The Latex Doctor

F Bader

? What possible new products can be made from natural rubber latex?

Anonymous, *International Latex Conference Charlotte, US*

New products from natural rubber latex

Specific new products are currently in the minds and imaginations of inventors. I can't possibly know this. However, there are numerous methods of manufacturing to make latex products. Evaluating these methods may lead to the next 'new' latex product. Here is a partial list of typical methods:

- Coagulant dipping: Typical glove method.
- Straight dipping: Typical condom method.
- Coagulant/straight dipping: typical for products with discrete areas of greater thickness.
- Heat-sensitive dipping: Heated forms dipped into heat sensitized latex compound.
- Coagulant/chemical rough dipping: Typical for products with an outer gripping surface.
- Extrusion: Mainly latex thread.
- Rotational casting: For seamless balls using heated metal moulds with heat-sensitive latex.
- Porous mould casting: Open top mould where coagulation is caused by water being absorbed by the mould. Remaining latex is re-used.
- Porous mould casting: Rotational, closed top with a measured amount of latex.
- Cast film — doctor blade: Spreading of latex on a moving steel belt. Latex is dried, cured, post-cured, processed and rolled on a core.
- Dipped laminates: Natural latex straight- and coagulant-dipped with an over-dip of synthetic (nitrile or chloroprene) latex compound.
- Batch foam: Latex compound is whipped in an industrial version of a kitchen mixer. The whipped foam is poured onto a mould and steam-vulcanized.
- Continuous foam: As above, except that the foam is generated in continuous industrial air/latex/coagulant (usually sodium silica fluoride) blender. The foam is then injected into a mould or spread on a moving metal belt.
- Spray coating: There are several varieties of surfaces onto which the spray is directed. In some cases, the latex spray becomes a permanent coating. In others, the spray is dried, cured, and removed to become a unique film.
- Fire and flame retardants: There are many additives which improve the fire and flame resistance of latex products. These can become items of apparel or safety-related products.
- Doctor blade coating of fabrics: Similar to a cast film process. But the latex is cast onto a fabric and remains as a permanent coating, usually to provide water or slip resistance.

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

NR latex minus allergy & "replacements"

I want a latex product without proteins. Also, I want NR latex properties without using NR latex. Further, what is/are replacements for NR latex?

KJ *on e-mail*

The United States became aware of NR latex protein allergies and vulcanization accelerator residue contact dermatitis cases in the late 1980s when the mass influx of low-cost medical gloves from South-east Asia started.

Low-cost meant that in addition to low labour rates, the processing costs also were low.

Water being an expensive item needed for proper processing, it was one item whose use was greatly reduced or eliminated.

For many years, it was known that leaching

was needed to make latex products with good shelf life and freedom from discolouration. However, with the advent of disposables that was no longer considered important. Leaching was curtailed or eliminated. I witnessed that in several factories in SE Asia in 1990.

This led to cases of NR latex allergies and many more cases of contact dermatitis.

There is no easy solution to the problem. Synthetic latex has different physical properties. However, these are usually sufficiently close enough to those of NR latex to make satisfactory products. Yet, in most cases, the problem of contact dermatitis continues. Vulcanization accelerators are also used for synthetic latices.

The other alternative is to use natural latex from other than the *Hevea Brasiliensis* rubber tree. If that is your choice, the problem of contact dermatitis is still present since, here again, vulcanization accelerators are used. Also there are claims that the proteins in these latices can result in allergic reactions.

The answer is. whatever latex you use, proper processing is needed and until something better comes along proper vigorous leaching is needed.

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Discolouration & other poor balloon properties

I have a problem with small natural latex balloons used for a medical procedure. The balloon is packaged in a heat-sealed plastic bag and is EtO-sterilized. We find the balloon is discoloured in its package and its physical properties have degraded. This occurs after 10-12 weeks storage.

***Anonymous**, e-mail*

There are several possibilities. Plastic is not as efficient as aluminium foil as packaging for latex products. Plastic allows air penetration and unless it has a colour coating it will also allow light penetration. Light will cause discolouration in those areas of the product having direct light contact.

Air penetration will result in ageing much the same as you would expect from an unpackaged latex balloon. You are likely to see ozone cracks as well as discolouration and physical property degradation. If the storage temperature is above 80°F, those problems will occur in a short period of time.

Flame retardants in NRL

Do you have specific recommendations for a flame retardant in natural latex products?

***Anonymous**, 2005 International Latex Conference, Charlotte, NC*

There are over 30 materials listed in the *Rubber World Blue Book*. Most are of the type which releases halogens to produce their retardant properties. They, thus, act much as does chloroprene latex.

I suggest you try a natural/chloroprene blend of latices as an alternative to natural latex plus a flame retardant.

AO, the villain

We find a pale red or pink discolouration on our medical gloves in temporary storage prior to quality inspection and packaging. What is the likely source of that discolouration?

A S-E Asian glove maker

The discolouration is likely due to the anti-oxidant (AO) that you are using. There are several manufacturers and suppliers of AOs that produce items that result in a pink discolour-ation of the product when the AO is doing its job.

There are good AOs. But in many products the colour change is unacceptable. To avoid the problems, a switch to a non-discolouring AO is the solution. A phenol-type AO is the usual choice. ■