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Acron HI

The perfect high impact denture base material

Martyn Young, Cotswold Dental Laboratory, highlights the key factors when selecting a high impact denture base material



Because of the growing private market, coupled with higher patient expectations and the rise in fees, dental laboratories are under increasing pressure to produce better quality prosthetics, but at ever more competitive prices. Consequently they are looking to use high quality denture teeth together with a high quality, "high impact" denture base acrylic.

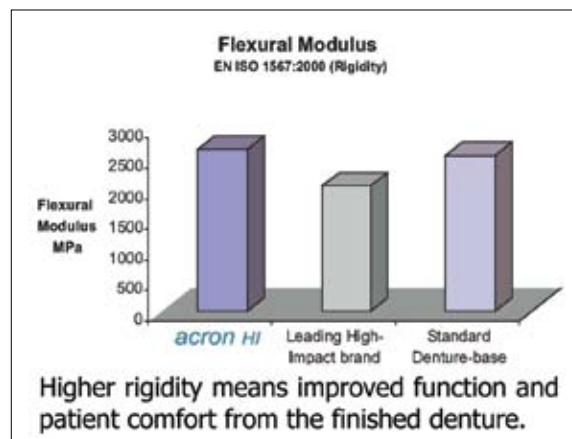
With so many high impact denture base acrylics on the market, how do you know which one to choose?

The most important criteria to consider are:-

- strength – this must be as high as possible
- amount of residual monomer after curing – this must be as low as possible
- colour – this should be natural
- time taken to reach dough stage
- working time during the dough stage
- curing time
- cost



Graph 1



Flexural Strength and Impact Strength

One of the reasons most dentures break prematurely, while in use, is because of repeated slight flexing resulting in stress fractures. Many high impact acrylics

sacrifice flexural strength in favour of high impact strength, exacerbating this problem.

Acron HI combines a similar, if not slightly higher, flexural modulus (**graph 1**) to standard denture base materials with a much higher impact strength (**graph 2**) because of its special Multi Matrix technology. Consequently

it overcomes the problems frequently associated with other high impact denture base materials.

Acron HI can be processed using either a conventional flask & pack technique or injection moulding. The latter offers

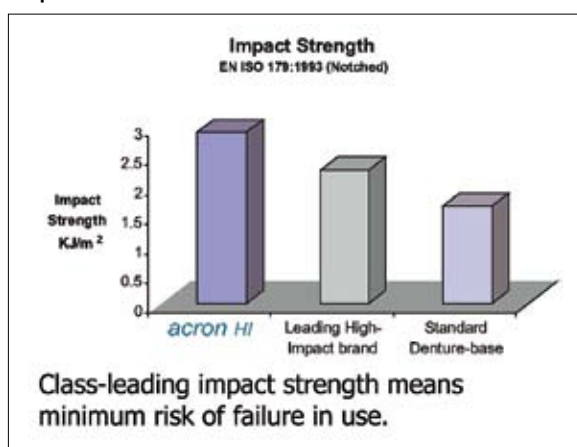


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Graph 2



several advantages. First there is greater accuracy of the fitting surface and vertical dimension due to the closed flask employed in the process. Secondly, there is an increase in the density of the denture base material, which also enhances its strength.

Low residual monomer

Many acrylics on the market can be cured in as little as 20 minutes but may contain a high level of residual monomer, which can result in allergic reactions and reduced strength of the finished prosthesis.

By ensuring a lower level of residual monomer the technician can minimise the risk of allergic reactions and produce dentures that are stronger and less likely to fracture because of increased cross-linking.

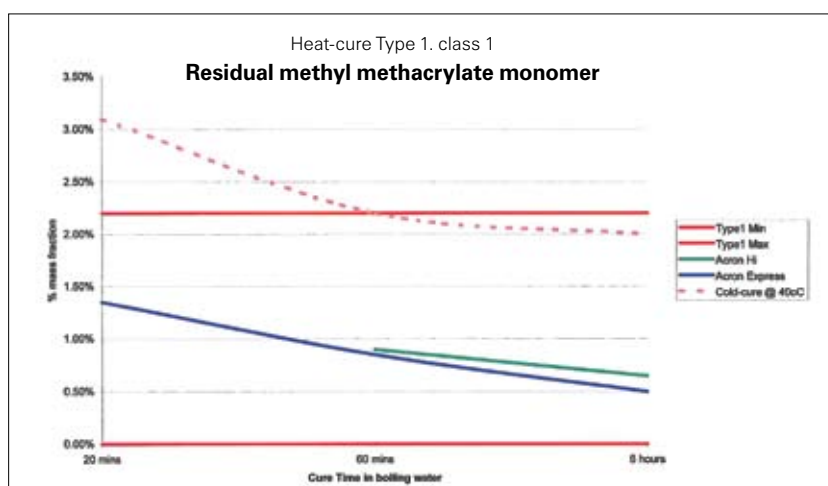
Technicians can control the level of residual monomer by always ensuring they use the correct powder to liquid mixing ratio. The level can also be reduced by using a slow cure overnight. **Graph 3** demonstrates that the levels of residual

monomer in various denture base materials have always reduced after six hours of curing.

Hints & Tips For Optimised Results

1. Always use the correct liquid for the appropriate powder. The monomer is highly flammable and harmful by inhalation, in contact with skin or swallowed. It should be stored in its container in a well ventilated place at below 25°C.
2. Shake the powder container well before use, especially when using veined shades. This ensures the veins are evenly dispersed throughout the powder for optimised aesthetics. Replace the cap tightly and store unused powder between 16-25°C.
3. Prepare the mould, carefully removing all traces of wax with boiling water and a suitable detergent / wax solvent and allow to cool.
4. Apply a suitable plaster separator, e.g. Kemdent Liquid Tin Foil, and allow it to dry thoroughly before packing.
5. Accurately measure the correct amount of liquid (20ml for a full full denture) into a clean dry mixing vessel using the plastic measuring vial supplied.
6. Accurately measure the correct amount of powder (a level 60 ml measure for a full full denture) using the blue powder scoop provided.
7. Carefully add the powder to the liquid in the mixing vessel.
8. Mix thoroughly with a clean metal spatula to ensure the powder particles are completely wetted.

Graph 3





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CPD Questions

- Q1:** Name three important criteria to consider when choosing a high impact denture base material?
- Q2:** Name one of the reasons most dentures break prematurely while in use?
- Q3:** What enables Acron HI to combine a higher flexural strength with its much higher impact strength?
- Q4:** Name two advantages of the injection moulding process compared with conventional flask & pack?
- Q5:** Name two problems resulting from a high level of residual monomer within a cured denture base material?
- Q6:** Name two ways a technician can help reduce the amount of residual monomer within a cured denture base material?

If you wish to claim verifiable CPD please ensure that you add and sign the following declaration when submitting responses by post or by email. (Email type your full name)

I certify that the answers hereby submitted for these questions are completely and wholly my own work and have not been copied in part, or in whole, or otherwise plagiarised from the work of others.

Signed

Date

9. Carefully clean the sides of the mixing vessel to prevent any dry particles dropping into the mix.
10. Cover and leave to dough for a minimum of 20 minutes at 20°C.
11. The dough is at the right consistency when it is free from stickiness but not rubbery. This should take about 30 minutes at 20°C.
12. The flask should be at room temperature when packed.
13. Ensure the mould is properly filled as indicated by excess dough being squeezed out all around the edges.
14. Close the flask slowly.
15. A trial closure is recommended. This helps reduce the risk of porosity in the denture.
16. **Never pack the dough after the working time has elapsed or the material has become rubbery. This is very important!!!**
17. Keep the flask under pressure for at least 15 minutes before curing.
18. Immerse the flask fully in cold water and cure according to the recommended temperature and times. The flask must be kept under pressure throughout the curing cycle to prevent expansion, distortion and minimise the risk of porosities. I recommend using a multi-cure water bath with a cycle of seven hours at 80°C rising to boiling point for the final two to three hours.
19. Once completely cured allow the flask to cool to room temperature on the bench for at least 20 – 30 minutes. If necessary, after this time, immerse in cool water (<20 °C) for at least 20 minutes before deflasking.

Relines & Repairs

It is recommended that relines and repairs are carried out by reprocessing using Acron HI heat-cured acrylic as explained above. Alternatively, Kemdent manufacture a high impact strength cold-cure acrylic called Simplex Hi. Simplex Hi uses the same Multi-Matrix technology to provide the ideal balance of flexural and impact strength. It is available in matching shades and provides a quick alternative for additions and repairs.

Acron HI and Simplex Hi are manufactured in the UK by Kemdent Ltd.

For further information contact Kemdent on 01793 770090 or visit www.kemdent.co.uk

Martyn Young has been a qualified Dental Technician since 1971 and is a Director of Cotswold Dental Laboratory which is a specialist prosthetic laboratory.

Visit

www.cotswolddentallab.co.uk for further information.