

OptiDam™

Product Manual



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1. Rubber Dam Technique

1.1 Background

The application of dental dams is indicated in endodontics, for restorative dental treatments involving the acid-etch/ self-etch technique and where moisture control is vital. One of the main reasons for dental dam application is to have a non-contaminated operating field, as nearly all materials perform better in such an environment.

During normal clinical procedures it is difficult to keep saliva, blood and other debris from getting onto tooth preparations without a rubber dam. When an operating field is difficult to control, the clinician's attention is distracted from the clinical procedure. Properly placed dental dams provide a perfect, non-contaminated field, which – in addition – is more accessible and improves visibility.

The frequency of the rubber dam technique's use varies significantly according to individual circumstances and is generally too low given its benefits achieving a perfect result. The main reason for many dentists aversion to use it might be frustrating results with products of technically difficult application and a lack of comfort for the patient.

Now KerrHawe offers OptiDam, the first 3D rubber dam with nipples for easy application, great accessibility and high patient comfort.

1.2 Indications

The rubber dam can be used for all kind of treatments where a dry environment is needed, e.g.:

- Endodontic treatments
- Composite fillings
- Luting of indirect restorations by composite luting materials
- Bleaching
- Fissure sealing

1.3 Why to use rubber dams

Even 150 years after the invention of the rubber dam by S.C. Barnum this kind of isolation method is still up-to-date.¹ In this period appropriate instruments for efficient suction did not exist increasing the need to solve the problem of moisture control. Today dryness of the working area is important for many reasons:

- Non-contaminated field: A review of published clinical results comparing treatments with/without rubber dam application can not provide conclusive proof that isolation by rubber dam is superior to other isolation techniques and that therefore rubber dam application is a must. However, the authors of these study reviews agree that rubber dam technique involves obvious advantages for such procedures.^{2, 3} Nearly all materials perform better in a non-contaminated field. It is difficult to keep saliva, blood and other debris from getting into tooth preparations without rubber dams.⁴
- Endodontic treatments: Endodontic isolation against fluids and microorganism contaminants in the oral cavity has top priority for the clinical long-term success. In addition the need of protecting the patient against accidental aspiration or ingestion of small Endodontic instruments is underlined by court rules in many countries: Such incidences are considered to be preventable and as a consequence can be attributed to the negligence of the dentist.⁵ The German Dental Association (DGZMK) accordingly recommends routine rubber dam application for Endodontic treatments.⁶
- Infection control: Microorganisms, viruses, saliva, blood, tooth structure and particles of restorative materials are present during the use of hand pieces and air-water syringes. Considering the growing number of new diseases with potential for infection during dental treatment, the added value of rubber dams as prophylactic measure gains increased significance. The use of rubber dams is an additional measure to reduce the spread of infectious disease agents in the dental office and offers barrier protection at the source of microbial contamination.⁷
- Access to the operating field: The use of rubber dams provides greater access to the working area. The patient's cheeks and tongue do not longer interfere with the dentist's work. The rubber dam widens the accessible oral area improving visibility and optimising working conditions at the same time.
- Comfort for the patient: After initial slight discomfort involved by the rubber dam placement itself most patients relax and feel more comfortable, as the

¹ Winkler, R., Sanford Christie Barnum – Der Erfinder des Kofferdam, Die Quintessen 3/1991, 483.

² Hickel, R., Der Kofferdamm – Nach wie vor eine Notwendigkeit?, Phillip J, 1997; 14, P. 363.

³ Kamann, W., Kofferdamm – Wandel von Indikation und Technik, Schweiz Monatsschr Zahnmed 1998, 108, P. 771.

⁴ Christensen, G. J., Using rubber dams to boost quality, quantity of restorative services, JADA 1994, 185, P. 81.

⁵ Hulsmann M. Juristische Probleme in der Endodontie. Endodontie 1995, 4, P. 93.

⁶ DGZMK, DGZ, Schäfer, E., Wurzelkanalaufbereitungen. Dtsch Zahnärztl Z 2000, 55, P. 735.

⁷ Cochran, M. A., Miller, C. H., Sheldrake, M. A., The efficacy of the rubber dam as a barrier to the spread of microorganisms during dental treatment, Jada, 07/1989, 119, P. 141.

rubber dams offers protection against inadvertent contact with dental instruments.⁸

- No expectoration: Patients who feel the permanent need of mouth rinsing can complicate the dental treatment. The use of rubber dams and the suction provided by the dental assistant gives you more control over your patients. Mouth rinsing is not continually required throughout the dental procedure and patients become more relaxed, thus reducing procedure times. The use of rubber dams helps to save time and energy, as spitting out and continued repositioning of the operating field are no longer part of the process.⁹ Christensen¹⁰ reports effective timesavings of up to 40 – 50 percent on many clinical procedures, as patients no longer interfere with clinical procedures by talking, coughing, mouth rinsing or otherwise disrupting operating position and the clinical field. In addition the quality of restorative procedures is increased significantly.

⁸ Christensen, G. J., Using rubber dams to boost quality, quantity of restorative services, JADA 1994, 185, P. 81.

⁹ Christensen, G. J., Using rubber dams to boost quality, quantity of restorative services, JADA 1994, 185, P. 81.

¹⁰ Christensen, G. J., Using rubber dams to boost quality, quantity of restorative services, JADA 1994, 185, P. 81.

2. Product Design

2.1 OptiDam – first 3 dimensional rubber dam

Today most dentists were taught at the university to use rubber dams. However, as with many other procedures – introduction to a new technique can be traumatic and difficult. Therefore, when a practitioner is in a less coercive environment, the relatively difficult concept is often discarded, unless it was repeated many times. GFK data reports that in Germany only 33% of the dentists use rubber dams. However, the percentage of regular users cannot be specified and might be much lower.

The placement of rubber dams is, for many dentists, a cumbersome and time-consuming procedure. Rubber dam application is equated with time loss, patient pain, extra cost, frustration and irritation and might bring back unpleasant memories of the first rubber dam experience. Today current systems on the market involve extensive practice to allow fast application without placement problems.

A panel test was done by KerrHawe asking dentists for their actual procedure and experience with rubber dams. In this test 87% of the dentists were rubber dam users. (The selection of the participants was not representative). Regarding their currently used system 78% of the dentists were satisfied with their system mainly due to habit and long-term experience. When testing OptiDam, 54% of the participants of the panel test would buy OptiDam in addition to their current system, 15% would directly switch to OptiDam.



Pre-assembling of the frame is easily possible thanks to the 3 D design and the anatomical shape of the frame.

OptiDam is the first 3D rubber dam with a nipple design and anatomical frame offering easy application and high patient comfort. OptiDam represents a completely new approach in the fields of rubber dam technique:

- Thanks to its so-called "nipple" design OptiDam involves much less preparatory work. There is no need of marking the tooth positions on the dam, where perforations are to be made later. Nipples on the dam indicate the tooth positions. Instead of punching holes into the dam, the nipples are easily cut of providing the holes for the placement.
- A major problem for the application of rubber dam is excessive tension, i.e. when the taut rubber dam sheet exerts too much pull on the rubber dam clamps, causing them and the entire dam to come off. This tension also makes it difficult to apply the frame. The 3 D design of OptiDam and the anatomical frame perfectly match the contours of the mouth. This specific combination of 3 D design of the rubber dam and the anatomical frame allow reduced tension resulting in easier rubber dam application and lower risk of clamps and dam coming off.
- The reduced tension of OptiDam allows easy pre-assembling. OptiDam draws on the concept of shifting as many steps as possible into the preparatory phase prior to the placement of the rubber dam into the patient's mouth. For assembly the 3 D dam is stretched over the ergonomic frame. Next the outward oriented nipples are cut of. Then a winged clamp can be inserted into the pre-loaded frame in order to position clamp and OptiDam in one step into the patient's mouth.
- The tension-controlled design allows for less tension on the clamps and reduces the need for excessive clamp pressure that can result in damage to porcelain or composite restorations.
- When seated the reduced tension of OptiDam widens the accessible oral area offering improved visibility and optimum working conditions for the practitioner. For the patient the reduced tension guarantees more comfort, breathing is unrestricted thanks to the anatomical shape of the dam.

2.2 Why 2 different versions

OptiDam is offered in two different versions: OptiDam Anterior and OptiDam Posterior.



OptiDam Anterior



OptiDam Posterior

OptiDam Anterior is specially designed in order to allow isolation of larger areas, as it is generally the case with anterior teeth. With OptiDam Anterior mandibular and maxillary teeth can be isolated at the same time providing great access and visibility thanks to the tension controlled design of the dam. 12 mandibular and 12 maxillary nipples indicate the tooth positions. The specific 3 D shape of OptiDam allows rubber dam placement without using clamps - depending on the individual anatomic situation in the mouth. High patient comfort is guaranteed, even if all 24 teeth are isolated.

OptiDam Posterior respects the specific anatomic contours especially for the difficult to access molar area. 7 mandibular and 7 maxillary positioned nipples indicate the tooth positions. The 3 D shape of the dam in combination with the anatomic frame offer great access and visibility also in the molar area.

2.3 Anatomical frame

The anatomical shape of the frame of OptiDam respects the contours of the mouth in order to provide perfect fit of the dam for optimum working conditions for the dentist and high comfort for the patient. The high quality material of the frame allows steam autoclaving (for further details see 3.3).



3. Technical Product Specifications

3.1 OptiDam Anterior

Material

OptiDam Anterior is made of high quality, pure natural rubber latex compound which is FDA approved. OptiDam is scent free. Regarding the wall thickness of the dam - OptiDam is offered in a medium/ heavy quality.

OptiDam is indicated for single use only.

Tension Control

Please see 3.2.

3.2 OptiDam Posterior

Material

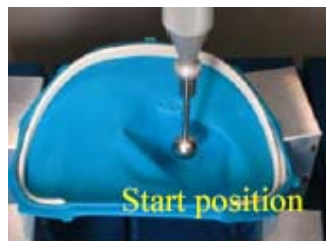
OptiDam Posterior is made of high quality, pure natural rubber latex compound which is FDA approved. OptiDam is scent free. Regarding the wall thickness of the dam - OptiDam is offered in a medium/ heavy quality.

OptiDam is indicated for single use only.

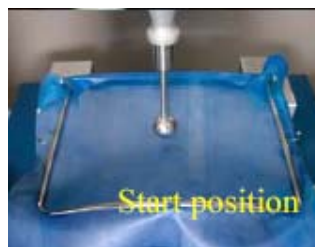
Tension Control

As already mentioned under 2.1 one of the main benefits of OptiDam is the tension-controlled design. The following test design shows the total force, which acts on the frame and on the clamp, once the dam is placed in the patient's mouth.

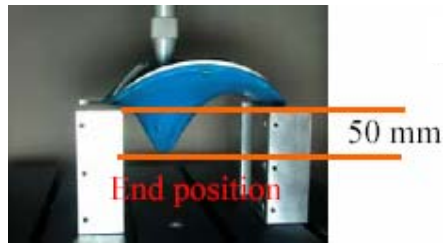
Method: The dam is mounted regularly on the frame and fixed onto a reference table. With a metal sphere coupled with a force transducer sensor the force is measured while the dam is stretched in function of the depth in the oral cavity.



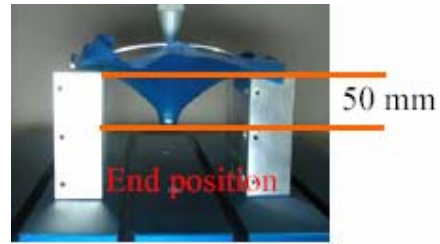
OptiDam



Conventional Rubber Dam

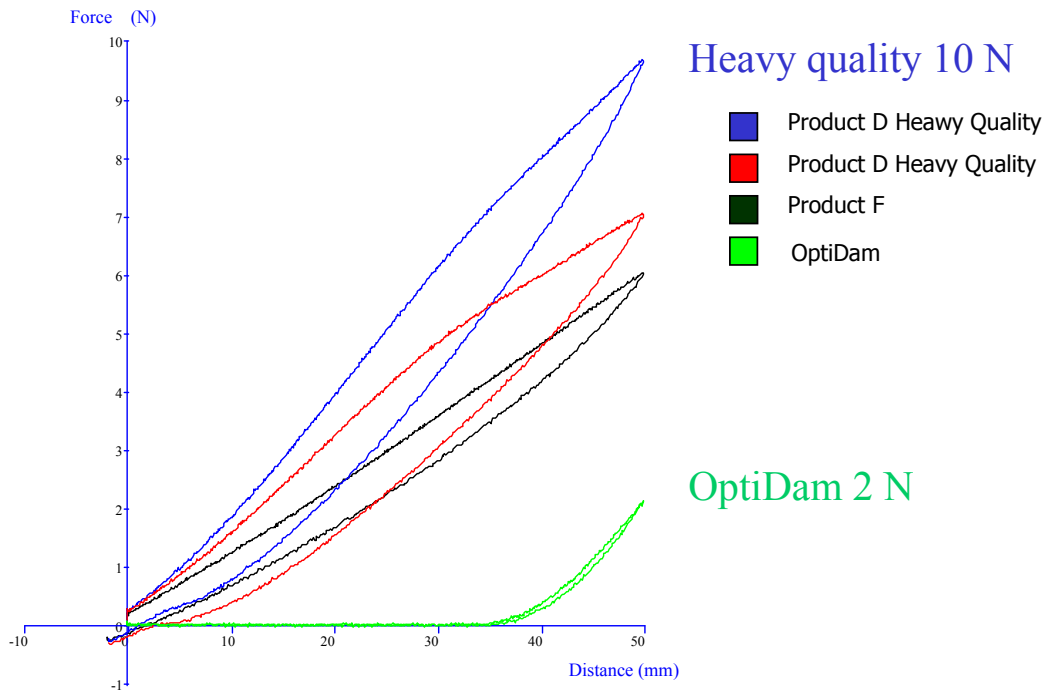


OptiDam



Conventional Rubber Dam

The following results show that OptiDam is definitively the rubber dam system that induces approximately five times lower force on the rubber dam clamp and on the frame compared to conventional rubber dam systems.



Data source: KerrHawe laboratory

These results show that the force on the metal clamp or any other fixation system is much lower. Therefore retention systems with much lower force can be used. For the patient lower force means more comfort, as less stress is applied on frame, tongue, lips and soft tissues. In addition there is no sealing effect between dam and lips enabling the patient to easily breathe through the mouth.

3.3 Anatomical Frame

The anatomical frame of OptiDam is made of medical grade thermoplastic, which is indicated for multiple use. The frame can be sterilized up to 134° for 3 minutes.

4. Clinical Application

4.1 OptiDam Anterior

OptiDam draws on the concept of shifting as many work steps as possible into the preparatory phase prior to the placement of the rubber dam into the patient's mouth. This requires that clinical placement be not done before the dam is securely attached to the frame.

In the following the pre-assembled dam technique is described. Alternatively OptiDam can also be placed directly in the patient's mouth without pre-assembling.



1. Mount one end on the frame



2. Mount 2nd and 3rd end on the frame



3. Mount the rest of the bead onto the frame.



4. Cut off with sharp scissors the nipples corresponding the teeth to be isolated.



5. Place OptiDam by orienting „+“ in maxillary and „-“ in mandibular position. Use the “+” and the “-” as a guide to center the dam at the midline.



6. Stretch the rubber dam over the teeth starting with the central incisors.



7. Use dental floss to push the dam through the mesial contact.



8. Slip the rubber dam over the remaining teeth to be isolated.

Please note OptiDam Anterior does not necessarily require a fixation by a clamp depending on the individual anatomic situation and on the kind of dental procedure to be done. In case an additional fixation of OptiDam is desired the placement of a ligation might be an appropriate solution.

4.2 OptiDam Posterior

For the rubber dam placement on posterior teeth there are 4 different basic ways to apply the rubber dam and the clamp.

1. Clamp first, then rubber dam:

First a well-fitted abutment tooth clamp is selected and then seated in place. After having checked the stability of the clamp the dam is placed: The dentist places his index fingers on the dam – buccally and lingually to the abutment hole, stretching the dam to an oval shape and passing it over the bow of the clamp and then over the wings. This method offers excellent visibility on tooth and clamp. Clamp securing, e.g. with dental floss is very important.

2. Rubber dam first, then clamp:

The abutment hole is stretched in buccal-oral direction and then placed over the teeth till the gingival tissue is visible. The rubber dam is held in this position by the dentist and an assistant is placing the clamp. Then the rubber dam can be released.

3. Bow of clamp in the rubber dam:

The bow of the clamp is placed through the perforation. Then the rubber dam is gathered to one side and held with the hand, while the clamp is placed onto the tooth. Afterwards the rubber dam is placed onto the frame. This technique offers excellent view on the area where the clamp has to be placed.

4. All in one:

This method involves pre-loading of a winged clamp onto the rubber dam. The perforated rubber dam is placed onto the frame. Then a winged clamp is placed into the opening engaging the wings of the clamp into it. Rubber dam and clamp are applied as a unit together. The "unit" is placed with the rubber dam forceps. Then the dam is slipped off the wings with a flat bladed instrument to the subclamp position. This technique can be accomplished without the aid of an assistant.

As already mentioned under 4.1 OptiDam draws on the concept of shifting as many work steps as possible into the preparatory phase prior to the placement of the rubber dam into the patient's mouth. Therefore in the following the clinical application of OptiDam Posterior is shown using the "All-in-One" Technique:



1. Mount one end on the frame.



2. Mount 2nd and 3rd end on the frame.



3. Mount the rest of the bead onto the frame.



4. Cut off with sharp scissors the nipples corresponding the teeth to be isolated.



5. Insert the clamp into the opening.



6. Position clamp with OptiDam Posterior in one step.



7. Dam is slipped off with a flat bladed instrument.



8. Slip the rubber dam over the remaining teeth to be isolated.

5. Trouble-Free Rubber Dam Application

Preparatory steps:

One of the most important preparatory steps for fast and easy rubber dam application is to clear all contact areas prior to rubber dam placement.¹¹ Problems encountered with the passage of the rubber dam through tight contacts can be avoided. Each tooth having proximal contacts to be isolated by rubber dam application should be pre-tested with dental floss. In general waxed floss is recommended to allow easier passage. Shredding of floss may occur due to the microscopic surface roughness of restorations, interproximal calculus or to the roughened edges of carious lesions. Regardless of the reason, it is wise for the dentist to check every contact area during the initial appointment with a new patient.

Another important preparatory step is the selection of a proper clamp and the check of the fit of the clamp. Clinicians must find those clamps that meet best their personal needs. Routinely placing clamps on molars instead of premolars and the avoidance of clamps on anterior teeth whenever possible is suggested.¹² After the clamp has been seated on the tooth during the trial fitting, it should be settled further into place to be able to check the fit. Movement of the clamp during dental procedures might injure cementum and cause traumatic injury to gingival tissues, delicate porcelain or composite restorations.

¹¹ Christen, A. G., Trouble-Free Placement of Rubber Dam Using the Young-Type Frame, J Indiana Dent Ass, Vol. 56, No. 2, P. 8

¹² Christensen, G. J., Using rubber dams to boost quality, quantity of restorative services, JADA 1994, 185, P. 81.

Rubber Dam Placement:

Feeding the rubber dam septa through the individual interproximal contacts might be facilitated by the prior application of rubber dam lubricant to the bottom side of the rubber dam material. Oily substances such as petroleum jelly should be avoided, as these are not water-soluble and might degenerate the rubber dam.

The use of waxed floss is recommended, as it slips easier through tooth contact areas than unwaxed floss.

Inversion of the dam offers further seal and makes it virtually leak-proof. The dam is turned inward each tooth by an appropriate instrument helping to seal the dam against oral fluids.

Rubber dams are most effective when qualified trained dental staff applies them. As with every new product which you introduce to your dental staff and to your dental procedures, proper training is the base for the success.