Images that change your world.

KaVo DIAGNOcam –
a whole new perspective on caries

New with TWAIN interface.

Facilitates an easy integration
with almost every imaging software

KaVo. Dental Excellence.

A whole new perspective on caries

- **Significantly improved diagnosis quality – in unsurpassed image quality**
- **Ideal for patient information outstanding monitoring**
- **Simple operation – easily integratable**

KaVo DIAGNOcam – completely revealing.

With your KaVo DIAGNOcam you will get images that give you additional insight – immediately, without X-ray radiation, for even greater diagnostic reliability.

KaVo DIAGNOcam uses the structures of the tooth as light conductors. Simultaneously, a digital video camera, captures the context.

Optimum diagnosis – thanks to top quality images.

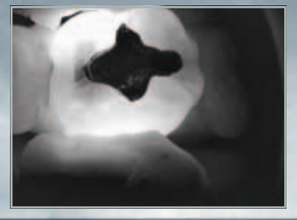
So much becomes visible for the first time.

KaVo DIAGNOcam images give you even more certainty in diagnosis, thanks to their revolutionary image quality. With your KaVo DIAGNOcam you can tooth structures such as carious lesions or cracks that are virtually impossible to view with other diagnostic aids.

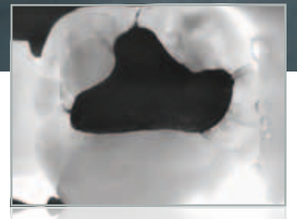
With the KaVo DIAGNOcam it is above all much easier to identify proximal and occlusal caries. Furthermore, secondary caries can also be detected (up to a certain filling size).

Proximal caries

Occlusal caries



Secondary caries



Cracks

X-ray quality without radiation.

How is it possible to create such images without X-rays? The key phrase is DIFOTI technology*. KaVo DIAGNOcam delivers images, which are reminiscent of X-rays but which are completely radiation free – by means of a light that is especially adapted to this examination method.

The tooth structures allow the passage of light from the entry site to the camera. Areas that block light transmission (e.g. carious lesions) show up clearly as well delimited, dark areas. A digital videocamera captures the actual situation and makes it visible in real-time on the screen.

Comprehensive caries detection on all tooth surfaces

Diagnostic competence	DIFOTI technology* (DIAGNOcam)
Occlusal caries	✓
Proximal caries	✓
Smooth-surface caries	✓
Secondary caries	✓
Cracks	✓
Dental cleaning essential	no

* Digital Imaging Fiberoptic Transillumination

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Patient information – made easy.

The subtle difference.

Diagnoses by X-ray and KaVo DIAGNOcam are two of a kind – they complement each other perfectly. With your KaVo DIAGNOcam you can conveniently verify and supplement your X-ray diagnosis. KaVo DIAGNOcam shows you the coronal tooth structures above the gingiva in detail. This enables early detection of caries, as well as prophylactic, or minimally-invasive and pain-free treatment. Your patients will be delighted!

You can demonstrate to your patients how just pleasant X-ray-free diagnosis with KaVo DIAGNOcam is. This particularly convinces pregnant women and parents of young children.

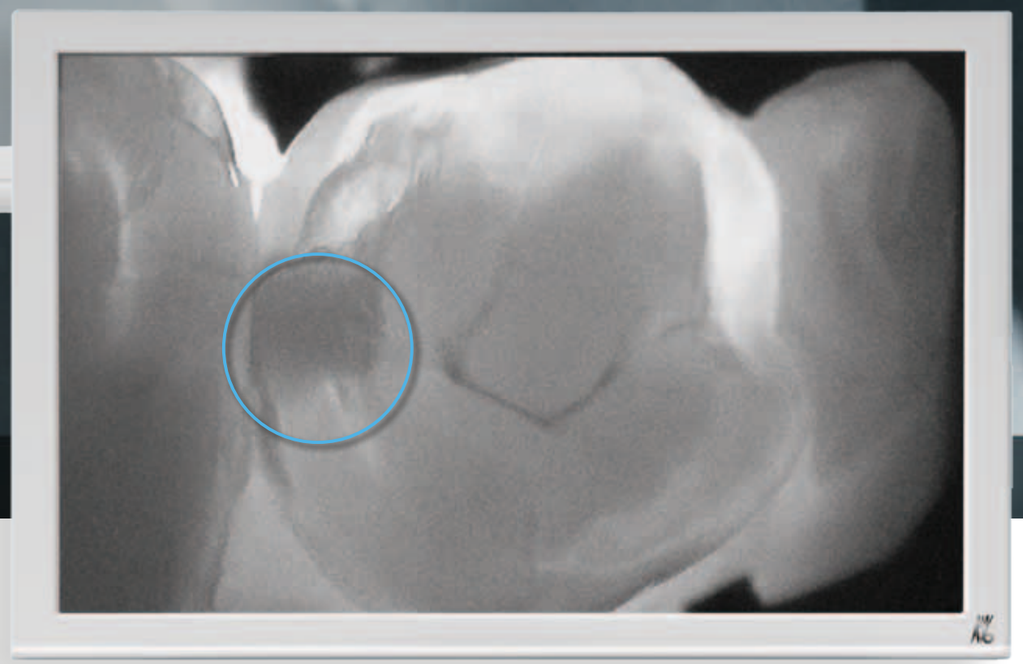
Convincing images for your patients, right from the outset.

Informed, satisfied patients will visit your practice more readily.

One of the invaluable advantages of your KaVo DIAGNOcam is the clarity of the images. You may show the images immediately to your patients on the screen and use them to explain your proposed treatment plan. Of course you can also save and print out the images and use them for regular checks in long-term monitoring. The supplied software provides perfect support.

The future is X-ray free.

Even though X-ray diagnosis is important, some patients are concerned – particularly when performing diagnosis on children or pregnant women. KaVo DIAGNOcam is an extremely operator-friendly diagnostic device that operates completely without X-ray radiation. Use it with all your patients, as often as you want.



Carious lesion is clearly visible, as a darker-coloured area.

Diagnostic process – simple and convenient.

Pure comfort.

The suprisingly simple operation of KaVo DIAGNOcam will win you over almost at once. And with KaVo DIAGNOcam you save time and can perform diagnoses directly on your treatment unit. Prolonged familiarization period? Not any more. Complicated handling? No longer. Simply place the tip over a tooth and take your stills or videos. It's really that simple.

Simply integrated into the practice routine.

KaVo DIAGNOcam fits seamlessly in your personal practice routine. And best of all: its special software with VDDS interface or TWAIN interface allows for the communication with other practice softwares or imaging softwares. KaVo DIAGNOcam can be used at any time. Even without performing previous dental cleaning.

Highlights and advantages:

Significantly improved diagnosis quality – in unsurpassed image quality

- X-ray-free imaging method for caries identification
- Supragingival diagnosis of occlusal, proximal and secondary caries
- Identification of cracks
- Early caries identification that is not possible with other diagnostic aids
- No proximal overlapping as with X-rays – second plane for reliable diagnosis visualisable

Ideal for patient information and outstanding monitoring

- Images can be displayed on screen in real-time
- Current images can be compared with older ones
- Images and video sequences can be assigned to each individual tooth and edited

Simple operation – easily integratable

- KaVo DIAGNOcam can be used at any time
- No preliminary dental cleaning required
- The VDDS interface allows for the communication with a different practice software
- The TWAIN interface allows for an easy integration with X-ray software

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Studies bring the facts to light.

See and be certain.

Studies show that the values for sensitivity and specificity in connection with X-ray diagnosis are significantly increased with KaVo DIAGNOcam.

Study 1

Am Dent Assoc. 2008 Oct;139(10):1374-81
The correlation of DIFOTI to clinical and radiographic images in Class II carious lesions.
Bin-Shuwaish M, Yaman P, Dennison J, Neiva G.
Department of Restorative Dental Sciences, College of Dentistry, King Saud University, Riyadh, Saudi Arabia.

Abstract
BACKGROUND: The authors conducted a study to evaluate the correlation between digital imaging fiber-optic transillumination (DIFOTI) (KaVo Dental, Lake Zurich, Ill.) and clinical and radiographic images in estimating the true clinical axial extension of Class II carious lesions. **METHODS:** The authors examined 51 Class II carious lesions visually, imaged them by means of DIFOTI and radiographed them with D-speed film and a complementary metal oxide silicon (CMOS)-based digital radiographic sensor. They validated axial extension of the lesions clinically. They compared the clinical and radiographic depths of the carious lesion with the size of the lesion on the DIFOTI images. **RESULTS:** The authors detected 84 percent of the lesions with DIFOTI, and 82 percent showed a visible dark shadow under the marginal ridge when examined clinically. DIFOTI correlated significantly with the clinical depth of decay (Pearson r = 0.43189). The combination of a CMOS digital sensor and DIFOTI (R2 = 0.7210) provided readings closer to the clinical measures than did the combination of D-speed film and DIFOTI (R2 = 0.6215). **CONCLUSIONS:** DIFOTI images correlated with clinical depth, especially in smaller lesions, and improved the estimation of lesion size when used in conjunction with the CMOS digital sensor and D-speed images. **CLINICAL IMPLICATIONS:** Using radiographs in combination with DIFOTI images could help clinicians determine the presence and, to some extent, the size of proximal caries, especially in smaller lesions. **PMID:** 18832273 [PubMed - indexed for MEDLINE]Free Article Am Dent Assoc. 2008 Oct;139(10):1374-81

Study 2

Caries Res. 1997;31(2):103-10. Assessment of dental caries with Digital Imaging Fiber-Optic TransIllumination (DIFOTI): in vitro study. Schneiderman A, Elbaum M, Shultz T, Keem S, Greenebaum M, Driller J. Department of Oral Pathology, Biology, New Jersey Dental School, University of Medicine and Dentistry of New Jersey, Newark 07103, USA.

Abstract
This paper describes Digital Imaging Fiber-Optic TransIllumination (DIFOTI™), a new method for the reliable detection of dental caries. Images of teeth obtained through visible-light, fiber-optic transillumination (FOTI) are acquired with a digital CCD camera, and sent to a computer for analysis with dedicated algorithms. The algorithms were developed to facilitate the location and diagnosis of carious lesions by the operator in real time, and provide quantitative characterization for monitoring of the lesions. The DIFOTI method has been tested by imaging teeth in vitro. The results suggest the superior sensitivity of DIFOTI for detection of approximal, occlusal and smooth-surface caries vis-à-vis radiological imaging. **PMID:** 9118181 [PubMed - indexed for MEDLINE]

Your leap forward with KaVo DIAGNOcam.

KaVo DIAGNOcam images will change your world in relation to caries diagnosis and early identification. Thanks to the unique imaging which is only available like this from KaVo, you will be able to diagnose more rapidly and reliably and hence react more promptly.

Study 3

From the Divisions of Cariology and Endodontology,
Department of Dental Medicine
Karolinska Institutet, Stockholm, Sweden

Exploring the boundaries of caries detection
Álfheiður Ástvaldsdóttir
Two advanced methods evaluated

Abstract
BACKGROUND: Caries detection methods require thorough validation. This should include studies which clarify what characteristics of the caries lesions are being measured, the limitations of the method and comparison of performance with conventional caries detection methods. The outcome of validation tests has important clinical implications, such as interpretation of the data at the cut-off points used by the clinician to differentiatebetween lesions requiring invasive and non-invasive intervention. **CONCLUSIONS:** The LF method can be useful for occlusal caries detection and quantification, under certain conditions: a) no general cut-off threshold can be recommended due to inconsistency between instruments. b) the method does not give information on demineralization or specific information on bacterial content of lesions, but rather responds to the synergistic effect of the caries process. The results of the in vitro investigations suggest that the DIFOTI method may be of value for caries detection and quantification on both approximal and occlusal surfaces. The method shows superior performance to both film and digital radiography, especially for detection of early caries lesions on approximal surfaces. Thus the method shows promise as a means of monitoring early caries lesions and warrantsfurther investigation.

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Technical Specifications

Current max.	0.5 A
Supply voltage	5 V
Cable length	2.5 m
Weight	190 g
Length approx.	245 mm
Diameter:	30 mm
Lighting	laser diode
Wavelength	780 nm
Opt. power	15 mW
Opt. power as per DIN EN 60825-1	
after the occlusal tips	max. 1 mW

The minimal system requirements are as follows:

- PC with min. 1 GHz processor
- min. 32 bit operating system
- USB-2 connection
- 256 MB RAM for single-user station or workstation
- 512 MB RAM for SQL database server
- 50 MB free hard disk space on system drive
- Depending on data volume 5 to 50 GB hard disk memory on data drive (can coincide with system drive)
- Min. screen resolution 1024 x 768, min. colour depth 24 bits
- Operating system: Microsoft Windows XP from service pack 3

	Material number
DIAGNOcam	1.001.900
consists of: installations - software, large attachment, small attachment, DIAGNOcam tray, USB extension cable	
Accessories	
Installations – CD multi-workstation option	1.009.6958
VDDS software	1.009.6960
TWAIN interface	1.010.3642
large attachment	1.005.1300
small attachment	1.005.1360
DIAGNOcam tray	1.005.1380
USB extension cable	1.005.1076

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