4

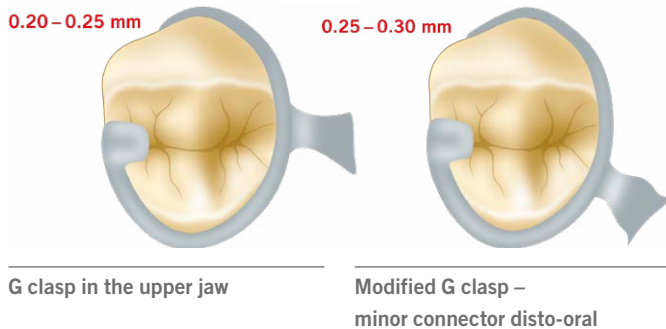# Clasp function and indication

Each clasp should have the following functions/components in order to meet its purpose as a retaining and supporting element in full:
• Support – dental rest
• Bracing – passive clasp arm and clasp shoulder
• Retention – active clasp arm (direct retainer)

Note: Rigid clasp sections serve as guide planes when inserting the denture, by guiding it evenly into its final position. With a large number of clasps and high undercut values, the patient must be shown on which abutment tooth he should insert or remove the denture first.

In the premolar area, modified G clasp are predominantly used in connection with terminal clasp teeth. The mesial support represents an indirect saddle extension. The minor connector placed in a disto-oral position improves the support value of the G clasp. By shifting the minor connector in the disto-oral direction, the distance of the passive arm to the rest is shortened, thus enhancing the stability of the rest. At the same time the active arm becomes longer.

0.20 – 0.25 mm   0.25 – 0.30 mm

G clasp in the upper jaw   **Modified G clasp –**
                                      minor connector disto-oral

Indications for the E clasp exist in connection with abutment teeth at small tooth-bounded saddles as well as on terminal molars. In contrast to the ring clasp, the E clasp offers the advantage that the distal field remains free. It is increasingly modified such that a clasp arm remains rigid as an embracement. Special importance is attached to the latter since it supports the insertion and removal of the denture in the specified path of insertion. In the case of very little pronounced retention areas, the E clasp is used in its original form with two retaining arms. If the retentive forces of the second clasp arm are utilized, the undercut depth can be reduced by 50 % with equal retention force.
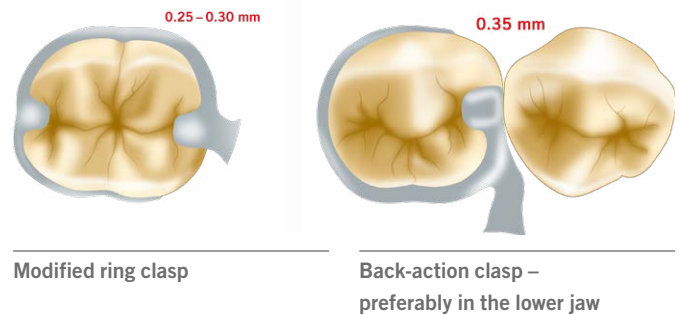
0.25 mm   0.25 mm

0.25 mm   0.00 mm

E clasp   **Modified E clasp with**
                         counter bearing
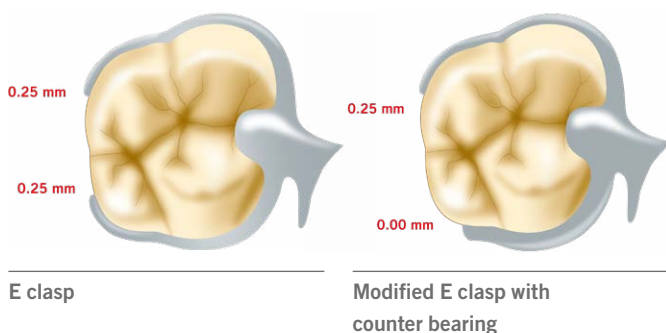
The ring clasp is reserved exclusively for the molar area.

Ring clasp made of WIRONIUM®

It is only employed if the respective undercut areas on the two sides of the jaw permit opposite ring clasps (corresponding undercut points). Since the solid clasp arm substantially covers the clinical crown, the ring clasp is recommended only for terminal and considerably tilted or shifted molars. In case the antagonist is missing in the opposite jaw, a second distally placed support may be indicated.

0.25 – 0.30 mm   0.35 mm

Modified ring clasp   **Back-action clasp –**
                                 preferably in the lower jaw

The Bonwill clasp is used almost exclusively as a static element with primarily splinting or blocking function.

Bonwill clasp made of WIRONIUM®

Images and illustrations are examples. Colors, symbols, designs, and information on the depicted labels and/or packaging may differ from reality.

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Since the necessary retention force is distributed to two teeth, critical abutments are relieved. Furthermore, the Bonwill clasp stabilizes a denture with very long, unilateral free-end saddles. In this situation the oral clasp arms must have a broad design without retentive effect.


0.25 mm
0.25 mm
0.25 mm
0.25 mm
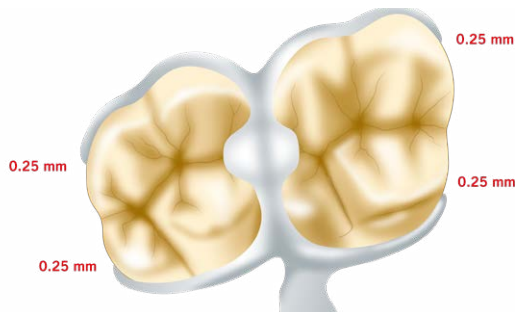
Bonwill clasp – four undercuts


0.25 mm
0.25 mm
0.00 mm
0.00 mm
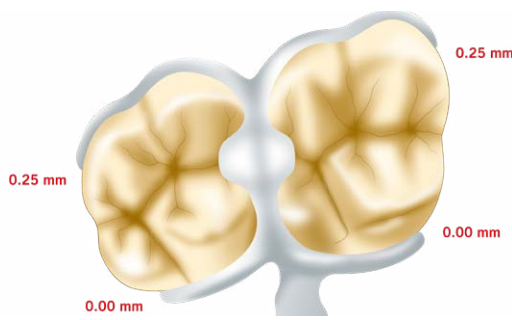
Modified Bonwill clasp – two undercuts

The indication for the Roach clasp is in the front and visible posterior tooth area. It is primarily used in the case of labial tilting of the front teeth in connection with a dental support. The modified C-shaped Roach clasp avoids marginal sore spots because the contact point of the minor connector to the clasp is located above the marginal gingiva.
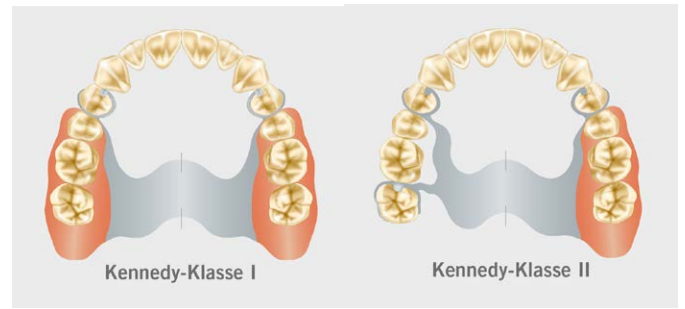

0.25 – 0.50 mm

Roach clasp

0.25 – 0.50 mm
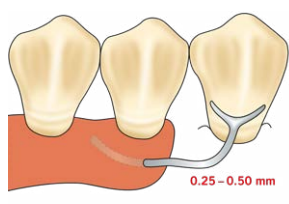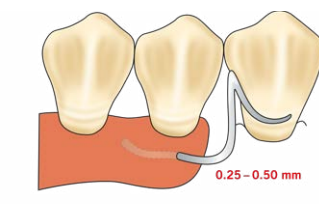
C-shaped Roach clasp

Weighing up functional advantages and disadvantages of the specific types of clasps and allocation to the main Kennedy classes help to find the right indication in each case.

Kennedy-Klasse I

Kennedy-Klasse II

Bilaterally shortened dental arch

Unilaterally shortened dental arch

Kennedy-Klasse III

Kennedy-Klasse IV

Lateral edentulous space

Frontal edentulous space reaching further than the middle line

4

G clasp

Other designations:
- E clasp with mesial rest
- Modified G clasp (minor connector distopalatal)

Indications:
- Premolars, to a limited extent molars (maxilla and mandible)
- Kennedy classes I and II, III prophylactically
- Inadvisable in case of pronounced distal inclination

Customary designs:
- Two-arm clasp
- Buccal retentive and oral rigid clasp arm with mesial rest away from the saddle
- Minor connector starting on distal side from tooth-bounded or free-end saddle

Functional advantages:
- Mesial support acts as indirect saddle extension and possibly compensation for tensile forces
- Niche formation is avoided, additional connector not necessary
- Passive clasp arm guides denture during insertion and stabilizes it during masticatory function

Functional disadvantages:
- Large-scale tooth coverage thanks to stable oral clasp arm that leads to rest
- If it is necessary to block out deep lingual undercuts the lower part of the passive clasp arm easily loses contact to the tooth surface
- Gap formation between the bottom of the clasp and the marginal gingiva can be expected with teeth having a short clinical crown
- Inadequate dimensioning of the passive clasp arm leads to an elastic, unstable rest
- Constriction of interdental space due to oral clasp arm leading to the rest

Aesthetic assessment:
- Unfavorable in front and visible posterior tooth area; modified form with disto-palatal connector is advantageous in terms of aesthetics

Situation-related modifications:
- Premolars with short clinical crown or pronounced infra-bulge may require that the passive clasp arm be positioned slightly occlusal
- Shifting the minor connector in the disto-palatal direction extends the active clasp arm and shortens the distance of the passive arm to the rest

E clasp

Other designations:
- Akers clasp
- Ney clasp 1
- Double-arm clasp with rest
- Three-arm clasp
- Modified E clasp (rigid embracement)

Indications:
- Molars, premolars (maxilla and mandible)
- Kennedy class III, to a limited degree IV
- On terminal tooth, with edentulous space in posterior tooth area
- With small edentulous spaces also in premolar area

Customary designs:
- Two-arm clasp
- One or two retentive clasp arms with rest near saddle
- Minor connector starting from tooth-bounded or free-end saddle

Functional advantages:
- Easy-to-determine path of insertion
- Two-sided retention field is possible
- Adjustable, evenly distributed withdrawal force
- Reliable insertion and removal of denture
- Stable support through proximity to saddle is guaranteed
- Indicated also with small undercut: due to the second retentive arm, the retentive forces are added together
- Two clasp shoulders: secure fixing to tooth
- Distal field of terminal teeth remains free of clasp elements
- Little risk of bending when activated

Functional disadvantages:
- Support near saddle (in case of shortened dental arch!)
- Short range of spring, only little undercut depth possible
- Weak effect against tensile forces (modified E clasp)

Aesthetic assessment:
- Unfavorable in front area and visible posterior tooth area because clasp shoulders are visible

Situation-related modifications:
- Design one clasp arm rigidly as embracement
- The reverse E clasp counteracts the tensile forces resulting in the case of long free-end saddles
- Design, for example, at terminal molars: mesial rest, mesio-oral minor connector, distal retention near saddle
- At canines a broad oral clasp arm or a rest overlapping on the incisal edge acts as a support
- As a small retainer with a short arm

Back-action clasp

Indications:
- Premolars, molars, preferably mandible
- Kennedy classes I, II and IV as well as III prophylactically
- In case of bilateral arrangement
- Not indicated in mandible if only little or no retention area exists in the case of pronouncing lingual tilt

Customary designs:
- Single-arm clasp
- Clasp arm ending in mesio-buccal direction
- Minor connector placed at the side of the interdental space (mesio-oral), shifted slightly towards the mesial rest if necessary

Functional advantages:
- Support away from saddle
- Support is stabilized through minor connector
- Long range of spring, large retention field
- Possibly make use of occlusal third of minor connector as a reciprocator / embracement
- Splinting element in case of terminal premolars that are tilted towards the saddle (distal inclination)

Functional disadvantages:
- Large-scale coverage of the natural tooth due to long clasp arm
- Niche formation between minor connector and saddle
- Clasp part near saddle must be elastically exposed in the acrylic
- No unilateral application: should be arranged correspondingly (opposite) as far as possible, otherwise one-sided horizontal shear

Aesthetic assessment:
- The long clasp arm can be placed deep in the buccal retention field at an early stage
- No clasp shoulder visible in buccal area, thus the back-action clasp is more favorable than the E or G clasp in aesthetic terms

Situation-related modifications:
- For molars place minor connector somewhat more in palatal direction instead of mesio-palatal; coverage of interdental space is avoided!

Ring clasp

Other designation:
- Single-arm clasp

Indications:
- Molars (maxilla and mandible)
- Kennedy classes III and IV
- In the case of interrupted dental arch, on terminal tooth
- Ideally bilateral arrangement so the denture does not tilt during insertion and removal
- Terminal, greatly twisted or tilted teeth
- For molars that have shifted with extreme change in position
- In the case of retention field near saddle

Customary designs:
- Single-arm clasp
- Clasp arm ending in mesio-buccal (maxilla) or mesio-oral (mandible) direction
- Minor connector starting from tooth-bounded saddle underneath the mesial rest

Functional advantages:
- Dentures with large tooth-bounded saddles are fixed securely by means of the long clasp arms
- Long range of spring enables deep undercut
- Retention area near saddle also secures the saddles against tensile force
- Distal shift of the clasp arm is prevented
- Favorable with tilted molars standing alone
- The cheek mucous membrane is not irritated by clasp tips when the denture is inserted

Functional disadvantages:
- Clinical crown is extensively covered
- Clasp shoulder with a broad end is necessary
- Risk of deformation of the long clasp arm during insertion and removal
- In case of deformation: ring clasp more difficult to activate
- Covers distal field of terminal teeth
- No unilateral application: must be placed opposite as far as possible; otherwise the denture is exposed to one-sided horizontal shear
- During removal the passive clasp arm does not act as an embracement because it loses contact to the tooth

Aesthetic assessment:
- Indicated only in molar area, aesthetic disadvantages are insignificant, focus is on function

Situation-related modifications:
- If necessary, second rest in distal area in the case of terminal lower molars tilted in the lingual direction

4

Bonwill clasp

Other designations:
- Modified Bonwill clasp (E clasp combined with ring clasp)
- Double E clasp (double Akers clasp)

Indications:
- Primarily molars, to a limited extent premolars (maxilla and mandible)
- Kennedy classes II, III and IV
- In closed dental arch
- In the case of slightly periodontally loose teeth (splinting element)

Customary designs:
- Four-arm clasp
- Two or four retentive clasp arms
- Minor connector shifted towards the double rest and placed sideways of the interdental space

Functional advantages:
- Increased support value since the load is distributed to two abutment teeth
- Compensates for horizontal shear (particularly important if only one half of the jaw is dentulous)
- Retention is distributed to four undercuts
- Indirect splinting of abutment teeth

Functional disadvantages:
- Clinical crown is extensively covered
- Occlusal parts of the clasp shoulders and rests impairs occlusion
- Adequate space must be prepared for rests and clasp shoulders
- Four clasp arms require solid minor connector
- Because of the position of the minor connector, unfavorable from hygienic point of view: remedial action through minor shift out of interdental space so the latter can continue to be rinsed thoroughly
- Difficult to insert: if the denture tilts, risk of injury to cheek mucous membrane by contact through clasp tips

Aesthetic assessment:
- Unfavorable at premolars, can be tolerated better as purely a molar clasp

Situation-related modifications:
- Combination of E and ring clasp (the latter arranged posterior!), advantageous with terminal teeth, tilting or mesial retention field, no risk of injury to cheek mucous membrane during insertion
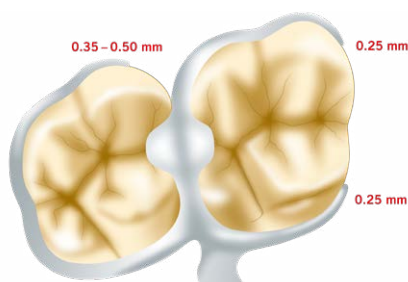
Roach clasp

Other designations:
- J clasp according to Scheu, T bar clasp, Y clasp
- C-shaped Roach clasp (modified, minor connector interdental!)
- Bonyhard clasp widespread incorrect designation for readymade Roach clasps (Bonyhard clasp = ball-button clasp!)

Indications:
- Front teeth, to a limited extent premolars (preferably mandible)
- Kennedy class I, II, III and to a limited extent IV
- In the case of front teeth greatly inclined in the labial direction as well as in visible posterior tooth area

Customary designs:
- Two-arm clasp
- Oral rigid clasp arm with mesial or distal rest, labial and/or buccal C-shaped or U-shaped retentive clasp arm
- Minor connector starting from distal side to the oral clasp arm and to the rest

Functional advantages:
- Also indicated in connection with extremely deep undercuts
- Easy to insert
- Little tooth coverage by clasp elements

Functional disadvantages:
- Unstable if design is too delicate - no longer has contact to the tooth after a short time because many patients use the easily accessible clasp for removal
- Unfavorable in terms of periodontal hygiene, self-cleaning impaired in minor connector area
- Minor connector often causes sore spots on marginal gingiva
- Because the clasp only has contact in the cervical third, the tooth can be pressed out in the labial direction (tongue pressure)

Aesthetic assessment:
- Hardly visible because in cervical third

Situation-related modifications:
- C-shaped Roach clasp: a connector shifted into the interdental space avoids sore spots on the marginal gingiva and offers more security against labial tilting

0.35 – 0.50 mm   0.25 mm   0.25 mm

E clasp combined with ring clasp

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