Porcelain Application, Staining, Glazing and Polishing of Metal Ceramic Restoration

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Porcelain Application

- Opaque porcelain
- All porcelain margin
- Dentine and Enamel porcelain
- Porcelain surface treatment
  - Natural or Auto glaze
  - Applied glaze
  - Polishing with rubberized abrasive and compound
Opaque Application

- Objectives of opaque layer:
  - Mask the metal
  - Restore the basic shade
  - Initiate the porcelain-metal bond
Opaque Application

**Method**

- Opaque powder is mixed with distilled water or special liquid
- A thin wash layer is applied with a brush
- No through mask is done with initial opaque layer
- Coping is dried and fired under vacuum
Opaque Application
Opaque Porcelain

- Second opaque layer is applied to mask the metal
- Opaque layer should be as thin as possible
- Coping is gently vibrated to condense porcelain and remove excess water
- Opaque layer of porcelain should be approx. 0.3 mm thick
All Porcelain Margin

Direct lift technique

1. Mark the finish line on die
2. Brush on special sealing material on die
3. Blow the excess off
4. Apply a lubricant or porcelain release agent
All Porcelain Margin

- Mix the margin porcelain with investment liquid
- Which hardens as the wet porcelain mixture dries on die without fracturing the margin
- Add initial increment of shoulder porcelain
- It extends 2-3 mm on the coping
- Condense & blot it dry with tissue
- Carve the porcelain
All Porcelain Margin

- Smoothen the porcelain at the margin with stable condensing brush
- Carefully tease the coping from die
- Inspect inside of casting
- Place the coping on sagger tray
- Fire the porcelain under vacuum
- At temperature recommended by manufacturer
All Porcelain Margin

- Inspect the casting on the die after firing
- Small opening may be found
- More shoulder porcelain can be added
- Firing is carried on again
- When the margin is satisfactory proceed with dentin and enamel build up
Dentin and Enamel Build-up

**Dentin Build-up**
- Mix the dentin porcelain with distilled water or special liquid.
- Apply it over the opaque with a stable brush.
- Start at the gingivofacial of the coping.
- Develop full contour of crown.
- Vibrate to condense.
- Absorb excess liquid with tissue.
Dentin and Enamel Build-up

- Completed build-up should be over contoured
- Carve the dentin back to allow placement of enamel porcelain
Dentin and Enamel Build-up

- Cut back commonly to produce some form of level on the incisofacial segment of build-up dentin
- Apply the enamel porcelain to restore the full contour
- Condense & blot the excess liquid
Dentin and Enamel Build-up

- Porcelain exhibits significant linear firing shrinkage
- Typical central incisor crown would shrink up to 0.9 mm at the incisal edge
- Restoration should be slightly larger incisally to compensate for the shrinkage
- One-fifth larger than desired size
Dentin and Enamel Build-up

- Add into the proximal area
- Remove excess from unveenered metal at the junction
- Tease the crown from the die
Dentin and Enamel Build-up

- Build up is dried in front of the furnace
- Fired under vacuum
Dentin and Enamel Build-up

- Try the restoration back on working cast
- Proximal contact often need addition
- Insufficient contour can be corrected
Dentin and Enamel Build-up

- Following correction, baked crown may not seat completely
- Adjustments are made with diamond disc, aluminum oxide stones or carboundrm stones.
Porcelain Surface Treatment

- Desired contour & occlusion have been achieved
- Restoration is ready for surface treatment
Try in the Patient mouth
Porcelain Surface Treatment

Natural or Auto glaze
- Porcelain has the ability to glaze itself

Applied over glaze
- Applied over glaze is a low fusing clear porcelain
- It is painted on surface of restoration and fired

Polishing
- Rubberized abrasives and polishing compound are available to polish porcelain
Natural Glaze

- Applied glaze is indicated in situations where porcelain loses its ability to form natural glaze after multiple firings
- Caution must be exercised not to over fire the porcelain
- Over firing leads to a condition known as divitrification
- Porcelain becomes more crystalline and milky or cloudy in appearance
Polishing

- Relatively in small areas of adjustment e.g.: proximal and occlusal contacts
- It is regarded as rougher surface
- Jacobi et al showed polished porcelain to be less destructive to tooth structure in the opposing arch than glazed porcelain
Shade Modification

Custom staining

- Dark shade is impossible to lighten
- Used to create fracture lines
- Areas of discoloration
- To give natural appearance
The new VITA Akzent stains are available for staining porcelain restorations. The coarse-particle Fumo stains are intended to be used to imitate plaque accumulations (fumo 1 – Akz 18 to fumo 3 – Akz 20).