IMPRESSION MATERIALS

Non-elastic

ZnO-Eugenol
= zinc oxide paste + eugenol catalyst (mixed with accelerators, fillers & binders); sets in water to form ZINC EUGENOLATE
low viscosity- no compression on soft tissues, great for secondary impressions for edentulous patients
good dimensional stability <0.1%
good surface detail reproduction
use in thin section 1mm
close fitting non perforated special tray needed
rigid - can distort undercuts
eugenol allergy- use EBA instead

Plaster

Waxes

Impression Compound
= resin (wax, shellac, gutta percha), filler (calcium carbonate) and lubricants (stearic acid and stearin)
thermoplastic setting (softens when heated to 50 degrees and hardens on cooling)
mucocompressive so accurate recording of underlying ridge for close fitting special tray (use green stick for border moulding)
non-irritant
poor dimensional stability easy to distort on removal from mouth

Elastic

Aqueous Hydrocolloids
Agar & Alginate

Agar
reversible (cool/heat to reverse between sol and gel)
= Agar (seaweed - polysaccharide), borax (to increase gel strength), potassium sulphate (improves gypsum surface hardness), 85% water
setting 2 phases - liquefaction (heat using water baths) + transformation (heat just above body temp)
non toxic & non irritant
low tear resistance
low dimensional stability (cast immediately)
slow setting time

Alginate
= sodium alginate (alginic acid), calcium sulphate, sodium phosphate (retarder), fillers (silicate powder) & potassium fluoride
decomposition irreversible (sol to gel) setting is calcium alginate and sodium sulphate, see colour change & pH 11 to 7
quick, cheap, minimal tissue displacement good fluidity for accurate detail
ideal for study casts, opposing casts, splints
dimensionally unstable (pour immediately), the longer until its poured = more distortion
3mm thickness to limit distortion
poor tear resistance
poor dimensional stability (imbibition - absorbs water, syneresis shrinks loses water)
if poor mix and get air or particles - grainy, single pour
setting dependent on water temperature

Non-aqueous Elastomers

Polyether
= polyether polymer, alkyl aromatic sulphonate initiator, fillers and plasticiser
cross linkage via cationic polymerisation
hydrophilic less shrinkage
non-toxic & non-irritant
good dimensional stability
one-step technique
low tear strength short working time
rigid so difficult to remove from undercuts
absorbs water which changes its dimension

Polysulfide
first elastomeric impression material, less likely to use these anymore
= polysulphide polymer, plasticizers & fillers catalysed by lead dioxide/copper oxide or inert oil
condensation polymerisation occurs releases water so increases contraction-shrinkage
excellent tear strength good detail reproduction
high flexibility
can stain clothing smells & tastes bad
needs moisture control condensation occurs
poor dimensional stability

Silicones

Condensation
= (poly)dimethyl siloxane, accelerated by stannous octoate + alkyl silicate, catalysed by metal organic ester
condensation reaction releases ethyl alcohol (results in contraction shrinkage)
if casted ASAP its accurate
good elastic properties
tolerated by patient well
high shrinkage on set due to loss of ethyl alcohol - poor dimensional stability
hydrophobic - poor wettability

Addition
popular choice for accurate impressions
improved version of condensation silicones as there is no by-product
= siloxane prepolymers + vinyl polydimethyl siloxane + chloroplatinic salt, as well as fillers and surfactants
addition polymerisation means hydrogen cross linkage
high dimensional stability good elastic recovery
reasonable tear strength as cross linkage occurs (do not take out mouth early)
accurate multiple casts
variety of forms - heavy, medium & light body
hydrophobic so needs moisture control
care if using latex gloves which contain sulphur and can inhibit setting time
possible hydrogen gas release creating bubbles in cast and increases porosity of models

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For more information
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