Instrument used for tooth preparation

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Introduction

• Before considering tooth preparation with rotary or any other instruments dentist must be aware of the instruments at his disposal so that the most suitable one should be used.

• Teeth are vital organs, so they must be treated with consideration.
Classification of rotary instruments

- Enamel
- Dentin
- Cementum
- Pulp
- Bone
- Ceramics
- Composite/polymers
- Amalgam
- Metals
  - Precious
  - Non precious
- Gypsum
Classification of rotary instruments

- **Material**
  - Diamonds
  - Tungsten carbide
  - Steel
  - Ceramic abrasives
  - Polishers

- **Shape**

- **Size**
Diamond instruments

- Production methods
  - Electrolytic bonding
  - Sintering
- The size of the diamond particles (the grit size) gives the coarseness of the
  - green-blue-red-yellow-white

- Use: cavity prep., tooth prep., correction on ceramics, polishing, finishing

20-40 µm
Diamond instruments
Tungsten carbide instruments hard metal (HM)

- Made from wolfram and carbide as major constituents
- Form under high pressure from the initial material
- Blade angle: 90°
- They are capable of smooth surface preparation in enamel and dentin, smooth finish line preparation
- Use: cavity prep., tooth prep., composite polish, bone surgery, cut of metals, work on polymers in lab.
Crown cutter
Hard metal instruments for amalgam removal
Stainless steel instruments

- Made from stainless steel base form using cutting machines
- Material: chromium and nickel containing wolfram steel
- Blade angle: 45 °
- Cutting mechanism
- Use: cavity prep., bone surgery !!!!
ISO numbering

806 314 168524 016

Material  Shank type  Shape and design  Nominal size in 1/10 mm (diameter)
The shank types

- **FG** = friction grip (314, 313, 315, 316)
- **RA** = right angle (204, 205, 206)
- **HP** = hand piece (103, 104, 105, 106)
Abrasive stones

- Working on metal alloys and ceramics
  - Silicon carbide
  - Arkansas stone
  - Corundum \((\text{Al}_2\text{O}_3)\)
  - Diamond

- Crystals are embedded into silicon polymer with bonding (szilikon)

- Used particles can break and produce a new sharp surface or fall out from surface.
Turbine

- Air driven
- Water cooling
- Low moment
- High RPM (not adjustable)
- FG instruments
- Direction of rotation is fixed
Micromotor

• Cannot be used alone
  • Contra ange or straight handpieces

• Electric motor

• High moment

• Adjustable speed (0-30000 1/min RPM) and direction
Straight and contra-angle handpieces

- Driven by micromotor
- Adjustable RPM and direction
- Water cooling
- High moment
- Color coding for the gear ratio
  - High speed – red (FG)
  - Low speed – green (RA)
Lab micromotor

- Adjusted RPM
- High moment
- Staright form
- Fast gripping fixation of instrument with 2.34 mm diameter
Thank you!