

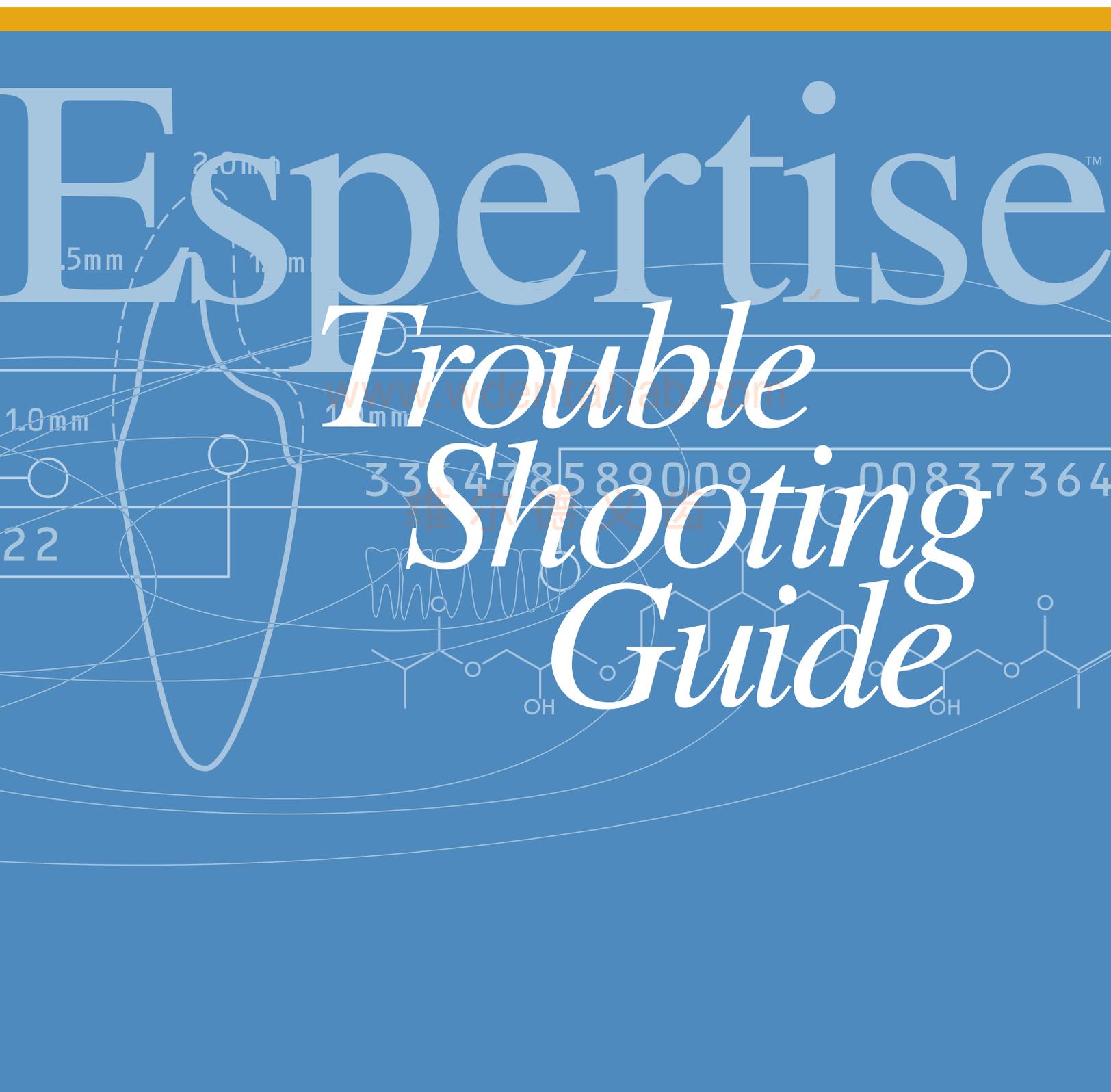
**3M** ESPE

Making Better Impressions

Expertise™

*Trouble*

*Shooting*  
*Guide*



# Making Better Impressions

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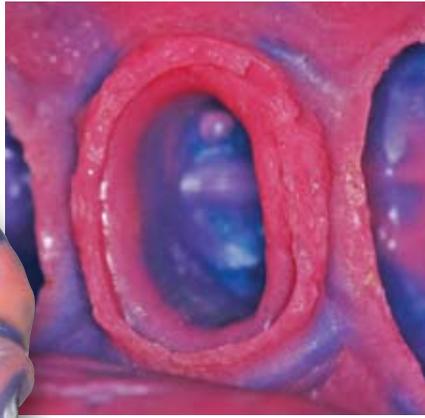
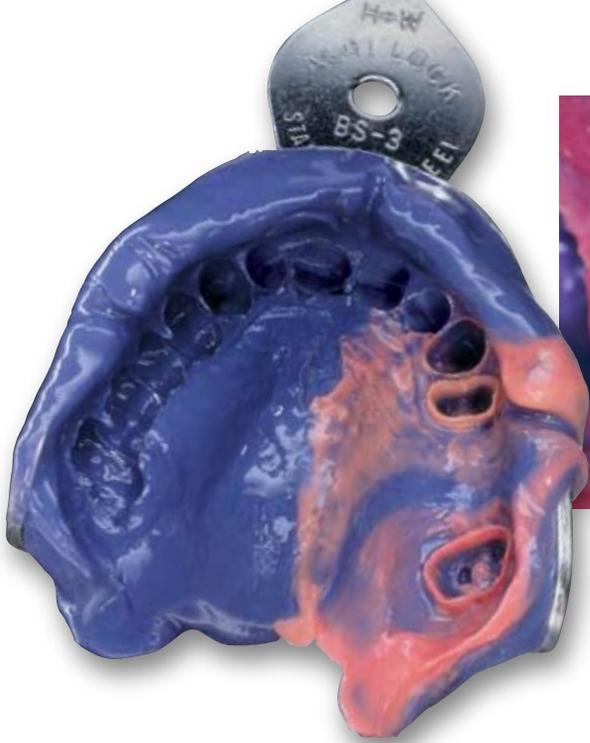
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## A Troubleshooting Guide

This guide is a part of an educational program of product-related information sources from 3M ESPE, designed to help improve technique, solve problems and help you make more informed decisions.

Even the most experienced practitioner, using the best materials, can encounter difficulties when making an impression. 3M ESPE has a long history in developing and testing impression materials. The information assembled in this guide is based on our experience and clinical input, and is intended to help identify common impression problems and offer solutions. This information should help you avoid costly and time-consuming remakes or adjustments to crown and bridge restorations.



3M™ ESPE™ Impregum™ Polyether Impression Materials.  
Photos courtesy of Jorge Perdigao, DMD, and Holmer Meiser, DDS, University of Minnesota.

## Guidelines for a Good Impression

Making an accurate and detailed impression is the first and most important step in creating superior prosthetic restorations for your patients. A good impression will have the following:

1. Uniform, homogeneous mix of material
2. Tray is sufficiently filled with impression material
3. Thoroughly applied tray adhesive
4. Rigid, sturdy impression tray
5. No voids or pulls on margin detail
6. Detailed margins with no tears or rough surfaces
7. No tray show-through of the impression material
8. Good blend between heavy body and light body materials
9. Strong bond between impression material and tray
10. No tooth contact with the tray
11. Complete information about the impression material used provided to the dental laboratory



3M™ ESPE™ Imprint™ 3 VPS Impression Materials.  
Photos courtesy of Dr. Med. Dent Gunnar Reich, Munich, Germany.

# Inhibited or Slow Setting

**Visual Appearance:** Impression not completely set. Shiny, no detail of site.

**Result:** Inadequate surface detail on stone cast, poor fitting restorations.

## CAUSE

## SOLUTION

### For Vinyl Polysiloxane Materials

Sulfur inhibition due to contact of latex gloves with tissue/tooth/retraction material or impression material.

Wear gloves proven not to contain traces of sulfur.

If contamination is suspected, scrub affected area with diluted hydrogen peroxide.

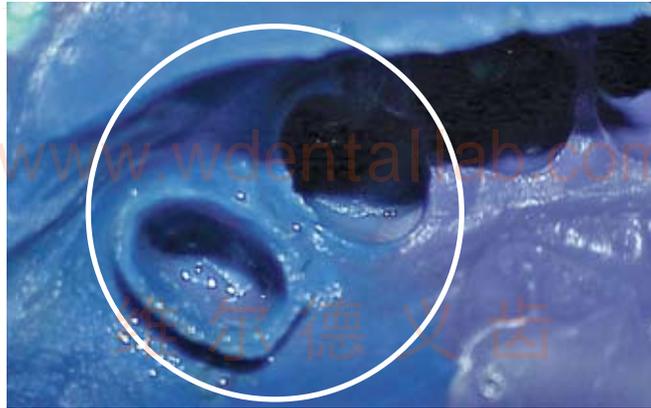
Residues from custom temporary or provisional cements (acrylics) present.

Do not use impressions already used to fabricate the temporary restoration.

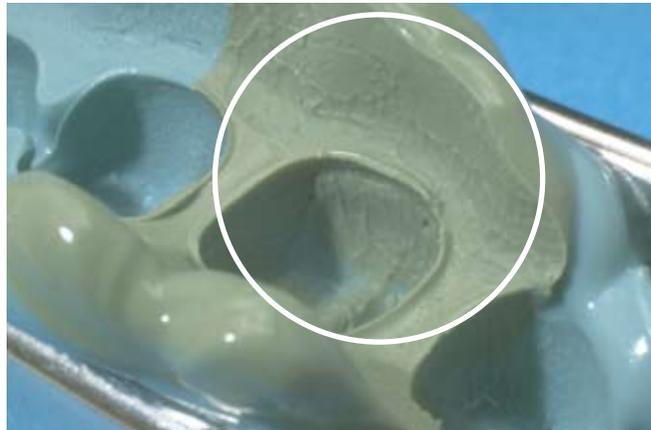
Fabricate the temporary crown or bridge after final impression has been made.

Remove air-inhibited layer on the exposed surface with an alcohol wipe before making final impression.

*Continued*



**Inhibited Setting**



**Surface Inhibition**

## CAUSE

## SOLUTION

### For Polyether Materials

Substances with pH < 4 inhibit setting reaction, most commonly by the contact with acidic retraction materials and hemostatic agents containing epinephrine or ferric sulfates.

Use retraction materials having pH  $\geq 4$ .

Select retraction materials and hemostatic agents not containing these chemicals.

Rinse, remove, dilute hemostatic solution with water spray and suction. Dry before taking the impression.

### For VPS and PE Materials

Expired impression material does not set properly, elastomeric properties are insufficient.

Check expiration date of impression material.

Inadequate mix.

Bleed before applying mix tip to ensure even dispensing.

Use mix tip according to manufacturer's instruction for use.

Ensure mix tip is correctly attached.

When using hand-mix materials ensure correct mixing ratio and thorough mix of catalyst and base paste.



**Inadequate Mix**

# Lack of Impression Detail

**Visual Appearance:** Muted detail reproduction.

**Result:** Crowns may be too tight, or loose, and not fit correctly.

CAUSE	SOLUTION
Impression material stored at elevated temperature.	Store impression material at room temperature.
Impression material stored at too low a temperature (prolongs the setting reactions, changes viscosity and requires exceptionally high extrusion forces for automix materials).	Keep impression material at a temperature of 18°C/64°F at least one day prior use.
Thick blood/saliva pooled around prep.	Remove blood and saliva prior to making impression.  Use 2-step impression technique.
Inadequate retraction of sulcus around prep.	Use good retraction technique, with proper moisture control.
Exceeding the working time.	Follow manufacturer's working time specifications.  Choose material with longer working time.
Inadequate disinfection effects surface quality (detail reproduction) and dimensional stability.	Use water based disinfectants according to FDA guidelines.  Follow manufacturer's instructions for use.

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*Continued*



**Lack of Impression Detail**

## CAUSE

### For Polyether Materials

Substances with  $\text{pH} < 4$  inhibit setting reaction, most commonly by contact with acidic retraction materials and hemostatic agents containing epinephrine or ferric sulfates.

## SOLUTION

Use retraction materials having  $\text{pH} \geq 4$ .

Select retraction materials and hemostatic agents not containing these chemicals.

Rinse, remove, and dilute hemostatic solution from the preparation with water spray and suction. Dry before taking the impression.

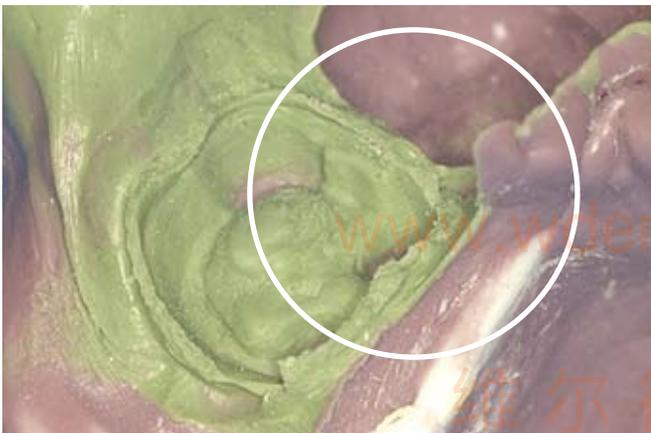
Incorrect storage conditions of the final impression affects surface quality (detail reproduction) and dimensional stability.

Rinse polyether impressions with water and blow dry before sending it to the lab.

Do not send the impression in the same bag as an alginate impression to the lab.

Avoid storing impressions in sealed bags.

Store the impression at room temperature away from direct sunlight.



Poor Retraction and Syringing Technique



Exceeding the Working Time

# Voids on the Margin

**Visual Appearance:** Voids/holes on margin of the prepared teeth. Incomplete margin.

**Result:** The fit and function of the final restoration may be compromised. Short crown margins and/or open margins.

CAUSE	SOLUTION
Air trapped in intraoral syringe.	Properly bleed filled elastomer syringe.  Keep tip immersed in material when loading syringe.  Do not stop when in the middle of loading syringe.
Air trapped while filling impression tray.	Keep mix tip immersed in tray material while filling the tray.
Improper syringe technique.	Keep syringe tip immersed in wash material to avoid entrapping air.  Wiggle and stir while syringing. Push material forward.
Inadequate coverage of marginal area with light body impression material.	Use wash material liberally on preparation and abutments.

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*Continued*



**Void Caused by Syringe Technique**

## CAUSE

Blood and saliva contamination around prep.

## SOLUTION

Use good moisture control technique. Rinse and dry prep area before taking the impression.

Stop bleeding by using appropriate retraction technique and hemostatic agent. Leave cord in sulcus until no blood or saliva are present before syringing the light body impression material. Consider two-cord retraction to displace tissue and control fluids.

Tray not seated straight.

Insert impression tray straight.

Ensure that correct centric bite is attained when using dual arch impression trays.

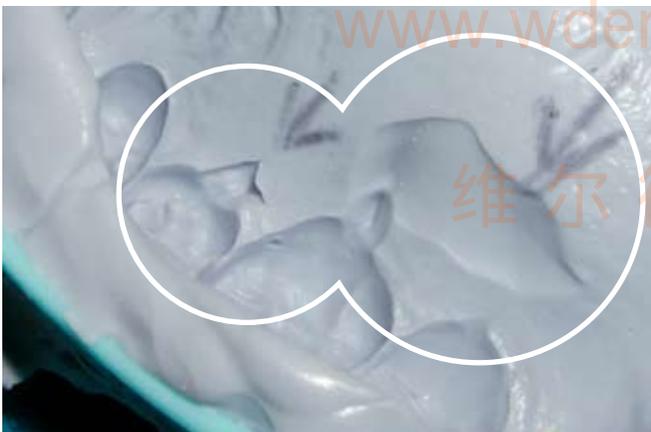
Exceeding the working time.

Follow manufacturer's working time specifications.

Choose material with longer working time.

Impression material stored at elevated temperature.

Store impression material at room temperature.



Trapped Air or Moisture

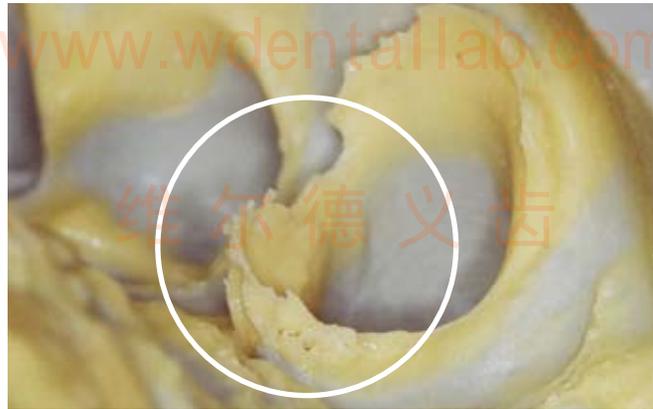
# Tearing at the Margin

**Visual Appearance:** Rip, or visible tearing on the margin of the preparation.

**Result:** Short crown margins and/or open margins.

CAUSE	SOLUTION
Expired impression material.	Check expiration date of impression material.
Inadequate mix.	Bleed before applying mix tip to ensure even dispensing.  Use proper mix tip.  Ensure mixing instructions are followed and materials have a streak-free appearance.
Insufficient retraction.	Displace tissue to allow the impression material to access prepared area.  Consider two-cord retraction. Leave pilot cord in the sulcus when taking the impression.  Use impression material with sufficient tear resistance.

*Continued*



**Poor Retraction — Insufficient Tear Resistance**

## CAUSE

## SOLUTION

### For Polyether Materials

Substances with pH < 4 inhibit setting reaction, most commonly by contact with acidic retraction materials and hemostatic agents containing epinephrine or ferric sulfates.

Use retraction materials with a pH  $\geq 4$ .

Select retraction materials and hemostatic agents that do not contain these chemicals.

Rinse, remove, and dilute hemostatic solution from the preparation with water spray and suction. Dry before taking the impression.

### For Vinyl Polysiloxane Materials

Sulfur inhibition due to contact of latex gloves with tissue/tooth/retraction material or impression material.

Wear gloves proven not to contain traces of sulfur.

If contamination is suspected, scrub affected area with diluted hydrogen peroxide.

Residues from custom temporary or provisional cements (acrylics) present.

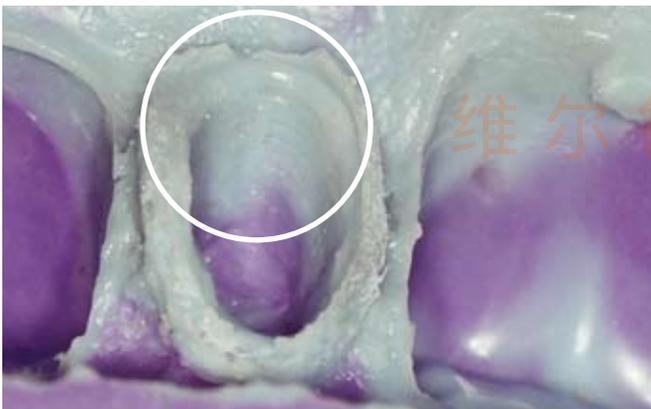
Do not use impressions already used to fabricate the temporary restoration.

Fabricate the temporary crown or bridge after final impression has been made.

Remove air-inhibited layer on the exposed surface with an alcohol wipe before making final impression.

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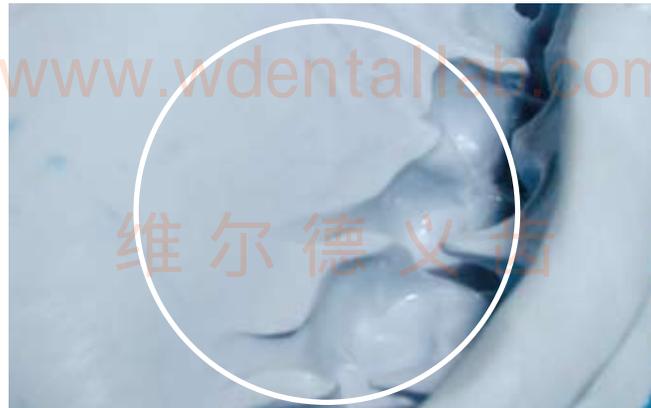
Tearing at the Margin

# Facial-Lingual Pulls

**Visual Appearance:** V-shaped void, trough-like.

**Result:** Failure to capture complete and accurate dentition.

CAUSE	SOLUTION
Exceeding the working time.	Follow manufacturer's working time specifications.  Choose material with longer working time.
Tray movement or repositioning after seating.	Do not move tray after seating.
Insufficient amount of impression material used.	Use more material to create back flow effect.
Impression tray does not support flow of impression material.	Use lingual stops.  Use an impression tray that supports the flow of the material.



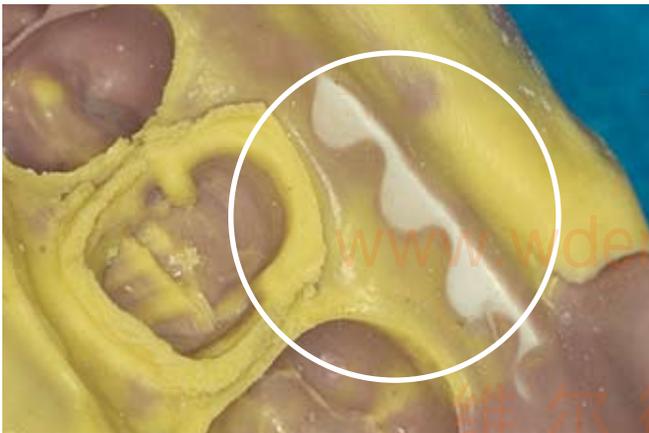
**Lingual Pulls**

# Tray-Tooth Contact

**Visual Appearance:** Show-through of tray. Impression tray exposed.

**Result:** Restoration may have slight distortion at marginal area, or rocks.

CAUSE	SOLUTION
Prepared teeth contact the sides or bottom of impression tray.	Use proper size tray. Test various tray sizes to ensure proper size.
Tooth contact with the pre-set tray material when using the two-step technique.	Carve out tray material properly before applying wash.
Insufficient impression material used.	Fill tray adequately.



Contact with Impression Tray

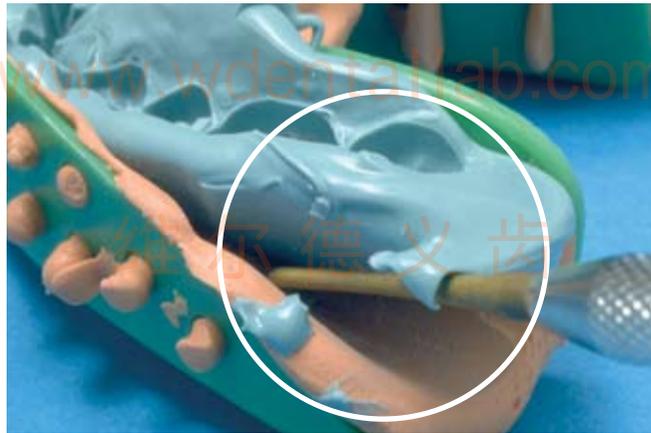
# Delamination

**Visual Appearance:** Heavy body and light body materials not blended, or mixed together.

**Result:** Restoration will not seat or fit properly.

CAUSE	SOLUTION
Exceeding the working time.	Follow manufacturer's working time specifications. Choose material with longer working time.
Impression material stored at elevated temperature.	Store impression material at room temperature.

VPS	SOLUTION
Sulfur or acrylic contamination of pre-set heavy body material in two-step technique.	Avoid contact with sulfur contaminants: Wear gloves proven not to contain traces of sulfur.  Avoid contact with acrylic and methacrylic contaminants: Ensure impression material does not come into contact with methacrylate residue from acrylate temporary materials.



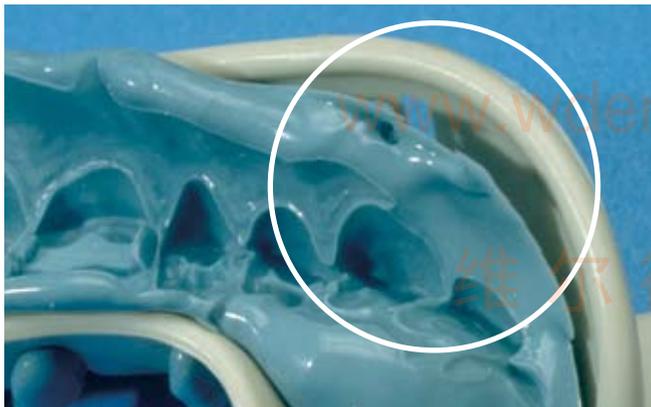
**Poor Bond Between Heavy Body and Light Body Material**

# Poor Bond of Impression Material to the Tray

**Visual Appearance:** Impression pulling away from the sides/bottom of tray.

**Result:** Crown(s) may be tight and not seat fully, or require excessive internal adjustment.

CAUSE	SOLUTION
No tray adhesive used.	Use tray adhesive.
Incompatible tray adhesive used.	Use appropriate tray adhesive. VPS adhesive for VPS. Polyether adhesive for polyether materials.
Inadequate drying time for tray adhesive.	Follow manufacturer's instructions for application, and drying time.
Thin plastic trays allow deflection, which can cause rebound upon removal.	Use a tray that fits better, and is stiffer and more rigid.



**Separation of Material from Tray**

# Stone Model Discrepancies

**Visual Appearance:** Voids on margin, powdery cusp tips on incisal edges on prepared tooth. “Golf-ball” appearance of stone model.

**Result:** Incomplete seating of indirect restorations.

CAUSE	SOLUTION
Tooth contact with impression tray, or gauze of double bite tray causes water to leach out of the tray, dehydrating the stone.	Instruct patient to bite passively in centric occlusion when using dual arch trays.  Fill tray with sufficient amount of material.
Cast not made according to model preparation guidelines and lacks detail.	Provide as much information as possible to the lab. Indicate type of impression material (polyether or VPS) and whether or not the impression has been disinfected.
<b>VPS</b> Hydrogen gas emission.	Follow manufacturer’s instruction for casting time.



Stone Model with Hydrogen Evolution Voids



Stone Model with Powdery Cusp Tips

## A Leader in the Dental Industry

You can trust 3M ESPE as an educational resource. This guide is part of our ongoing efforts to add value to the products and materials you use in your practice on a daily basis. Of the more than 2,000 quality products 3M ESPE manufactures and markets to the dental industry, we offer a full line of impression materials, as well as products to meet your restorative, crown and bridge, preventive, infection control, and cosmetic dentistry needs.

For more information, call the 3M ESPE Technical Hotline:

**1-800-634-2249 or visit [www.3MESPE.com](http://www.3MESPE.com).**

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