CASE STUDY

intertronics
adhesives, coatings, sealants & equipment
for your manufacturing and technology applications

preeflow
eco-DUO 450
Volumetric mixing and dispensing system

Our customer

BPR Medical

Customer benefits

- Confidence of consistently high quality
- Increased productivity
- Decreased operating costs
- Time savings pre, during & post-operation
- Reduced material usage
- Reduced reject rates
- De-skilled assembly process
- Aesthetically superior products

preeflow eco-DUO volumetric adhesive dispensing helps ensure integrity of life-saving medical device

BPR Medical, based in Mansfield, Nottingham, is a perfect example of a small British company which combines expertise, creativity and entrepreneurialism to design, develop and manufacture world-beating products. The company's latest success story is the Bidirectional Firesafe™ Cannula Valve, used for in-home medical oxygen supplies to extinguish fires which can occur in the line between the concentrator and the user's mask or nasal cannula. Such fires can occur if the line comes into contact with ambient flame – such as a candle – or more commonly if the patient is a smoker.

The valve acts as a thermal fuse whereby the oxygen supply is cut off when a fusible component softens as a result of the heat from an approaching fire in the oxygen delivery tube. Integrity of operation is vital and could literally represent the difference between life and death.

BPR had chosen a two-part epoxy to bond both halves of the valve's body, and needed a dispensing solution that would ensure deposition of a precise, repeatable volume of the adhesive, metered and mixed in the correct ratio, on to a cylindrical assembly. The resulting bond integrity would help meet conformance for CE marking under European Medical Device Directive.

Technical Director Ben Johnson's team evaluated a number of possibilities, including premixing and dispensing via a pinch tube valve. This yielded inconsistent results due to changes in viscosity which begin to occur naturally as soon as epoxy is mixed, exacerbated by temperature fluctuations. It also required an unacceptable amount of set-up and clean up time.

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Having determined that volumetric technology would provide a better solution, BPR contacted Intertronics and two other vendors to arrange equipment demonstrations. Trials using the selected epoxy were conducted in a wide ambient temperature range. Rigorous pull, flexural and other testing of the assembled valve, revealed that the **preeflow eco-DUO precision metering, mixing and dispensing system** suggested by Intertronics was the correct solution. It offers ±1% dosing accuracy, >99% repeatability and can dispense volume flows of 0.2 to 32ml per minute, with a minimum volume of 0.01ml. The preeflow positive displacement technology means that the volume dispensed is not affected by viscosity changes in the material.

The **preeflow eco-DUO** was selected, not only on the basis of the eco-DUO meeting BPR's needs, but because of the lower total cost of ownership and promise of superior initial and ongoing support from Intertronics. The system operates an automatic purge at the end of the shift, eliminating the need for cleaning down. Control is via a preeflow plug 'n' mix interface and stored settings ensure consistency and repeatability, and eliminate daily set-up time. Thanks to preeflow's accuracy, the volume of epoxy applied has been reduced to 0.05 g from the pinch tube valve's 0.06 g.

Ben Johnson and Product Development Programme Manager Mike Brudenell worked with Intertronics to configure the dispenser into its bespoke manufacturing jig, into which the two populated halves of the Firesafe valve body are manually loaded prior to being rotated whilst epoxy is applied. Each of the 20,000 units per month produced at the time of writing is non-destructively tested, whilst regular samples are subject to a three-point flexural test.

Ben Johnson commented:

> *"We had to go through a number of stringent processes to ensure the integrity of the bonding of the two body halves. An essential part of this was how the two-part epoxy adhesive was applied: to ensure a highly accurate, repeatable dose on a rotating jig, but also to maintain the correct dispense volume regardless of viscosity changes caused by temperature. After evaluating a number of options, we chose the eco-DUO from Intertronics as it provided the best results for both of these criteria."*

He continued:

> *"Intertronics helped us choose a volumetric dispensing solution that was the best one for our needs. We've been very impressed with their expertise; they're responsive and always on hand to support us with any queries or technical support we might need. The way they've helped us to integrate and set up the system means that we always achieve a consistently high level of process capability.*
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> *"Not only that, but we estimate our return on investment to be in the region of £2,000 a month."*

Click here to watch a video of this case study

preeflow eco-DUO

- Genuine volumetric meter, mix and dispense dosing
- Viscosity independent results
- Easy to program and control

Applications include: Electronics packaging; SMD/SMT; Semiconductor; LCD/LED/OLED; Medical; Biological chemistry; Laboratory; Photovoltaic; Optics and photonics

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