

Air

Water

Surfaces



Air

- Climate and ventilation ducts
- Evaporator and cooling coil
- Production, working and maturing rooms
- Cold stores and warehouses
- Laboratories and medical practices

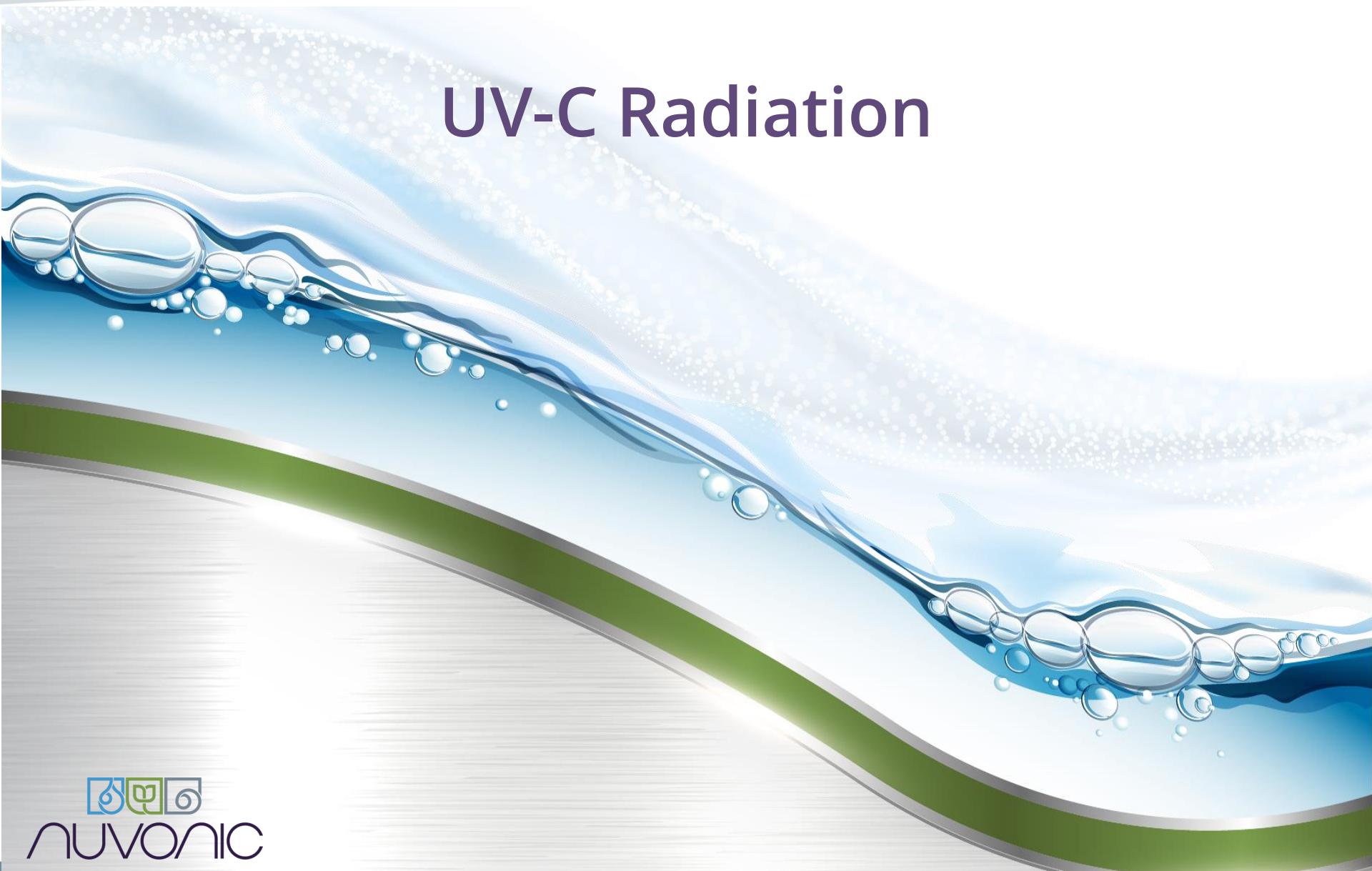
Water

- Water reservoirs, cisterns and ice water tanks
- Recooling units and spray humidifiers
- Drinking water, service water and grey water
- Process Fluids

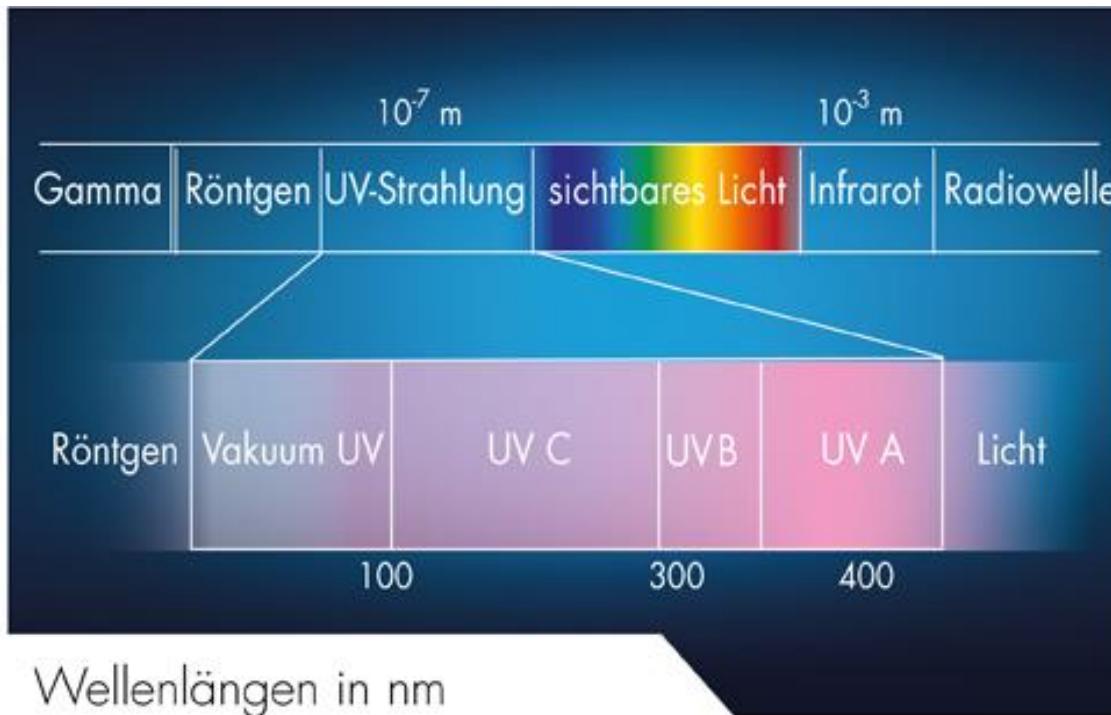
Surfaces

- Foils and cups
- Conveyor belts
- Work surfaces, floors and product locks

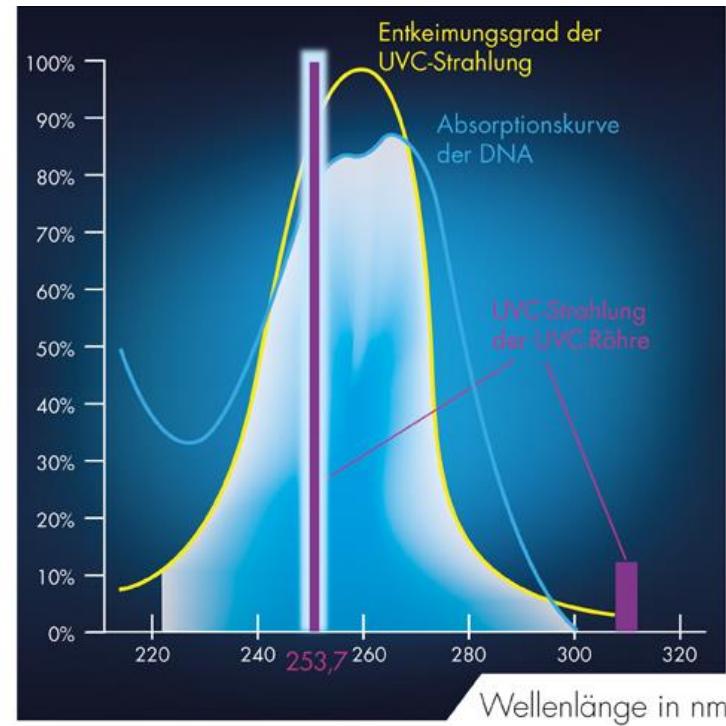
UV-C Radiation



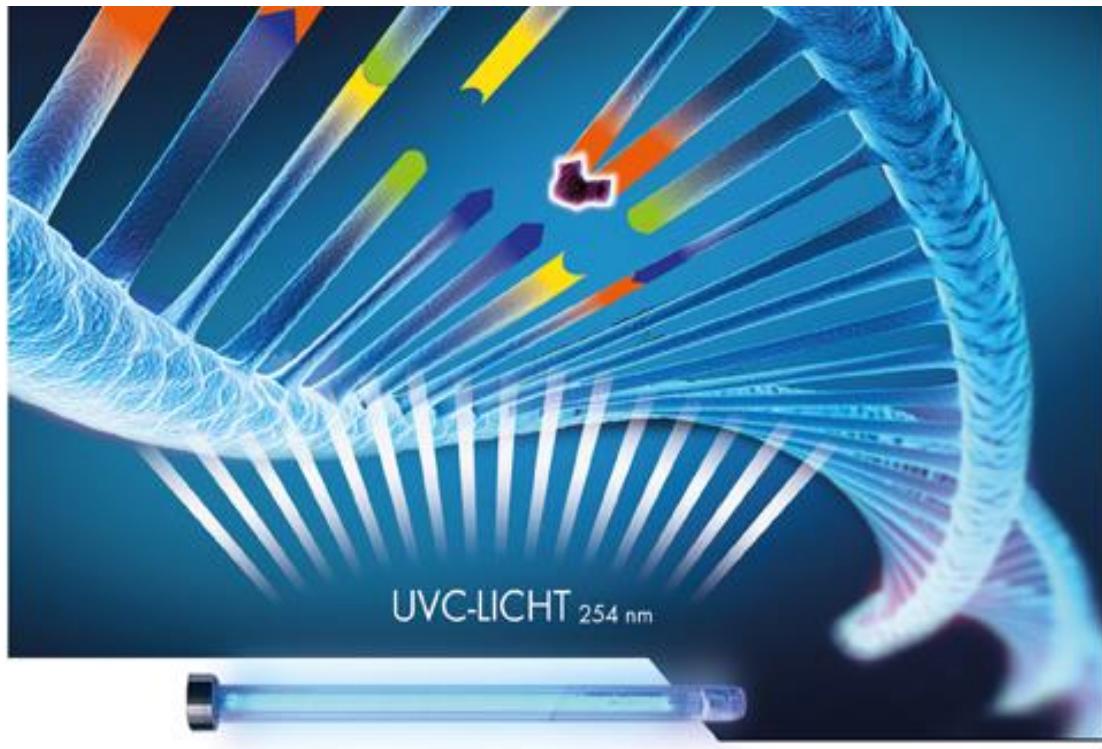
Optical radiation



Influence of the wavelength (nm) on the degree of sterilisation



Inactivation of the DNA



The mechanism:

UVC radiation (253.7 nm)



Thymine-Dimer formation in DNA

Reading processes are blocked
DNA is destroyedProtein biosynthesis prevented
Cell division and reproduction impossible

The Cells die

Since all cells are encoded by DNA (RNA), there is no protection against UVC and thus **no resistance formation**

LD₉₀ dose as a measure of sterilisation

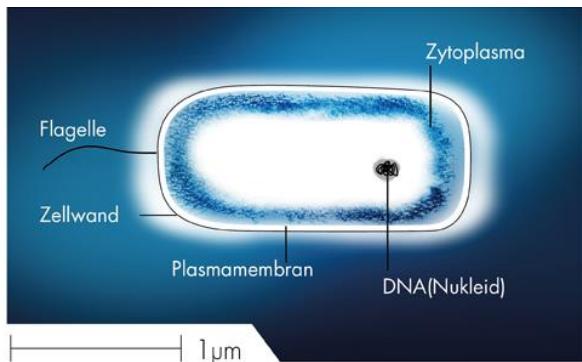
Size, structure and pigmentation influence the UVC effect

- In UVC disinfection, there is a specific lethal dose (LD) for each type of microorganism
- So there is no such thing as resistance!
- The standard is LD₉₀, i.e. the dose at which 90% of a population is killed.

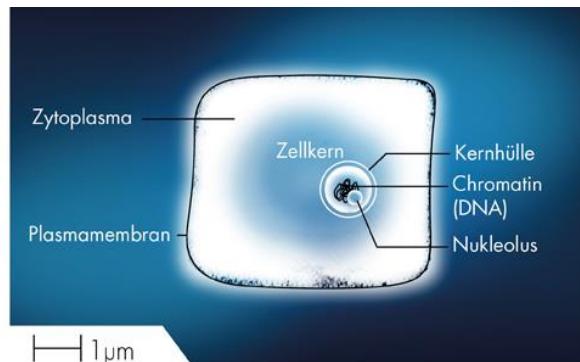


	Typical LD90 doses*	mJ/cm ²
Viruses	PRRS virus Influenza A virus Herpes virus Hepatitis A virus Rota Virus SA11	1,8 2,1 4,3 6,7 7,5
Bacteria	Campylobacter spec. Legionella spec. Escherichia coli Salmonella spec. Pseudomonas spec Streptococcus spec. Staph. aureus Listeria spec. Bacillus subtilis (Sp.)	2,2 2,3 2,5 4,3 4,5 4,5 4,8 5,0 6,8
Yeast	Saccharomyces. ellip. Sacch. cerevisiae Sacch. carlsbergensis Candida albicans	3,5 6,2 7,5 11,0
Mould spores	Penicillium roquefortii Mucor mucedo Penicillium digitatum Aspergillus glaucus Aspergillus niger	13 18 38 44 98

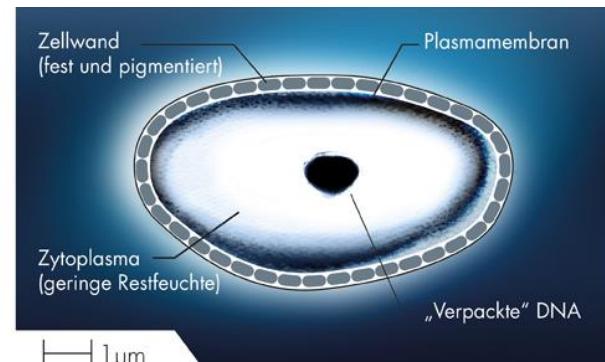
Bacterium (prokaryotic cell)



Yeast, vegetative fungal cell (eukaryotic cell)



Fungal spores as a survival stage



- DNA hardly protected
- small cells
- Simple cell without core

→ **low LD₉₀ doses:**

- DNA as chromosomes
- Large cell with organelles
- Complex cell with nucleus

→ **medium LD₉₀ doses:**

- DNA complexly packaged
- dense cell volume
- Thick cell wall (partly pigments)

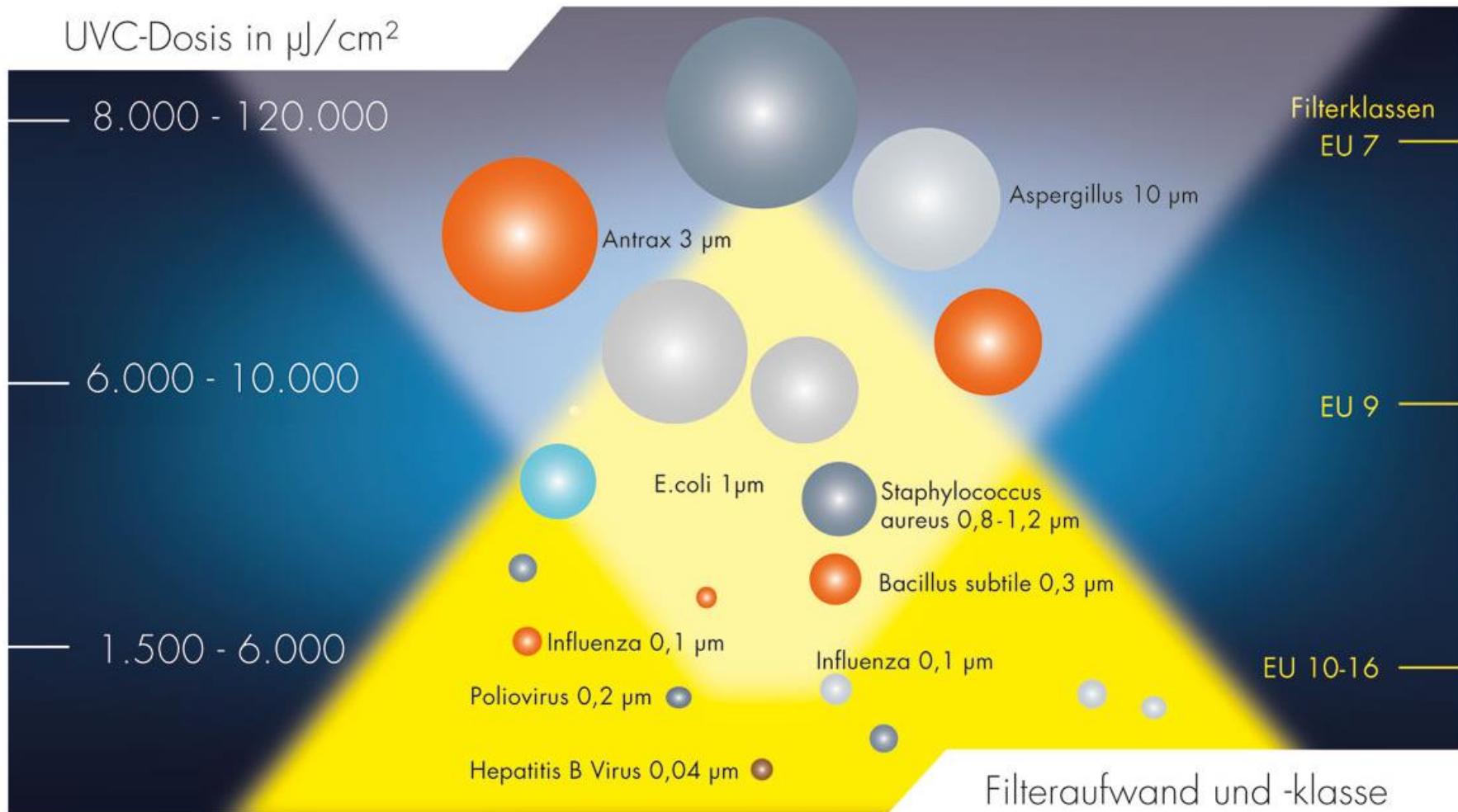
→ **high LD₉₀ doses:**

1 - 6 mJ/cm²

4 - 10 mJ/cm²

8 - 100 mJ/cm²

Typical LD₉₀ doses (90% kill) for different groups of organisms



UV_{pro} Products

KM Channel module

Air disinfection, calculated and effective

- for supply and exhaust air ducts
- Extremely simple assembly, even retrofitted
- Number and type of tubes according to calculation
- Proven technology for long-lasting use

UVpro KM modules are designed for initial or subsequent installation in supply and extract air ducts. Air volume and other influencing parameters determine the number of devices required. Software-based calculation of the disinfection performance.



SPECIFICATIONS

Short name	UVpro KM		
In conformity with requirements	EMC, CE, IP51		
Material	stainless steel: WN 1.4301 and WN 1.4305		
Operating temperature [°C]	0...+40		
Type [duo]	UVpro KMD 40		
Suitable UVpro lamp	UVpro K(T)20-2/-4	UVpro K(T)30-2/-4	UVpro K(T)36-2/-4
Input power [W]	42	62	82
Current flow [mA]	210	290	390
Total UVC output [W _{253,7 nm}]	14	22	32
Lamp intensity at 1 m [µW/cm ²]	65	95	150
Lamp length from screw joint [mm]	371	556	814
Weight [kg]	3,3	3,35	3,43
Screw joint, wrench size [mm]	34		
Lamp replacement interval [h]	12.000 (75 % ±5 % output performance)		
Life expectancy electronics	> 10 years		
Supply voltage [V _{AC}]	220-240 (50-60 Hz)		
Power cable length [m]	10 (length customisable)		

technical changes reserved

FM Flange Module

Maximum flexibility in application and performance

- for air ducts, tanks, basins, in plants etc.
- Suitable for full immersion (IP68)
- Extremely simple assembly, even retrofitted

UVpro FM flange modules are available as mono and duo units. The units are ideal for initial or subsequent installation in air ducts, storage containers as well as for surface treatment in crate washers, etc. It is precisely the variety of possible applications, the high reliability and the simple installation that make it our all-rounder.



SPECIFICATIONS

Short name	UVpro FM		
In conformity with requirements	EMC, CE, IP68		
Material	stainless steel: WN 1.4301 and WN 1.4305		
Operating temperature [°C]	0...+40		
Suitable UVpro tube	UVpro K(T)20-4	UVpro K(T)30-4	UVpro K(T)40-4
Type [mono / duo]	UVpro FMM 40 / UVpro FMD 40		
Input power [W]	21 / 42	31 / 62	41 / 82
Current flow [mA]	110 / 210	145 / 290	195 / 390
Total UVC output [W _{253,7} nm]	7 / 14	11 / 22	16 / 32
Tube intensity at 1 m [μW/cm ²]	65	95	150
Tube length from screw joint [mm]	371	556	814
Weight [kg]	2,65 / 3,2	2,7 / 3,25	2,75 / 3,3
Screw joint, wrench size [mm]	34		
Tube replacement interval [h]	12.000 (75 % \pm 5% output performance)		
Life expectancy electronics	> 10 years		
Supply voltage [V _{AC}]	220...240 (50...60 Hz)		
Cable length, grid / tube [m]	10 (customisable) / 1		

Technical changes reserved



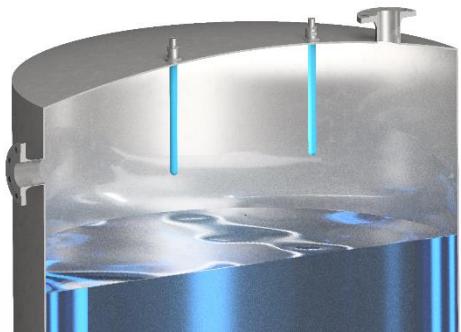
FMDT

Disinfection in storage tanks

- disinfection of air and surfaces in the tank
- for storage tanks of liquids
- very simple installation, also retrofitting
- incl. monitoring unit, for function monitoring with potential-free contact in case of malfunction and tube failure for alarm messages
- the lamps are PTFE coated and comply with the HACCP and IFS requirements for splinter protection

FMDT

UV_{pro} FMDT UVC disinfectors are specially designed for disinfecting air and surfaces in storage tanks. The lamps are flange-mounted on the tank and protrude into the tank, the sucked-in air contaminated with germs as well as the inner tank walls are disinfected. The UV_{pro} FMDT is also suitable as a complement to the disinfection of liquids by means of a continuous flow reactor



SPECIFICATIONS

Short name	UV_{pro} FMDT
In conformity with requirements	EMC, CE, IP68
Material	Stainless-steel: WN 1.4301 und WN 1.4305
Operating temperature [°C]	0...+40
Suitable UV _{pro} lamp	UV_{pro} KT30-4
Type [duo]	UV_{pro} FMD 40
Input power [W]	62
Current flow [mA]	290
Total UVC output [W _{253,7} nm]	22
Tube intensity at 1 m [μW/cm ²]	95
Tube length from screw joint [mm]	556
Weight UVC module [kg]	3,25
Weight control unit [kg]	1,8
Screw joint, wrench size [mm]	34
Tube replacement interval [h]	12.000 (75 % \pm 5 % output performance)
Life expectancy electronics	> 10 years
Supply voltage [V _{AC}]	220-240 (50-60 Hz)
Oversupply category	III
Cable length, grid / tube [m]	10 (customisable) / 2

Technical changes reserved



LKV air cooler attachments

Tackle problems where they start

- Constant air quality due to high recirculation rates
- Hygienic surfaces in the condensation area
- Improved drainage properties of the condensate
- Stable cooling capacity without biofilm on the fins
- No secondary infection of the room air through the air coolers
- Can also be mounted inside hygienic air coolers (LKE Unit)

SPECIFICATIONS

Short name	UVpro LKV
In conformity with requirements	EMV, CE, IP68
Operating temperature [°C]	0...+50
Material	Stainless steel: WN 1.4301 and WN 1.4305
Suitable UVpro lamp	UVpro K36-2 / K40-4
Total UVC output [W _{253,7nm}]	36
Lamp intensity at 1m [μW/cm ²]	145
Lamp replacement interval [h]	12.000 (75% \pm 5% output performance)
Life expectancy electronics	> 6 years
Current flow [mA]	400
Supply voltage	230V _{AC} \pm 10%, 50..60Hz
L x B x H, mm	150 x 625 x 1000
Weight [kg]	8,5

Technical changes reserved

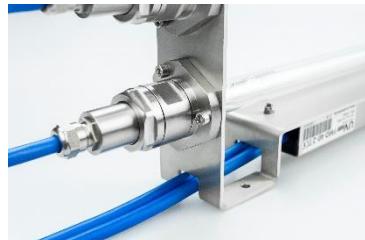


LKE Air cooler installation kit

Air disinfection, calculated and effective

- Installation module for air cooler
- Fully waterproof (IP68)
- Extremely simple assembly, even retrofitted

UVpro LKE air cooler inserts are designed for initial or subsequent installation in air coolers. This form of installation irradiates the air as well as the germ-prone, internal surfaces and thus continuously disinfects them.



Kelvion



SPECIFICATIONS

Short name	UVpro LKE
In conformity with requirements	EMV, CE, IP68
Material	Stainless steel: WN 1.4301 and WN 1.4305
Operating temperature [°C]	0...+40
Type [duo]	UVpro LKE 80
Suitable UVpro tube	2x UVpro K(T)36-2/40-4
Input power [W]	82
Current flow [mA]	400
Total UVC output [W _{253,7 nm}]	36
Tube intensity at 1 m [μW/cm ²]	145
Tube length from screw joint [mm]	814
Weight [kg]	5,53
Measurements (L x B x H) [mm]	902 x 60 x 173*
Screw joint, wrench size [mm]	34
Tube replacement interval [h]	12.000 (75 % ± 5 % output performance)
Life expectancy electronics	> 10 years
Supply voltage [V _{AC}]	220...240 (50...60 Hz)
Power cable length [m]	10 (customisable)

*Height can be customised to requirements.

Technical changes reserved



V-Series - Ventilating Air Units

A system without compromise

- Extremely simple assembly, even retrofitted
- for production, maturation and storage rooms
- Very good price-performance ratio

UV_{pro} V-series recirculating air sterilisers are ideal for reliable air sterilisation in industrial food production. The four types are made of stainless steel and are available with a non-corrosive reflector.



SPECIFICATIONS

Short name	UV _{pro} V50 / V300 / V500 / V1000						
In conformity with requirements	EMC, CE, IP54						
Material	Aluminum, stainless steel: WN 1.4301 and WN 1.4305						
Operating temperature [°C]	-10 to +40						
Type	UV _{pro} V50	UV _{pro} V300	UV _{pro} V500	UV _{pro} V1000			
Input power [W]	35	92	174	296			
Current flow [mA]	220	395	790	1200			
Size (L x Ø) [mm]	670 x 120 (160)	1092 x 234	1091 x 314	1150 x 314			
Suitable UV _{pro} tube	UVpro K(T)20-2/-4	UVpro K(T)36-2/-4	UVpro K(T)36-2/-4	UVpro KT36-2/-4			
Number of tubes	1	2	4	6			
Total UVC output [W _{253,7 nm}]	8	28	56	84			
Air volume [m ³ /h]	50	250	250/450 switchable	250-800 adjustable			
Weight [kg]	3	14,5	24,5	27			
Mount	Wall and ceiling mounting	2 eyelets for chain attachment					
Tube replacement interval [h]	12.000 (75 % ±5 % output performance)						
Life expectancy electronics	> 10 years						
Supply voltage [VAC]	220...240 (50...60 Hz)						
Noise emission [dB]	51	34	34 / 41	30 to 51			
Power cable length [m]	5 (customisable)						

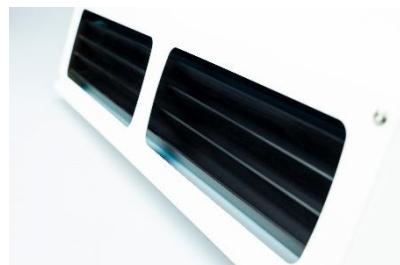


V-lab - Recirculating air purifier

A system without compromise

- for laboratories, treatment rooms, clinics, tasting rooms
- easy wall mounting, ready for operation
- programmable operating times

UVpro V-Lab ventilating air disinfection units ensure a reliable disinfection of air in sensitive areas of any kind up to 100 m³/h. Very low noise levels, easy wall mounting, ready for operation as well as a simple and intuitive user interface make the device attractive for a variety of applications.



SPECIFICATIONS

Type	UVpro V-Lab
In conformity with requirements	EMV, CE, IP51
Material	stainless steel: WN 1.4301 and WN 1.4305
Operating temperature [°C]	0...+40
Input power [W]	80
Current flow [mA]	400
Suitable UVpro lamp	UVpro N30-2 (2x 31 W) / UVpro N30-4P (2x 31W)
Total UVC output [W253,7 nm]	22
Air volume [m ³ /h]	0 – 100 (adjustable)
Noise emission [dB]	1 – 31 (dependent on fan power)
Mount	wall mounting
Size (L x H x D) [mm]	846 x 402 x 136
Weight [kg]	13.35 kg
Lamp replacement interval [h]	12.000 (75 % \pm 5 % output performance)
Life expectancy electronics	> 10 years
Supply voltage [V _{AC}]	220-240 (50-60 Hz)
Power cable length [m]	5 with earthed plug

Technical changes reserved





Surfaces

- Cutting belt sterilisation at Tönnies, Tillmanns, Westfleisch, Vion, Wiesenhof with a total of over 500 units supplied.

BD 2016 HD Belt Sterilisation Unit

Robust, waterproof - Hygienic Design

- for conveyor and cutting belts
- Easy to install, even in existing systems
- Avoidance of cross-contamination
- Extremely robust and waterproof design
- IP69K TÜV-tested
- Easy to clean due to hygienic design

The **UVpro** BD 2016 HD is ideal for reliable disinfection of conveyor belts in the food industry. The devices have a validated high disinfection performance, are very robust and can remain on the belt during cleaning. IFS and HACCP compliant.

SPECIFICATIONS

Short name	UVpro BD 2016 HD			
In conformity with requirements	EMC, CE IP69K, IFS and HACCP conform			
Material	stainless steel: WN 1.4301 and WN1.4305, blue sustarin CFG			
Operating temperature [°C]	0...+25			
Type	BD 2016-40 HD	BD 2016-60 HD	BD 2016-80 HD	BD 2016-100 HD
Input power [W]	60	80	120	180
Current flow [mA]	280	380	550	800
Suitable UVpro lamp	UVpro KTS20-4	UVpro KTS30-4	UVpro KTS40-4	UVpro KTS50-4
Total UVC output [W253,7 nm]	27	33	48	60
Maximum conveyor width [mm]	400	600	800	1000
Size (L x B x H) [mm]	513 x 200 x 54	698 x 200 x 54	955 x 200 x 54	1155 x 200 x 54
Weight [kg]	8.6	11.1	14.7	17.2
Mount	with optional mounting kit			
Lam replacement interval [h]	12.000 (75% ^{±5} % output performance)			
Life expectancy electronics	>10 years			
Supply voltage [VAC]	220...240 (50...60Hz)			
Power cable length [m]	3.5 (customisable)			

technical changes reserved



BDM - Belt Sterilisation Unit

Robust, waterproof - Hygienic Design

- for transport and short dismantling belts
- Easy to install, even in existing systems
- Extremely robust & waterproof design (IP69K)
- Avoidance of cross-contamination
- optionally with switch-off in cleaning position
- Easy to clean due to hygienic design

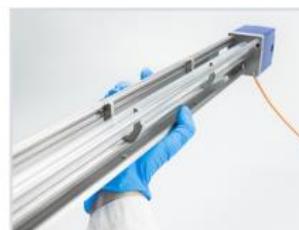
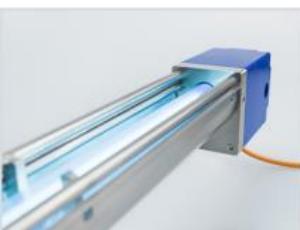
UVpro BDM 2016 HD belt disinfection units are ideal for reliably disinfecting smaller conveyor belts in the food industry. The units have a validated high disinfection performance, are very robust and can remain on the belt during cleaning. IFS and HACCP compliant.



SPECIFICATIONS

Short name	UVpro BDM 2018 HD				
In conformity with requirements	EMC, CE IP69K, IFS and HACCP conform				
Material	stainless steel: WN 1.4301 and WN1.4305, blue sustarin CFG				
Operating temperature [°C]	0...+25				
Type	BDM 2018-25	BDM 2018-40	BDM 2018-60	BDM 2018-80	BDM 2018-100
Input power [W]	14	20	30	40	60
Current flow [mA]	70	90	120	180	280
Suitable UVpro Lamp	KTS15-4bl	KTS20-4bl	KTS30-4bl	KTS40-4bl	KTS50-4bl
Total UVC output [W _{253,7 nm}]	4,5	7	10	13	20
Maximum conveyor width [mm]	250	400	600	800	1000
Size (L x B x H) [mm]	387 x 60 x 70	521 x 60 x 70	706 x 60 x 70	963 x 60 x 70	1163 x 60 x 70
Weight [kg]	2,2 + 0,65	2,7 + 0,65	3,6 + 0,65	4,5 + 0,65	5,4 + 0,65
Mount	with bracket mounting kit				
Lamp replacement interval [h]	12.000 (75% $\pm 5\%$ output performance)				
Life expectancy electronics	>10 years				
Supply voltage [V _{AC}]	220...240 (50...60Hz)				
Power cable length [m]	3,5 (customisable)				

technical changes reserved



BFM - Aperture flange module

Surface disinfection, effective and safe

- for packaging machines and filling lines
- High directional power
- Mounting via two retaining points on the fascia
- HACCP and IFS compliant, protection class IP68

The **UVpro** lamps of the BFM series are ideal for the reliable sterilisation of foils as well as cup and bottle openings. Due to the reflector, the directed radiation reaches the depth of containers and, with appropriate alignment, also the walls.

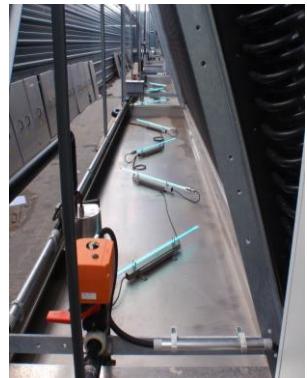


SPECIFICATIONS

Short name	UVpro BFM		
In conformity with requirements	EMC, CE, IP68		
Material	stainless steel: WN 1.4301 and WN1.4305		
Operating temperature [°C]	-10...+25		
Suitable UVpro lamp	UVpro K(T)20-2/-4 UVpro K(T)30-2/-4 UVpro K(T)36-2/-4		
Type [mono / duo]	UVpro BFMM 40 / UVpro BFMD 40		
Input power [W]	21 / 42	31 / 62	41 / 82
Current flow [mA]	110 / 210	145 / 290	195 / 390
Total UVC output [W ^{253,7 nm}]	7 / 14	11 / 22	16 / 32
Lamp intensity without refl. at 1 m [μW/cm ²]	65	95	150
Size, shield (L x W x H) [mm]	438 x 78 x 46	624 x 78 x 46	880 x 78 x 46
Weight [kg]	~ 3,4 / 4,6	~ 3,8 / 5,35	~ 4,35 / 6,3
Radiation angle [°]	~180		
Lamp replacement interval [h]	12.000 (75 % ±5 % output performance)		
Life expectancy electronics	> 10 years		
Supply voltage [V _{AC}]	220...240 (50...60 Hz)		
Cable length, grid / lamp [m]	10 (length customisable) / 1		

technical changes reserved



**JAEGLI****BENTLEY**

Water disinfection

Immersion Units for different applications

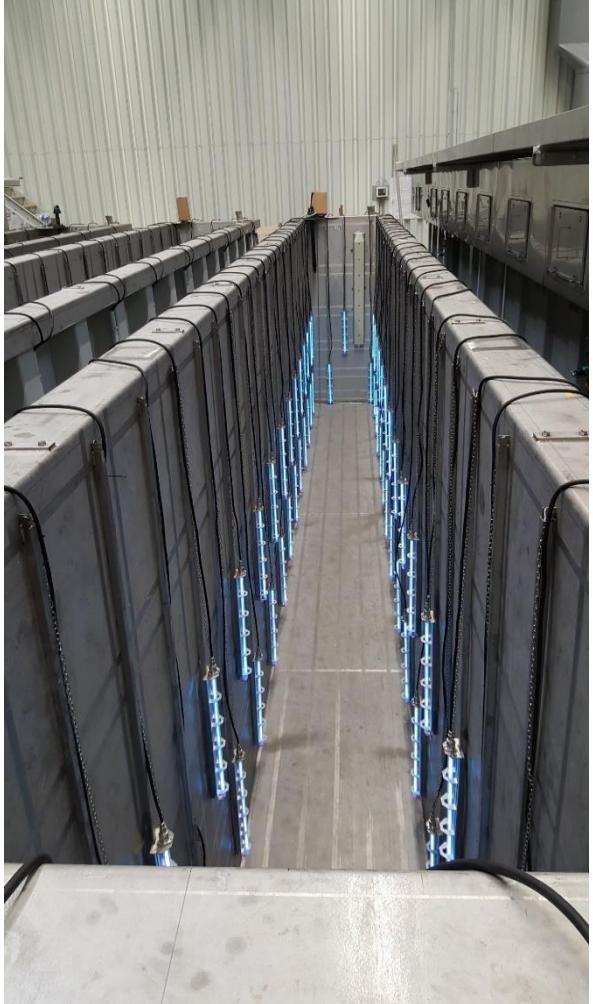
- Cooling towers, air washers, water tanks
- Cooling baths, brines (sausage/cheese production)
- Fish farming and ornamental ponds
- Greywater cisterns

Projects:

- OEM supplier of the company Jaeggi Hybridkühler, Switzerland
- Equipment of air washers in the automotive industry at BMW, VW, Ford, Bentley, Audi, Mini and others
- Equipment of the water basins in the painting facility of the Airbus A380 and A320



AIRBUS



TS - Immersion Radiator Unit

Water disinfection perfected

- for water tanks, humidifiers, cooling towers, etc.
- Suitable for full immersion (IP68)
- Extremely simple assembly, even retrofitted

UVpro TS 40 immersion lamps are ideal for reliable disinfection of water tanks in air humidifiers, air washers and cooling towers, among others. Positioning directly in the reservoir not only effectively disinfects the service water, but also prevents the formation of biofilms in the tank and on exposed surfaces.

SPECIFICATIONS

Type	UVpro TS 40		
In conformity with requirements	EMC, CE, IP68		
Material	stainless steel: WN 1.4301 and WN 1.4305		
Operating temperature [°C]	+2...+40		
Suitable UVpro lamp	UVpro K20-4	UVpro K30-4	UVpro K40-4
Input power [W]	21	31	41
Current flow [mA]	110	145	195
Total UVC output [W _{253.7 nm}]	7	11	16
Lamp intensity at 1 m [μW/cm ²]	65	95	150
Lamp length from screw joint [mm]	371	556	814
Weight [kg]	3.0	3.05	3.13
Screw joint, wrench size [mm]	34		
Lamp replacement interval [h]	12.000 (75% ^{±5} % output performance)		
Life expectancy electronics	>10 years		
Supply voltage [V _{AC}]	220-240 (50-60Hz)		
Cable length [m]	10 (length customisable)		

Technical changes reserved



UVC Line Module DM2081

Modular monitoring unit

- Monitoring in UVC disinfection installations
- Operating hours counter for each of eight channels
- RS 485 bus, potential-free contact
- Optional connection of UVC power sensors

With the **UVpro** UVC-Line module you have a very flexible way of monitoring your UVC installations that can be combined and used. In addition to the current consumption of each individual channel, operating hours and ignition processes are registered. Optionally, a UVC power sensor can be integrated into the system via the bus system. The system is delivered ready-mounted in the control box at the customer's request.

TECHNISCHE DATEN

Type	UVpro UVC-Line DM20811
In conformity with requirements	EMC, CE, IP20
Operating temperature [°C]	0...+55
Supply voltage [Vdc]	24 \pm 5 %
Supply current flow [mA]	~40
Bus system	RS 485 with internal 24 VDC power supply
Current monitoring paths	8, potential-free through inductive current transformer
Max. load capacity of a current path [A]	2
Measuring range [mAac]	0...1200 (50 Hz)
Optional UVC sensor connection	yes
Potential-free signal contact	yes
Operating hours counter	yes, individual for each current path
Upgradeable	yes, on request pre-assembled in a control box
Size (W x H x D) [mm]	45 x 114 x 99
Weight [g]	283
System configuration	DIN rail housing with internal bus system and display/keyboard

Technical changes reserved



UVC Safe

UV risk assessment at the workplace

- Safe and simple assessment of the risk posed by UVC low-pressure lamps
- Can be connected to all Android devices via mini USB
- Android device and calibration certificate included

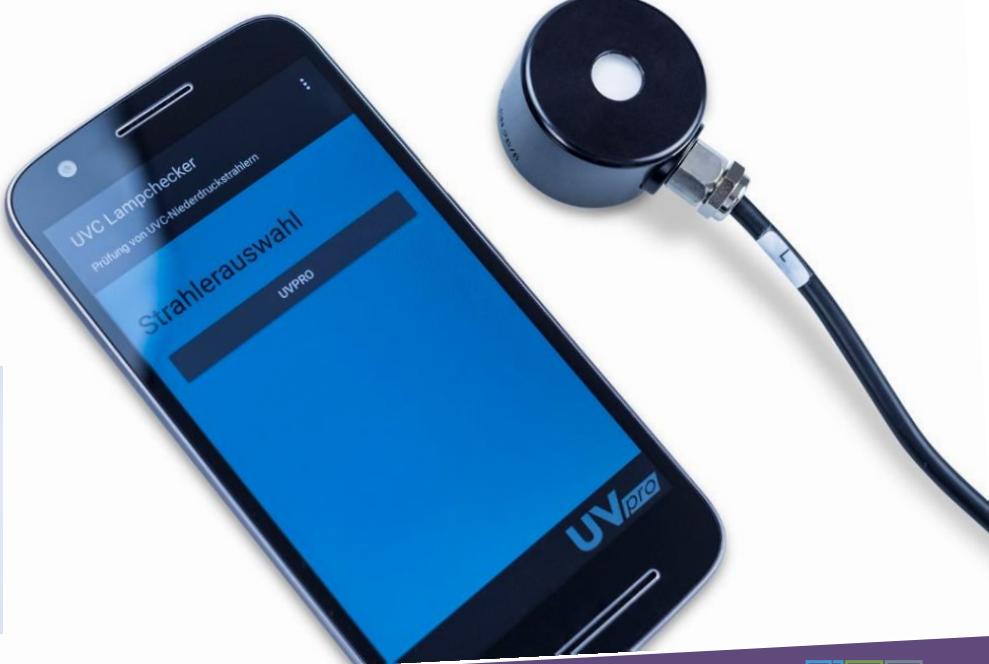
The UVC Safe is a measuring device for determining potential UVC exposure in the workplace. Based on Directive 2006/25/EC, the UVC Safe measures the currently prevailing and biologically weighted area-related UVC irradiance in the range of 254nm and determines the maximum permissible exposure duration of the skin and eye.



UVC Lampchecker

Measuring device for determining the tube power

- Safe and simple determination of the tube power
- Including Android device, sensor holder for **UVpro** tubes and calibration certificate
- The sensor can be connected to all Android devices via mini USB.



Thank You! Questions?