Compass | All-ceramic restorations

Recommendations - Products and their use in the dental practice.

Including PrepMarkers and information on occlusal onlays

Scientific advice Set 4665:
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Scientific advice - Expert Sets
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As at February 2025

Ceramic restorations have been scientifically recognised for a long time and enjoy great popularity because they are free of metal and give an aesthetically pleasing result. More and more patients directly ask for a ceramic restoration. What is important though is that all requirements for a successful ceramic reconstruction are already considered during the preparative stages ("think ceramic!").

Premature loss of a ceramic restoration is often due to insufficient depth of the cavity or non-observance of the minimum thickness of the layers.

The below recommendations aim to enable the dentist to safely prepare the cavity in preparation for a ceramic restoration and to avoid frequently made errors.

Occlusal onlays

Set 4665ST

Indirect restorations completely made of ceramics are becoming increasingly important. They do, however, require special types of preparation with materials and fixation techniques specially adapted to the specific requirements of these restorations. To this end, special preparation guidelines were compiled* for all-ceramic inlays, partial crowns and crowns, and suitable preparation instruments were developed (see expert sets on page 12 et seq.). Beyond the traditional preparation options, the special properties of high-strength dental ceramics – such as monolithic lithium silicate – allow new, less invasive types of preparation with reduced trauma during grinding and incorporation and, consequently, a reduced risk of pulpitis. This is particularly important from a clinical perspective because postoperative inflammation of the pulp is the main risk associated with crowns and partial crowns.
The DGPro (German Society for Prosthetic Dentistry and Biomaterials) already addressed the risk of pulpitis in a statement published in 2004. According to the statement, the risk of pulpitis should be controlled by always considering possible alternatives prior to placing a crown. If the defect is limited to the occlusal area, minimally invasive restorations such as occlusal onlays (also known as occlusal veneers or table tops) are a feasible option.
It is, however, difficult to prepare these with traditional preparation instruments. To greatly facilitate the process, we have developed a new sequence of preparation steps and new diamond instruments with suitable geometries in close cooperation with Private Lecturer Dr. M. Oliver Ahlers and Prof. Dr. M. Daniel Edelhoff.

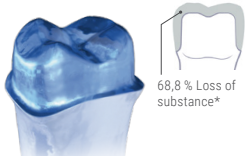
Indications:

- Preparation of occlusal onlays
- Treatment of carious teeth
- Restoration of individual teeth or all molars/premolars damaged by bruxism and/or biocorrosion
- Reconstruction of the occlusion

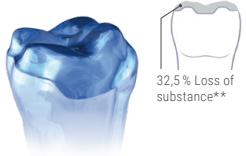
* Ahlers, M.O.; Blunck, U.; Hajto, J.; Probster, L.; Frankenberger, R.: „Guidelines for the Preparation of CAD/CAM Ceramic Inlays and Partial Crowns" Int J Computer Dent 12,4 (2009) 309-325

Occlusal onlays

The innovative alternative to crowns



Traditional preparation of a first molar prior to receiving a crown.



Minimally invasive preparation of a first molar prior to receiving an occlusal onlay.

The traditional preparation: Crowns.
(Veneer) crowns are the traditional restoration method for extensive defects in the hard substance of molars and premolars.

Advantages:
Long-established method.
Durable restorations all dentists are familiar with.

Disadvantages:
The preparation causes a substantial loss of hard substance. This increases the probability of biological complications, such as pulpitis and crown margins almost reaching up to the gingiva.

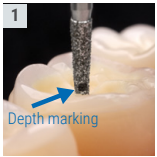
The minimally invasive approach: Occlusal onlays (“Table Tops“).
Occlusal onlays have been introduced as a new, minimally invasive alternative for the restoration of occlusal defects in the hard substance of molars and premolars.

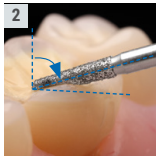
Advantages:
Clearly reduced loss of hard dental substance – and fewer biological risks.

Disadvantage:
The preparation of occlusal onlays used to be difficult without special instruments from a technical point of view.

* Source: Edelhoff D; Sorensen JA.: Tooth structure removal associated with various preparation designs for posterior teeth. Int J Periodontics Restorative Dent. 2002 Jun; 22(3):241-9.

** The loss of substance involved with the preparation for occlusion onlays* is less than half of that caused by the preparation of crowns.





Clinical case:

Pre-preparation
According to the information currently provided by manufacturers, occlusal onlays made of lithium silicate require a minimum thickness of 1 mm. Teeth damaged by biocorrosion often have an irregular shape. It is therefore recommended to unite the steps of depth marking and pre-contouring in a pre-preparation process.

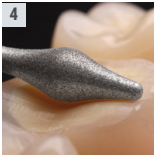
To this end, we have provided an abrasive diamond instrument of a suitable shape with a black laser mark at 1 mm from the instrument tip. When the instrument is rotating, the mark looks like a black line.

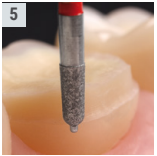
1. Whenever you wish to remove occlusal substance, apply the instrument 855D to the occlusal surface in a vertical position and prepare guide grooves with a depth of 1 mm.

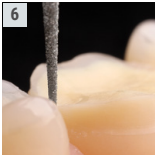
2. Then even out the occlusal surface, making sure to maintain the correct cusp-fossa relationship (see image) and level any sharp burr at the edges of the occlusal surface. Like this, you can control the amount of substance removed already at the pre-preparation stage – completely without a depth marker – unless, of course, the loss of dental hard substance is so extensive that there is no need to create further occlusal space.

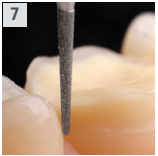
Occlusal contouring and finishing
Ceramic preparations require perfectly round contours. The centre of the occlusal surface needs to have a concave shape, whereas the area of the former cusps should have a convex shape to optimally support the occlusion onlay. Since none of the previously existing diamond instruments were able to create such a special shape, we developed brand new occlusal abrasive cutters to this end, the so-called OccluShapers (fig. 370).

These are the first instruments to be able to combine both shapes. To ensure that the diamond instruments match the occlusal surfaces of each tooth, the OccluShapers are available in 2 sizes, one for









molars and another one for premolars. To complete the range, we have added finishers of matching shape (fig. 8370).

3. For occlusal contouring, prepare the occlusal surface with an OccluShaper of suitable size in a mesio-distal direction, along the central fissure.

4. Repeat with a finisher of the same size and congruent shape.

Oro-vestibular sides

To give the ceramic restoration stability, the lateral surfaces on the oral and vestibular sides have to be intact and of sufficient size. To make sure that these surfaces can be prepared to the required depth in a reliable manner, we have taken an abrasive diamond instrument with an ideal length/diameter ratio and provided it with a guide pin at the front end of the instrument. Thanks to its special diameter, the instrument can already be used during the first step as a finisher with controlled penetration depth. The instrument hardly vibrates which makes it pleasant to use.

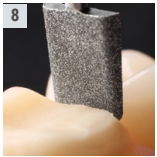
5. With the guide pin instrument 8849P, you can prepare the lateral sides from a vestibular and oral direction – as deeply as the guide pin lets you and as far away from the adjacent tooth as the contour of the instrument allows.

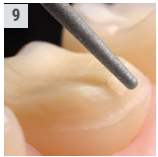
Separation and finishing

Minimally invasive preparations do not stop at the interproximal region. That's why the set includes particularly slim separating instruments that allow interproximal preparation in the dental enamel.

6. Prepare the interproximal region with the separating instrument 858 in an axial direction, protecting the adjacent tooth with a tension-free matrix strip and without extending the preparation.

7. Finally, smooth the interproximal surface with a finisher of matching shape 8858 in preparation for impression taking and production of the restoration.





As an even better alternative – compared to the finisher 8858 –, we recommend our sonic tips SFM6 and SFD6 for interproximal smoothing and finishing which we specially developed for use in combination with our occlusal onlay set. Coated with diamond grit on one side only, the geometry of these sonic tips was specially made for the interproximal preparation prior to applying occlusal onlays. Our tests revealed that these tips are particularly suitable for the interproximal finishing of crown preparations.

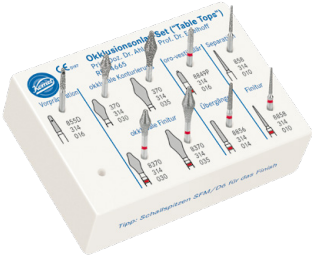
You will be amazed to see how fast interproximal surfaces can be smoothed with these tips – without any risk of damaging the neighbouring teeth!

Note:
The SFM6 and SFD6 are not suitable for the interproximal preparation prior to inserting ceramic inlays! Please use our sonic tips SFM7 and SFD7 instead – they were specially designed for this purpose (see page 17 et seqq.).

8. If you have the required equipment available at your practice, we suggest that you smooth the interproximal surface with the sonic tips of matching shape and diamond coating on one side – without matrix!

Transitions
9. To finish the treatment, connect the vestibular and oral preparations with the interproximal preparations in all four transitional regions by means of the finisher 8856 – and you're done!

Set 4665ST
Occlusal onlay set "Table Tops" in a sterilizable stainless steel bur block



Set 4665
Occlusal onlay set "Table Tops" in a plastic bur block

Contents Set 4665/4665ST

855D.314.016
For pre-preparation, with laser mark

OccluShaper

for premolars

370.314.030
Contouring

8370.314.030
Finishing

for molars

370.314.035
Contouring

8370.314.035
Finishing

8849P.314.016
Oro-vestibular preparation

8856.314.014
Transitions

858.314.010
Separation

8858.314.010
Finishing

Matching sonic tips:
(not included in the set)

SFM6 - mesial

SFD6 - distal

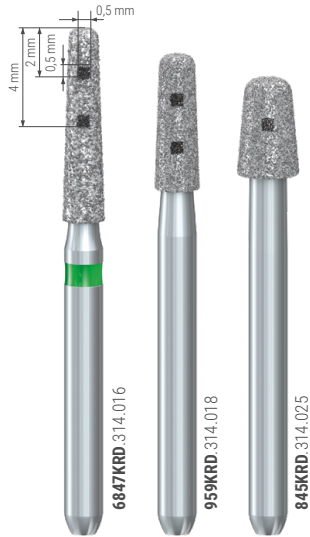
Recommendation for use in the
Komet sonic hand piece SF1LM/S:
Power level 1: Finishing
Power level 2: –
Power level 3: Shaping

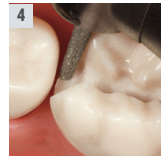
Ceramic inlays and partial crowns

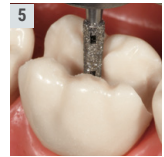
Expert Set 4562

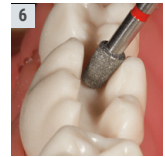
The set 4562 was compiled in close cooperation with six renowned experts from dental clinics and practices with a view to simplifying and systemising the precise shaping of cavities prior to receiving ceramic inlays and partial crowns.

The set contains, among other instruments, three newly developed burs which are provided with a depth mark (to be recognised by the letter "D" standing for "depth" in the reference number) in order to guarantee the required minimum occlusal thickness of ceramic restorations.









Use of the instruments (shown on a model)

1. Open the cavity with a tapered diamond instrument with coarse grit and rounded edges (6847KRD.314.016, green). The depth marks at 2 and 4 mm help to guarantee the required minimum thickness of the ceramic underneath the fissure.

2. The same instrument is then used to create a proximal box. The proximal enamel wall remains intact for the time being. The adjacent tooth can be protected with a steel matrix.

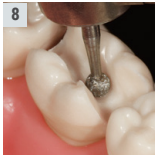
3. A thin, flame-shaped instrument with fine grit (8862.314.012, red) is used to remove the proximal enamel. In this step, the enamel wall is removed. Make sure not to create a spring edge.

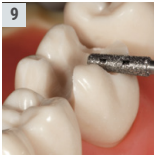
4. Use a finishing instrument (8847KR.314.016, red) whose shape corresponds to that of the diamond instrument described under point 1 to smoothen the inner walls and the floor of the box.

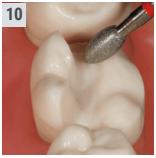
5. Depending on the size of the cavity, 2 shorter, tapered instruments with rounded edges can be used to shape the cavity as required: 959KRD.314.018 (see photograph) and 845KRD.314.025. Both instruments are provided with depth marks, either at 2 and 4 mm (in case of the 959KRD) or at 2 mm (845KRD).

Handy hint: We recommend our sonic tips on page 17 for the shaping of the interproximal cavity margin.

6. Two instruments of matching shape with fine grit are available for subsequent finishing: 8959KR.314.018 and 8845KR.314.025. Both instruments are provided with a red ring. The tapered instrument should be tilted in oro-vestibular direction in order to increase the opening angle in occlusal direction.







7. Use a thicker flame-shaped finisher (8862.314.016 red) to give the edges of the box a concave shape. The instrument should be pulled from apical in occlusal direction.The concave contour in the dental substance is automatically created by the convex tip of the instrument. The opening angle should be enlarged in occlusal direction. Make sure to create an open rather than an excessively steep preparation. Again, do not create a spring edge. The transitions between the cavity floor and the box must be rounded.

8. The cavity underneath the fissure can be further deepened with a ball shaped instrument with normal grit (801.314.023), if necessary.

9. The cusps are shortened horizontally with the tapered instrument 959KRD.314.018. For that, the instrument is held in horizontal position. Its diameter of 1.8 mm (1.4 mm at the tip) is an ideal dimension to ensure sufficient reduction. Thanks to its larger diameter of 2.5 mm (1.9 mm at the tip), the 845KRD.314.025 is ideally suitable for creating smooth margins. The same instrument can be used to prepare rounded shoulders inside the preparation, if required.

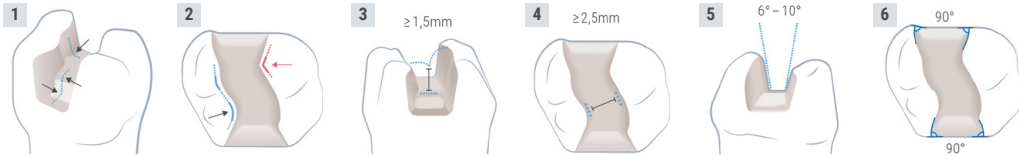
10. Use the egg shaped instrument with fine grit 8379.314.023 (red) to round off all inner edges.

11. The same instrument can be used to slightly round all horizontal outer edges. Round off all edges within the preparation to avoid leaving any sharp transitions.

12. Round off any remaining corners and edges in hard-toreach areas with the thin, flame shaped finisher 8862.314.012 (red) as per fig. 3. Round off any sharp transitions at the contour of the preparation margin. Make sure not to create a spring edge!

Speed:

- During preparation:
  ↻opt. 160.000 rpm,
  red contra-angle
  During finishing:
  ↻opt. 20.000 rpm



Graphic illustrations of the most important rules to be observed during preparation

1. Round off the transitions between the floor and the walls of the cavity as well as all angles within the cavity.

2. Check the contour of the preparation from occlusal to exclude any sharp edges. The inlays are ground from the outside to exactly match the shape of the cavity. The bur used to grind the inlay is unable to recreate such sharp edges, which would lead to undesirable gaps between the inlay and the cavity wall.

3. When creating the fissure, make sure that a minimum occlusal depth of 1.5 mm is observed even underneath the fissure. You can deepen the cavity floor with a round bur.

4. To avoid fracture of the inlay, make sure that a width of at least 2 mm is observed even at its most narrow point (isthmus).

5. Work in diverging manner rather than in a parallel manner. The recommended opening angle of the cavity walls is 6°– 10°. The adhesive fixation eliminates the need for any other type of retention.

6. The surface angle at the transition between the cavity and the surface of the tooth should be approx. 90°, to give the ceramic and the dental substance increased stability. Protect the neighbouring tooth with a steel matrix. Give the proximal edges a slightly concave shape by means of a flame-shaped instrument which should always be used on the sides of the box, never on its floor. Oscillating instruments are equally suitable for shaping the walls of the box (page 17).

Contents of sets 4562/4562ST

6847KRD.314.016

959KRD.314.018

845KRD.314.025

8862.314.012

801.314.023

8847KR.314.016

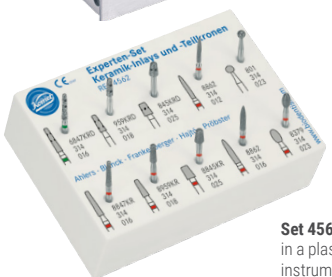
8959KR.314.018

8845KR.314.025

8862.314.016

8379.314.023

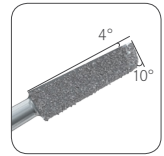
Set 4562ST
in a stainless steel bur block suitable for sterilization



Set 4562
in a plastic instrument tray

Sonic tips

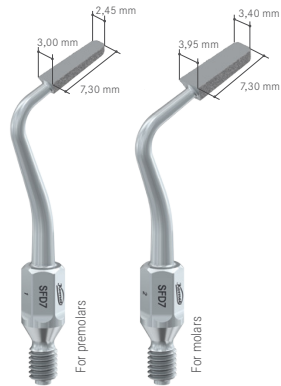
for interproximal cavity preparation.



In close cooperation with Private Lecturer Dr. M. Oliver Ahlers, Hamburg, Komet has developed sonic tips for the preparation of interproximal cavities. The new sonic tips are designed for the final shaping of cavities and for smoothing the interproximal cavity margins. The diamond coated working parts of the 4 sonic tips (mesial and distal) are bisected lengthwise. Their special design makes them ideally suited for work on molars and premolars.

To prevent damage to the adjacent tooth, the tips are only coated on one side.

Thanks to their rounded angles in the transition area between the axial and the shoulder region, these sonic tips are capable of preparing the cavities to a perfectly chamfered shape, thus creating ideal conditions for taking a precise impression of the preparation, with either conventional impression material or by means of advanced radiographic techniques. The new sonic tips are therefore ideal for both conventional and CAD/CAM restorations. What's more, they create perfect conditions for the subsequent work in the dental laboratory. The clear and concise shape of the preparation greatly facilitates the construction of precise restorations.



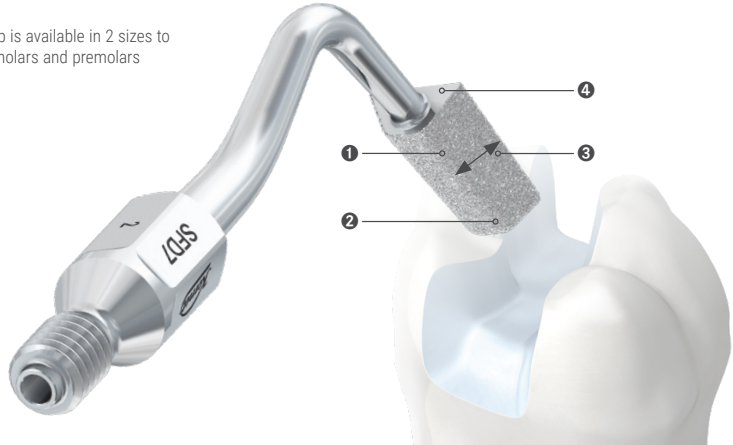
4 arguments in favour of Komet tips:

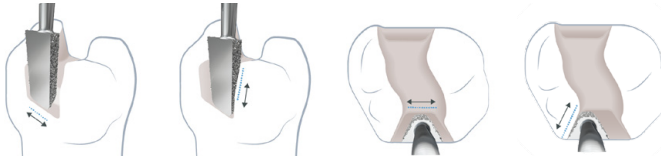
❶ optimised diamond coating (60 µm instead of 40 µm) to facilitate shaping and finishing

❷ the shape is adapted to modern ceramic inlays (instead of the previously used ceramic inserts) and guarantees plane lateral surfaces and rounded transitions

❸ more axial depth to improve the shaping of the buccal and lingual surfaces of the interproximal box as well as the floor of the box

❹ the tip is available in 2 sizes to suit molars and premolars





Prior to using these sonic tips, the basic preparation is carried out with rotary instruments

The interproximal cavity margin is shaped and smoothed performing vestibular/oral movements.
The sonic tip is guided along the cavity margin in mesio/distal direction in order to remove any instable enamel structures.

Recommended power levels in the Komet sonic handpiece SF1LM/S:
Power level 1: Finishing
Power level 2: –
Power level 3: shaping

The sonic tips made by Komet can not only be used in Komet's sonic hand-piece SF1LM/S, but also

- in the Scalers made by the co. W&H (Series Proxeo© ZA-55/L/LM/M/LS and Proxeo© ST ZE-55RM/BC, Series Synea© ZA-55/L/LM/M or series Alegra© ST ZE-55RM/BC), as well as
- in the SONICflex™ hand-piece provided by the company KaVo (Series 2000N/L/X/LX or series 2003N/L/X/LX) or
- in the SIROAIR L of the co. Sirona©

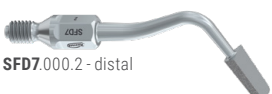
For premolars:

SFM7.000.1 - mesial

SFD7.000.1 - distal

For molars:

SFM7.000.2 - mesial



SFD7.000.2 - distal

Handy hint:
Designed for the gentle and precise positioning of the restoration, the CEM tip SF12 ideally complements these sonic tips.

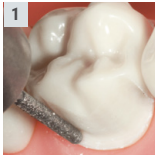
SF12 and holder SF1981

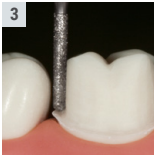
Ceramic crowns

Expert set 4573ST

Based on the successful expert set 4562 for ceramic inlays and partial crowns, the set 4573ST is designed for the preparation of crowns allowing for the special requirements of ceramics.

The key instrument contained in this set is figure 856 (tapered round, which is available in different sizes and grit types).
The experts opted for this instrument, as it is perfectly adapted for preparing a distinct chamfer featuring rounded interior angles. Sinking the instrument up to half of its diameter into the tooth creates a distinct chamfer with a 0.8 mm radius, which assures sufficient substance removal and rounded interior angles. Both aspects are considered major requirements for a successful ceramic preparation. On one hand, the large radius helps to avoid a lip preparation. On the other hand, the large diameter 021 produces smooth surfaces without grooves or scratches, especially during finishing.
The ideal amount of substance removed to assure sufficient material thickness is between 1.0 and 1.5 mm. It is therefore sufficient to include instruments with 2 diameters in this set: 021 for larger teeth and 018 for smaller teeth. The instrument is provided with a cone angle of 2°.
This allows the creation of a total angle of 4° in case of a circular preparation without having to swivel the instrument.





All-ceramic crown on back teeth*

1. The instrument 6837KR.314.012 is used to prepare a 1 mm uniform shoulder approx. 0.5 –1 mm above the future preparation limit.

2. Interdental separation using the instrument 6856.314.012, preparing a thin, proximal enamel wall for the time being. The adjacent tooth can be protected additionally with a steel matrix.

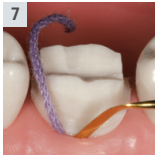
3. Subsequent to the interdental separation, the initial shoulder preparation is carried out using the diamond instrument described under point 1. For the time being, parallel substance removal is carried out by holding the instrument in vertical position.

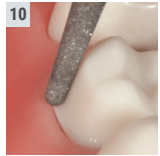
4. The occlusal view clearly shows the 1 mm sized, circum-ferential shoulder following the anatomical contour of the root.

5. Reduction of the occlusal surface using the instrument 6836KR.314.014. A minimum substance removal of 1.4 mm can easily be achieved by completely introducing the instrument.
An occlusal substance removal of up to 2 mm is possible.

6. With the occlusal reduction, please make sure to prepare a simplified replica of the anatomic cusps. To this end, the instrument described under point 5 is applied to premolars and molars from 4 different directions.

*** Note:** The use of the instruments is shown on a model. It is possible to change the order of the shown preparation steps, according to your personal preference.





7. To protect the gingiva, it is recommended to place a retraction cord after carrying out the initial preparation.

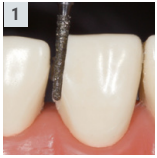
8. Final shaping of the preparation limit to achieve a chamfer with a 0.8 mm radius. The larger instrument 6856.314.021 is used for easy access to oral and vestibular areas. When using the large instrument (021), please make sure not to damage the adjacent teeth.

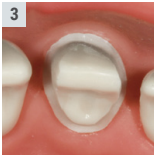
9. If the adjacent teeth do not require preparation, it is recommended to first use the thinner instrument 6856.314.018 for creating the chamfer in the interdental areas.

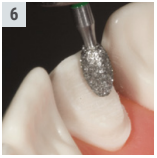
10. Definition of the final preparation limit using the finishing instruments of matching shape, i.e. 8856.314.018 and 021.

11. If there is sufficient interdental space, it is also possible to use the finishing instruments described under point 10. Please make sure not to damage the adjacent teeth.

12. Check the completed preparation for sufficient interocclusal clearance. With all-ceramic restorations, all sharp edges and corners have to be rounded off.
Flexible polishing discs are particularly suitable for this.







All-ceramic anterior crown*

1. Interdental separation with the thin instrument 6856.314.012 (tapered round, green ring).

2. Preparation of a 1 mm sized, uniform shoulder approx. 0.5 – 1 mm above the future preparation limit, using the instrument 6837KR.314.012.

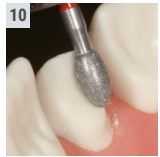
3. The occlusal view clearly shows the 1 mm sized, circumferential shoulder following the contour of the root.

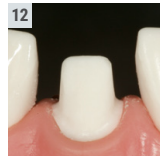
4. Reduce the labial surface of the sagittal curve of the crown by 1 mm, using the same instrument as mentioned under point 2.

5. Incisal reduction with 6836KR.314.14 (short cylinder with rounded edges, green ring). When completely introducing the instrument, a minimum substance removal of 1.4 mm can easily be achieved. An occlusal substance removal of up to 2 mm is possible.

6. Palatinal reduction by at least 1 mm, using the egg shaped instrument 6379.314.023 (green). To protect the gingiva, it is recommended to place a retraction cord after carrying out the initial preparation.

*** Note:** The use of the instruments is shown on a model. It is possible to change the order of the shown preparation steps, according to your personal preference.





7. Final shaping of the preparation limit to achieve a chamfer with a 0.8 mm radius. The larger instrument 6856.314.021 is used for easy access to oral and vestibular areas. When using the large instrument (021), please make sure not to damage the adjacent teeth.

8. If the adjacent teeth do not require preparation, it is recommended to create the chamfer in the interdental areas using the thinner instrument 6856.314.018 first.

9. Definition of the final preparation limit using the finishing instruments of matching shape, i.e. 8856.314.018 and 021.

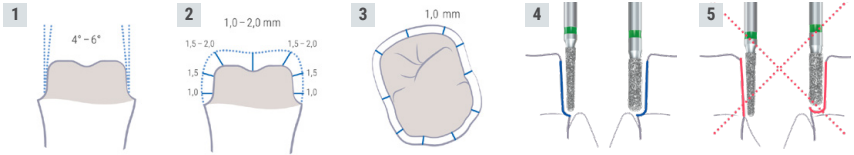
10. Finishing the palatinal surfaces using the egg-shaped fine grit instrument 8379.314.023 (red).

11. Check if sufficient substance has been removed using a silicone index.

12. Completed preparation. With all-ceramic restorations, all sharp edges and corners have to be rounded off.

Speed:

- During preparation: $\circlearrowleft_{opt.}$ 160.000 rpm, red contra-angle
  During finishing: $\circlearrowleft_{opt.}$ 20.000 rpm



Graphic illustrations of the most important rules to be observed during preparation

1. Create a stump with a 4 – 6° cone. Round off all the transitions within the preparation, to avoid disadvantageous tensions underneath the restoration material.

2. If the position of the tooth does not require correction, the outer contour of the crown is reduced by 1.5 mm, the occlusal surface by 1.5 – 2 mm and the margin by at least 1 mm, without mimicking the crown equator. Please make sure to eliminate all sharp edges and corners as these might impair the optimal fit of the future restoration.

3. The preparation limit has to have a width of at least 1 mm.

4. Both a shoulder preparation with rounded interior angles and a distinct chamfer preparation may be carried out. Rework the preparation margin using finishing instruments of matching shape (red ring).

5. Make sure to avoid tangential, spring edge or lip preparations as they are contraindicated with all-ceramic restorations. Therefore, exercise special care when using instruments with a round tip and do not introduce them any further than up to half their diameter at maximum!
Please note that tangential preparations are technically unfeasible and would result in too thin, i. e. instable and overcontoured, crown margins.

* These specifications are but guidelines. The user is responsible for observing the preparation instructions provided by the manufacturer of the material. Ivoclar Vivadent, for example, indicates that in cases of crowns made of IPSe. Max-lithium-disilicate fixed according to an adhesive method, the material thickness can be reduced to 1 mm.

(IPS e.max Scientific Report Vo. 03 – 2001-2017).

Contents of set 4573/4573ST

6837KR.314.012

6836KR.314.014

6856.314.021

8856.314.018

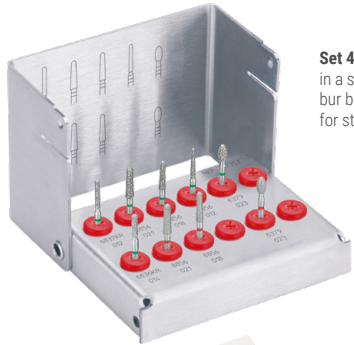
6856.314.018

8856.314.021

6856.314.012

6379.314.023

8379.314.023



Set 4573ST
in a stainless steel bur block suitable for sterilization

Set 4573
in a plastic instrument tray

Ceramic veneers

Set 4686ST

Up to now, large defects of the front teeth had to be treated by placing a full crown, usually in the shape of a veneer crown with a metal core. In combination with adhesive fixing methods, the newly developed high-strength tooth-colored dental ceramics (lithium disilicate and other suitable types of ceramic) have led to new minimally invasive types of restoration. These are generally referred to as "veneers", but their size and shape vary to suit the defect to be treated. What they all have in common is that the required preparations cause fewer traumas during grinding and fitting, thus reducing the risk of pulpitis. This is important from a clinical aspect because post-surgical pulpitis counts among the main risks associated with full crown restorations.

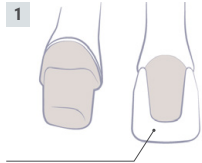
After enlarging the preparation, we distinguish between:

- Purely labial veneers ("short wrap design")
- Veneers that comprise the contact point and extend in an interproximal direction ("medium wrap design")
- Veneers that comprise the interproximal spaces and incisal edges ("long wrap design")
- 360° veneers that cover the entire dental surface and are limited to the dental enamel ("full wrap design")
- Palato-incisal functional veneers, usually on the canines

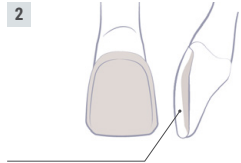
The preparation for these veneers is difficult with traditional preparation instruments. This is why we developed a new sequence of preparation steps along with suitable new abrasives in cooperation with External Lecturer Dr. M. Oliver Ahlers and Prof. Dr. Daniel Edelhoff.

Ceramic veneers

The minimally invasive alternative to full crowns.



68.2 % substance loss during a traditional crown preparation*



16.6 % substance loss during a ceramic-veneer

The traditional preparation:

Up to now, traditional (veneer) crowns used to be standard practice when it came to restoring large front tooth defects

Advantages:
Traditional crowns are well-established, durable restorations and all dentists know them.

Disadvantages:
This type of preparation leads to a considerable loss of hard dental substance. This, in turn, triggers off a higher rate of biological complications, such as pulpitis and crown margins in close vicinity to the gingiva.

The minimally invasive preparation: Ceramic veneers in different extensions

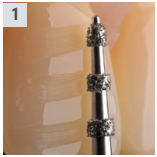
Ceramic veneers are now firmly established and scientifically recognized* as a new, minimally invasive method of restoring dental defects in the front region**.

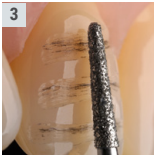
Advantages:
Clearly reduced loss of hard dental substance caused by the preparation – and consequently, less biological risks.

Disadvantages:
Up to now, the preparation prior to placing veneers used to be technically challenging without special instruments.

*Source: Edelhoff D, Sorensen JA. Tooth structure removal associated with various preparation designs for anterior teeth. J Prosthet Dent 2002;87:503-509.

**Joint statement issued by the Deutsche Gesellschaft für Zahnerhaltung (DGZ) and the Deutsche Gesellschaft für Zahn-, Mund- und Kieferheilkunde (DGZMK). Authors: M. Federlin, W. Geurtsen, B. Haller, G. Schmalz: "Zahnfarbene Restaurationen aus Keramik: Inlays, Teilkronen und Veneers". DZZ 62 (09) 2007





Pre-preparation depth marking

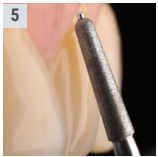
The durability of veneers largely depends on keeping the preparation within the dental enamel. It is, therefore, of decisive importance to limit the penetration depth accordingly. To this end, we have developed special depth markers with guide pin. Thanks to their geometry, these depth markers reliably limit the penetration depth [1] – even if the instrument is inadvertently applied at too steep an angle [2].

The suggestion* to highlight the bottom of the preparation groove with a felt or marker pen proved useful [3]. Like this, the maximum permissible removal depth is clearly recognizable during the shaping preparation at a later point.

Shaping preparation

Shaping [3] and finishing [4] are done with a tapered diamond abrasive. The tip of this instrument is rounded to an ellipsoid shape. The diameter of the instrument used depends on the size of the prepared tooth.

*) Kern M, Ahlers MO. Controlling the depth of ceramic veneer preparations by using a color marker in the depth grooves. J Prosthet Dent. 2015;114(6):862-4.



Traditional labial veneers (short wrap design)

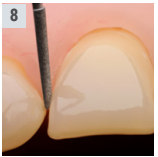
The preparation prior to placing veneers is sophisticated precision work. To ensure durability of the ceramic veneer, this should ideally be 0.6 mm thick, but certainly no less than 0.3–0.4 mm. The enamel of maxillary incisors and canines is thinned down to a thickness of merely 0.4 mm in the cervical region, which is why the preparation prior to placing traditional labial veneers should be limited to this value.
The observance of the required thickness is facilitated by the depth marker 868BP.314.020 and the special labial abrasive with guide pin 856P.314.018 as well as the finisher 8856P.314.018 with matching shape [5].

Thin veneers

The enamel in the cervical region of incisors – both in the upper and lower jaw – is even thinner, which is why the preparation depth has to be limited to just 0.3 mm.
The depth marker 868BP.314.018 makes sure that this is observed. The instrument is followed by a tapered diamond abrasive 868.314.012 with matching shape and an ellipsoid tip as well as a congruent diamond finisher 8868.314.012.

These instruments are particularly suitable for "small" anteriors and for the preparations prior to placing purely labial veneers as well as veneers extending in an interproximal and/or incisal direction.

There are special instruments and techniques for extending a preparation in maxillary central incisors and all canines in an interproximal and labial direction. These are described on the following page.



Extended veneers (medium/long wrap design)

Discolorations, diastemata, enamel defects and previous root canal treatments all require the placement of extended veneers that extend from interproximal to incisal. The extension is done with a tapered diamond abrasive 868.314.016 rounded to an ellipsoidal shape and a diamond finisher 8868.314.016 of identical shape.

The aesthetic appearance and the durability of the restoration profit from this, but the interproximal preparation is particularly challenging due to the close vicinity to the adjacent tooth [see 6].

In response to this, special sonic tips are available that perfectly complement the Perfect Veneer Preparations set. Their shape corresponds to that of the diamond abrasives, but they are bisected lengthwise [7] and coated on one side only to safely prevent injury to the neighbouring tooth [8] and to guarantee ideal interproximal geometries [9].

Palato-incisal functional veneers

Another condition for durable ceramic veneers is the absence of dysfunctional loads. If the canine guidance is lost due to tooth wear caused by erosion, attrition or abrasion, it might be necessary to rebuild the canine guidance. Instead of invasive crowns, palato-incisal functional veneers have now become a well-established*, scientifically recognized option**.

The preparation prior to placing these veneers is done in two steps with two instruments:
In a first step, the preparation takes place using an egg-shaped diamond abrasive 379.314.023 [10], followed by finishing with a diamond finisher 8379.314.023 of identical shape.

During finishing, it has proved useful to create a preparation groove with the tip of the abrasive instrument in the thickest part of the enamel.

Perfect **V**eneer **P**reparations

Classic Veneers (0,4 mm)

Depth marking

868BP.314.020
Depth marking
0,4 mm

Labial preparation

856P.314.018
Abrasive

8856P.314.018
Finisher

Extended preparation

868.314.016
Abrasive

8868.314.016
Finisher

Thin Veneers (0,3 mm)

Depth marking

868BP.314.018
Depth marking
0,3 mm

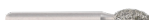
Labial/
Extended preparation

868.314.012
Abrasive

8868.314.012
Finisher

Function Veneers

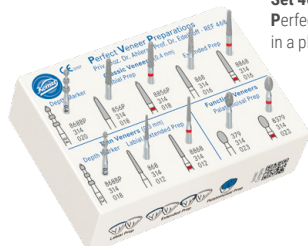
Palato-incisal preparation



379.314.023
Abrasive

8379.314.023
Finisher

Set 4686ST
Perfect **V**eneer **P**reparations
in a sterilizable stainless steel
bur block



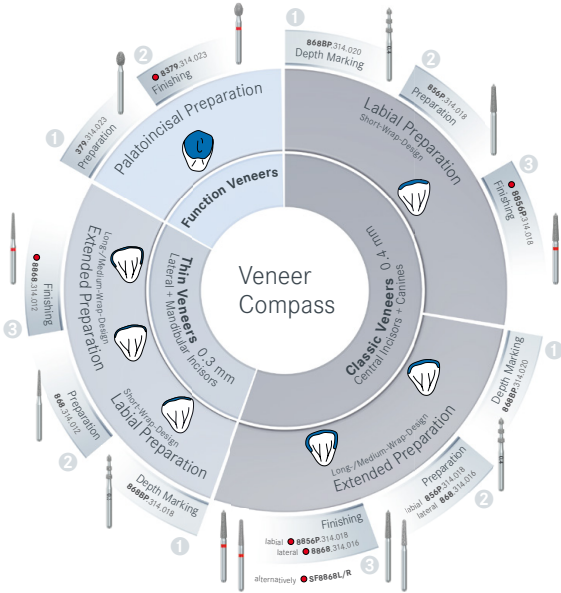
Set 4686
Perfect **V**eneer **P**reparations
in a plastic bur block

Matching sonic tips:
(not included in the set)

SF8868L.016
left

SF8868R.016
right

Recommendation:
For occlusal veneers, we recommend the occlusion only set 4665/ST (see page 5 ff).



Alternatively, our set 4388 is available for those who do not require instruments with guide pin.

Contents of set 4388
In a plastic instrument tray

Depth reduction

868B.314.018

868B.314.020

Shaping

868.314.012

868.314.016

379.314.023

Fine correction

852EF.314.014

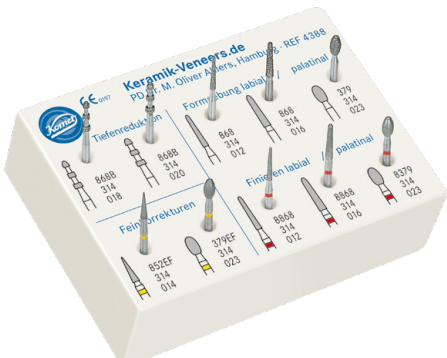
379EF.314.023

Finishing

8868.314.012

8868.314.016

8379.314.023



DIAO.

Outstanding Performance – excellent control.

Sharpness means control

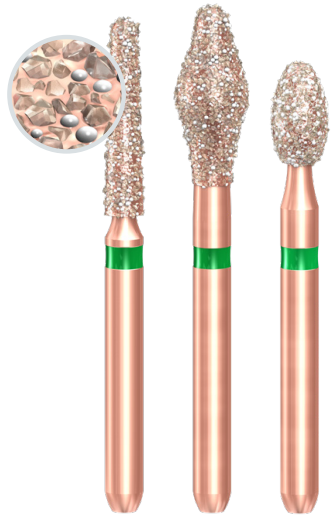
Sharpness that you feel: on average 27% more initial cutting performance than other instruments on the market for optimal controllability and preparation results.

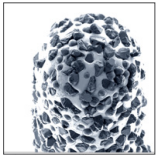
Extreme durability

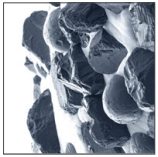
Long-lasting sharpness, on average 34% longer than other instruments on the market.

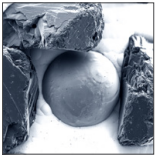
Easy to recognize

The sophisticated rose-gold colour allows users to reach for the optimal preparation instrument again and again, thereby simplifying practice processes.







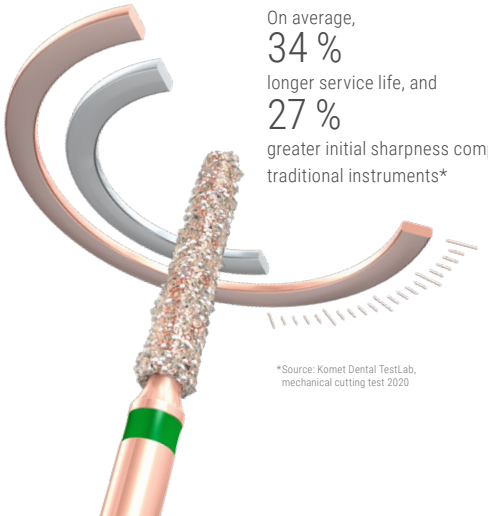


DIAO.
Innovation you can feel

What makes the innovation of DIAO so unique? The combination of ceramic pearls and diamond grains ensures unparalleled performance and control of the instrument. The innovative diamond coating of DIAO provides a significantly longer lasting sharpness than comparable instruments and also makes them easier to clean.

Concentrated cutting performance for optimum control and long lasting, effective substance removal

DIAO is much easier to handle and impresses the user with its smooth operation and the way it glides over the tooth. Although easy to control, DIAO instruments remove substance consistently and at greater speed.



On average,
34 %
longer service life, and
27 %
greater initial sharpness compared to traditional instruments*

*Source: Komet Dental TestLab, mechanical cutting test 2020



Speed:

Use at an optimum speed of $\circlearrowleft_{opt.}$160.000 min^{-1} (except KP6370: $\circlearrowleft_{opt.}$100.000) preferably in a red-contra angle. The maximum speeds can be found on the product label.

At $\circlearrowleft_{opt.}$300.000 min^{-1} use in a turbine is also possible. (except KP6370).

Instruments with 6 mm working length

Cylinder, round edge

● **KP6836KR**.314.012/014/016

Cylinder round

● **KP6880**.314.012/014/016

Torpedo

● **KP6877**.314.012/014/016

Instruments with 8 mm working length

Cylinder, round edge

● **KP6837KR**.314.012/014/016

Cylinder round

● **KP6881**.314.012/014/016/018

Torpedo

● **KP6878**.314.012/014/016

Tapered, round

● **KP6856**.314.012/014/016/018/021

Instruments with 9 mm working length

Cylinder, elipse

KP6979.314.012/014/016/018

Tapered, elipse

KP6979K.314.021/023

Instruments with 10 mm working length

Cylinder round

KP6882.314.012/014/016

Tapered, round edge

KP6848KR.314.014/016/018

Torpedo

KP6879.314.012/014/016/018

Tapered, round edge

KP6847KR.314.014/016/018

Tapered, round

KP6850.314.014/016/018

Instruments with 12 mm working length

Cylinder, round

KP6882L.314.014

Torpedo

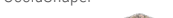
KP6879L.314.014

Tapered, round

KP6856XL.314.021

Occlusal/lingual reduction

OccluShaper



KP6370.314.030/035

Wheel

KP6909.314.040

Egg

KP6379.314.018/023

KP6379E.314.029

Bud

KP6368.314.016/023

PrepMarker

When creating ceramic restorations, it is important to already "think ceramic" during preparation and to adhere to the required minimum layer thicknesses.
The new PrepMarkers are designed for marking the preparation depth prior to the restoration.

The PrepMarkers are intended for all-ceramic preparations (e.g. (partial) crowns, onlays or overlays). They can be used from the occlusal, buccal, oral or vestibular side. PrepMarkers are equally suitable for new types of preparation, for example "Table Tops".

The instruments are available in 4 sizes: 0.5 mm, 1 mm, 1.5 mm and 2 mm. For easy identification, the preparation depths are laser marked on the instrument shank.

Photos courtesy of:
Dr. Olivier Etienne

Photo courtesy of:
Dr. Jürgen Wahlmann

DM05.314.009
T = 0,5 mm

DM10.314.009
T = 1,0 mm

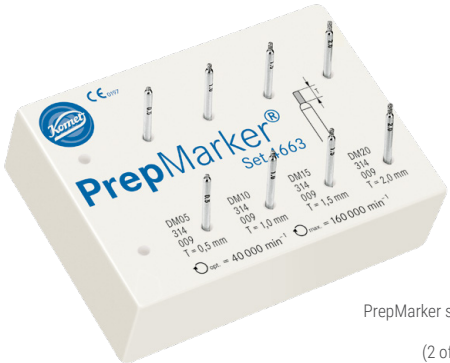
DM15.314.009
T = 1,5 mm

DM20.314.009
T = 2,0 mm

Speed:

- Recommended speed:
  Optimum speed:
  $\circlearrowleft_{opt.}$ 40.000 rpm

  Maximum speed:
  $\circlearrowleft_{max.}$ 160.000 rpm



Set 4663
PrepMarker starter set with
8 instruments
(2 of each version)

All-Ceramic Crown Cutting

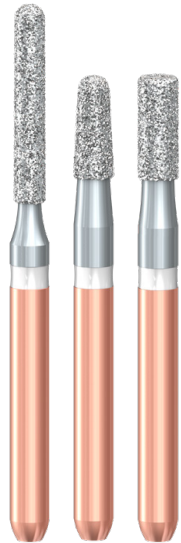
Rocky. A Breakthrough in Crown Cutting.

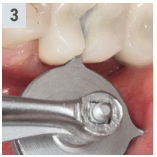
Ceramic crowns have become increasingly popular due to their durability and aesthetic appeal. However, their removal has posed a significant challenge for dental professionals, often requiring multiple instruments and lengthy procedures. That changes with Rocky – engineered to outclass existing solutions with a level of efficiency never seen before. With a remarkable 74%* increase in sharpness and an outstanding 87%* better cutting performance, this crown cutter slices through ceramic materials with unprecedented precision and speed – an industry-leading advancement.

Rocky's exceptional power lies in its innovative design. Its innovative*² diamond grit, developed after extensive research, ensures superior cutting performance and a notably longer service life compared to standard instruments. The crown cutter's extraordinary durability means that it has to be replaced less frequently, making it the most cost-effective and high-performing choice on the market.

Additionally, its distinctive rose gold shank not only provides a premium, signature look but also ensures instant identification in a busy practice environment.

The benefits of this next-level crown cutter extend beyond speed and strength. Rocky's unrivaled efficiency minimizes the effort required during crown removal.





For separating all-ceramic crowns, we recommend Rocky (aka CERCS or CERCSC). As with tungsten carbide crown cutters, apply the instrument at an angle of 45° to the crown surface to achieve best results. Apart from the axial wall, the incisal edge and, in case of molar and premolars, the occlusal surface should also be cut. This applies in particular to adhesive all-ceramic restorations.
To remove the restoration, this has to be widened until it fractures. This can be done with a lever or Planert crown widening pliers (DP 788R Aesculap Dental, Tuttlingen).
To grind down residual fragments, we recommend the CERC.314.012/014

○ **CERCSC**.314.016

○ **CERCS**.314.016

○ **CERC**.314.012/014

USP`s at a glance:

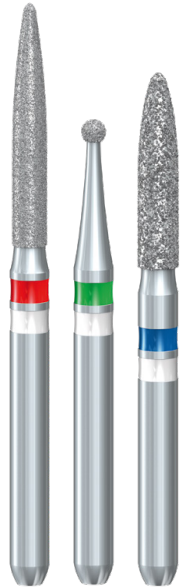
- **Time Efficiency:** Enables practitioners to save up to 87%* of the time required to cut a ceramic crown.
- **Exceptional Sharpness:** The new all-ceramic crown cutter offers unmatched 74%* higher initial sharpness compared to competitor products.
- **Extended Durability:** Designed with an exceptional lifespan, significantly outlasting existing products.
- **Innovative*² Diamond grit**: Delivers superior performance through an innovative, diamond grit unmatched by any other on the market.
- **Premium Design:** Features a distinctive rose gold shank for easy identification

* Source: Komet Dental TestLab, mechanical cutting test 2025
*²German utility model GM 20 2025 100 047

Work on all-ceramic restorations

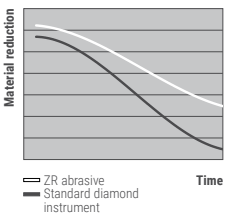
Grinding of ceramic abutments, trepanation or fitting of all-ceramic restorations constitute a real everyday challenge for the dentist. Comprehensive test series were carried out and as a result, we offer a special ZR abrasive with diamond grain, which is perfectly adapted to these special requirements.
The solution is a special bond, which bonds the diamond grains durably so that these abrasive instruments feature a considerably longer operating life and material reduction compared to conventional diamond instruments.

Different grains are available to suit the respective indications. Trepanation of all-ceramic restorations is preferably carried out with the instruments with coarse grain (green/white ring). When fitting the dental prosthesis, it is recommended to use finer instruments with medium (blue/ white ring) or fine grain (red/ white ring). The special ZR Komet abrasives are perfectly made for precise work on all-ceramic restorations and are sure to become an invaluable aid in every dental practice.

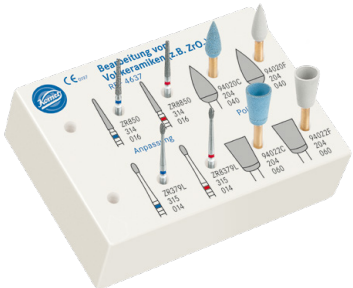


Recommendations for use

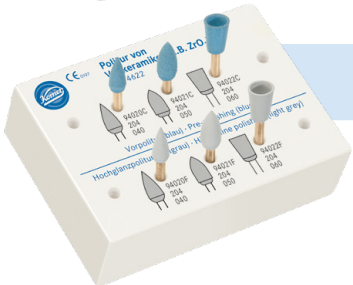
Efficiency of the
ZR abrasives



- Optimal speed:
  $n_{opt.}$ 160.000 rpm
- It is recommended to use the instruments in the red contra-angle, as the higher torque is advantageous for efficient work on all-ceramic restorations (compared to the torque of a conventional turbine).
- Use maximum spray coolant, especially during the trepanation procedure (min. 50 ml/min.).
- Apply low contact pressure (< 2N).



Set 4637
making small corrections and polishing of all-ceramic restorations (e. g. ZrO_2)



Also ideal for polishing SUPRINITY® glass ceramics made by the company VITA.

Set 4622
for polishing all-ceramic restorations (e. g. ZrO_2)

Handy hint:
A wheel-shaped version is also available 94012C.204.110 (pre-polishing) 94012F.204.110 (high shine polishing)

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