

For Winston Smith, they are the ultimate terror: "Of all the horrors in the world – a rat," he says in George Orwell's 1984. A similar view of the rodent is held by sections of industry as diverse as food retailers and telecoms companies. As well as spreading disease, rats are destructive – chewing through a variety of metal, wood and plastics products.

"Rats' teeth grow constantly, so they need to chew in order to keep their teeth worn down," says Shekhar Dandekar, managing director of Rex Polyextrusion, a pipe extruder based near Poona in India.

His company produces protective pipes for telephone cables. For the last three years it has produced a special pipe that incorporates a 'rat repellent' masterbatch. The masterbatch, developed by C Tech Corporation of Mumbai, is beginning to find use in Europe, but most of the applications are still to be found in India.

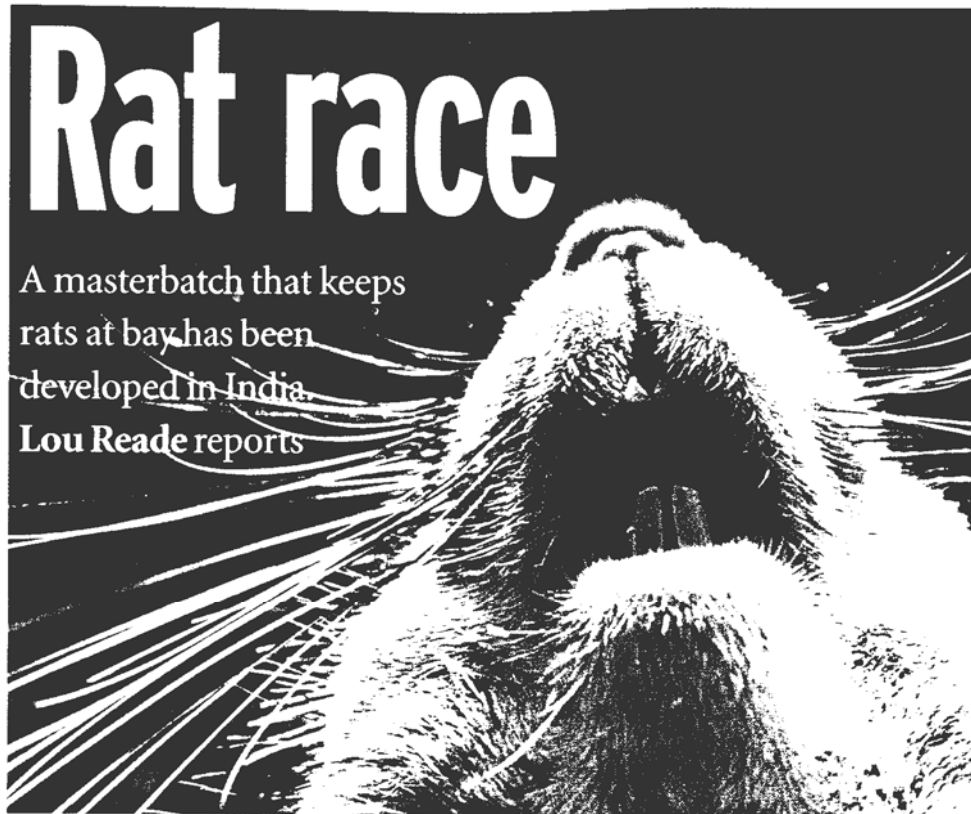
The masterbatch incorporates a number of chemicals to keep rats at bay. First, there is a 'contact repellent' – which mimics the smell of predator urine. Second, there is a resin derived from chillies, which has the same effect as it would on humans. Finally, the masterbatch is laced with denatonium benzoate, which is dubbed "the bitterest substance known to man".

Dandekar says: "We have tested the pipes, by burying them in the ground, leaving them for a month and counting the bite marks. The formulation certainly reduces the damage by rats."

Rex produces 2,000 tonnes/year of

Rat race

A masterbatch that keeps rats at bay has been developed in India. Lou Reade reports



Rats must chew constantly in order to wear down their teeth. This causes havoc for many industries

co-extruded HDPE pipe, of which around 10% uses 'Rodrepel'. The reason for the relatively small amount, says Dandekar, is cost. The rat repellent pipes cost 30% more than standard pipes, which puts them out of reach of many customers.

The alternative is to bury the pipes deeper, as rats usually only burrow to a depth of 1m. But digging deeper holes is more expensive.

"Our customers have to weigh this up against the added cost of the pipe," says Dandekar.

Regarding the processing of the material, he says that it can be very smelly and offensive. "The odour can

be absorbed by humans," he says.

Unsurprisingly, the food industry also has a rat problem. New Delhi-based Ajay Poly Products, a leading producer of seals and gaskets for the white goods industry, is now testing products that incorporate Rodrepel.

The company produces around 100 tonnes/month of flexible PVC refrigerator gaskets. Managing director Rajeev Jain says: "We are evaluating the potential of using Rodrepel in our refrigerator gaskets."

The company is currently in the middle of testing the product. After this, it will decide whether or not it will start to use the masterbatch in its products.

The tests began because the users of commercial refrigerators were complaining about damage to their products.

"Rats like the smell of the plasticisers in the PVC," says Jain. "This attracts them to the gaskets."

He says that, if rat repellent gaskets become commercial, this might well be used as a marketing tool by manufacturers.

"Rat repellent seals might eventually become a USP [unique selling point] for the refrigerator manufacturers," says Jain.

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Once bitten, twice shy

Rodrepel, the rodent repellent masterbatch from C Tech Corporation, is supplied in three main carriers: PVC, LDPE and PP. Chaitanya Joshi, managing director, says that he sells around 3,000 kg/month to Europe, for three applications. These, as in India, are in fibre optic cable protection and agricultural film. There is also potential interest from the automotive industry – where one manufacturer has complained of rodents biting through internal cables.

The masterbatch is loaded into the resin at around 5%. The masterbatch itself is very concentrated. Joshi says that the production of the masterbatch is very specialised. There is growing interest from Europe, says Joshi, but he finds it difficult to service the market. "Some European masterbatchers are interested in the technology, but they want to sell it under their own name," he says.

As well as anti-rat formulation, C Tech has developed masterbatches against other animals. The company's Termirepel, for example, disrupts the mating cycle of termites. He also has one customer in North America who incorporates a grizzly bear repellent into large plastic bins.