

# THE DENTAL ADVISOR

TM

"Improved Patient Care Through Research"



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## Elastomeric Impression Materials

In prosthodontics, impression materials are used to record intraoral structures for the fabrication of definitive restorations. The accuracy of these final restorations is highly dependent on the impression materials and techniques utilized. Elastomeric impression materials (addition silicones and polyethers) offer high elastic recovery and acceptable flexibility on removal of the impression from the mouth.

Recently, new elastomeric impression materials with very high elastic recovery and high tear strength have been introduced.

Addition silicones (polyvinylsiloxanes) have a moderately low-molecular weight silicone that contains silane groups. Since addition silicones do not produce a volatile by-product during polymerization, very small dimensional changes occur on setting. Hydroxide groups in many products produce hydrogen gas, resulting in small bubbles on the model surface if pouring is not delayed by 30-60 minutes. Many of these addition silicones contain catalysts like palladium that absorb this hydrogen. Newer addition silicones have been formulated to be more hydrophilic.

Polyethers are composed of a moderately low-molecular weight polyether, a silica filler and a plasticizer. When mixed, rubber is formed by a cationic polymerization process. Polyethers have excellent dimensional stability. They also have excellent wettability, resulting in minimal voids and excellent reproduction of detail.

### Desirable Features

- Low viscosity – injectable
- Heavy viscosity – tray
- Automix, easy to use
- 4-minute working/setting time
- Ability to be disinfected
- Compatible with cast/die materials
- Adequate shelf life
- Cost-effective
- Distinctive color contrast between light- and heavy-body viscosities

### Critical Properties – Clinical Significance

**Wettability** An impression material should have intimate contact with the tooth and underlying soft tissues and should not form bubbles or voids. Wettability is best with a hydrophilic material. Material should possess ability to displace moisture.

**Flexibility** Flexible impressions are easier to remove from the mouth when set.

**Elastic Recovery** A set impression must be sufficiently elastic so that it will return to its original dimensions without significant distortion upon removal from the mouth.

**Tear Strength** Adequate tear strength is important. Thin areas of material must resist tearing upon removal from the mouth and when separating the model and the impression.

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# Rating Elastomeric Impression Materials

Product	Company	Working Time, min	Time in Mouth, min	Elastic Recovery	Flexibility	Tear Strength	Cost, US \$/ml*	Rating
<b>Addition Silicones – Light-body</b>								
AFFINIS	COLTENE/WHALEDENT	1.0	2.0	Very High	Low	Low-Medium	0.34	92%
AFFINITY (Regular Set)	CLINICIAN'S CHOICE	1.75	2.5	Very High	Low	Medium	0.35	na
AQUASIL ULTRA XLV	DENTSPLY/CAULK	2.25-2.75	5.0	Very High	Low-Medium	Very High	0.43	93%
AQUASIL ULTRA LV	DENTSPLY/CAULK	2.25-2.75	5.0	Very High	Low	Very High	0.43	93%
CORRECT PLUS - THICK N' THIN	PENTRON	1.5	3.0	Very High	Low	High	0.17	91%
EXAFAST NDS	GC AMERICA	1.0-1.20	1.5	Very High	Low-Medium	Low-Medium	0.26	93%
EXAMIX NDS	GC AMERICA	2.25	4.0	Very High	Low-Medium	Low-Medium	0.26	91%
FLEXITIME CORRECT FLOW	HERAEUS KULZER	2.5	5.0	Very High	Low-Medium	Medium	0.31	97%
1st IMPRESSION PVS (Fast Set)	DEN-MAT	1.25	2.25	High	Low	Medium	0.27	na
1st IMPRESSION PVS (Regular Set)	DEN-MAT	2.5	4.5	Very High	Low	Medium	0.27	na
GENIE (Fast Set)	SULTAN CHEMISTS	1.4	2.8	Medium-High	Low	—	0.17	96%
GENIE (Regular Set)	SULTAN CHEMISTS	2.25	4.5	High	Low	—	0.17	96%
HONIGUM	ZENITH/DMG	2.25	3.5	Very High	Low	Low-Medium	0.63	96%
IMPRINT II GARANT	3M ESPE	1.0	4.0	Very High	Low	Medium	0.41	ce
TAKE 1 WASH	SDS/KERR	2.0	3.0	Very High	Low-Medium	Low-Medium	0.30	na
VIRTUAL (Fast Set)	IVOCLAR VIVADENT	1.55	2.5	Very High	Low	Medium	0.34	96%
<b>Addition Silicones – Heavy-body</b>								
AFFINIS	COLTENE/WHALEDENT	1.0	2.5	Very High	Very Low	Medium	0.46	92%
AFFINITY (Regular Set)	CLINICIAN'S CHOICE	1.75	2.5	Very High	Low	High	0.35	na
AQUASIL ULTRA HEAVY	DENTSPLY/CAULK	2.25-2.75	5.0	Very High	Low	High	0.43	93%
AQUASIL ULTRA RIGID (Fast Set)	DENTSPLY/CAULK	1.25-1.75	3.0	Very High	Very Low	Medium	0.43	93%
CORRECT PLUS - TRAY	PENTRON	1.5	3.0	Very High	Very Low	Medium	0.17	91%
EXAFAST NDS	GC AMERICA	1.25	1.5	Very High	Low	High	0.26	93%
EXAMIX NDS	GC AMERICA	2.0	4.0	Very High	Low	High	0.26	91%
EXAJET (Fast Set)	GC EUROPE N.V.	1.5	2.5	Very High	Low	Medium	0.43	ce
EXAJET (Regular Set)	GC EUROPE N.V.	2.0	3.0	Very High	Low	Medium	0.43	ce
FLEXITIME HEAVY TRAY	HERAEUS KULZER	2.5	5.0	Very High	Very Low	Medium	0.31	97%
1st IMPRESSION PVS (Fast Set)	DEN-MAT	1.25	2.25	Very High	Very Low	Medium	0.27	na
1st IMPRESSION PVS (Regular Set)	DEN-MAT	2.5	4.5	Very High	Very Low	Medium	0.27	na
GENIE (Fast Set)	SULTAN CHEMISTS	1.4	2.8	High	Low	—	0.17	96%
GENIE (Regular Set)	SULTAN CHEMISTS	2.25	4.5	Very High	Low	—	0.17	96%
HONIGUM	ZENITH/DMG	2.25	3.3	Very High	Very Low	High	0.39	96%
IMPRINT II PENTA	3M ESPE	2.0	4.0	Very High	Low	Very High	0.38	ce
TAKE 1 TRAY	SDS/KERR	2.0	3.0	Very High	Low	Very High	0.30	na
VIRTUAL (Fast Set)	IVOCLAR VIVADENT	1.25	2.5	Very High	Low	Medium	0.34	96%
<b>Polyethers – Light-body and Heavy-body (respectively)</b>								
IMPREGUM GARANT SOFT	3M ESPE	2.0	3.5	High	Low-Medium	Low-Medium	0.50	93%
IMPREGUM PENTA SOFT	3M ESPE	2.5	3.5	High	Low-Medium	High	0.42	93%

\*Costs are listed for comparison only and are not used to calculate ratings.

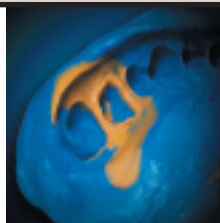
ce = currently evaluating

na = not available

THE DENTAL ADVISOR Recommends: Addition Silicones – *Flexitime, Genie, Honigum, Virtual*, Polyether – *Impregum*



**Honigum and MixStar**  
(Zenith/DMG)



**Virtual**  
(Ivoclar Vivadent)



**Impregum Penta and Garant Soft  
Polyether Impression Materials**  
(3M ESPE)



**1st Impression Materials**  
(Den-Mat)

## Elastomeric Impression Materials *continued*

**Dimensional Stability** Minimal dimensional changes that result during polymerization and prior to casting of the impression are desired. In addition silicones, these changes are small resulting in a dimensionally stable impression that is usable for weeks.

**Detail Reproduction** An impression material must reproduce even the finest of details and transfer these details accurately to gypsum, metal or polymer dies.

### Steps for a Flawless Impression Procedure

#### Tips for the Dental Assistant

- Apply the correct adhesive to all internal surfaces and perimeter of the impression tray and let dry.
- Express a small amount of material from the automix cartridges before placing the tip.
- Keep the tip of the syringe buried in the expressed material during loading to minimize bubbles.
- Pay strict attention to working time. Viscosity increases with time reducing flow and detail production.
- Working and setting times are shorter in higher temperature and humidity.

#### Tips for the Clinician

- Select a tray of adequate size and extension. Provide occlusal stops if needed.
- Seat the loaded tray in a timely fashion. Once the material becomes rubbery, movement of the tray will cause internal stresses leading to an inaccurate impression.
- Removal of the impression too early will cause significant distortion.
- If using a closed-bite tray, be careful to avoid burn-thru, which can create distortion of the impression and produce less than ideal final restorations.

### Clinical Notes

#### Sources of Impression Distortion

- Anatomical irregularities in the mouth (e.g., tori) can interfere with and distort the closed-bite tray.

- If a patient has a very strong tongue, avoid using a closed-bite tray because of an increased chance of distortion, especially for lower impressions. In this case, a quadrant tray usually works well.
- Patients with retained wisdom teeth are usually not good candidates for taking impressions with posterior closed-bite trays. Because of lack of space, proper closure is difficult, often resulting in inaccurate articulation. Anterior closed-bite trays work well for these patients.

#### Packing the Tissues

- Use a small diameter cord #00 followed by #0 cord (*Ultrapak/Ultradent*).
- Pack and keep in place for about five minutes.
- Keep area very dry to avoid dilution of chemicals or displacement of cords.
- Moisten the field before removal of the #0 cord, rinse well and make the impression.
- Remove the #00 cord before temporization.

#### Alternatives to Packing Tissue

- Isolate the prepared tooth.
- Inject impression material containing expansive and hemostatic properties around sulcus (*Expa-syl™/SDS/Kerr*).
- Have patient bite on dry cotton or into previously fabricated and hardened bite registration.
- Keep in place for five minutes.
- Remove immediately prior to taking impression.

#### Astringents

- To control hemostasis, an effective hemostatic agent is a ferric sulfate solution (*ViscoStat/Ultradent; Cut-Trol/Ichthys*).
- Pack a dry cord and then apply the ferric sulfate solution.
- Rinse the site thoroughly, since the ferric sulfate solution can interfere with the setting and accuracy of addition silicone impression materials. ■



**EXAFast NDS**  
(GC America)



**EXAMIX NDS**  
(GC America)



**EXAJET**  
(GC Europe N.V.)



**Imprint II Penta and Garant Vinyl Polysiloxane Impression Materials**  
(3M ESPE)