Sword Probes

- DE 4.0
- DE 2.4
- DE 1.75

2003

INVIZ DE 4.0 sword camera. At only 3,9mm, it was the slimmest camera at its time

2004

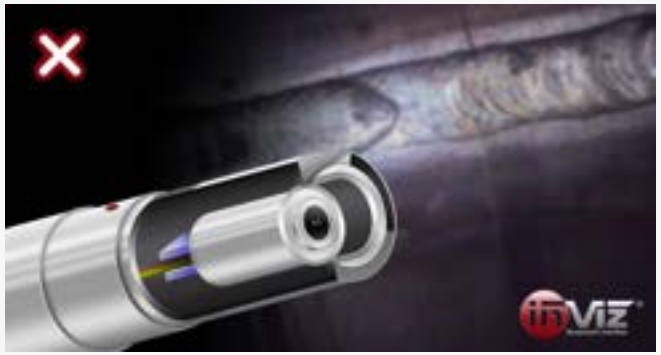
INVIZ DE 2,4 sword camera. At only 2,4mm, again it was the slimmest camera at its time

2002

Multiple projects in nuclear and defense industry boosted the reputation of viZaar

2005

viZaar patented the unbeaten future of endoscope optics: The motorized lens drive for remote focusing



2008

viZaar offers the first real Ultraviolet permitting scope for penetration testing

2012

INVIZ MATRIX Documentation and Remote Visual Inspection Platform

2006

viZaar once again offered world's slimmest inspection camera at 1.75mm

2009

INVIZ VUMAN RA-Y sets new standards with increased light performance, using a powerful fiber LED hybrid and optimized documentation features.

30 % of all viZaar activities are nuclear related:

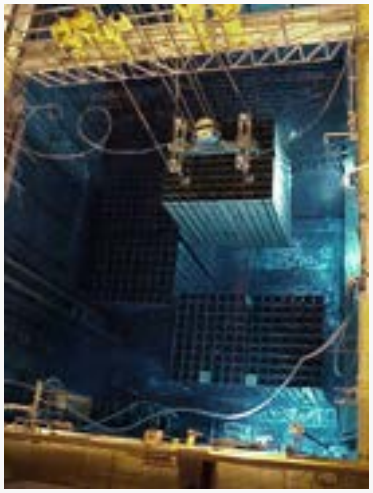
:: 65% of all nuclear activities are related to PWR's ,

:: 20 % related to BWR's,

:: 15 % different nuclear technologies

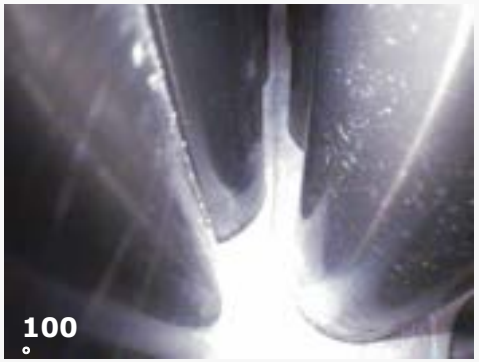
Typical nuclear applications

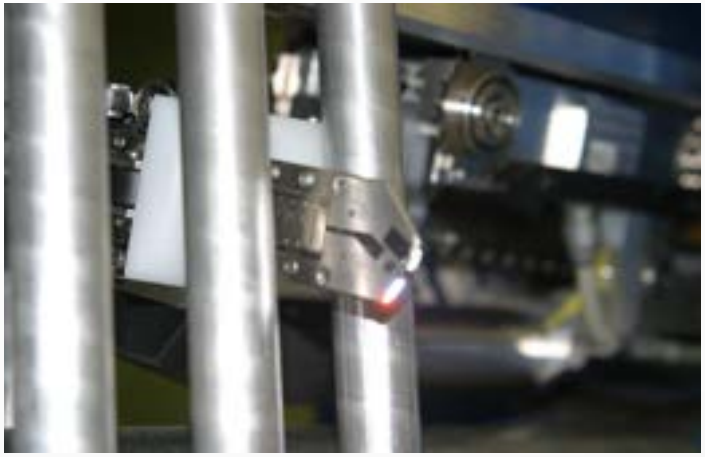
- Delivery of INVIZ inspection cameras
- Repair of inspection cameras
- NTD inspection service for plenty PWR and BWR components
- Foreign object search and retrieval (FOSAR)
- Custom engineering for power plants owners and service companies
- Equipment rental for non–containment applications



Standard inspection innovation: Steam generator in-Bundle inspection with DE camera heads with FOSAR capabilities

- :: DE camera systems are the most bright and precise sword– design cameras in the world
- :: DE 4.0: adjustable focus and adjustable DOV
- :: DE 2.4: 100° wide angle with LED illumination, focus range 9mm to 120 mm
- :: 2mm retrieval tool channel
- :: Different head designs: Front view, down -view, -35 ° DOV etc



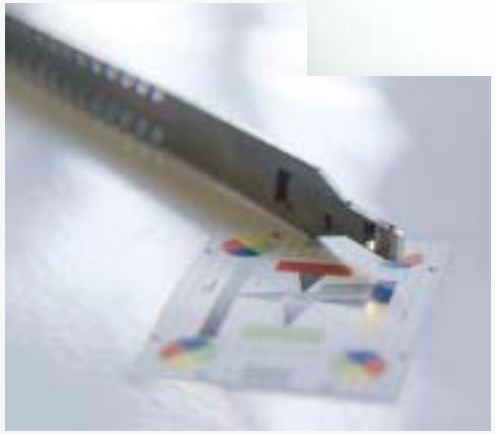


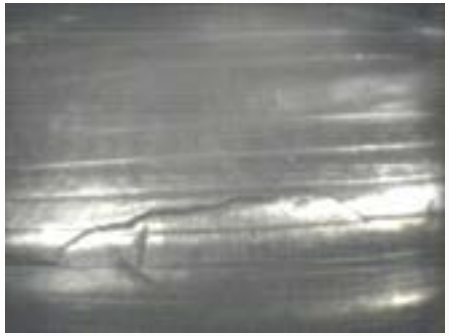
Courtesy Westinghouse Germany

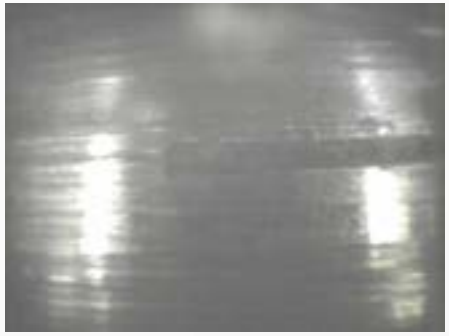
(Video)

Standard inspection innovation:
reactor head control rod outlet / metal cladding.
In addition to remote control eddy current probe manipulator

Courtesy IntelligeNDT







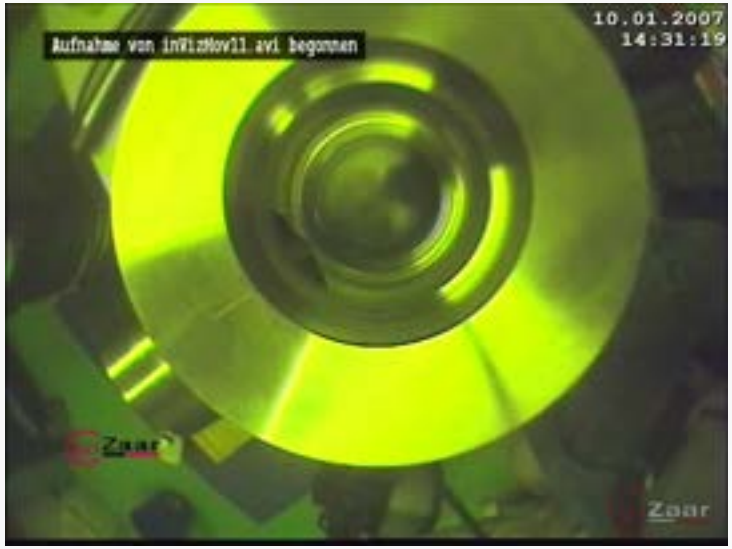
(Video)

New territories:

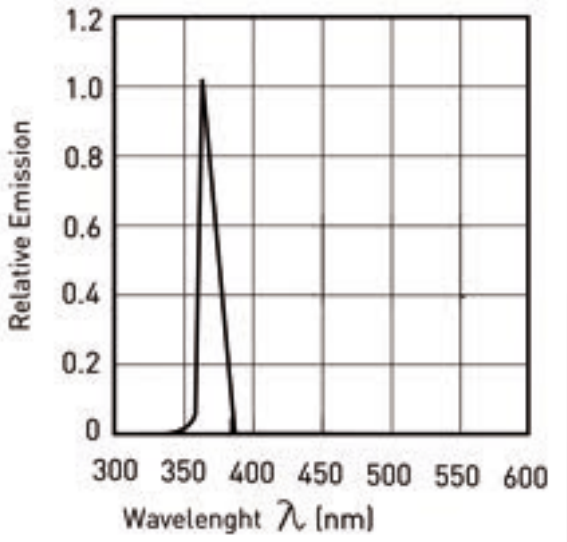
First Qualified UV – Videoscope PT inspection in Mai 2010, will exceed minimum requirements of reference standard

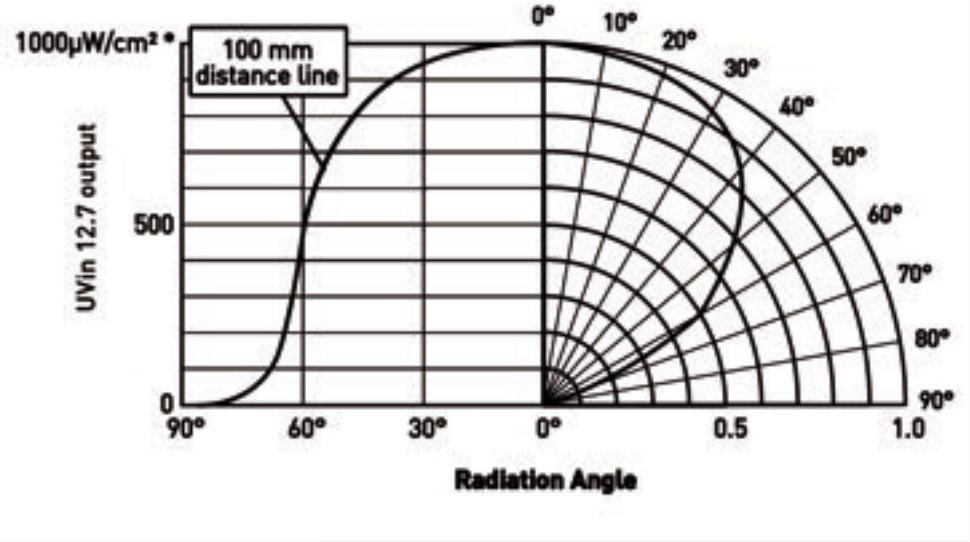
Type1 according EN 9934-2

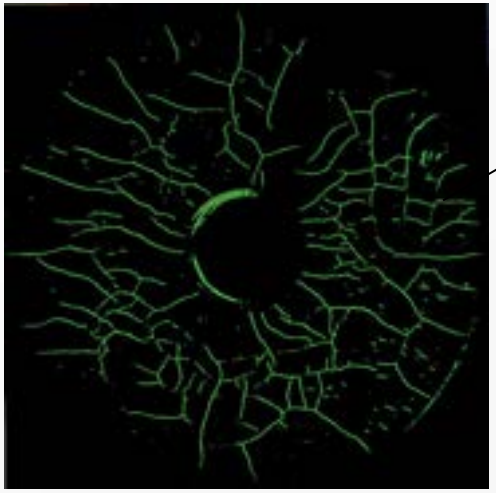
Qualification test build-up:

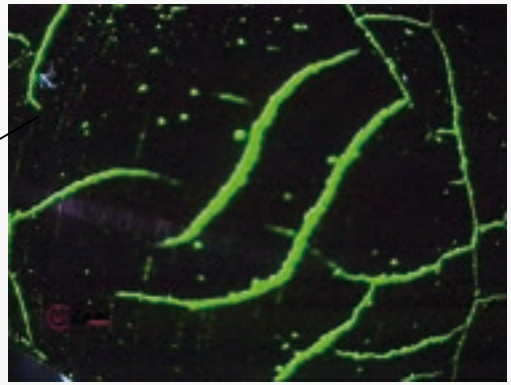


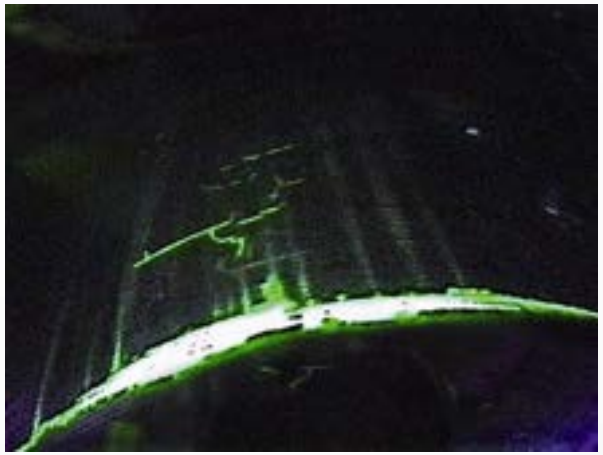
(Video)

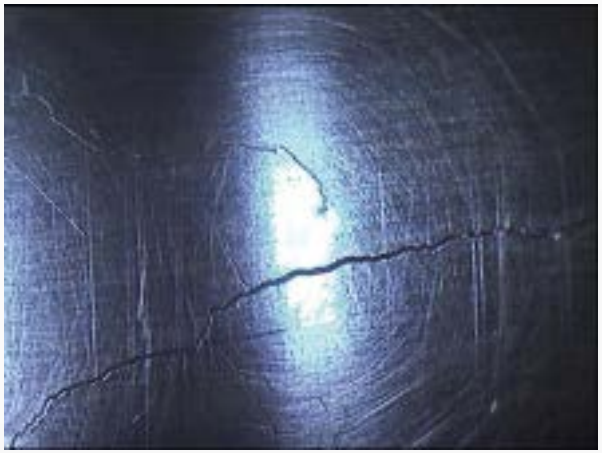

Relative Emission
1.2
1.0
0.8
0.6
0.4
0.2
0
300 350 400 450 500 550 600
Wavelenght λ [nm]


1000µW/cm² *
100 mm distance line
UVin 12.7 output
500
0
0°
10°
20°
30°
40°
50°
60°
70°
80°
90°
90°
60°
30°
0°
0.5
1.0
Radiation Angle









(Video)

Thank you for your attention

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FOR MORE
INFORMATION

INVIZ® DE 2.4 / DE 4.0

The world's slimmest, most versatile heat exchanger / steam generator video inspection system

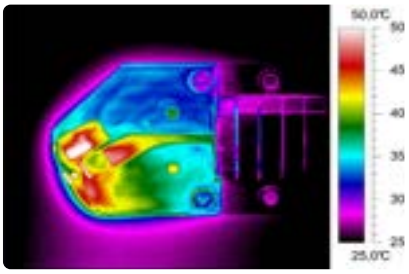
Employing only the latest LED illumination technology, breaking glass fibres are obsolete history for INVIZ® customers. 25 lumen + light turbo mode is enabling to illuminate even 4" / 100mm ID round pipes. Two optimized (light sensivite) optics (100° FOV and 60° FOV) will make your probe to the best possible inspection tool for your facillity. Benefit from colorful and high contrast, forget about annoying noise in the image.
At only 2.4 mm thick, the INVIZ® DE 2.4 inspection camera can maneuver through the narrow tube lanes created by the space saving arrangement of the tubes in nuclear steam generators (incl. Siemens KWU style) and conventional heat exchangers. The world's slimmest INVIZ® DE 2.4 camera allows to make a wide range of special narrow (gap) inspections, in spaces which have never been reached by high resolution optics before. Our engineering team has made a great effort to offer camera solutions which may be operated with delivery tools or operated by hand. Alternativly the even higher resoluted INVIZ® DE 4.0 style can be adjusted in image sharpness and direction of view (+/-30°), while allowing custom made probes of up to 15 Meter – not forgetting the working channel preparation for foreign part retrieval tools.

PW03-018_1-3

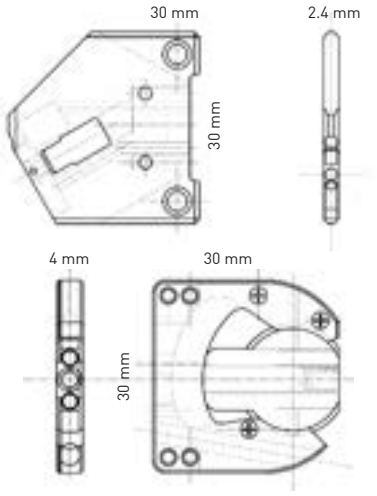
viZaar industrial imaging AG

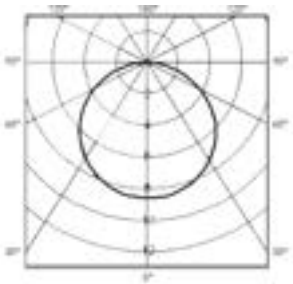
	INVIZ® DE 2.4	INVIZ® DE 4.0
Control unit / Processor		
Power requirements	96 - 256VAC, 50/60Hz	
Dimensions in mm (inch)	Standard: (W) 260 x (L) 205 x (H) 45	
Operation	Light adjustment, White balance setting (color adjustment)	
Output	Composite VBS and S-VHS (Y/C) out, NTSC or PAL (depending on camera)	
Option	Outlet for digital INVIZ LCD image and movie recorder	
Other	19" housing available | CCU can only serve DE 2.4 or DE 4.0	
Camera head		
Video	PAL 360 TV lines, 290.000 Pixel NTSC 330 TV lines, 250.000 Pixel	PAL 470 TV lines, 440.000 Pixel NTSC 460 TV lines, 380.000 Pixel
Optical system	100° FOV standard optic, 3 mm to 200 mm fix focus field of depth Option: 60° 'tele' lens system, fix-mounted, non interchangable.	Focus adjustable 60° FOV, range 3mm to infinity, typical depth of field 8 mm to 100 mm. Direction of view adjustable +/- 30°.
Magnification example	Usage with 14" CRT monitor 100° FOV: 10x / 20 mm distance.	Usage with 14" CRT monitor 60° FOV: 18x / 20 mm distance.
Illumination	Two high power white LED's, individually dimmable, protected electric circuit, illumination distribution: view chart. Option: optical fibres (Fibre + LED) available to boost illumination range.	As INVIZ® DE 2.4, no fibre illumination option available.
Dimensions	Thickness 2.4 mm ($^{-0,03}$ mm), other dimensions see chart, custom designed (down-) sizing is available (custom shape).	Thickness 4.0 mm ($^{+/-0,05}$ mm), other dimensions view chart, custom designed (down-) sizing is available (custom shape).
Water tightness	1 bar / 15 psi	0.5 bar / 7.5 psi
Other	-	2.1 mm hole for attachment of non–included retrieval tools prepared.
Video probe		
Working length	Standard 2 m, extension option available. Max. 6.5 m probe.	
Umbilical cord	2.5 m PU coated, protected cable, extension option available, max. up to 10 m (INVIZ® DE 2.4) or 15 m (INVIZ® DE 4.0) total combination length.	
Probe construction	Open frame 2.4 mm insertion belt, stainless steel, high flexible design for (not included) delivery tool operation. | Option internal glass fibre push rods for manual operation available.	
Operating / storage environment		
Camera operation range	-25°C to 65°C (-13°F to 150°F) LED operation | -25°C to 80°C (-13°F to 175°F) Non-LED operation	
CCU operation range	-20°C to 45° C (-4°F to 115°F)	
Gamma / neutron dose rating	Not specified due to wide, random lifetime deviations; within average of semiconductor specs.	

All specifications are subject to change without notice due to technical progress.



Innovative heat management limiting emission from LED's




Optimized illumination for 60° and 100° FOV

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