PRINTING GUIDANCE RAYSHAPE CAST RESIN

1. Layout requirements
   - For the crown, the supports are added on the crown's surface; while for stents or veneers, the supports are added on the non-assembly surface.
     - Required parameters:
       - Contact ball 0.5mm Ø
       - Without ball contact, support trunk 0.8mm Ø
       - Support density 2.5mm Ø

2. Printing requirements
   - Select the correct printer and material
   - Print with a 0.05mm layer thickness
   - The curing depth of the cast is relatively thick, and the z-axis compensation should be taken to ensure the proper thickness of the cast
   - For the missing tooth, to avoid the deformation caused by the solid structure, the model should be hollowed
   - Please ensure the material is mixed well

3. Post-processing
   - Use Centri™ Print Wash or equivalent but avoid an IPA
   - Soak in an ultrasonic or bath twice, for 1 minute each cycle
   - Do not immerse for too long as the wax models are easy to deform
   - The material does not require curing, do not attempt
   - Remove the supports with scissors or a wax knife and ensure the resin is dry

4. Casting requirements
   - Select an investment suitable for 3D print resins
   - The initial water-powder ratio shall be selected according to the material's instructions
   - Adjustments might need to be made to take into account different ambient temperatures and humidity levels
   - Set the furnace to 800℃ for firing and then ramp to 900℃ and hold for 1 hour

5. Common problems
   - Scan data
     - Check and confirm the projector focusing and the optical path status
     - Nine square column test (verify centre distance)
     - Standard model test, adjust material parameter
   - Deviation in thickness
     - Confirm the designed thickness(measure the thickness of the STL file)
     - Select appropriate Z-axis compensation
   - Different tightness of front and rear teeth
     - The diameter and the length of the lateral wall are different, so other designed parameters can be selected according to the actual situation
   - The printed inner crown is too tight
     - Increase the predetermined cement gap and adjust accordingly (according to the tooth position and bridge length)
     - The printed inner crown should be cleaned with alcohol, dried with the air gun, and then fit on the dental model

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- The printed inner crown is too loose
  - Increase the predetermined cement gap and adjust accordingly
  - The designed wall thickness is too thin
  - Too much Z-axis compensation
- The inner crown has warped
  - Check and confirm whether the adhesive gap and the additional adhesive gap are correct
  - Check there is enough space between the missing tooth, residual root and inner crown (it can be confirmed by grinding off the lower part of the missing tooth and the place where the plaster contacts)
- The long bridge is not in the position
  - Sometimes the adjacent area is too deep to be scanned, and software will be used to complete the design, so there will be errors
- Layer striation on the model
  - The model is designed too thin
  - The environment temperature is too low, and the viscosity of the material increases. It is recommended to maintain the environment temperature between 25-30℃
- Elements of the print are missing
  - Check the optical path, and confirm whether the projection is normal
  - Issue with the supports;
    - Insufficient supports
    - The top width is too thin
    - Distance in part is short
  - The resin tank film is broken
  - There are some impurities and fragments in the resin tank
- Ring burning and cracking
  - Ensure you are using a suitable investment for 3D printing resins
  - The furnace temperature is not enough
  - The sprue is cushioned at an angle downward
  - Do not overlap the rings as much as possible, so as not to crack the rings due to uneven heating
  - Do not close the furnace door prematurely if there is no exhaust port
  - When adding the casting pass, the missing position shall be a thick wax line, generally a 2.5mm wax line
- The casting surface is rough with sand holes
  - The temperature and time of the firing ring are not enough
- Casting sample deformed
  - Designed wall thickness should be 0.3+mm
  - Hollow the solid teeth and perforator
  - The sprue is reserved at each tooth position to strengthen the tension
  - Adjust the water-powder ratio without affecting the tightness
  - A crossbar support can be added to the lingual surface of the teeth
- The casting inner crown is too tight
  - Consider adjusting the proportion of water-powder of the investment. If the crown is tight, it means that there is more water and if the crown is loose, it means that there is less water. Pay attention to the possibility that the reduction of water will increase the possibility of the bridge body warp