

IAFP Sanitation PDG Webinar

June 2017

THE HYGIENIC DESIGN OF FOOD INDUSTRY CLEANING BRUSHES

Deb Smith

Global Hygiene Specialist



WHO AM I?

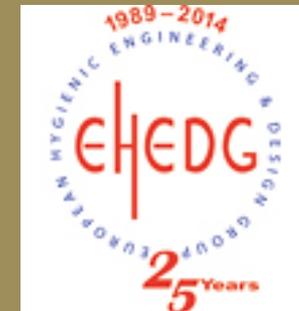


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Design Group (EHEDG)



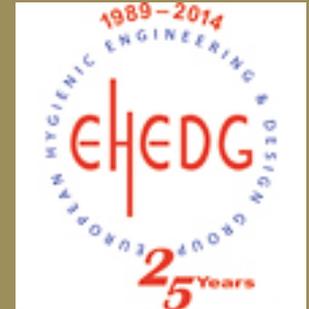
HYGIENIC DESIGN

What does it mean?

How easy it is to clean

Cleanability

The ability to clean something easily



Two things to consider

Hygienic design of the equipment

Materials of construction



EUROPEAN HYGIENIC ENGINEERING DESIGN GROUP (EHEDG)

Independent, not-for-profit organisation

Academic and industry volunteers

'..promotion of safe food by improving hygienic engineering & design in all aspects of food manufacture.'

Guidance

Training

Certification



BENEFITS OF HYGIENIC DESIGN

Equipment and facilities that are of good hygienic design

- are quicker and easier to clean
- minimise the risk of product cross-contamination (microbes, allergens, foreign bodies, food residues)
- maximise food safety and quality
- Reduce the risk of expensive product rejection or recall
- minimise food waste

= cost benefits and business protection

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 (MAFF/CBRI)

FSSC 22000

ISO/TS 22002-1:2009 (2013) Prerequisite programmes on food safety Part 1:
Food manufacturing

11.2 Cleaning and sanitising agents and tools:

'Tools and equipment shall be of hygienic design.....'

BRCv7 Global Standard for Food Safety

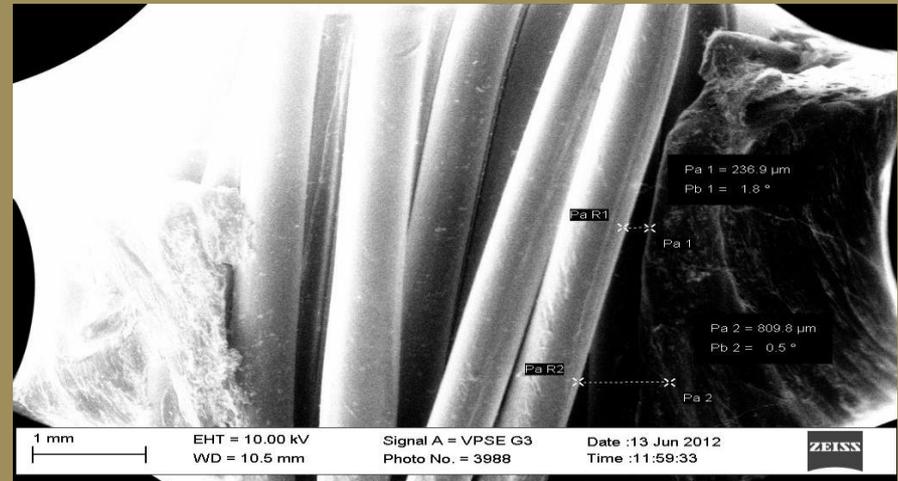
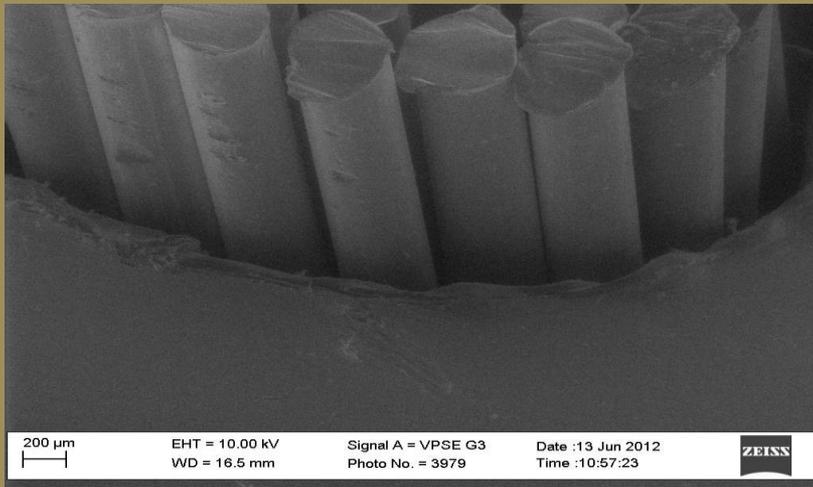
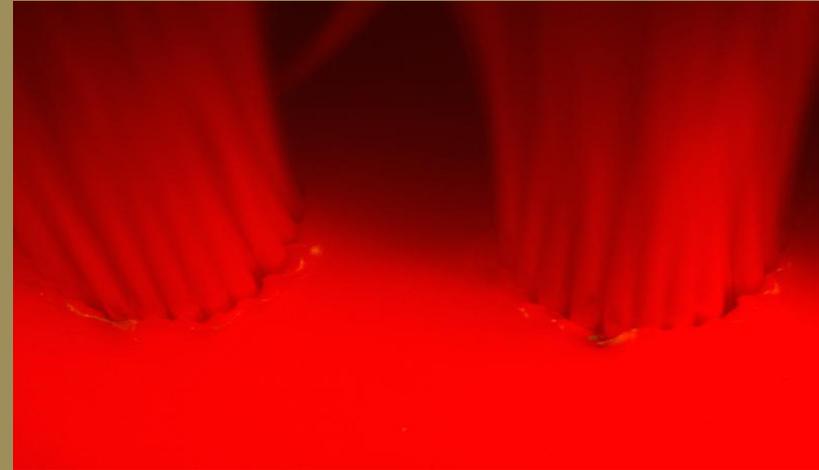
4.11.6. 'cleaning equipment should be hygienically designed'

Some food industry brushware is not food contact compliant

There is *little guidance* on hygienically designed cleaning equipment



HYGIENIC DESIGN INVESTIGATIONS - DRILLED & STAPLED BRUSHWARE



Courtesy of CampdenBRI



HYGIENIC DESIGN OF BRUSHWARE

UV LOTION INVESTIGATION METHOD



UV lotion



Applied and rubbed into the hands

Hands washed and dried using the prescribed method



Hands inspected under UV light to visualise remaining 'contamination'



Usually used to train food operatives in good hand washing techniques



'CONTAMINATION' OF BRUSHWARE

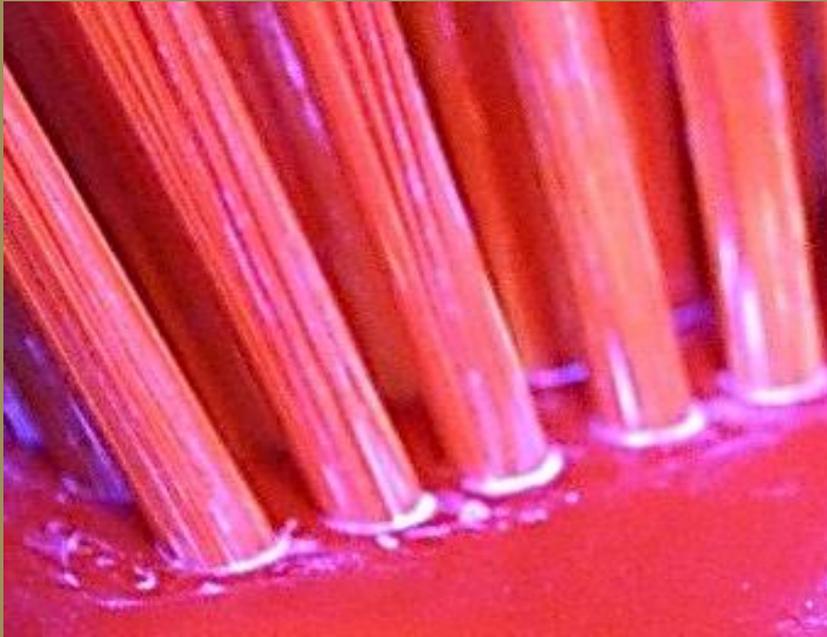


'CONTAMINATION' SEEN UNDER UV LIGHT

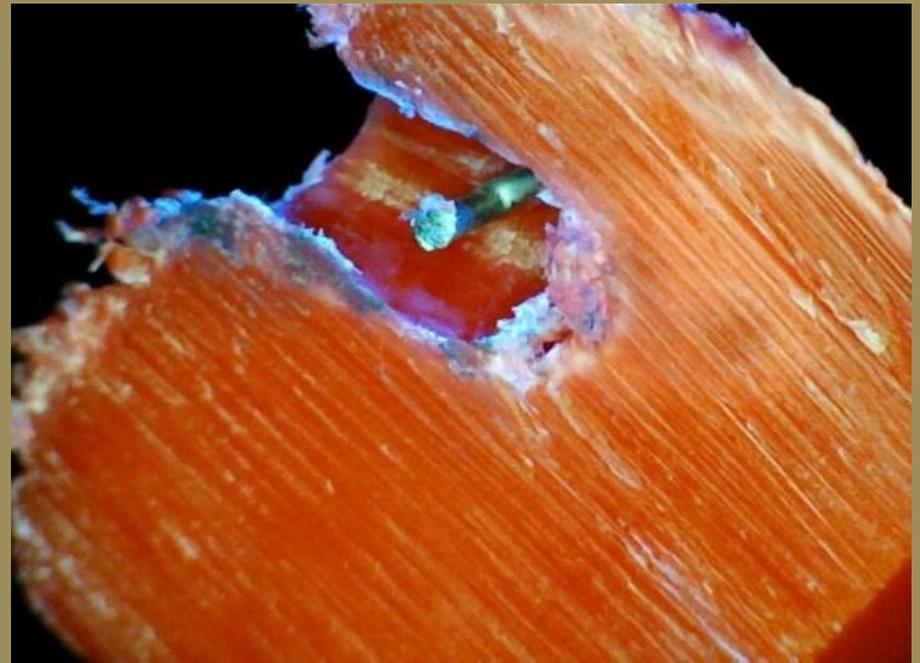


DECONTAMINATION PROCEDURE



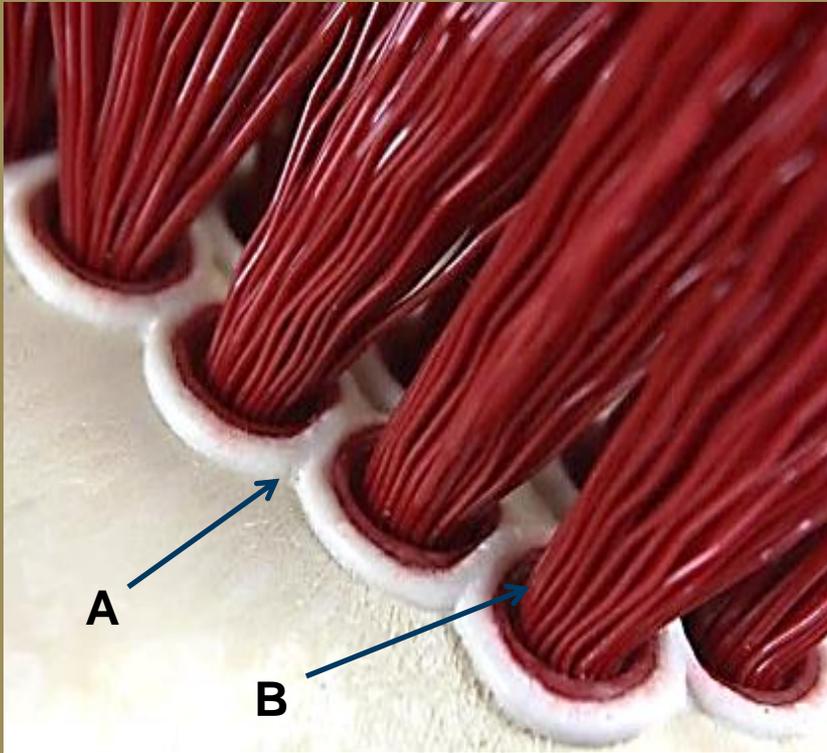


'CONTAMINATION' REMAINING



HYGIENIC DESIGN INVESTIGATIONS

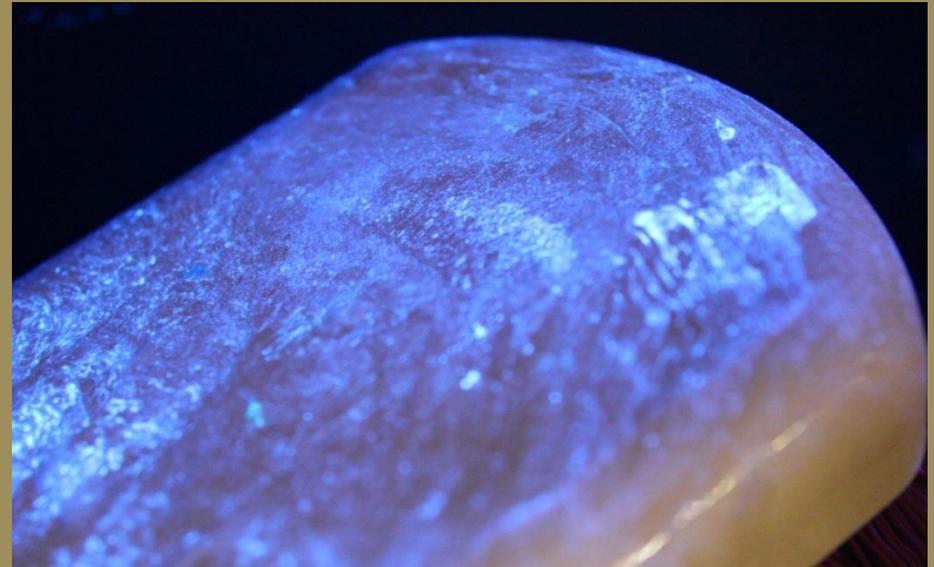
FUSED BRUSHWARE





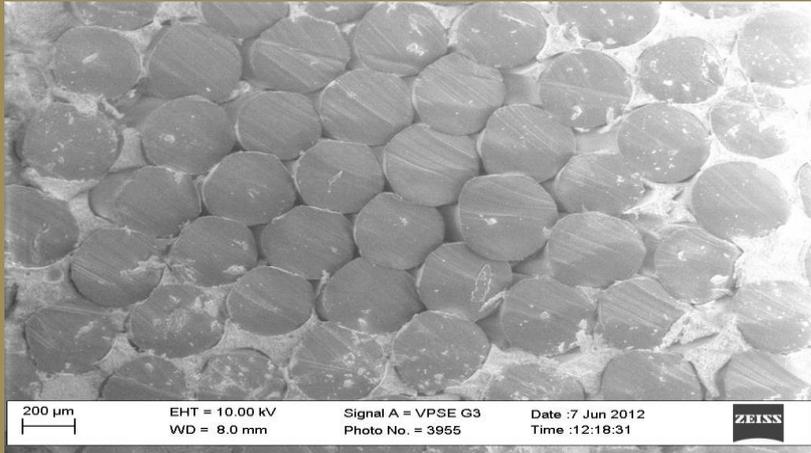
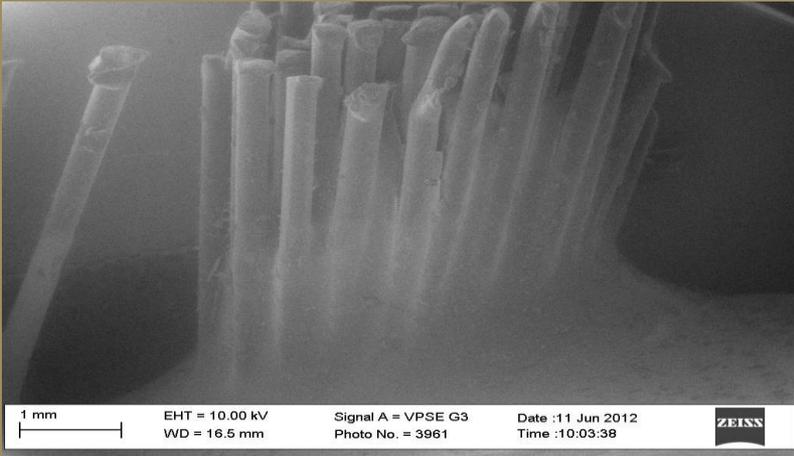
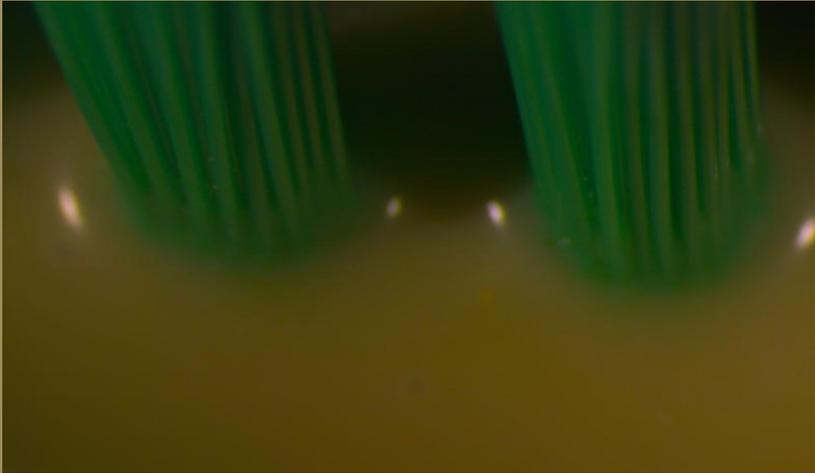
‘CONTAMINATION’ REMAINING

Poor surface finish
EHEDG recommend an R_a
of less than $0.8\mu\text{m}$ as
cleanable.



HYGIENIC DESIGN INVESTIGATIONS

RESIN SET BRUSHWARE

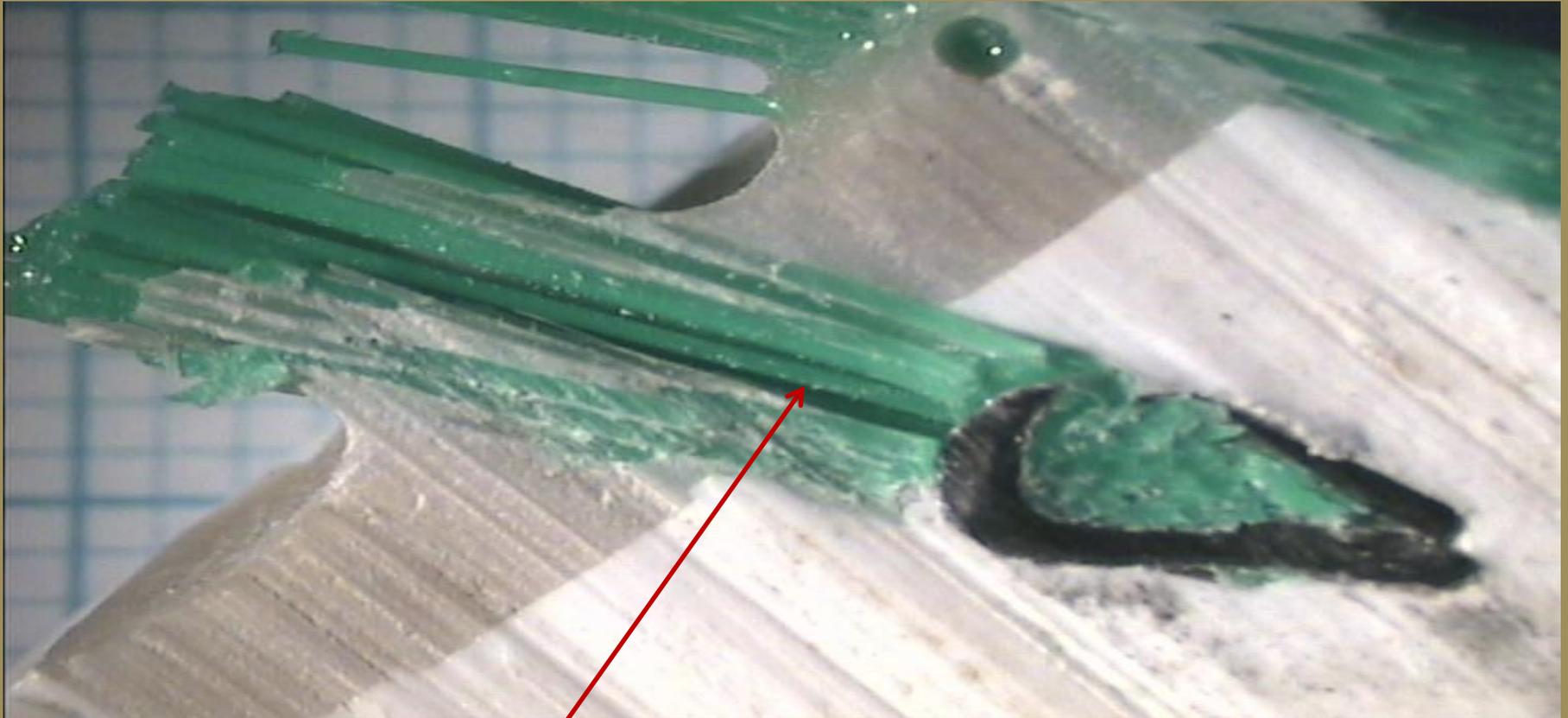


Courtesy of CampdenBRI



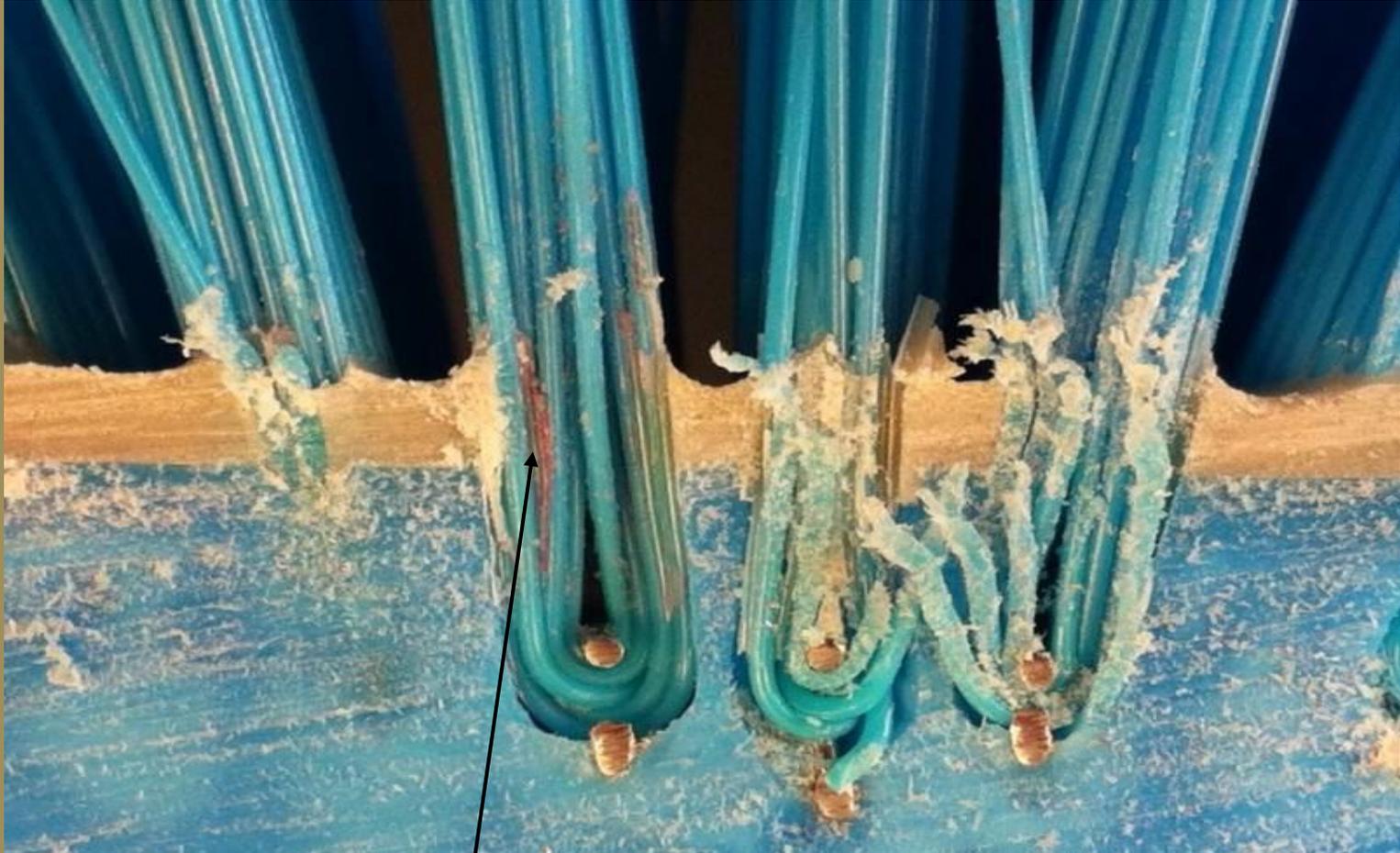
HYGIENIC DESIGN INVESTIGATIONS

RESIN SET BRUSHWARE



Channel, potential contamination trap

'CONTAMINATION' REMAINING



Trapped contamination, after dishwashing

MATERIALS OF CONSTRUCTION

In the EU plastic equipment and utensils that is likely to come into contact with food or food contact surfaces must comply with EU food contact regulations:

- EC Regulation Nos. 10/2011 and 1935/2004 and subsequent amendments and updates
- These regulations require,
 - Migration tests
 - Declarations of Compliance



***FDA compliance alone is NOT sufficient within the EU**

EU FOOD CONTACT COMPLIANCE

Declaration of Compliance

Resin-Set: Inside thread – Sweepers & Brushes

Art. Numbers:

Sweepers: 91136-, 93147-, 93157- Washing brush: 93135-, 93155-
Banister brushes: 90252-, 90255- Churn brushes: 90546-, 90548- Utility brushes: 90232-, 90233- Hand scrub brushes: 95063-
Trade names: Sweepers, Washing-, Banister-, Churn-, Utility- & Hand scrub brushes
Brush block: Polypropylene grade (98%) - master batch (2%): White, Blue, Red, Yellow, Green, Black, Orange, Purple, Brown and Grey
Filaments: Polyester PBT (Polybutyleneterephthalate):
Wire staple: Stainless steel (AISI 304).
Resin: Two component resin

We confirm that the above mentioned products fulfill the requirements on materials and articles used for food contact as described in the European Regulation 10/2011/EC as amended up to and including 202/2014/EC. The master batches are furthermore in compliance with European Resolution Res AP (89) 1.
Substances used for the manufacturing of the products are all listed in Annex I of Regulation 10/2011/EC as amended up to and including 202/2014/EC. The products contain substances restricted by specific migration limits as defined in Regulation 10/2011/EC Annex I. The products have been tested for overall and specific migration according to the specifications in Regulation 10/2011/EC as amended up to and including 202/2014/EC. Both overall and specific migration limits are complied with when the products are used as specified.
The products can be used for contact with all kinds of foodstuffs at maximum 40°C for a maximum of 1 hour.

Two component resin

The resin-set items are made by a two component molding system. The hardened resin archives adhesion to most plastics materials, and the resin ensure single filaments to pulling out and the method inhibits the accumulation of dirt or moisture in the tuft holes.

The two component resin is not approved for directly contact with food.

materials and articles intended for food contact as described in EC Regulation 10/2011/EC as amended up to and including 202/2014/EC and the Danish executive order no. 822 of 26/06/2013.

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The two component resin is not approved for directly contact with food.

FDA (American Food and Drug Administration): All raw materials are in compliance with FDA-CFR 21 / Food code 2009.

EU regulations: Made in accordance with EU regulations: 10/2011/EC as amended up to and including 202/2014/EC, 1935/2004/EC,

2023/2006, 979/2011/EC.

EU directive: 93/43/EEC.

Glass/Fork: fulfill the rules to be marked with the glass/fork symbol.

Before use: It is recommended to clean, disinfect and/or sterilise the article before use.

After use: clean, disinfect and sterilise the article after use according to the appropriate to it's intended use, using the correct chemical, concentration, time and temperature.

Sterilise in an autoclave max temp. 120°C (max temp for cleaning the article 134°C).

Disinfected: tolerate all approved disinfectants.

Declaration made by: Karsten Skov.

Date: 2015-04-08

IMPROVED HYGIENIC DESIGN

Conclusion: All brushware investigated have hygienic design issues

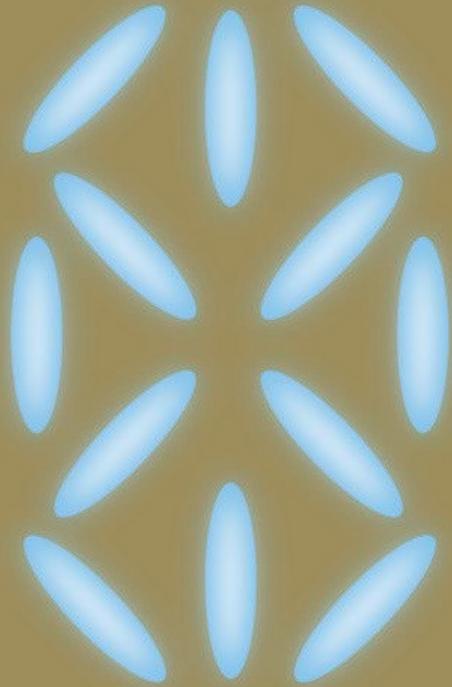
Application of EHEDG/3A *hygienic design principles to future cleaning tool development:

- 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"*

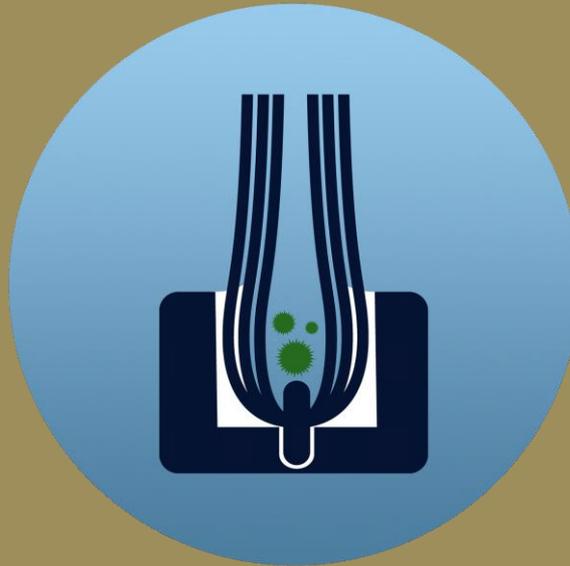
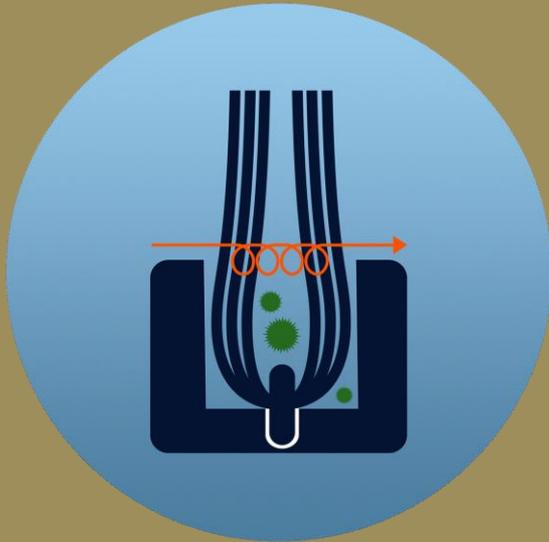


ULTRA SAFE TECHNOLOGY BRUSHWARE

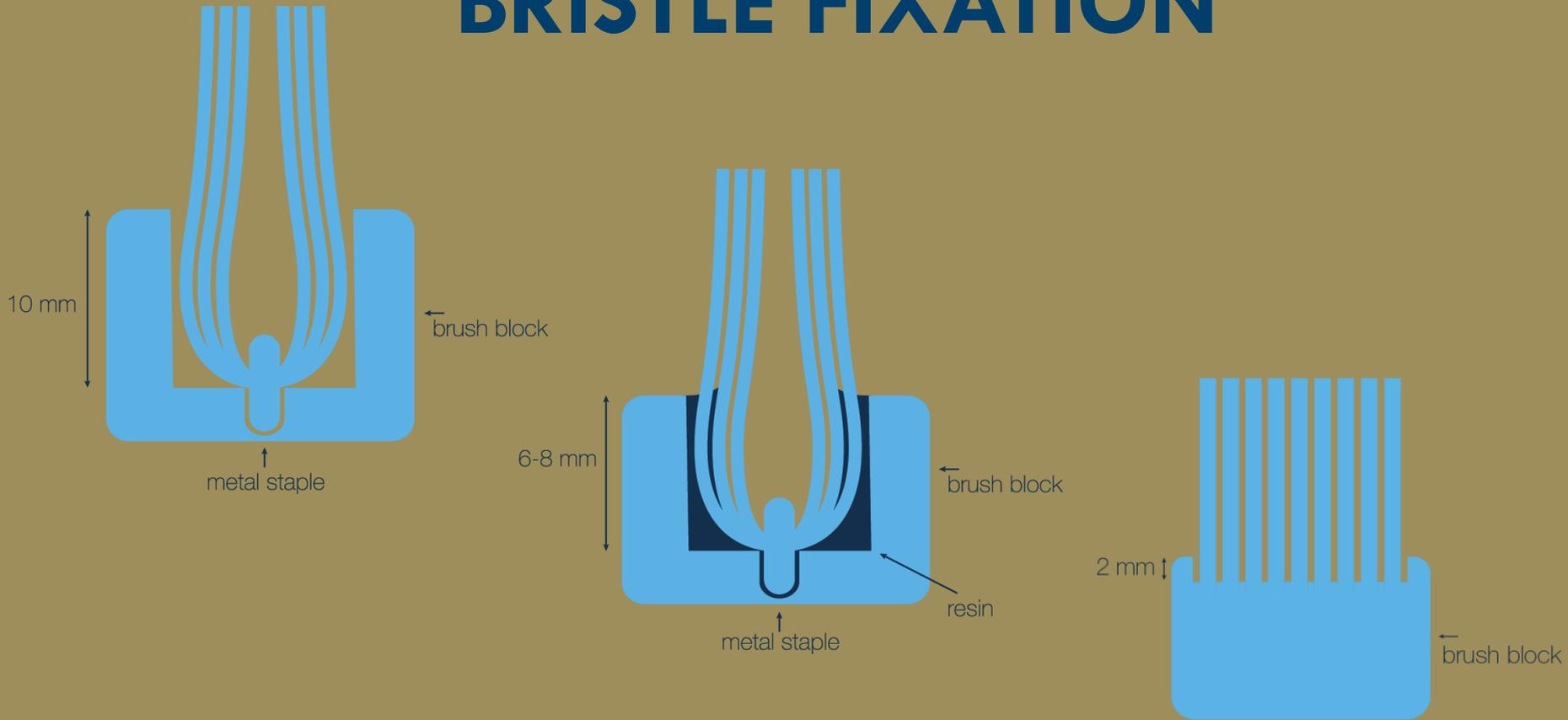


- Fully moulded construction
- Reduced risk of foreign bodies;
 - No resin
 - No metal staples
 - Reduced risk of bristle loss
- No drilled holes
- No sharp internal angles
- Smooth surface finish ($<0.8 R_a$)
- Easier to clean and dry
- Made entirely of food contact approved materials (EU & FDA)
- Fully coloured
- Fully tested and documented

CLEANABILITY



BRISTLE FIXATION



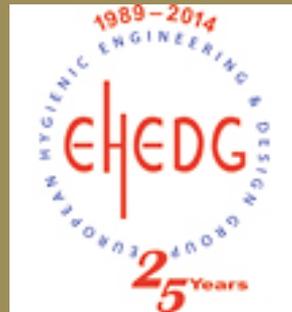
TOP 5 TAKE HOME MESSAGES

1. Cleaning equipment can be a major source and vector of contamination.
2. The hygienic design of cleaning equipment is a requirement of FSSC 22000 and BRCv7
3. Very few cleaning tools are made with hygienic design in mind and there is little guidance on this subject.
4. Cleaning equipment and utensils likely to come into contact with food or food contact surfaces must be appropriately food contact approved
5. Choose equipment that is appropriately hygienic for the job (based on risk assessment)

THE FUTURE..?

Guidance, standards, certification, training on food industry cleaning equipment, food contact utensils?

EHEDG/3A Guidance & Certification?



Further information about hygienically designed cleaning tools

- Vikan White Paper
- Journal of Hygienic Engineering & Design (JHED) 2015
- EHEDG Handbook of Hygiene Control in the Food Industry, 2nd ed, 2016
 - EHEDG Yearbook 2017/18
 - www.vikan.com/ust/int

**THANK YOU FOR YOUR
ATTENTION**



ANY QUESTIONS?

HYGIENE SEMINAR PROGRAMME

Sunday, July 9th

8.00pm John Holah, Technical Director, Holchem, UK - Principles of Hygienic Design

8.20pm Edyta Margas, Food Safety & Hygienic Design Expert, Bühler, CH - Hygienic Design of Food Processing Equipment

8.40pm Deb Smith, Global Hygiene Specialist, Vikan, UK - Hygienic Design of Food Industry Brushware

9.00pm Deb Smith, Global Hygiene Specialist, Vikan, UK - Workshop: Hygienic Design of Brushware

Monday, July 10th

12.15pm Amit Kheradia, Education & Technical Support Manager, Remco, USA - HACCP vs. HARPC

12.30pm Deb Smith, Global Hygiene Specialist, Vikan, UK - Minimizing the Spread of Contamination

5.15pm Stine Lønnerup Bislev, Hygiene Compliance Manager, Vikan, DK - Listeria and Food Safety

5.30pm Duane Grassmann, Market Hygienist, Nestlé USA & Canada - Validation of Cleaning Processes

Tuesday, July 11th

12.15pm Bill Bremmer, Principal/Owner, Kestrel Management, USA - Contamination and Cross-contamination in Food Operations

12.30pm Amit Kheradia, Education & Technical Support Manager, Remco, USA - Food Safety Culture & Color- Coding

5.15pm Deb Smith, Global Hygiene Specialist, Vikan, UK - Metal Detectable Brush Bristles

5.30pm Tom Kirby, Director of National Accounts Accuform, USA - Trends in Safety, 5S Organization

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