

The latex doctor



Harry F. Bader

On creasing, testing tensile strength, the latex 'mystery', and adhesives...

I am a production executive at a glove factory in Malaysia. We've been facing some quality issues lately. Some of our nitrile gloves become creased/crinkled after they are produced while others do not. This is particularly the case of chlorinated gloves and is normally found when the glove is being hot-tumbled. Could you please tell us what the possible causes, physical and chemical, for such creasing are?

W. Y. Lee

Riverside Resources Sdn. Bhd.

Creases after hot tumbling are usually due to gloves being removed from the tumbler while still hot. The creases occur as the gloves cool in the tote box or hamper. This is more of a problem with nitrile gloves. Turn off the heat about 10-15 minutes before removing the gloves from the tumbler.

Another possible cause is that the tumbler basket is revolving too fast. This causes the gloves to hold to the side of the basket, developing creases. When this occurs you usually see signs of abrasion on the creases. If that is the case, slow the rotation of the tumbler (25 rpm is usually about right).

A third cause could be that the tumbler temperature is too hot. Chlorinated gloves should not experience more than ~~200°C~~ ^{50°C} after chlorination.

Results of creases are: 1) Poor appearance and poor customer acceptance, 2) Easy ozone attack at the stressed crease, which will affect the shelf-life.

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Currently, our clients need some guidance in testing tensile strength and elongation of gloves after oil dipping (coating). Would you mind offering your professional technology to release the testing methods either from ASTM or other standards? Please describe testing methods in detail?

Andrew Chen,
Sales Manager

Sheen More Enterprise Co. Ltd.

Testing physical properties of nitrile gloves would be according to methods in ASTM D 412 and to the specifications in ASTM D 6319. Essentially, what is done is that physical properties are checked before and after exposure to the oil. The results are compared with the standard minimum requirement. This is according to ASTM D 471. Another method of evaluation is to measure the permeation of the glove material by the oil, using ASTM F 739.

I'm sorry, due to copyright laws I cannot send a copy of these standards and specifications. All are in the ASTM Standards Books, and

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Send your questions to:

'The Latex Doctor'
Rubber Asia,
Dhanam House,
Cochin - 682 020,
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Fax: 94-484-317872

should be available in a university library or a large city public library.

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I am sending one sample of sponge foam rubber the basic raw material of which is a mystery to me. It appears as synthetic latex, but I am unable to decide whether it is neoprene latex or polyisoprene lattices. I shall be grateful to you if you could enlighten me on the raw material used, its source of availability and the process applied.

Ram Ji Seth

Raghav Udhayog, F-10 Pabnki
Site II, Industrial Area, Kanpur

The foam samples were subjected to a simple flame test.

Natural rubber will support combustion and will tend to melt as it burns. Neoprene will not support combustion. It will go out if not continuously in contact with a flame source. SBR will support combustion, but it does not burn aggressively and it chars.

It is my opinion that the polymer of your foam rubber sample is mainly, if not totally, SBR rubber. To obtain a more precise analysis, an FTIR Polymer Identification would be required.

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Is there any cost-effective elastomer/TPE, natural or synthetic, excluding silicones and plasticised PVC, that can give transparent, colourless and crystal-clear moulded rubber components (food grade) like the nipples?

Is bleached natural rubber latex available anywhere? Which is the best source, preferably Indian, for complete technology of dip/compression/inj. moulded rubber components (food grade)? Who are the dip-moulding pattern suppliers here? What are the (latex) adhesives (food grade) available to stick such moulded components to plastic wares/toys (PVC/PET/PC)?

Can such rubber components be welded to plastics? Can you

explain the latest procedures adopted for microfine hole piercing, as in pacifiers, etc. for large volumes?

S. Chandrasekhar

When you add "cost-effective" to your question, you make it much more complicated. What is cost effective for surgeon's gloves or for infant pacifiers is not "cost-effective" for exam gloves.

It is difficult to keep up with new technology. I suggest you contact suppliers who advertise in *Rubber Asia* to get information on new latex polymers which can be used to make "clear" products. Contact the Indian Rubber Board for sources of rubber technology.

For a reference on latex technology, I recommend *High Polymer Lattices* by D.D Blackley (1966, Mac Laren & Sons Ltd., London, Palmerton Publishing Company Inc., - New York, printed by the Garden City Press Ltd., Letchworth, Hertfordshire, UK), and *Polymer Lattices* by D.C. Blackley (1997, Chapman & Hall India, R. Seshadri, 32, Second Main Road, CIT East, Madras 600 035 India). Both should be in either your university library or a city library.

The best source of adhesives information is the manufacturers themselves. If you explain what you want to adhere, they will recommend the adhesive and give you samples to try.

I am told that rubber films are being "welded to plastics". I understand this is possible only with very stringent quality and process controls. Also, both material costs and equipment costs are high. This information is about a year old, so there may be improvements available. As with most things, the latest information should be available from the equipment suppliers.

The latest hole cutting technique for pacifiers is automated laser cutting.

The latex will remain stable if kept cool during storage and in the dip tank. During dipping, the latex must be kept circulating to ensure only the latex touching the hot forms coagulates. ■