

LAB APPLIANCE FABRICATION REQUIREMENTS

General Guidelines

Prescriptions

Please provide complete and signed Rx with every case.

Impressions

- Accurate impressions with any kind of impression material are acceptable.
- Impressions must adequately reflect **all relevant** anatomy.
- Impressions material **must not** be separating from the impression tray.
- Consider pouring your models right away if your impressions are moisture, temperature or time sensitive.
- Impressions sensitive to moisture content should be wrapped in a damp paper towel and placed in a sealed plastic bag if models are not poured immediately.
- Only metal impression trays and those with PVS impression material will be returned.
- The nature of impression materials currently on the market may contribute to common model problems encountered in the laboratory. Have you ever encountered porosity (bubbles, voids) or poor surface quality? Plaster or stone mixes are water based and they interact with impression surfaces in a water-like manner. Liquids placed on solid surfaces will be either attracted to, or repelled from that surface in varying degrees. Please be aware when selecting impression material if it is hydrophilic or hydrophobic:
 - **Hydrophilic:** is attracted to or can be wetted by water.
 - **Hydrophobic:** is when liquid is repelled, or fails to bond with liquids.

Polyvinyl siloxane (PVS) options can be hydrophobic or hydrophilic. Alginate is hydrophilic.

- There are advantages and disadvantages to these impression options but there are products on the market to help reduce the disadvantages. Surfactants and debubbler sprays can be used to lower surface tension between surfaces making the impression material more hydrophilic and assure a better impression result.
- Great Lakes carries ACU-Flow™ a PVS impression material which is hydrophilic and requires NO surfactant spray for surface tension reduction, eliminating bubble formation. Surfactants must be used properly and excess surfactant should not be allowed to pool in the cusp tips. This can cause loose, sandy-like cusp tips. Excess surfactant needs to be blown out leaving a wet look only before pouring.

Models

- Plaster or stone models are acceptable. Generally, the durability of the stone is preferred.
- Models should be reasonably trimmed, yet sufficiently thick for strength considerations.
- No horse shoe shaped models; all models should have bases of at least 7mm in the thinnest area.

- Bases will be added as necessary for an additional fee to the models without bases, or lacking adequate base thickness or strength.
- Please indicate if your model must be duplicated, as work models may get damaged during appliance fabrication process.

Bite Records

- Please package bite registrations carefully.
- Bite records **must not** be left between models for shipment to the lab.
- Dedicated packaging should be considered for brittle materials such as Delar wax.
- Please identify the nature and the intent of each bite record, if more than one is being supplied.
- Please consider mounting the maxillary model, before sending it to the lab, for those cases requiring mounting. Sending such items as face bows, bite forks and mounting jigs through the mail often results in unreliable mountings.

Articulators

We use the following articulators and their accessories in our laboratory:

- | | |
|-----------------------|---------------|
| • SAM 1, SAM 2, SAM 3 | • Hanau |
| • Danar | • Stratos 200 |
| • Panadent | • Artex |
| • Whip Mix | • Kavo |

Please consider that fully mounted models may not transfer perfectly from your articulator to the one in the lab.

NOTE: Great Lakes can only fabricate Digital Splints/Deprogrammers for models mounted with the following compatible articulators -

- ◆ SAM[®] 1, SAM[®] 2, SAM[®] 3
- ◆ Denar[®]
- ◆ Hanau[™] Modular

Models mounted with other articulators can only be used for fabricating conventional splints/deprogrammers.

- Please consider that fully mounted models may not transfer perfectly from your articulator to the one in the lab.

Materials and Components

- (*) Biocryl resin: Cold Cure Acrylic MMA (Methyl methacrylate)
- Clear Biocryl: Thermo formable PETG (Polyethylene terephthalate glycol)
- Colored/patterned Biocryl: Thermo formable PVC (Polyvinyl chloride)
- Splint Biocryl: Thermo formable PETG

- Triad® (Visible Light Cure)
- Mouthguard material: Thermo formable EVA (Ethylene vinyl acetate)
- (*) Duraloy: Cobalt/Chromium Alloy
- (*) Stainless Steel: Chromium/Nickel Alloy
- (*) NiTi: Nickel Titanium Alloy
- TMA: Titanium/Molybdenum Alloy
- Menzanium: Nickel-free Stainless Alloy
- (*) Silver Solder

() Material is potentially allergy causing in sensitive patients.*

Retainer and Active Plate

Technical Requirements

- Stone models are preferred.
- Opposing model is required for cases with inter-occlusal plastic (bite plates) or potential inter-arch interferences (clasp, habit breakers, pontics, reset teeth, deep overbites).
- Centric occlusion or treatment specific bite record is suggested when supplying the opposing model.

Default Materials

- Clear Biocryl
 - We will use Triad® (Visible Light Cure material); Biocryl resin (Methyl methacrylate) or PVC based thermo formable materials when requested or when technologically necessary.
- Duraloy
- Stainless Steel
- Silver Solder

Practical Considerations

- Be sure to indicate design specifics and/or treatment objectives, color/pattern preferences and pontic shades.

Spring Aligner

Technical Requirements

- Stone models are preferred.
- Opposing model is required when any desired corrections may cause a traumatic occlusion.
- Centric occlusion bite record is suggested when supplying the opposing model.

Default Materials

- Clear Cold Cure Acrylic (adjacent to anterior teeth)
- Clear Biocryl or Cold Cure Acrylic (appliance body)
- Stainless Steel
- Duraloy

Practical Consideration

- Some IPR (interproximal reduction) is frequently necessary to achieve desired corrections.
 - Specific IPR details are provided by the lab in writing for each case, involving resetting of teeth.
 - Most commonly 0.25mm is removed cumulatively at a proximal contact area.
- Ideal correction is not always possible due to space availability, occlusal interferences and appliance capability limitations.
- Only mild misalignment of **incisors** can be corrected with these appliances.

Inman Aligner

Technical Requirements

- Stone models are preferred.
- Opposing model is required when any desired corrections may cause a traumatic occlusion.
- Centric occlusion bite record is suggested when supplying the opposing model.

Default Materials

- Cold Cure Acrylic
- Stainless Steel
- Duraloy
- Nickel Titanium Coil

Practical Considerations

- Some IPR (interproximal reduction) is frequently necessary to achieve desired corrections.
 - Specific IPR details are provided by the lab in writing for each case, involving resetting of teeth.
 - Most commonly 0.25mm is removed cumulatively at a proximal contact area.
- Ideal correction is not always possible due to space availability, occlusal interferences and appliance capability limitations.
- Only **incisors** are generally corrected with these appliances. Capacity to move canines is severely limited.

Invisible Inman Aligner

Technical Requirements

- Stone models are preferred.
- Opposing model is required when any desired corrections may cause a traumatic occlusion.
- Centric occlusion bite record is suggested when supplying the opposing model.

Default Materials

- Cold Cure Acrylic
- Splint Biocryl
- Stainless Steel
- Duraloy
- Nickel Titanium Coil

Practical Considerations

- Some IPR (interproximal reduction) is frequently necessary to achieve desired corrections. Specific IPR details are provided by the lab in writing for each case, involving resetting of teeth. Most commonly 0.25mm is removed cumulatively at a proximal contact area.
- Only **labially** directed rotations or movement are possible.
- Ideal correction is not always due to space availability, occlusal interferences and appliance capability limitations.
- Only **incisors** are generally corrected with these appliances. Capacity to move canines is severely limited.

Metal Appliance

Technical Requirements

- Opposing model is required for cases with inter-occlusal plastic or potential inter-arch interferences (pontics, habit breakers, etc).
- Bands/Crowns already on the model are preferred.
 - We will adapt your bands/crowns if requested if they are not on the model already, or provide our bands/crowns if requested.
- Centric occlusion or a treatment specific bite record is suggested when supplying the opposing model.

Default Materials

- Duraloy
- Stainless Steel
- NiTi Alloy (used in IPC and Distal Jet appliances)
- TMA (used in Pendulum-like appliances)
- Silver Solder
- Clear Cold Cure Acrylic

Practical Considerations

- When supplying bands/crowns separately, models or impressions should reflect the teeth with no hardware in place.
- Consider path of insertion! Bands/crowns are fitted individually, but delivered as a unit, and must have a shared path of insertion.
- Your finished appliance may have some solder and/or laser welded joints.

Occlusal Splint (Standard)

Technical Requirements

- Stone models are preferred.
- Opposing model is required.
- Mounted models are preferred or upper mounted only and bite registration.
- Treatment-specific bite record is recommended.
 - If more than one bite record is provided please identify each bite record.
 - Arbitrary Centric Occlusion will be used if no bite record is provided.

Default Materials

- Clear Splint Biocryl and Clear Cold Cure Acrylic.
 - Variflex™, Durasoft with Cold Cure, Cold Cure only, or Clear Splint Biocryl only, may be used when requested or when technologically necessary.
 - Reinforcement mesh, polyester or metal may be added upon request.
- Stainless Steel clasps and reinforcement bars.

Practical Considerations

- Face bow mounted models are likely to result in fewer occlusal adjustments to the splint.
- Consider mounting just the maxillary model.
 - We will complete the mounting of the lower model to your bite record.
- Consider not sending face bows or transfer jigs, as these do not travel well.
- Consider the vertical dimension of the bite record.
 - Avoid perforation of the bite record.
 - Splint will require more adjustments, if the lab is forced to alter the bite record.
 - Ideal clearance at first contact (usually in the posterior) is at least 1.5mm.
- Index model base well for durable articulation.
- Consider using better, non-alginate impression materials.
 - Due to the extensive plastic-to-tooth contact, splints are very vulnerable to even minor model inaccuracy.
- Consider clasping for controlled retention.
 - We will add clasps if deemed necessary.
- Protrusive bites can be sent to set the condylar inclination of the articulator. Lab standard articulator settings are 20° inclination and 5° Bennett.

Occlusal Splint (Digital)

Technical Requirements

- Stone models are preferred.
- Opposing model is required.
- Treatment-specific bite record is recommended.
 - If more than one bite record is provided please identify each bite record.
 - Arbitrary Centric Occlusion will be used if no bite record is provided.
- If providing mounted models:

- Currently only SAM and Denar mounted cases (magnetic and screw-on) are accepted for digital fabrication.
- Mounting portion of the models should preferably be full thickness and not “hourglass” shaped.
- Mounting stone must be used and not mounting plaster.

Default Materials

- Clear Splint Biocryl and Clear Cold Cure Acrylic
 - Variflex™, Durasoft with Cold Cure, Cold Cure only, or Clear Splint Biocryl only, may be used when requested or when technologically necessary.
 - Reinforcement metal or polyester mesh may be added upon request.
- Stainless Steel clasps

Practical Considerations

- Face bow mounted models are likely to result in fewer occlusal adjustments to the splint.
- All non-mounted models intended for digital splint fabrication, will be mounted for the benefit of digital scanning and milling.
 - These mountings will appear incorrect when attached to a conventional articulator.
- Consider mounting just the maxillary model.
 - We will complete the mounting of the lower model to your bite record.
- Consider not sending face bows or transfer jigs, as these do not travel well.
- Consider the vertical dimension of the bite record.
 - Avoid perforation of the bite record.
 - Splint will require more adjustments, if the lab is forced to alter the bite record.
 - Ideal clearance at first tooth contact (usually in the posterior) is at least 1.5mm.
- Index model bases well for durable articulation.
- Consider better, non-alginate impression materials.
 - Due to the extensive plastic to tooth contact, splints are very vulnerable to even minor model inaccuracy.
- Consider clasping for controlled retention.
 - We will add clasps if deemed necessary.
- Protrusive bites can be sent to set the condylar inclination of the articulator if the case is fully mounted or upper mounted model only is sent by your office. Lab standard software articulator settings are 20° inclination and 5° Bennett.

Twin Block

Technical Requirements

- Upper and lower models required.
- Construction bite registration is required.
- Stone models are preferred.

Default Materials

- Clear Cold Cure Acrylic
- Duraloy
- Stainless Steel

Practical Considerations

- Construction bite should reflect the exact desired mandibular position with the following parameters in mind:
 - Anterior-Posterior Correction: as desired.
 - Vertical Opening: at least 5mm posterior inter-occlusal clearance as measured in the bicuspid area. If opening is insufficient, the lab will increase opening unless instructed not to alter.
 - Dental Midlines Relationship: skeletal symmetry is the objective regardless of mid-line alignment. Should there be a misalignment of upper and lower dental midlines in a desired construction bite, please diagram this on the Rx.

Herbst

Technical Requirements

- Upper and lower models required.
- Stone models are preferred.
- Treatment specific bite record is required.

Default Materials

- Clear Splint Biocryl and Clear Cold Cure Acrylic
- Duraloy
- Stainless Steel

Practical Consideration

- Construction bite should reflect the exact desired mandibular position with the following parameters in mind:
 - Anterior-Posterior Correction: as desired.
 - Vertical Opening: should be at least 2mm at nearest contact area for acrylic splint Herbst. If opening is insufficient, the lab will increase as necessary. No vertical concern for crown or band based Herbst.
 - Dental Midlines Relationship: skeletal symmetry is the objective regardless of mid-line alignment. Should there be a misalignment of upper and lower dental midlines in a desired construction bite, please diagram this on the Rx.

Bionator / Orthopedic Correctors

Technical Requirements

- Upper and lower models are required.
- Stone models are preferred.
- Treatment specific bite record is required.

Default Materials

- Clear and pink Cold Cure Acrylic
- Duraloy

Practical Considerations

- The bite should reflect the **exact** desired mandibular position with the following parameters in mind:

CL - II, Deep Bite

- Anterior-Posterior Correction: as desired (usually 2-6mm of mandibular advancement).
- Vertical Opening: at least 2mm inter-incisally. If opening is insufficient, the lab will increase opening unless instructed not to alter.
- Dental Midlines Relationship: skeletal symmetry is the objective regardless of mid-line alignment. Should there be a misalignment of upper and lower dental midlines in a desired construction bite, please diagram this on the Rx.

CL - II, Open Bite

- Anterior-Posterior Correction: as desired (usually 2-6mm of mandibular advancement).
- Vertical Opening: at least 2mm clearance at the nearest posterior contact. If opening is insufficient, asking the lab to increase it is almost certain to result in a non-fitting appliance.
- Dental Midlines Relationship: skeletal symmetry is the objective regardless of mid-line alignment. Should there be a misalignment of upper and lower dental midlines in a desired construction bite, please diagram this on the Rx.

CL - II, Neutral Vertical

- Anterior-Posterior Correction: as desired (usually 2-6mm of mandibular advancement).
- Vertical Opening: at least 2mm clearance at the nearest posterior contact and at least 2mm inter-incisally. If opening is insufficient, asking the lab to increase it is almost certain to result in a non-fitting appliance.
- Dental Midlines Relationship: skeletal symmetry is the objective regardless of mid-line alignment. Should there be a misalignment of upper and lower dental midlines in a desired construction bite, please diagram this on the Rx.

CL - III

- Anterior-Posterior Correction: mandible is in habitual position or comfortably retruded.
- Vertical Opening: at least 2mm clearance at the nearest posterior contact and at least 2mm inter-incisally. If opening is insufficient, the lab may be able to increase it on customer's request in lieu of taking a new bite record.
- Dental Midlines Relationship: skeletal symmetry is the objective regardless of mid-line alignment. Should there be a misalignment of upper and lower dental midlines in a desired construction bite, please diagram this on the Rx.

Activator

Technical Requirements

- Upper and lower models are required.
- Stone models are preferred.
- Treatment specific bite record is required.

Default Materials

- Clear and pink Cold Cure Acrylic
- Duraloy
- Stainless Steel

Practical Considerations

- Construction bite requirements are the same as for Bionators.

Although it is not a technical requirement, Activators usually have a greater vertical dimension of approximately 10mm.

Function Regulator (Fränkel)

Technical Requirements

- Upper and lower models are required.
- Stone models are preferred.
- Treatment-specific bite record is required.
- Complete and signed Rx.

Default Materials

- Cold Cure Acrylic
- Duraloy

Practical Considerations

- Models should reflect the resting depth of the vestibule (usually 10+ mm inferior to the gingival margins of #23, #26 and 10+ mm superior to the gingival margins of #3 and #14).
- Construction bite should reflect the exact desired mandibular position with the following parameters in mind:

CL - I: (FR-I, FR-IV)

- Anterior-Posterior Correction: none.
- Vertical Opening: at least 2mm posterior inter-occlusal clearance. If opening is insufficient, the lab may be able to increase it on customers request in lieu of taking a new bite record.
- Dental Midlines Relationship: skeletal symmetry is the objective regardless of mid-line alignment. Should there be a misalignment of upper and lower dental midlines in a desired construction bite, please diagram this on the Rx.

CL - II: (FR-II)

- Anterior-Posterior Correction: as desired, (usually 2-6mm of mandibular advancement)

- Vertical Opening: at least 2mm posterior inter-occlusal clearance. If opening is insufficient, the lab may be able to increase it on customer's request in lieu of taking a new bite record.
- Dental Midlines Relationship: skeletal symmetry is the objective regardless of mid-line alignment. Should there be a misalignment of upper and lower dental midlines in a desired construction bite, please diagram this on the Rx.

CL - II: (FR-V)

- Anterior-Posterior Correction: as desired, (usually 2-6mm of mandibular advancement)
- Vertical Opening: at least 2mm posterior inter-occlusal clearance. If opening is insufficient, asking the lab to increase it is almost certain to result in a non-fitting appliance.
- Dental Midlines Relationship: skeletal symmetry is the objective regardless of mid-line alignment. Should there be a misalignment of upper and lower dental midlines in a desired construction bite, please diagram this on the Rx.

CL - III: (FR-III)

- Anterior-Posterior Correction: mandible is comfortably retruded.
- Vertical Opening: at least 1mm clearance at the nearest posterior contact and at least 1mm inter-incisally. If opening is insufficient, asking the lab to increase it is almost certain to result in a non-fitting appliance.
- Dental Midlines Relationship: skeletal symmetry is the objective regardless of mid-line alignment. Should there be a misalignment of upper and lower dental midlines in a desired construction bite, please diagram this on the Rx.

Positioner

Technical Requirements

- Upper and lower models required.
- Bite registration is recommended.
- Stone models are preferred.
- Mounted models are preferred.

Default Materials

- Mouthguard material

Practical Considerations

- If impressions are taken over bracketed arches, the arch wires must be removed during impression taking.
- Bite registrations are taken in either Centric Relation or Centric Occlusion.
- Consider mounting just the maxillary model.
 - We will complete the mounting of the lower model to your bite record or to centric occlusion using our instruments.
- Consider not sending face bows or transfer jigs. These do not travel well.
- Consider providing a cephalometric x-ray or tracing if models are not mounted.

- Provide detailed description of desired corrections.
- Case must be close enough to ideal for the positioner to succeed.
 - 1 - 2mm of movement per tooth is the extent of appliance capability.
- Consider patient's compliance.

Elastodontic

Technical Requirements

- Upper and lower models required.
- Bite registration is recommended.
- Stone models are preferred.
- Mounted models are preferred.

Default Materials

- Medical Grade Silicone

Practical Considerations

- If impressions are taken over bracketed arches, the arch wires must be removed during impression taking.
- Bite registrations are taken in either Centric Relation or Centric Occlusion.
- Consider mounting just the maxillary model.
 - We will complete the mounting of the lower model to your bite record or to centric occlusion using our instruments.
- Consider not sending face bows or transfer jigs. These do not travel well.
- Provide detailed description of desired corrections.
- Case must be close enough to ideal for the Elastodontic appliance to succeed.
 - 2 - 3mm of movement per tooth is the extent of the appliance capability.
- Consider patient's compliance.

Sleep Apnea: Klearway®

Technical Requirements

- Upper and lower models required.
- Construction bite registration is required.
- Stone models are preferred.

Default Materials

- Variflex™
- Stainless Steel

Practical Considerations

- Construction bite should reflect the exact desired mandibular position with the following parameters in mind:
 - Mandibular advancement: 50% - 65% of the full protrusive position. Completed appliance has considerable titration capability.

- Vertical Opening: At least 5mm inter-incisal clearance. May be slightly increased or decreased by the lab upon request.
- Dental Midlines Relationship: should there be a misalignment of upper and lower dental midlines in a desired construction bite, please diagram this on the Rx.

Sleep Apnea: NAPA

Technical Requirements

- Upper and lower models required.
- Construction bite registration is required.
- Stone models are preferred.

Default Materials

- Cold Cure Acrylic - Methyl methacrylate
- Stainless Steel

Practical Considerations

- Construction bite should reflect the exact desired mandibular position with the following parameters in mind:
 - Mandibular advancement: 50% - 75% of the full protrusive position. Absolutely cannot be altered by the lab. Appliance has no titration capability.
 - Vertical Opening: At least 5mm inter-incisal clearance. Absolutely cannot be altered by the lab.
 - Dental Midlines Relationship: Should there be a misalignment of upper and lower dental midlines in a desired construction bite, please diagram this on the Rx.

Sleep Apnea: Elasto

Technical Requirements

- Upper and lower models required.
- Bite registration is required.
- Stone models are preferred.

Default Materials

- Medical grade silicone

Practical Considerations

- Construction record should reflect the exact desired mandibular position with the following parameters in mind:
 - Mandibular advancement: 50% - 75% of the full protrusive position. Absolutely cannot be altered by the lab. Appliance has no titration capability.
 - Vertical Opening: At least 5mm inter-incisal clearance.
 - Absolutely cannot be altered by the lab.

- Dental Midlines Relationship: Should there be a misalignment of upper and lower dental midlines in a desired construction bite, please diagram this on the Rx.

Sleep Apnea: Narval™ CC

Narval CC is contraindicated in patients who have:

- Central sleep apnea.
- Severe respiratory disorder.
- Loose teeth or advanced periodontal disease.
- Are less than 18 years of age.
- A completely edentulous lower arch.
- Complete removable dentures.
- Missing lower posterior molars on one or both sides of the mandible.
- Maximum mandibular advancement of less than 5mm.
- Short teeth, insufficient teeth per arch and quadrant (e.g. -4 minimum per quadrant), insufficient undercuts to retain the device.

Additional conditions should be considered including history of asthma, breathing, or respiratory disorders, or other relevant health problems.

Lab Requirements Overview

Note: Please download Narval CC Rx for complete information.

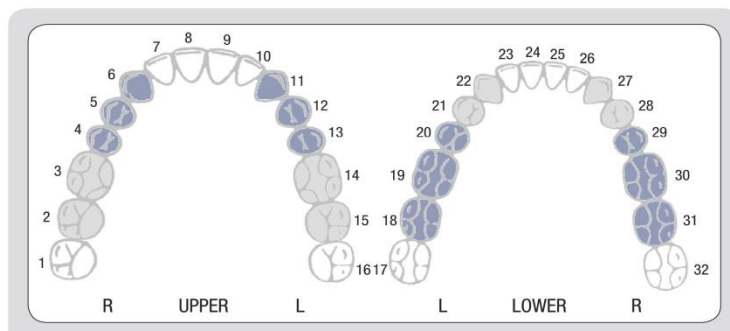
Dentition:

- Dental Requirements for proper retention are 6 maxillary and 6 mandibular posterior teeth.

Blue shaded teeth = Standard*

Gray shaded teeth = Optional*

***Note:** The dentition shown in blue indicates the **ideal** dentition within the minimum requirements for 6 maxillary and 6 mandibular teeth. If this is compromised for your patients, the teeth indicated in gray also may be used. Please contact Great Lakes to discuss your particular case details.



Model:

- Upper and lower models poured in colored Die Stone.
- Full arch models-no horseshoe. ½" model bases. Visible anatomy must show 5mm extension beyond all gingival margins buccal, lingual, and distal.

Bite Registration:

- 2mm vertical incisal clearance and 50% of full mandibular protrusion.