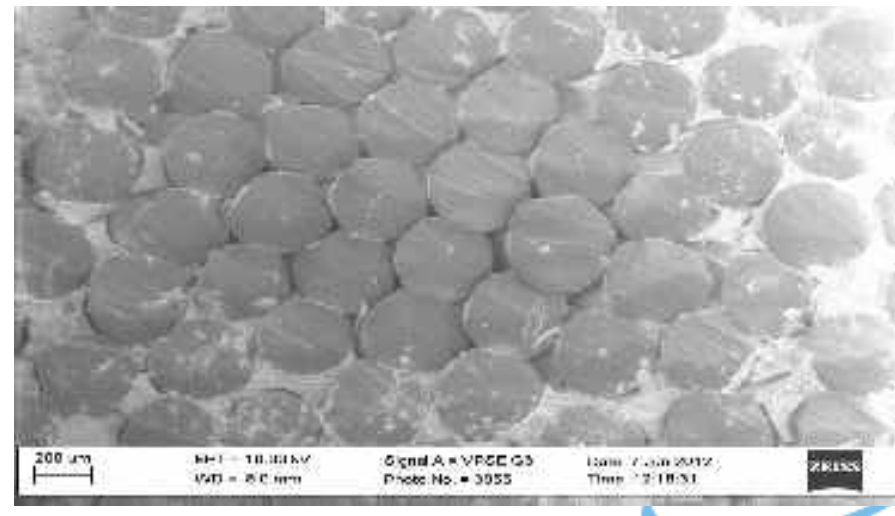
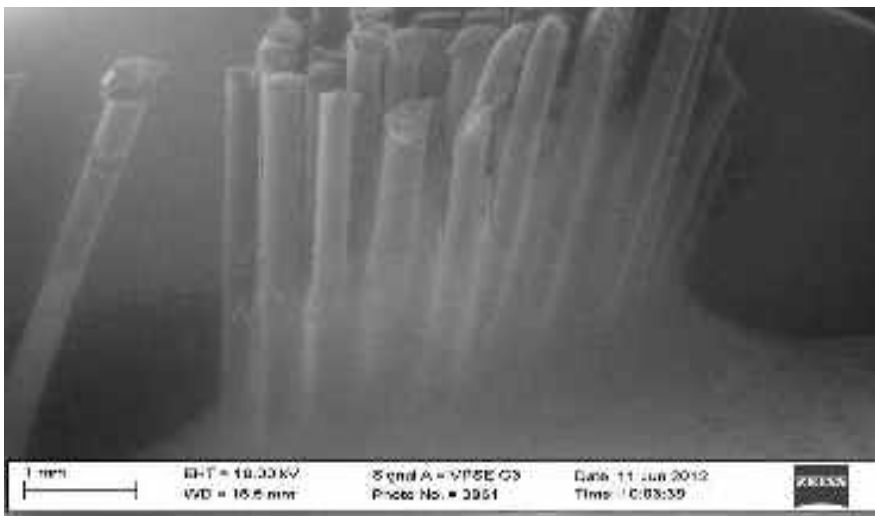
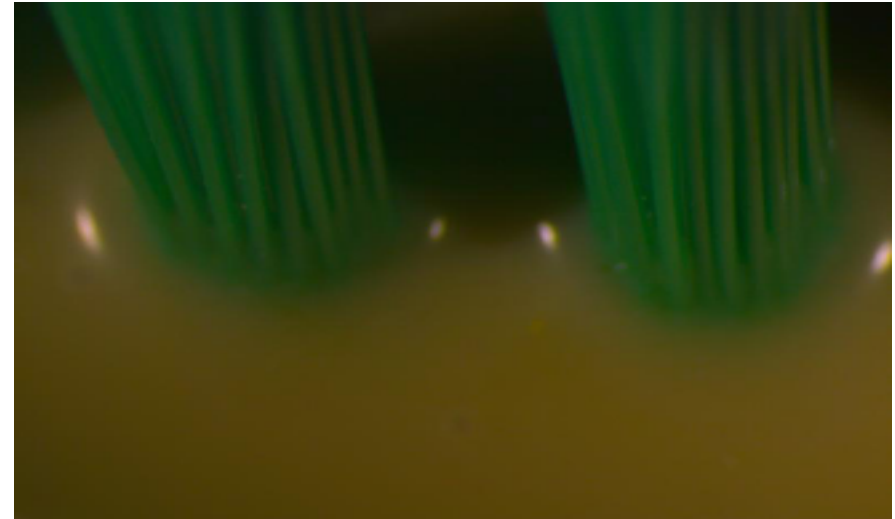
Poor surface finish



**‘Contamination’
remaining after
decontamination**

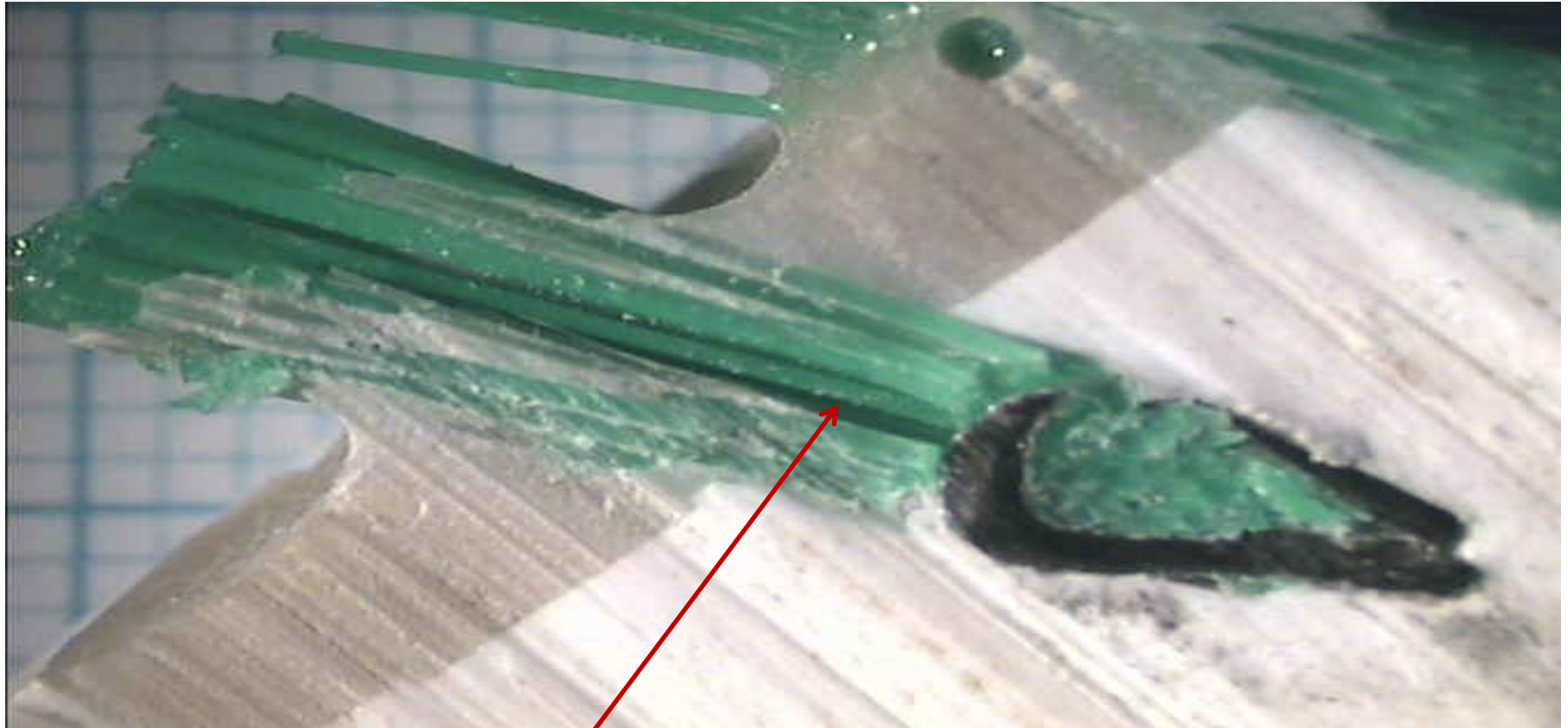


Hygienic design – resin set drilled & stapled products



Courtesy of Campden BRI

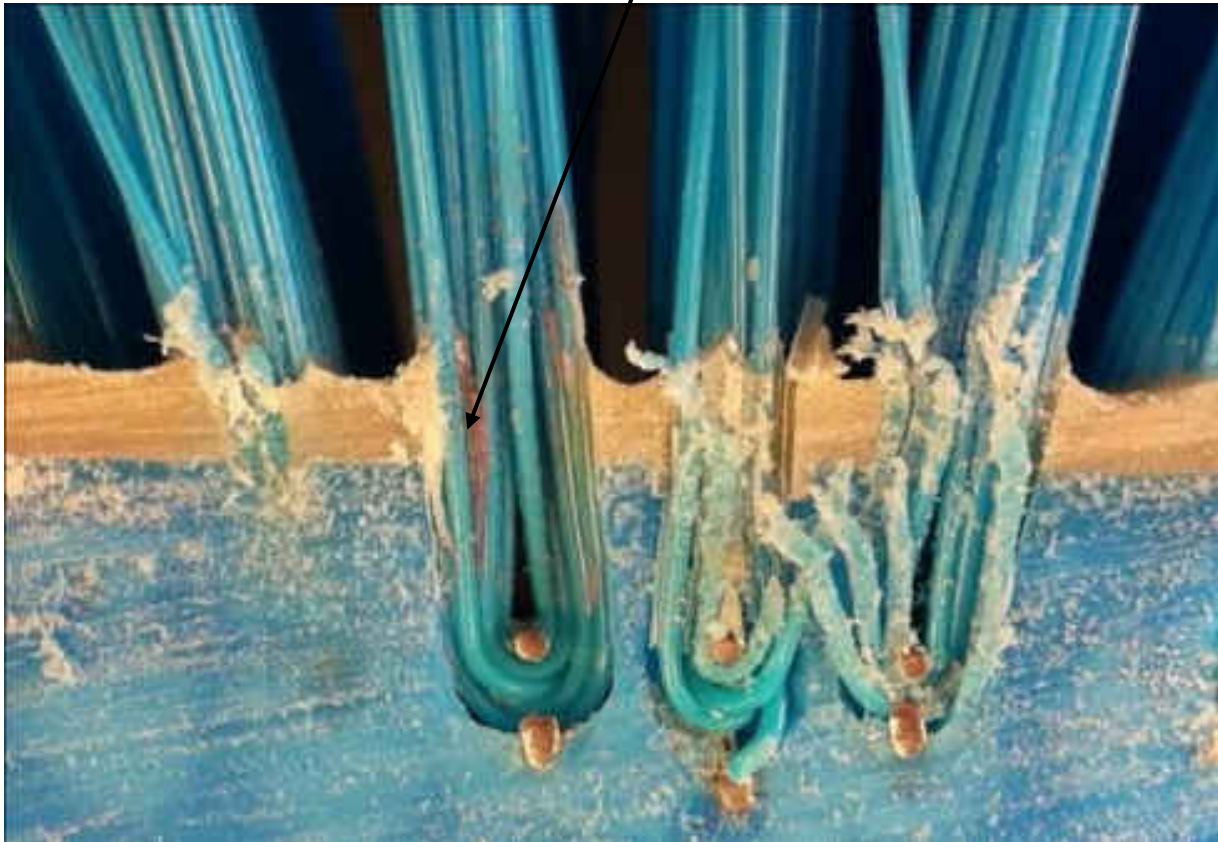
Hygienic design – resin set drilled & stapled products



Channel, potential
contamination trap



Trapped contamination, after dishwashing



Conclusion

**All the brushware options investigated have
hygienic design issues**



Improved Hygienic Design

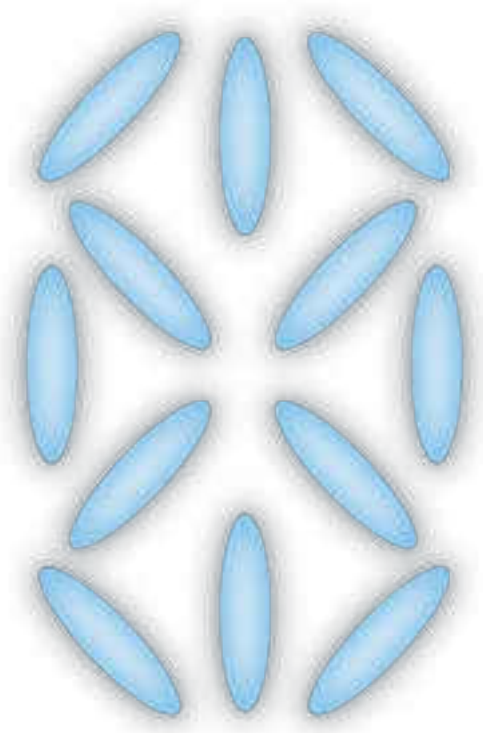
Application of EHEDG *hygienic design principles to future cleaning tool development:

- Absence of crevices and contamination traps
- Smooth surface finish
- Easy to clean (and dry)
- Made of food safe materials
- Well constructed

**EHEDG Guideline 8 Document "Hygienic Equipment Design Criteria"*, (see <http://www.ehedg.org/?nr=110&lang=en>)

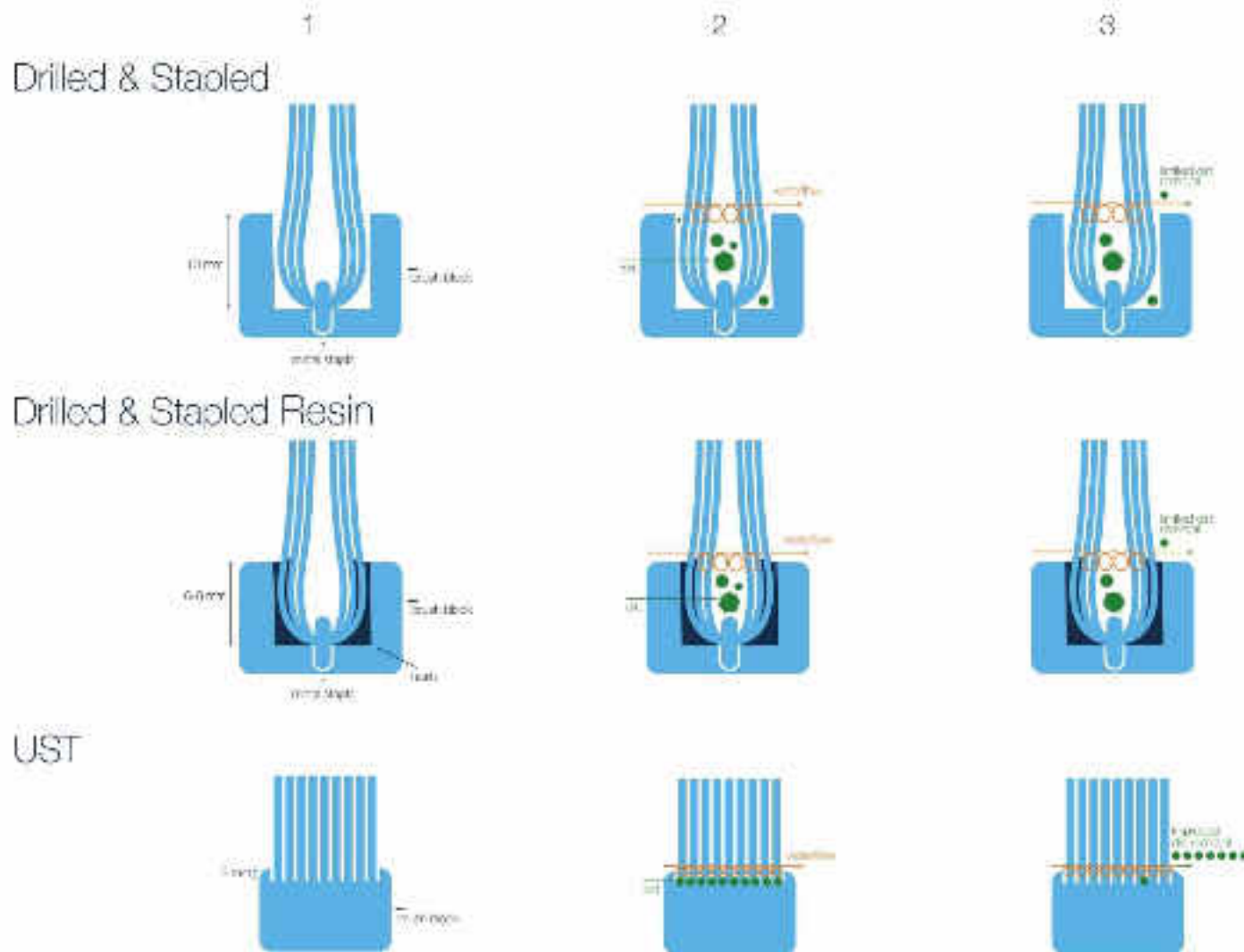


Ultra Safe Technology Brushware

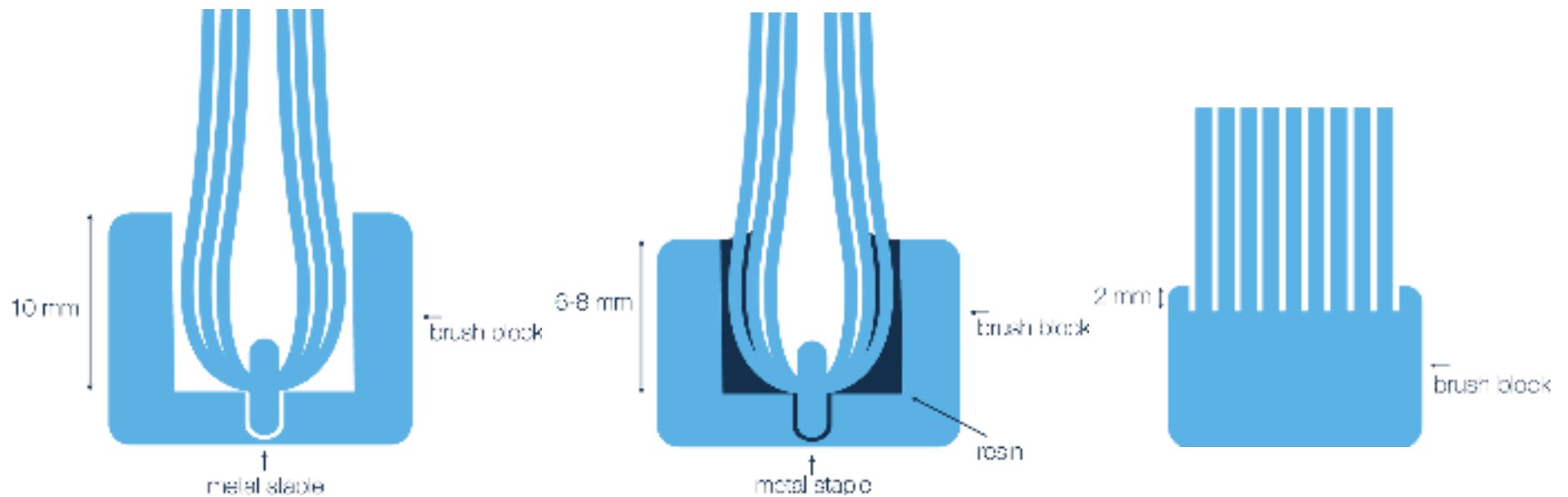


- Fully moulded construction
- No drilled holes
- No sharp internal angles
- Smooth surface finish ($<0.8 R_a$)
- *Made entirely of food contact approved materials (EU & FDA)
- Easier to clean and dry
- Reduced risk of foreign body contamination (bristles)

Cleanability



Bristle fixation



The future...?

- Incorporation of hygienic design principles into other food industry cleaning equipment designs
- Guidance, standards, certification, and training on food industry cleaning equipment
 - *EHEDG sub-group?*
- One day all brushes will be made this way!



Further information about hygienically designed cleaning tools

Vikan exhibition stand

White Paper

Journal of Hygienic Engineering and Design
(JHED) 2015

EHEDG Handbook of Hygiene Control in the
Food Industry, 2nd ed (spring 2016)

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