



HONG KONG
ASIAWORLD-EXPO
亞洲國際博覽館

3RD TO 6TH
DECEMBER
2025



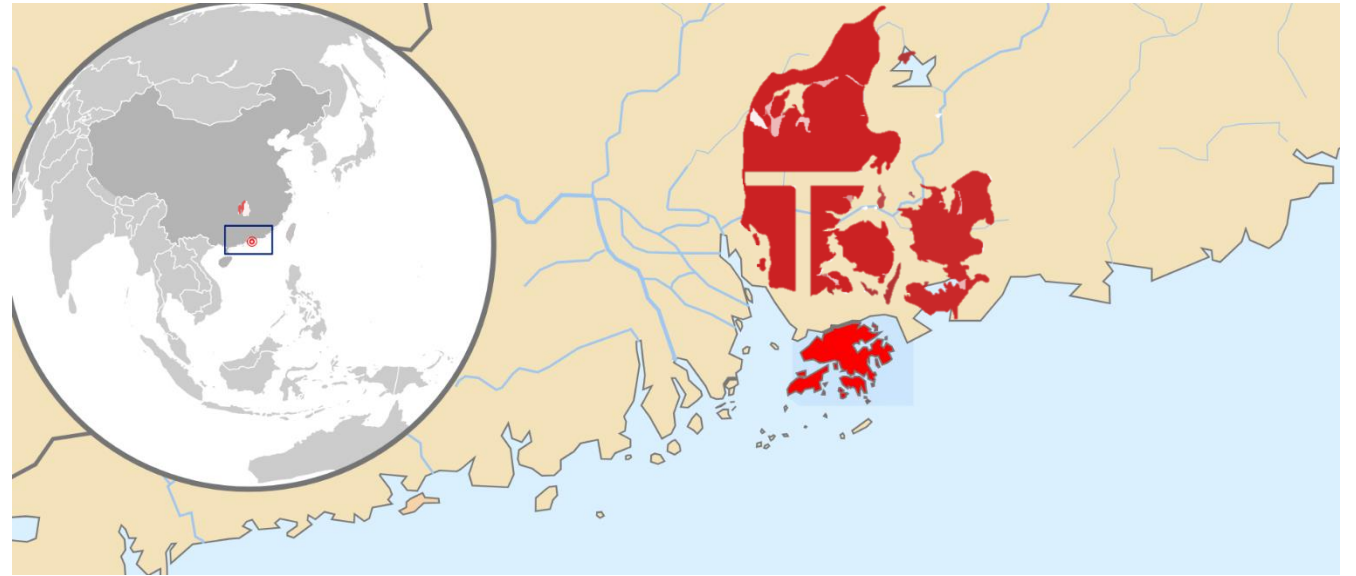
Validation of Washer-Disinfectors in a Danish Hospital Setting

- Cleaning Efficacy and Standardization

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Clinical Nursing Research Unit
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Where I come from



Distance: Denmark → Hong Kong: 8746 km



New CSSD



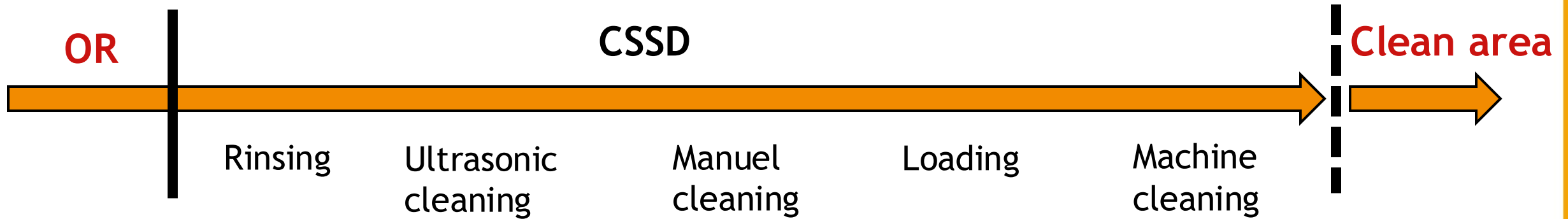
Where to start the validation process



What they do	What they bring
Quality Control Specialist	Hands-on experience
Process Engineer	Process flow overview
Researchers	Knowledge of evidence



What to test before the validation process ?



What to test before the validation process ?

OR

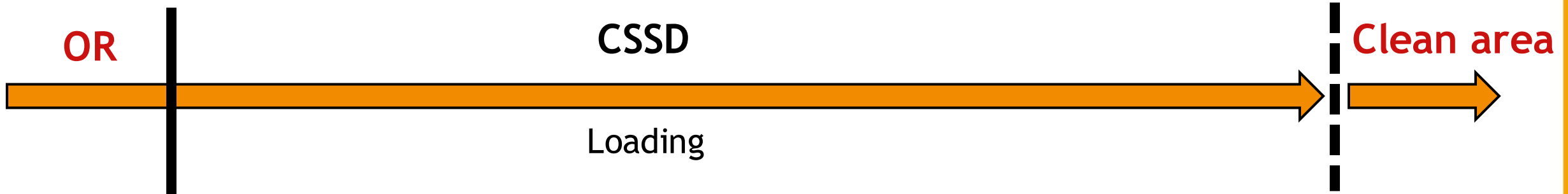
CSSD

Clean area

Rinsing + ultrasonic cleaning



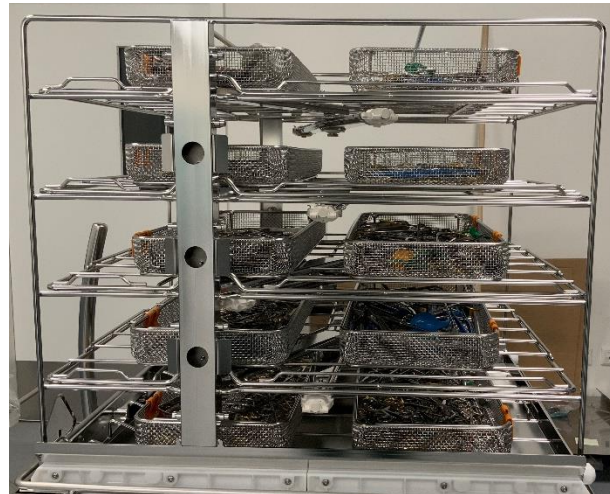
What to test before the validation process ?



Wagner

Aicon

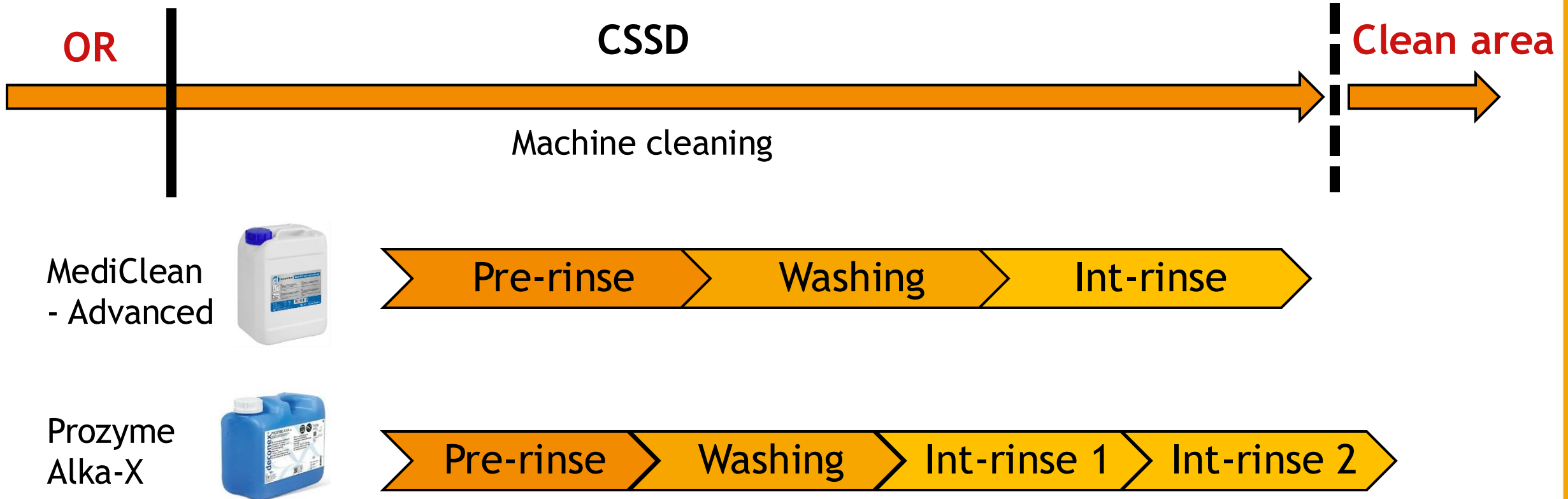
Aesculap
(JG222R)



VS



What to test before the validation process ?



Standardization - Choosing instruments

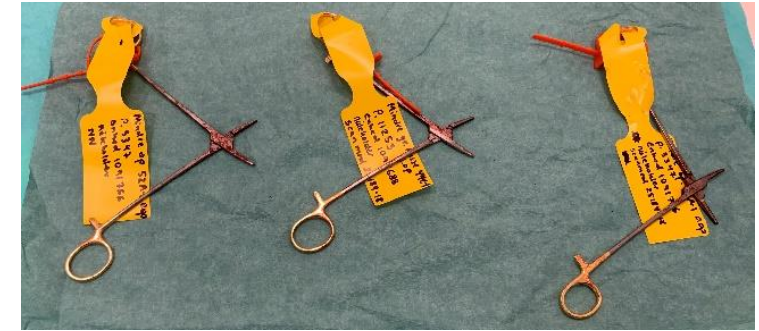
Discarded instruments from basic trays



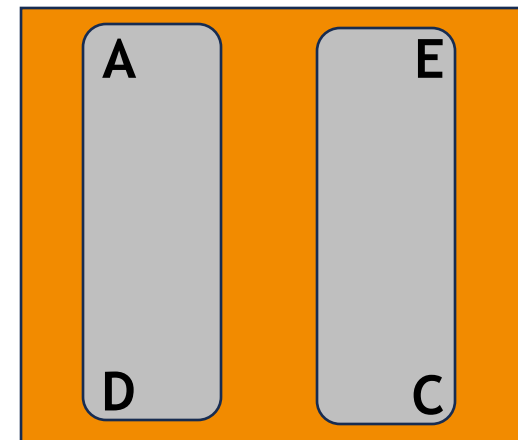
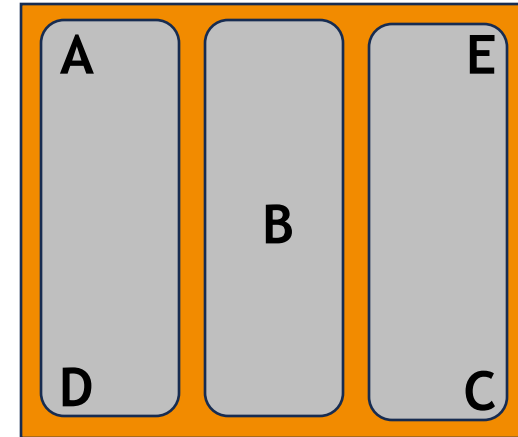
For example:

- Scissors
- Tweezer
- Forceps
- Needleholders

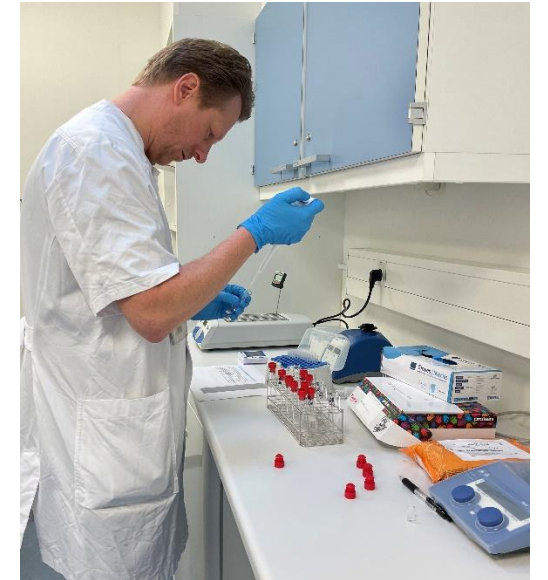
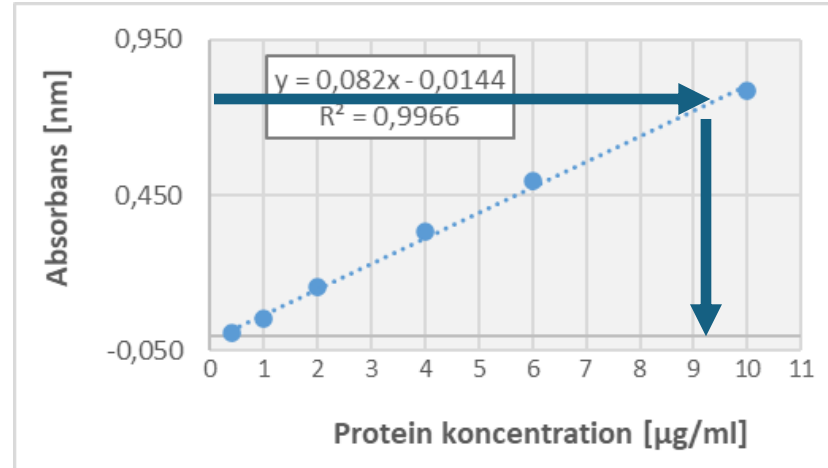
Real-life instruments used at OR



Standardization – Placing the instruments



What to test and how ?

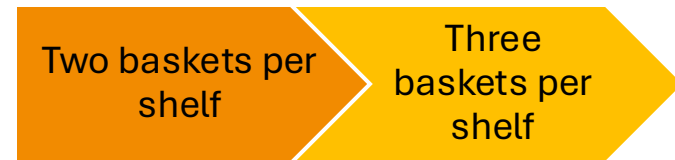


	Acceptable	Alert	Not acceptable
Quality limits [µg/Instrument]	< 100	100 - 200	> 200

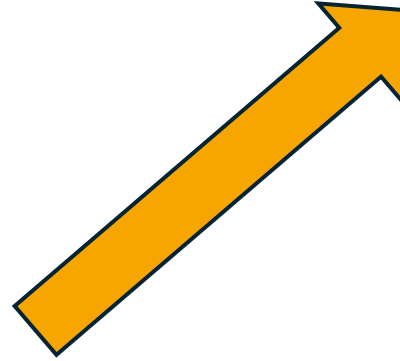


Test sequence

Advanced washing protocol



Alka-X washing protocol



Advanced wash + Sonication



Alka-X wash + Sonication



Setup of validation process

OR

CSSD

Clean area



30 sec



4 min



3 baskets
per shelf



MediClean -
Advanced



Setup of validation process

- Washer-disinfectors (WD): 6
- Washer-disinfectors rack: 4 types
- Validation runs per WD: 12 (3 runs for each rack type)



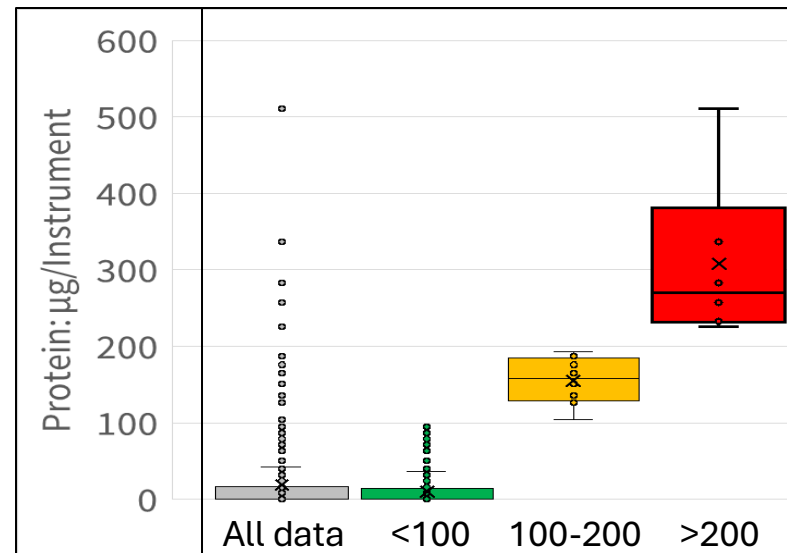
Setup of validation process

- Contamination: Real-life instruments used at OR
- Detergent: MediClean - Advanced
- Protein residue tests: Minimum of three instruments per run



Results from the validation process

	Total	Acceptable < 100	Alert 100 - 200	Not acceptable > 200
Instruments n, (%)	398 (100%)	380 (95%)	12 (3%)	6 (2%)
Protein: Median (Range) [µg/Instrument]	0 (0-511)	0 (0-97)	158 (104-193)	270 (226-511)



Influencing factor

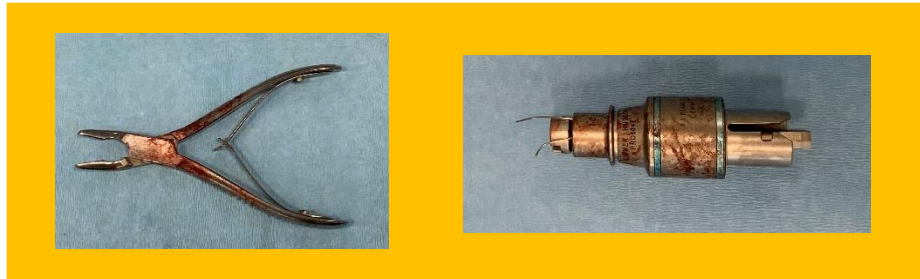
Dato	Klinisk test											Produkt						Test				Bemærkninger	✓	✗	✗
	Vaskemekanisme nr.	Cyklus nr.	SDS fremstillet	Konkordianummer (1-9)	Vaskedato	Test instrument nr.	Test nummer	Placering af testinstrument	Placering af testinstrument	Placering af testinstrument i net	Analyse	T.DOC Produkt	Produkt	Seifnummer	Enhedsnummer	Instrumenttype	Producent	Produkt	Instrumenttype	Testresultat	Testproben (testinstrument)				
31-03-2025	4	151	10-10-2024	1	MIS	1	1	0,6mm nozzle, radial jets, closed									STRYKER		4	511	Kørsel ikke godkendt, da der er et beskidt bøl i Gammakassen. Ved udtag af frosset prøve ses bundfald i glasset			511	
22-04-2025	6	335	1% solution	2	MIS	1	2	radial jets, closed				2894	DHS INSTRUMENTER	123A-1	1221505	T-Håndtag Quick-Kobling 120 mm DHS/DCS	Depuy Synthes	338.080	3	337	Kørsel ikke godkendt, da der sad noget skidt i en pincet. Denne var ikke et af testinstrumenterne.			337	
31-03-2025	5	155	10-10-2024	1	DIN 3 (Høje)	1	2	3-AD	Eget	A	16	3792	GAMMA 3-SYSTEM 1	75B-1	1201846	Bor AO-Kobling Ø 4,2 x 300 mm Grøn Gamma	STRYKER DANMARK	1320-3042	4	283	Synlig forurenet da den lægges i SDS væske. Ved udtag af frosset prøve ses bundfald i glasset			283	
26-03-2025	5	152	10-10-2024	1	DIN 5	1	1	5-AD	Eget	A	38	244	LAPAROSKOPI 2 A-OP	3A-2	1197950	Inderdel Tang Atraumatisk Fenestreret Laparoskopi Ø 5 x 330 mm	Richard Wolf	8393.181	4	257				257	
29-04-2025	4	197	SDS væske	1	MIS	3		Plug-in med silicone guards ø 4,2 mm					TEM 14A-1	14A-1	1220132	Tang Fatte Monopolar Lige Højre Ø 4,6 x 405 mm	Richard Wolf	8840.623	4	233				233	
30-04-2025	6	356	1% solution	3	MIS	1	1	Plug-in med silicone guards ø 4,2 mm				3074	SYNTHESE KABEL FØRERE	41A-1	1225378	Kabelfører Krum Stor 300 mm	Synthes	391.107	3	226				226	
26-03-2025	4	150	10-10-2024	1	DIN 3 (Høje)	3	2	2-B	Test	B	43	2183	FØDEKASSE	6E-1	1182531	Nåleholder Lige MAYO-HEGAR TC 200 mm	Medicon	10.18.70	4	193				193	
19-06-2025	2	114	SDS væske	1	MIS	1	1	0,2mm nozzle, radial jets, closed				2456	HALL 50 O-OP	27H-1	1274500	Wire Driver Kanyleret Ø 0,7-1,6 x 80 x 145 mm Hall PowerPro	NN	PRO6228	6	190	Omkørsel da kørsel for denne gang i reg. der blev observeret en kortslutning/lysglimt over lågen før			190	

Factors that could influence the cleaning results:

- WD nr.
- Type of washing rack
- Instrument placement in washing basket
- Type of instrument



Results from the validation process



Take home message

- Close collaboration between CSSD and research leads to:
 - Fast analysis of samples
 - Improved interpretation of results
 - Faster and more reliable validation process
- Examine and document only one parameter in the cleaning process at a time
- *“Real readiness for validation comes only after having completed one”*
Mette Hald Clausen



Acknowledgement

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- Mads Tanggaard Okholm and Thomas Rendal
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