1. **General product specification**

innoBlanc htp discs are milling discs for the production of permanent and provisional restorations either fixed or removable made for the chipping process in the CAD/CAM technology. Base is an industrial, high-meshed thermoplastic acrylic polymer.

For innoBlanc htp, only granulated, medically tested PMMA raw material which is polymerized in a special process and which has no toxic or allergic accessories is used. The material is processed in an industrial injection molding under highest quality control.

For the colouration, colour pigments with FDA (Food and Drug Administration/USA) licence are used

**Available measures**
Strength of the disc 15mm / 20mm / 30mm

**Available colours**

| bleach   | pearl    | grey-yellow | sunny | aurora | maroon |

Note: There can be a difference between the colours of the manufactured restorations and the recommended reference colours of the recommended Vitapan colour ring due to different geometries and volumes of the objects.

2. **Material composition**

- Acryl polymer on the basis of Methyl methacrylate
- Colour pigments

3. **Way of production**

innoBlanc htp discs are produced in special industrial injection moulding methods which are controlled according to DIN EN ISO 9001. Development, design and clinical assessment are operated at innoBlanc GmbH according to the regulation DIN EN ISO 13485 - appendix II for medical products.

Depending on indication and case, the constructions made of htp can be used as provisional (max. 180 days, semi-permanent > 24 months) or permanent restorations.

4. **Indications and application duration**

In principle, the indication and duration of application depends on the patient, the treatment aim and the geometry of the construction.

Concerning this item, you find support in the indication list and material characteristics chart on www.innoblanc.com.

Due to their mechanical values and the tri-biological characteristics, high performance resin materials on the basis of unfilled PMMA have restrictions with regard to elasticity, bending strength and abrasion resistance opposite to e.g. PVDF and Peek materials or filled PMMA materials and composites.

**In general, we consider the following indications to be contra-indicated:**

- Bridges in the posterior area with more than 2 bridge units in molar size/too small connector cross sections (see design, item 5) particularly in the lower jaw and in case of implant supported restorations
- Brackets and bracket model casts
- Narrow transversal ribbons or sublingual brackets
- Bars

5. **Design of the construction**

**In general**
High performance polymers based on PMMA are situated in the mechanical area between elastic and brittle. Therefore, for the construction take into consideration that you have sufficient connector strengths, crown wall thicknesses and an optimal friction of the pillar crowns.

(See also cementing).

**Design for veneering**
In principle, vestibular veneering is possible. Anyway, we recommend you to take the following construction characteristics into consideration:

- Design watch-glass fittings
- If possible, mill-in retention pearls or scoring structure ("rice terrace design").
- If possible, a thin, labial or circular shoulder (1mm).
- Ideally suited is a complete veneering according to the multilayer design (press-on method in flask technology, gluing structures (digital veneering) in split file technique e.g. with a composite split file).
- No antagonistic contacts in the transition zone frame/veneer.

(See also individualization/veneering)

**Recommended geometries for the frame construction (measures of a 3-unit bridge)**

**Note:** Exhaust the height for the construction of a connector to the highest possible measure!

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**Anterior Bridge**

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<td>1</td>
<td>0,6 mm</td>
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<td>0,8 mm</td>
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<tr>
<td>2</td>
<td>1,0-1,2 mm</td>
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<td>1,0-1,2 mm</td>
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<tr>
<td>3</td>
<td>10 mm²</td>
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<td>16-18 mm²</td>
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**Posterior Bridge**

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<tr>
<td>1</td>
<td>0,6-0,8 mm</td>
<td>1</td>
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<tr>
<td>2</td>
<td>1,2-1,4 mm</td>
<td>2</td>
<td>1,2-1,4 mm</td>
</tr>
<tr>
<td>3</td>
<td>16-20 mm²</td>
<td>3</td>
<td>22-25 mm²</td>
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<tr>
<td>4</td>
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<td>20 mm</td>
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1. = Wall strength
2. = Occlusal strength
3. = Connector strength
4. = Clamping width

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### 6 Manual processing

We recommend to use special milling instruments for **rough treatments** with the hand piece, like you use them for the treatment of non-hardening materials or e.g. Acetal (e.g. FSQ miller). Black ring milling instruments are ideally suited for titanium.

For the **fine preparation** use your common, cross linked red ring HM millers.

For the **preparation of the high gloss polish** classical grinding cords up to 1000 µm grain are uses as well as fine or medium-sized pumice stone flours. Rubber polishers endanger the smearing of the surface.

The **high gloss polish** is made with e.g. Sidol, Viss barn milk or suitable polishing pastes. The use of diamond polishing pastes is not necessary mandatorily.
Note: PMMA is a thermoplast. Avoid a too heavy pressure as this causes an overheating and smearing of the material.

CAD/CAM Milling Instruments

For the milling of innoBlanc gingiva discs we recommend to use cutting tools (e.g. innoMill-S-53ballD1,0) or you mill with cooling agents (wet milling). Otherwise it may cause a fusing of the material.

7 Surface conditioning

Preparations of the surfaces

Note: High performance PMMA produced in the industrial injection moulding method has merely a rest-content of monomers of less than 0.5%. The surface is very thick, the structure is dense and there are no free connections at the surface. This aggravates a chemical connection to other polymers, such as cold polymerisates. Therefore, an optimal conditioning of the surfaces before veneering or gluing is important.

Conditioning
- Blast the surface careful with aluminum oxide, 110 µm at 2.5 bar pressure
- Blow
- Apply primer. We recommend for example Visio Link (Bredent) CRB Bonder (Shofu), Rocatec (3 MEspe), Metal Primer (GC), Monobond plus (Ivoclar) or the composite primers with the manufacturers of the veneering resins recommend.
  (The recommended products do not lay any claim to completeness and do not represent any evaluation)

Please ask the manufacturer whether an intraoral application is also possible (such as CRB Bonder, Shofu).

8 Veneering

innoBlanc htp can be individualized with common veneering- and composite- materials.

In case you use veneering materials with a different glaze grade, we recommend a complete covering of the labial area to achieve an identical glaze.

Ideally suited is the use of a veneering material with an identical or similar modulus of elasticity like the one of the frame material. For removable denture, this is necessary to avoid gaps or separation of very brittle resin materials (e.g. highly filled composite) due to the self-movement of the construction.

For removable constructions we therefore recommend a complete veneering of the crowns and the application of a circular shoulder (1 mm).

Also the bonding of e.g. milled composite over-crowns in multilayer technique is possible if you design in split file technology e.g. with the Dental Designer of 3shape.

9 Individualization and plaque vulnerability

Full anatomical frames made of innoBlanc htp can be individualized with corresponding painting colours according to the instructions of the manufacturer (e.g. Lite Art/company Shofu).

Note:
Light hardening colours for the individualization or light hardening varnishes increase the risk of a plaque settlement.
The best protection against plaque vulnerability and superficial discourlarations of innoBlanc htp is a homogeneous, by polishing compressed surface of the pure basic material.

10 Extra oral agglutination (e.g. emergence build-ups, components in the multilayers' technique.)

Preparation of innoBlanc htp

See item 7 preparations of the surfaces

Preparation of zirconium dioxide frames
- Blast the surface careful with aluminum oxide, 50 µm at 1-1.5 bar pressure
- Degrease with acetone or ethyl acetate (one-time brush, q-tip). Ventilate well.
- Silanization/apply primer (e.g. Monobond plus (Ivoclar), Alloy Primer (Panavia/Kuraray), Metal Primer (GC) or similar products.

Preparation of adhesive build-ups made of titanium
- Blast the surface careful with aluminum oxide, 50 µm at 2.5 bar pressure
- Degrease with acetone or ethyl acetate (one-time brush, q-tip). Ventilate well.
- Silanization/apply primer (e.g. Monobond plus (Ivoclar), Alloy Primer (Panavia/Kuraray), Metal Primer (GC) or similar products.

Use and preparation of glues
We recommend the use of a self-adhesive, dual hardening composite glue for dental need. Please follow the instructions of the manufacturer (e.g. Panavia 2.0 (Kuraray), multi-link Implant (Ivoclar), Rely X Unicem (3 M Espe), Vario link (Ivoclar) and others) or use suitable adhesives for prosthetic applications.

We recommend to preheat the gluing material at approx. 50°C before use. This causes to a better viscosity (easier, gap-free assembling) and increases the polymerization degree.

In case you glue parts with adjustment spools (e.g. sticking post) we recommend marking the abutment with a pen to insure a safe positioning. Lock screw holes with wax.

11 Cementing

Provisional
Provisionally inserted works, which were removed and newly inserted during the provisional phase, can be inserted with provisional cements (e.g. Temp bond) or glass-ionomer cements (e.g. abutments). If the definite work is later inserted, adhesively, we recommend the use of non-eugenol cements.

Note: Milled CAD/CAM resin materials show a very smooth, dense surface, with a low self-friction. Moreover, in case of conical dye preparation, they show a hardly noticeable but existing elastic behavior. The friction cannot be compared with the friction of a metal crown (sticking fit). Also see “preparations for the frameworks for cementing”.

Semi-permanent/permanent
Due to the high polymerization grade, and therefore also the small content of remaining polymer, the cementing for permanent or semi-permanent insertion has to be prepared and made carefully.

In general, self-adhesive cements are superior to all other cement types.

The following cement types are ideally recommended:
- Crowns and bridges with a sufficient retention, (long, clinical crown, steep preparation angle, self-friction available) glass ionomer, self-adhesive
- Crowns and bridges with a strong conical preparation, short clinical crown, crowns on abutments self-adhesive
- Inlays, partial crowns adhesive

Examples of cements: Provisional/eugenol-free: Temp bond EF
Self-adhesive: E.g. Panavia 2.0 (Kuraray), multi-link implant (Ivoclar), Rely X Unicem (3M Espe))
Adhesive: E.g. Syntac-Classic+Tetric Flow

Preparations of the inner crowns:
We recommend the following preparation:
- Frame fitting in situ - clean - dry
- Blast the surface careful with aluminum oxide, 50 µm at 1-1.5 bar pressure
- Degrease with acetone or ethyl acetate (one-time brush, q-tip). Do not insert! Ventilate well.
- Apply silanisation. We recommend e.g. Rocatec (3MEspe), Metal Primer (GC), Monobond Plus (Ivoclar) and others.

12 Chemical Duration / Cleaning and Sterilization

Steam Cleaning
innoBlanc htp is a termoplastic polymer. Please clean only carefully by steam (max. possible short-time temperature at 100°C) to avoid the deformation of filigree parts.

Sterilization and Desinfection
Parts made of innoBlanc htp can not be sterilized in an autoclave. Due to the temperature and the pressure needed, deformations and an elevated water absorption can occur.

Consistency
innoBlanc htp is resistant against thin acids, bases, grease and oil. You absolutely have to avoid a contact or cleaning with organic solvents and strong acids (like e.g. acetone, ether, ethyl acetate, concentrated alcohol, benzol, CKW, stain remover, hydrochloric acid, Tulol)

Fixed Denture
Use middle-hard tooth brushes and non-abrasive toothpaste. After a professional cleaning, e.g. with air flow, it is necessary that the surfaces are polished to high-glaze again to avoid plaque attachments and discolourations of the surface.

Removable Denture
Do not use chemical prosthesis cleaner. No abrasive cleansing agents. The use of a middle-hard tooth brush and a non-abrasive toothpaste or mild cleaning soap is sufficient.
Note: You absolutely have to avoid highly concentrated cleaning alcohols / clinical alcohols, as they can cause tension crack-corrosion. An ultrasonic with non-abrasive cleansing agents (e.g. Pril) can be used.

13 Storage/store conditions

**Ideal storage temperature**
No extreme temperatures, optimal are 15 - 20 ° Celsius.
10 - 40 ° Celsius is unproblematic.

**Environment**
Dry, no humidity, no high air dampness, storage in the inside area.

**Light**
No direct sunlight, no illuminants with high UV share, optimal in the shade.

**Resistance and contamination**
Contact with other substances, as e.g. with oils, greases or solvents, has to be avoided.

Maximum durability of the disc without loss of the material qualities at the store conditions given above:
5 years.

14 Disposal

Remains of milled discs etc. can be disposed of over the domestic rubbish.

15 Final remarks

All details are based on our own experiences and of details out of the literature which we have listed in the clinical assessment of the innoBlanc. The statements and recommendations made do not lay any claim to completeness.

We reserve the right to change these instructions of use.