Some years ago the latex product manufacturing industry attracted very little attention. Although the largest single sector outside the tyre industry, consuming an estimated 10% of the world's natural rubber supply, the industry seemed to have reached a well-developed technological plateau, and to be set for continued expansion at about the same rate as overall natural rubber consumption. Even the major translocation of manufacturing facilities to South-East Asia took place in an orderly fashion without attracting too much attention from the media.

All this changed in 1988, when the emphasis on gloves as a barrier against the spread of infection by the HIV virus produced a hiatus in the natural rubber market. Over-estimation of the demand for latex gloves, coupled with double sourcing to guard against unrealistic fears of under-capacity in the industry, produced an enormous demand for latex, pushing up the price by a factor of three. The integration of latex concentrate and source materials for dry rubber ensured that the latter followed the upward spiral of latex prices. The International Natural Rubber Organization's buffer stock was eliminated within a few months, at a not inconsiderable profit to the funding countries.

The return to lower, and now definitely depressed, rubber prices has not removed the latex goods industry from the spotlight. There have been a number of developments in both the legislative and technological fields which have kept it as the focus of attention. The first of these was the decision by the US authorities that the pricing policy of Malaysian rubber thread manufacturers, who now produce the bulk of the world's latex thread, was harmful to US domestic producers. Despite vigorous protests from Malaysia, a countervailing import duty has been imposed on extruded latex thread exports from Malaysia to the US. However, the recommendation from the US International Trade Commission that a 25% tariff should be imposed on all extruded thread imports into the US above 7700 tonnes, or approximately 50% of the US market, was not accepted by the President.

Recently, glove manufacturers have been faced with allegations that latex films, particularly condoms, are not impervious to the passage of bacteria and viruses. An earlier assertion that glove films contained long, twisting channels has been refuted and shown to arise from faulty techniques in the preparation of samples for examination by electron microscopy. The most recent claims are that the particulate nature of natural rubber in latex leads to permeability because the gaps between particles do not close completely on coagulation. There is some evidence that there may be sufficient residual structure to facilitate the migration of water molecules to the surface of latex films but even the smallest virus is comparatively huge on this molecular scale, and there is no evidence that...

The latex goods industry has attracted attention recently due to a number of developments in both the legislative and technological fields. One of these developments—the increasing number of reports of allergic reactions to natural latex films, particularly among medical operatives who wear gloves for long periods—will be the subject of an international conference to be held in Amsterdam at the end of this year (see page 32).
latex films contain holes through which they can pass. However, there is much published evidence that they are effective barriers to viruses.\(^4\)

Despite the attention that these comments have received in the press, particularly in Eire where there is inherent opposition to the use of condoms, there is no reason to doubt that natural rubber latex films are effective barriers to disease transmission.

A more serious, practical problem has arisen for the glove industry from the increasing number of reports of allergic reactions to natural latex films, particularly among medical operatives who wear gloves for long periods. Although contact dermatitis caused by added chemicals, particularly dithiocarbamate accelerators, has been recognized for many years, it is now apparent that some individuals, particularly those with a history of allergic sensitivity, can react to residual naturally occurring proteins in latex gloves. The latex goods manufacturing industry has already taken positive steps to investigate and minimize this problem.\(^5\)

A major conference sponsored by the US Food and Drug Administration (FDA) in November 1992 examined all aspects of latex protein allergy.\(^6\) As a result, the FDA will require all goods made from natural rubber latex to carry a label identifying them as such, although no specific health warning will be necessary.

Further consideration is being given to latex protein allergy at two international meetings this year, one in Malaysia and one in Europe. The first, a Latex Protein Workshop, was held in conjunction with the International Rubber Technology Conference in Malaysia on 15th June. The objective of the Workshop was to inform latex product manufacturers of work carried out at the Rubber Research Institute of Malaysia on the reduction of residual latex protein in rubber goods. It also considered other recent work on the origin of the allergic reaction and the analysis of latex protein. The second meeting is an international conference, Latex Protein Allergy: the Present Position, to be held in Amsterdam on 6th December (see page 32). Sponsored jointly by European Rubber Journal and Rubber Consultants, the conference will consider the medical aspects of the problem, the manufacture of hypo-allergenic medical products, the use of alternative materials to natural latex and possible European health and safety legislation in this field.

Dry rubber goods manufacturers are already having to cope with the consequences of health and safety legislation on nitrosamine levels in rubber products. The only latex products currently affected by this legislation outside Germany are baby bottle teats and soothers. However, Germany has extended its nitrosamine recommendations to cover all products in its ‘special category’, including latex products such as toy balloons and toys, and also to condoms. It seems likely that regulations covering the whole of the EC will follow suit, and that any of these latex goods sold in Europe will need to meet nitrosamine regulations. The extent to which this may be a problem is revealed in a survey of nitrosamine and nitrosatable amine levels of a range of latex goods conducted as part of a multi-client study by Rubber Consultants. The study also examines the effect of accelerators and antioxidants in generating nitrosamines and nitrosatable amines in both post- and pre-vulcanized latex formulations. It is self-evident that the use of high levels of secondary amine-based accelerators to give rapid prevulcanization at relatively low temperatures is likely to generate high levels of aminic-based by-products. This and other factors affecting the production of low-nitrosamine latex vulcanizates are reviewed in this study. It should be essential reading for all latex product manufacturers, to whom it is now available (see page 27).

References
5. Latex producers respond to protein allergy problem, Rubber Developments, 1992, 45, 34.

Seminar
Recent advances in latex technology
Rubber Consultants is organizing a seminar entitled Recent advances in latex technology, to be held at the Tun Abdul Razak Laboratory, Brickendonbury, Hertford, UK on Friday, 22nd October 1993.

Latex processing is an area where little formal training is available in academic institutes. Practical experience is usually acquired by in-house training, with little opportunity to acquire background scientific knowledge to assist in developing and optimizing processing techniques. Recent advances in latex technology is intended to provide coverage of matters of current interest in the natural latex industry. These include the effects of extension of nitrosamine restrictions to products other than teats and soothers; the possibility of using alternative vulcanizing systems to eliminate nitrosamine formation; and concern over allergic reactions to natural latex proteins. Other papers will discuss the effects of zinc in natural latex and latex gelation. Participants will be able to see demonstrations of various types of equipment, including a new condom burst facility, surface defect examination by scanning electron microscope, a recently-installed computer-controlled laboratory dipping machine and heat-sensitive extrusion of latex tubing.

The seminar is intended primarily for those technically involved in latex product manufacture or research and in the testing or analysis of latex rubber products.

The speakers are all senior staff of the Latex Products & Processing Group of MRPRA – acknowledged experts in their particular field.

Attendance at Recent advances in latex technology will cost £160 plus VAT with 10% discount on the basic price for companies sending two or more delegates. This fee covers attendance at sessions, luncheon, refreshments and relevant MRPRA publications and lectures. For further details please contact Karen Roberts on (0992) 594966 or fax (0992) 554837.