

All diamond instruments have been developed and designed for their specific applications. Therefore inappropriate use can bring about damage to tissues, to premature wear, to the destruction of the instruments and to hazard to the user, the patient or third parties. Rotating instruments for the medical area may only be used by doctors or other experts who due to their training and experience are familiar with how to safely handle these instruments. The diamond instruments are made from high-quality materials. They are developed, conceived and manufactured with the utmost care. Only proper use of these quality instruments ensures the best working results and a long service life. Therefore it is imperative to observe and adhere to the following usage and safety instructions.

### **Proper use**

It has to be ensured that only technically and hygienically perfectly maintained and cleaned turbines and hand- and contra-angles are used. The instruments must be clamped as deeply as possible. Before operating the instrument, check that it is securely sited; instruments with any kind of damage or contamination generally must not be used. Before placing instruments on the object, bring them up to their running speed. Avoid tilting or levering which can cause an increased risk of breakage. Depending upon use it is advisable to use goggles. Users must avoid touching the instruments without protection (Use protective gloves). Always avoid thermal damage due to rotating instruments (Work at low speed and with sufficient cooling). Using coarse-grained diamonds (ISO 534 and 544) can result in an increased thermal load. So ensure that there is sufficient cooling and exert only slight contact pressure when using these products. In order to achieve optimal surface roughness, subsequent finishing is required after using these instruments.

Instruments with rounded edges are preferable as preparing sharp-edged undercuts can lead to a damaging notching effect. Sharp-edged instruments are labelled correspondingly in our catalogue.

Only use the instruments for their intended purpose and observe the instructions relating to speed.

### **Instructions on speed**

Clamp the instruments as deeply as possible. Before operating the instrument, check that it is securely sited. If the maximum speed is exceeded, long pointed instruments will resonate around the tip, potentially destroy the instrument. If working parts are used with diameters greater than the thickness of the shaft, speeds which are too fast can generate strong centrifugal forces and cause the shaft to bend and/or the instrument to break. For this reason the maximum allowed speed must never be exceeded. The maximum allowed speeds are listed in our current catalogue and shown on the packaging.

### **Pressing forces**

Excessive pressing forces must be avoided. With grinding instruments (diamond instruments) excessive pressing forces can cause the grinding tools to break off or the instrument to clog up and to overheat (danger of thermal necrosis). In extreme cases an instrument breaking caused by excessive pressing forces cannot be ruled out either. Never tilt or lever the instrument while using it. Material is removed optimally at a pressing force of approx. 2 N. This roughly equates to the pressure which needs to be exerted when we write with a fountain pen.

### **Cooling**

Ensure sufficient cooling when using rotating instruments. In the event of insufficient cooling the cutting edges of the instrument get clogged up with splinters, which can cause irreversible damage to the tooth and surrounding tissues. In addition, the an instrument's service life can rapidly diminish. Ensure adequate cooling with an air/a water spray (at least 50 ml/min) to avoid undesirable heat buildup during preparation. Additional external cooling is required with FG instruments totalling over 22 mm in length or a head diameter of over 2.0 mm.

**Frequency of usage of rotating instruments**

The following are approximate values which can deviate from the actual service times depending upon use and/or processed material. The instruments can sometimes be used for longer periods if no wear is visible Diamond instruments: up to 25 x.

**Segregation of worn out instruments**

Check instruments regularly for blunting and damage using a lens. The following instruments have to be segregated:

- Instruments with bare patches (in the case of diamond instruments)
- Instruments with damage to the shaft
- Bent instruments or those which do not rotate true

Blunt and cracked instruments can lead to high pressing forces and therefore raise the operating temperature. Therefore segregate damaged instruments immediately. If these instructions are not followed, instruments may break and endanger the patient and user!