

# Dispensing: what do we mean by accuracy and repeatability?

A number of the products that we offer are described as being highly accurate, precise and/or repeatable. We believe that these criteria are important to a process where consistent, high quality output is required, and they have a big impact on productivity through reduction of material waste, quality-based rejects, and rework. But what exactly do we mean when we say “accurate”, “precise” and “repeatable”?

Put simply, **accuracy is getting a result within acceptable tolerance of your requirements.**

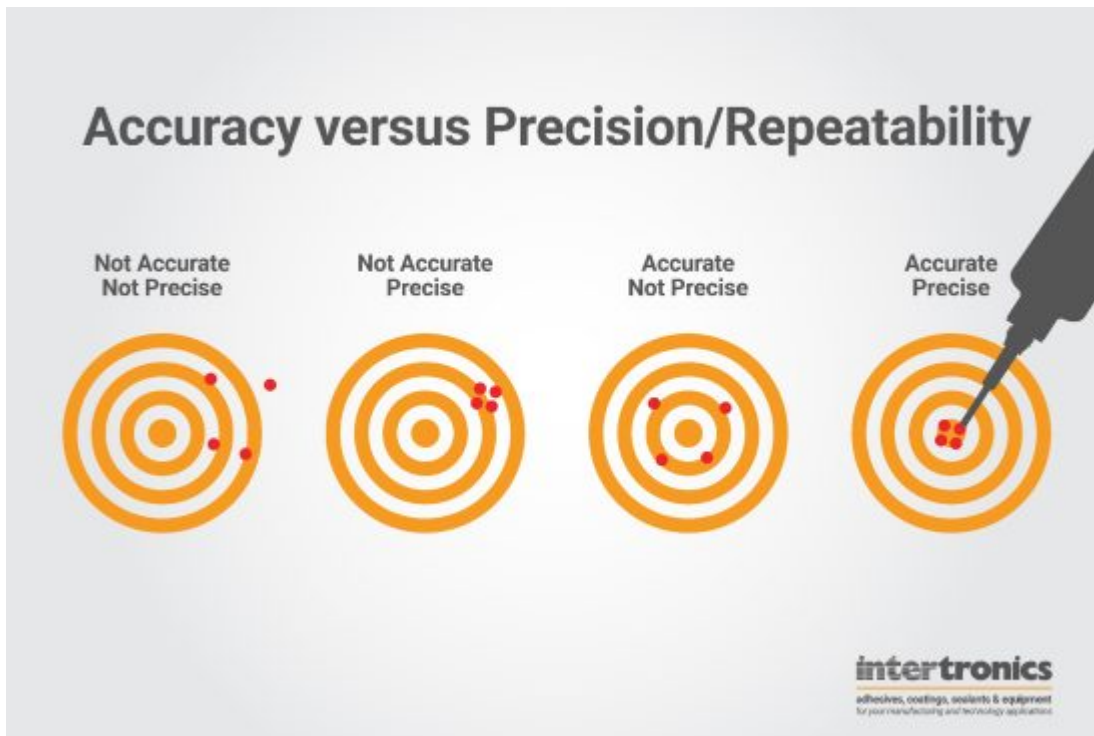
Whether that be dispensing a certain volume, or putting the material in the right place on your component, accuracy is a measurement of how closely that is achieved. One example of this is the [preeflow eco-PEN](#), which is +/- 1% accurate, meaning that it dispenses the required volume within a 1% overall tolerance.

Accuracy isn't the whole equation, though. Accuracy only tells us how close we get to our requirements on average. It doesn't tell us how often we are achieving the same result; that's “precision” or “repeatability”.

**Precision, or repeatability, tells us how consistent our process is.** That might be consistently dispensing the same dot size, or consistently putting it in the same place. Going back to our preeflow eco-PEN example, the eco-PEN is >99% repeatable, meaning that more than 99% of the time, you will get a result within +/- 1% of the target.

It is possible to be accurate without being precise or repeatable – this would be achieving the right result, but not as reliably as your process requires. It is also possible to be precise without being accurate – this would be achieving an unacceptable result consistently.

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A well-designed process includes an acceptable combination of accuracy and repeatability. Different processes will have different tolerance levels, but the important thing is that you are putting together a process that meets your needs, and considers all the different elements of the process. For example, for customers with exacting requirements such as those in medical device assembly, automotive and defense electronics, we often recommend preeflow eco-PENs or [Vermes jetting valves](#) for material dispensing because they both offer high accuracy and repeatability in dispensed volume. For most of these customers, a consistent process also includes placement of the dispensed material, so we offer [Fisnar dispensing robots](#) alongside the dispensing equipment to pair accurate and repeatable

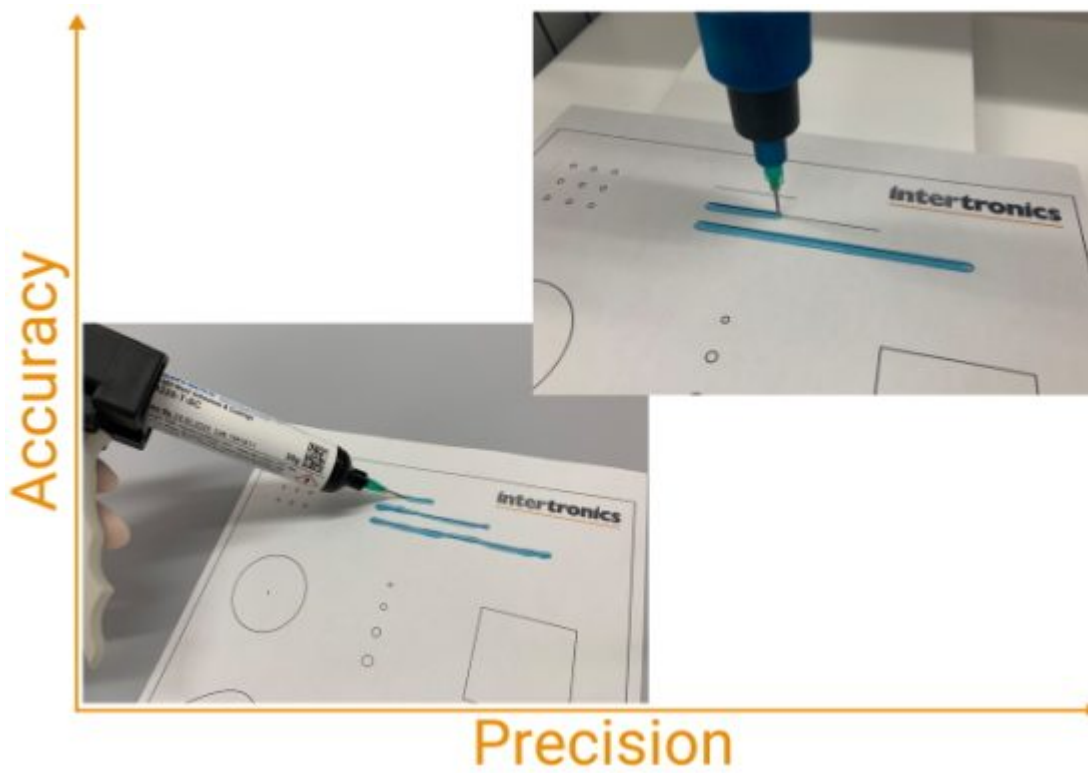
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dispensed amounts with accurate and repeatable dispensing placement. Our *archytas series* of robot integrations is an example of this.

For customers with less stringent requirements for placement accuracy and precision in material application, there is still scope for progress. Going from a manual application process using brushes, toothpicks or syringes to a simple [time/pressure dispensing controller](#) can deliver productivity gains in the same way.

Whatever your process tolerances are for accuracy and repeatability, we'd be pleased to discuss your application and how you can achieve those goals.

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Supplied by:

**intertronics**

INTERTRONICS

12a Station Field Industrial Estate, Banbury Road, Kidlington

Oxfordshire England OX5 1JD

t 01865 842842 e [info@intertronics.co.uk](mailto:info@intertronics.co.uk)

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Last updated: June 2020

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