

Chew beginnings

What glows, smells like sausage, and won't fall apart? Steven Pacitti finds out



The Labrador behind the lab work

When the office dog can't stomach the company's chew toys, most people buy a different brand. Not German company Neopur Technologies – it decided to invent a new one.

The result is PUchew, a hot-cast elastomer "bone" that looks like a playful accessory but is built on serious materials science. Developed in partnership with systems house Pearl Polyurethane Systems, PUchew is now being tested by almost 100 dogs, with a very demanding Labrador called Capser as chief product tester and "feel-good manager".

The idea was born in 2022 when Capser, the company dog at Neopur in Osnabrück, reacted badly to conventional chew bones. Commercial dog chews, whether natural or synthetic, can splinter, crumble or simply not stand up to vigorous chewing. That can mean ingestion of fragments, short product lifetimes and, crucially, unhappy dogs (and owners).

"We started experimenting because our own dog couldn't tolerate regular chews," said Christian Meyer, managing partner at Neopur. Early in 2023, the first prototypes went out to a small circle of dogs for field testing. According to Meyer, feedback was so positive on durability and "chew feel" that development accelerated and, by the time Pearl joined the project for formulation tuning, PUchew was already making a case for cast PU in the canine sector.

At first glance, PUchew sits in a crowded material space. Dog toys today are typically made from thermoplastic elasto-

mers, rubber or nylon. Neopur, however, opted for a hot-cast PU elastomer, using a prepolymer route rather than a one-shot process. The final material is based on MDI, which Meyer explained was selected for its chew resistance, fatigue performance, and resistance to saliva and moisture.

Each PUchew is a solid cast cylinder, 28mm in diameter with a hardness of about 87 Shore A – firm enough to resist damage, yet sufficiently compliant to provide satisfying deformation when biting down. Achieving that balance of properties was where Pearl came in. Its technical team made four rapid formulation iterations, shipping new systems from Dubai to Osnabrück in as little as 48 hours.

"With the Pearl raw materials, we reached what we see as the perfect balance," Meyer said. "We first had contact with Pearl in 2023. Wolfgang Schotten, the company's [now-retired] sales manager, established the contact between the two companies, and I had the honour of meeting the entire Pearl team in Egypt in 2025. We have been working even more closely together ever since."

Neopur estimates its process delivers a 5-10% improvement in mechanical characteristics on comparable formulations. This margin matters when facing a determined German Shepherd or Jack Russell.

Unlike a typical engineering part, a dog chew doesn't have a single critical area. "The whole PUchew is a high-stress bite zone," Meyer said. A dog might focus on one spot, gnaw along the length or clamp with maximum jaw force on the ends. That

ruled out the usual approach of locally reinforcing specific stress points.

Instead, Neopur focused on getting the bulk elastomer properties right and ensuring consistent material quality throughout the part. That meant optimising not only the formulation, but also mixing, casting and curing.

The company uses its own "Neopur style" hot-cast process, supported by specialised mixing stations from Statmix. These enable the homogeneous incorporation of pigments, flavours and additives into the PU matrix. Standard high-performance release agents from Acmos support demoulding, while tooling has been designed with a special surface finish that contributes directly to the chewing experience.

"The surface must not be too smooth," Meyer said. "Texture is very important for the dogs. They feel it with every bite."

"Glow-in-the-dark" bones

Where PU really differentiates itself from some rival materials is in its versatility for the inclusion of additives. Neopur can cast PUchew in virtually any colour and already offers a palette that includes Pearl's own corporate colours. Pigments are introduced via carefully controlled masterbatches. Long-term tests show that the chews might darken slightly over time, but without the pronounced fading or staining that can occur in some more absorbent materials.

Flavour is where the product truly stands out, Meyer explained. PUchew includes flavour carriers that are incorpo-

rated directly in the elastomer, creating a chew that smells and tastes attractive to dogs without crumbling like an edible treat. "Grilled chicken, salmon, Parmesan cheese, liver sausage, salami, bacon and Nürnberger bratwurst are just the beginning," he said.

Owners, meanwhile, might gravitate towards the glow-in-the-dark version, which charges in daylight and then emits light for two to three hours. That makes it easier to spot the bone in the garden or park during evening play sessions.

In the development phase, Capser always got the first sample of any new formulation or flavour, but Neopur quickly realised that a serious product would require more than one enthusiastic Labrador. Today, the company has a test panel of almost 100 dogs, ranging from smaller breeds to Labradors, Golden Retrievers and German Shepherds. Owners provide weekly reports, giving real-world insight into chew longevity, surface changes, odour development and overall acceptance.

Age is a key factor in the analysis. Puppies that are teething will, as Meyer points out, chew on everything and anything, which requires a robust yet safe chew. For older dogs, the focus shifts more towards long-term durability and sustained interest.

So far, the verdict from the canine panel is strongly positive, Meyer said. In fact, no dog has yet destroyed a PUchew quickly enough to fail Neopur's internal benchmarks for "chew-proof enough".

How does the team simulate a dog's bite in the lab? Mechanical tests play a

role, but Meyer admits that his own teeth have been part of the informal screening regime. "I chew by myself," he joked. For now, that human-in-the-loop approach seems to be working.

Breeding success

The current commercial PUchew is roughly L-size, aimed at cogs in the Labrador class, but geometry remains a work-in-progress. Early on, Neopur accidentally produced an XXL prototype weighing nearly 1kg. The part was technically impressive, but the test dogs were less enthusiastic. "We found no dog who wanted to play with nearly 1kg," Meyer said.

A medium size for smaller dogs is under development, and the company is exploring tougher geometries that maintain the proven durometer level while introducing new play behaviours. For example, shape changes can adjust how the chew rolls, how it can be gripped, and how it interacts with the dog's teeth and gums.

Neopur has already begun assessing bio-based and recycled polyols. At present, Meyer cites candidate bio-polyols as "an option but not yet suitable" for the extreme chewing conditions the company demands. Testing continues, however, and the flexibility of the PUchew formulation leaves the door open to future partially bio-based variants, he said, provided they can match the mechanical performance that dogs – and their owners – now expect.

Neopur Technologies sits within the WTM PUR Group, owned by Meyer, Florian Trilling, and long-time friend and com-

puter science specialist Daniel Weigand. Together they oversee a portfolio that ranges from hot-cast elastomers and integral skin foams to flexible foams, serving customers in agriculture, pipeline service, conveyor technology, mining and automotive. Since 2025, the group has also owned H&P Kunststofftechnik, a producer of flame-resistant PU components for rail vehicles. Across two locations, WTM employs around 65 people.

For Pearl, PUchew is a great example of how custom PU systems can help European mid-sized manufacturers innovate, even in challenging market conditions. Or, as Pearl CEO Martin Kruczina said in a recent LinkedIn post, the company "loves Germany and its German customers" and sees a bright future for the country's innovative SME sector.

Looking ahead, Neopur believes that cast PU pet products are only at the beginning of their development curve. Flavour carriers and glow-in-the-dark effects already showcase the material's versatility; the next wave could include smart additives, antimicrobial surfaces and further functional fillers tailored to oral health or play behaviour. For now, though, the immediate roadmap focuses on new geometries and extending the size range so that small-breed dogs can enjoy the same PU chew experience as their larger counterparts.

PUchew encapsulates the true progress of PU technology, reminding us that real chemistry can sometimes hide inside fairly innocuous products. Sometimes the best R&D director has four legs and a wagging tail.

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