

Unilever trials 'nano factory' in portable shipping container

To enable more flexible and agile food production, engineers at consumer goods company Unilever have designed a nano factory that fits into a 12-metre container. The prototype is a fully-functioning, mini production line that houses everything needed to produce a batch, from the point where raw materials go in at one end to where finished products come out at the other - bottled, capped and labelled.



The digital factory is currently being trialled in the Netherlands, and from the end of this month it will produce liquid bouillon for Unilever's Food Solutions business. If successful, the model could be adopted by other divisions.

For Unilever, the nano factory will be especially useful when producing smaller volumes of products, testing new products and responding quickly to changes in consumer demand.

"Unilever has over 300 factories across 69 countries. Many of these are big facilities, designed to manufacture products in large quantities, at high speed. But sometimes we need to produce a small volume – maybe a seasonal variant – or test a market with a particular product before launching it full scale. It's often not commercially viable to use a mass production line for this, as each switchover takes time.

"Similarly, there are occasions where we need to respond quickly to changing demand in local markets, whether that's to increase or decrease production. Again, it isn't easy to ramp up or scale down when you're designed for mass production," the company said.



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Flexible supply capability

Due to its size, the factory can be transported on the back of a truck and needs only an electricity cable and a water hose plugged in to be up and running. This means it's quick to deliver and set up and can provide additional capacity where and when required.

"So, not only can we use it to produce small batches in a cost-efficient way, but there's also virtually no waste – as much less product is left in the pipes when the line is stopped to be cleaned and switched over to a different product," Unilever said.

The intention is never to match the output of a large factory. But if necessary, the company can incrementally increase production with any number of these units hooked up side-by-side.

Unilever engineering manager Olivera Trifunovic explains, "If we build a network of these, we get flexibility in our supply chain which we don't have everywhere right now. We can see a future where we have a truly dynamic model, with thousands of local production lines all over the world instead of one big one in a massive building. We have a completely movable asset that you can pick up and drop anywhere."



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Controlled remotely

The nano factory is fully digitised, meaning it is programmed and controlled remotely. All instructions are fed from a 'superuser' sitting in a central location to a screen inside the container. Sensors on the line send data back continuously, so adjustments can be made and problems fixed quickly. As all the control systems are managed remotely, the unit itself only requires three on-site operators per shift.

"We're currently quality testing the prototype. If it passes, we hope to start live production in one of our markets. We'll then look to use it for other parts of the business. For instance, we're already exploring the idea of this working for mayonnaise and ice cream," said Shaohong Ma, who works in category supply chain for UFS and is the project's other joint lead.

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