



Harry F. Bader

Right accelerator-A/O combine, latex discolouration causes; NRL prospects etc.

In latex rubber, chemicals are used in the form of dispersions. In making dispersions and emulsions, how do we select a proper accelerator and a/o combinations in any latex compounding. In the case of solid rubber, we can check curing time for an article on ODR or MDR and then one can fix the time for curing. In the case of latex, by which method can cure time be checked?

And if you have guide formulations for dispersions, emulsions and latex compounding formulations, please let us know.

Anand on e-mail

This is a multiple question which I cannot reply to in the space provided in *Rubber Asia*. However, the following will provide some guidance:

Dispersion

1. First of all, I would suggest you obtain a source of information about dispersions and how dispersions are made plus suggested recipes for dispersing common latex compound chemicals.

Three sources are:

— *The Vanderbilt Latex Handbook*, 3rd edition, 1987, R.T. Vanderbilt Company Inc. (www.rtvanderbilt.com)

— *Neoprene Latex*, John D. Carl, 1962, E.T. DuPont and Co. Inc. (www.dupont-dow.com)

— *Polymer Latices*, 3rd edition, 1997, Chapman & Hall India (Madras 600035)

These provide a variety of infor-

mation, including typical dispersion recipes; ball-mill grinding recommendations, particle size measurement; also guidance towards avoiding the many possible problems which come from improper dispersions.

Latex compound recipes are in the same references.

2. These same references will provide guidance for the selection of accelerators and antioxidants. Of course, an understanding of the service expected from the latex product will guide the selection of antioxidants. Also, the processing to be used will help in the selection of accelerators.

3. It must first be decided if a pre-vulcanisation or post-vulcanisation system is to be used. This done, accelerators and a process system can be chosen. At that time, it can also be decided if residual accelerators are to be avoided. This will also influence the choice of accelerators.

4. For a post-vulcanisation system: Once the latex film has been dried to a moisture level of 1% or less, a cure time of 15-20 minutes @ 116°C should be sufficient. For a pre-vulcanisation system, no cure is required after drying is completed.

Final physical properties will show if everything has been done properly

I am a chemist with Kurlon Ltd., a rubberised coir manufacturing firm in south India. In the case of dry rubber compounds it is possible to find out the "vulcanisation time" by

Harry F. Bader,
Vice-President, Latex
Services, Akron
Rubber Development
Laboratory, Akron,
USA, and a world
authority on latex,
answers questions and
doubts of
readers on latex
and latex products.

Send your questions to:

'The Latex Doctor'
Rubber Asia,
Dhanam House,
Cochin - 682 020,
Kerala, India
Fax: 91-484-2317872
E-mail: danam@satyam.net.in
dhanrubber@eth.net

using Rheometer. Is there any method to find out the same for compounded latex?

Pradeep Kumar P. Joy,
Bangalore

If you feel confident that you can predict the vulcanisation time by a Rheometer, then do the same with the latex. Dry the latex film @ 70°C until the moisture content is less than 1.0%. Then run a Rheometer curve on the dried film.

Generally, if a latex film is dried to 1.0% moisture, a 15-20 minute cure @ 116°C will provide satisfactory physical properties. However, if the chloroform precure indicates pre-vulcanisation, then only drying is required.

What testing can we do to ensure a glove will meet requirements for food contact?

Rubber Research Tech. Industry, Maharashtra, India

For use in the US, the requirements are in the US Code of Federal Regulations (21CFR). Food and Drug Regulations has in Sec. 21 CFR 177.2600, a list of materials and the concentrations thereof which are permitted in products coming in contact with food or food products.

Also in that section there are extraction procedures and specifications for maximum allowable total extraction quantities in distilled water and Hexane extraction media.

With your glove compound recipe, you can determine if the materials content is within the allowable limits.

Extractions in DI Water and Hexane will determine if your product meets the requirements.

NOTE: For non-US requirements, investigate the specification for the point of sale country.

Is there any difference in maturing polyisoprene latex and natural rubber latex?

Anonymous, 2004 International Latex Conference, Akron, Ohio

A quick answer is Yes. There are many differences:

- The chloroform pre-cure measurement which works well for NR latex doesn't work for synthetic polyisoprene. You must use n-butyl alcohol. But, the hexane swollen diameter method works for both.
- Standard maturing methods (pre-vulcanisation) are not what you would expect from NR latex compounds. How they differ will, as expected, vary depending upon the compound recipe and the accelerator system being used. The polymerisation agent and stabiliser residues in the synthetic polyisoprene are, in my opinion, a major reason for these differences.

What is the cause of pink discoloration on my latex gloves after 1-2 weeks in plant process storage?

Anonymous - International Latex Conference 2004 Akron

Discoloration can occur for numerous reasons. Some of them are:

- Gloves are wet (above 1% moisture)
- Storage temperature is high.
- Ozone concentration is high in storage area.
- Gloves are exposed to fluorescent light.
- Gloves were hot when put into storage containers.

The pink colour is likely due to the antioxidant being used. 2,2-Methylenebis (6-4 butyl-4-methylphenol) is an excellent antioxidant. However, when it reacts with oxygen, the reaction product is pink. The physical properties are generally protected, but the pink colour is a problem. I suggest you try a non-staining AO such as 4,4-Butylidenebis (6-t-butyl-m-cresol). There are several manufacturers of this.

Between synthetic and natural latex, which has the better market growth potential over the next 5 to 10 years?

I believe the natural latex market percentage will grow more than synthetic polyisoprene. There are several reasons for my belief:

- * The processing of NR Latex will greatly improve both the residual accelerator dermatitis problem and the protein allergy problem.
- * Other sources of natural latex will come into play as alternatives to *Hevea* natural latex.
- * Clones of *Hevea* with greatly reduced protein content will be developed.
- * Methods of de-proteinising natural latex will be developed. ■

Statement about ownership
and other particulars of
RUBBER ASIA
Form IV, See Rules 8

Place of publication : Cochin
Periodicity of publication : Bimonthly
Printer's name : Kurian Abraham
Nationality : Indian
Address : Dhanam House 29/609 Kadavanthra Cochin-682020
Editor's name : Kurian Abraham
Nationality : Indian
Address : Dhanam House 29/609 Kadavanthra Cochin-682020

Names and addresses of individuals who own the newspaper and partners or shareholders holding more than one per cent of the total capital:

Dhanam Publications (P) Ltd., Kadavanthra, Cochin - 682 020.

I, Kurian Abraham, hereby declare that the particulars given above are true to the best of my knowledge and belief.

Sd-

Kurian Abraham
(Publisher)