

Putting feeling to drugs safety and handling

Total traceability extends to packaging as well as product in the rarefied world of pharmaceuticals. Capcoder Ltd has adopted a novel torque sensing system as the core of the datalogging capabilities of its bottle sealing machines.

When product integrity is paramount, packaging has a key role to play. It has to be secure enough for protection in all likely scenarios, but has to be easy to open in possibly high tension situations.

When using diagnostic fluids on ill or nervous patients, hospital staff are likely to be feeling the stress and will not take kindly to bottle tops that proves difficult to open. However they will want them to feel secure enough that they can be confident of the fluid's sterility.

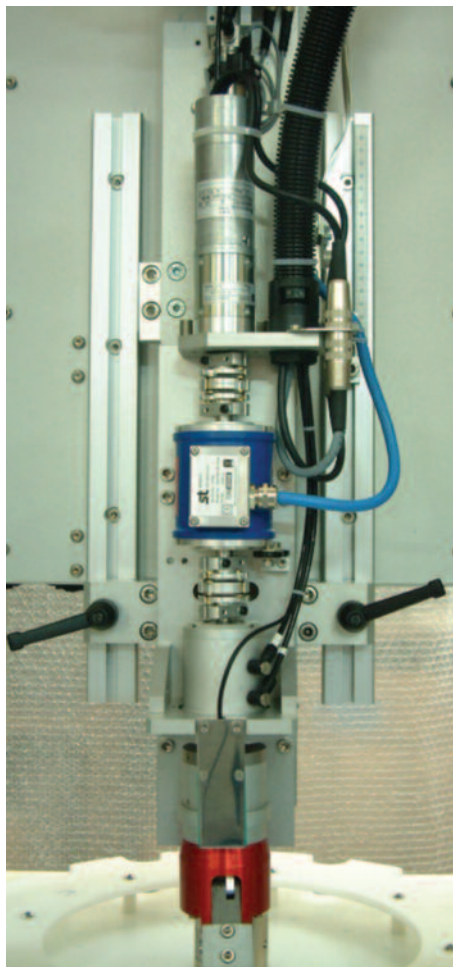
To this end specialist capping machines have been developed by Capcoder of Oxford, which not only tighten bottle caps within precisely defined tolerance but also log every detail of every bottle that is capped by one of their machines. And they have done it with a minimum of fuss, using an off-the-shelf technology and associated software.

"Our machines are essentially simple," says Roger Brown of Capcoder. "Filled bottles are presented to a torque head, which quickly screws on a cap. But the devil is in the details.

"A batch size is typically 10,000 bottles, which we have to cap at say one per second. Every cap has to be done up to the same torque, and we have to provide proof of this performance. Sterility has to be ensured – the machine may even be working in a high vacuum to ensure that no bacteria or other contaminants are present.

"Put all of this together and you end up with a need for a highly engineered machine."

As the need for traceability emerged, Capcoder realised that it would have to



develop a standard solution, which while not quite identical for every machine, would be based on the same technology deployed in the same way. And because exports are the lifeblood of such an OEM, flexibility to meet different countries' standards had to be designed in from the outset.

"Our philosophy is to have a simply machine design that avoids extraneous parts," says Roger. "This led us to the idea that we'd like the torque sensor to be wireless."

Mark Ingham of Sensor Technology takes up the story: "Basically we could use TorqSense 'as is' for this application; we just needed to work out mounting arrangements. Similarly, the associated software was ready to go after a bit of calibration and some front end graphics."

TorqSense is wireless in that it does not need to physically contact the bottle caps or shaft of the torque head it is monitoring. Instead sensing is achieved through a radio frequency link.

"When the shaft rotates a phenomenon known as Surface Affect Waves causes one comb to expand and the other to contract, changing their electrical resistance in proportion to the speed of rotation" explains Mark. "This unbalances the bridge and generates a signal indicating the torque value."

Roger explains: "Diagnostic fluids are distributed widely, typically to every hospital in the country, where they may be stored for months before use. Tracing each bottle's origin would be practically impossible without full records being automatically produced and saved to a central location.

"We found a solution to this complex but critical problem using an out of the box technology. And what amazes me is the diversity of other fields in which TorqSense is used – its really any machine with a rotating shaft."

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