



## User instructions

# Interaction Veneering Investment (IVI)

Phosphate-bonded investment with mixing liquid to manufacture heat resistant duplicate dies

Made in Germany



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### Introduction (indication)

Interaction Veneering Investment is a very precise investment to manufacture heat resistant duplicate dies onto which ceramic objects are built using the individual (Interaction) layering method.

The technique is based on an existing technique from the 1990s. At Elephant called, the successful Flexo-Ceram Inlay System.

Interaction Veneering Investment can be used effectively with both Antagon Interaction and Carrara Interaction.

### Physical properties

|                    |  |
|--------------------|--|
| Mixing ratio       | : 20 ml liquid - 100 grams powder                                    |
| Mixing time        | : 20 seconds in a vacuum   |
| Setting expansion  | : approx. 0.8% at 21°C and with IVI liquid                           |
| Working time       | : approx. 5 - 7 minutes at 21°C and with IVI liquid                  |
| Thermal expansion  | : approx. $12.7 \times 10^{-6} \mu\text{m}/\text{m.K}$ (25 - 500°C)  |
| Pressure intensity | : approx. 15 MPa before degassing and approx. 25 MPa after degassing |

### Warning

This product contains respirabel silica. When inhaled respirabel silica can cause silicosis and is suspected to be carcinogenic. Avoid inhalation, consult MSDS for precautions: [www.elephant-dental.com](http://www.elephant-dental.com).

### Processing

#### Producing the duplicate die(s):

1. Make a duplicating mould of the die(s) to be duplicated using a thin liquid addition silicone duplication material, such as Sillflex Orange Speed.
2. Treat the silicone surface with a tension-reducing agent. Carefully blow the surface completely dry afterwards, making sure to remove all residue.
3. Weigh out the powder accurately (25 grams is sufficient for 4 dies).
4. Carefully measure the required amount of undiluted liquid.

**Mixing ratio:** 5 grams powder – 1 ml liquid

5. Add the powder to the liquid and pre-mix briefly in a small mixing beaker using a spatula.
6. Then mix for 20 seconds with vacuum.
7. Fill the duplicating mould with small amounts of mixture. Prevent the inclusion of air bubbles.
8. Leave the die(s) to harden for at least one hour.
9. Reduce the volume of large, solid dies where possible. This is important because of the heat absorption during the ceramic firing phases.

#### Degassing:

Place the die(s) in a ceramic furnace and degas according to the table below

| Start temp. | Dry     | Vacuum start | Rate of heat increase | Final temp. | Hold time (with vacuum) | Hold time (without vacuum) | Cooling down |
|-------------|---------|--------------|-----------------------|-------------|-------------------------|----------------------------|--------------|
| 500°C       | 10 min. | 500°C        | 55°C/min.             | 1050°C      | -                       | 5 - 10 min.                | -            |

After degassing, the investment should have an even grey/white colour and no grey or dark discolorations should be visible.

Repeat the degassing procedure (if necessary at a 10°C higher final temperature) if there are any discolorations.

#### Applying the ceramic layers:

1. Begin by saturating the die(s) in distilled water, before applying the ceramics.
2. Dab off any excess water using a tissue.
3. Mix the ceramic mass with the matching ceramic mixing fluid until it forms a firm mixture.
4. Apply the necessary number of ceramic layers and build the required ceramic shape.
5. Fire the ceramic according to the applicable firing parameters.
6. If necessary, a second layer can be applied and fired. We advise wetting the die again before this procedure.
7. It is not necessary to wet the die again for the glaze firing phase.
8. When all firing phases have been completed satisfactorily, the investment can be removed. Remove the investment by blasting with glass beads at a maximum pressure of 2.5 bar.

#### Tips & recommendations:

- Cool down **slowly (at least 7 minutes)** when using in combination with **Antagon** Interaction.
- Cool down **quickly (0 minutes)** when using in combination with **Carrara** Interaction.
- To avoid unwanted and unnecessary problems with air bubbles and/or adhesion, we advise rinsing the investment dies in running water **AFTER** degassing.