



Design that delivers high performance

SKC AirChek air sampling pump

A tough one

SKC approached us because they had a problem. They specialise in air sampling pumps that are used to monitor air quality in potentially hazardous environments, like coal mines and some production facilities, where air borne dust may be dangerous.

Its new product was intended to operate in particularly difficult conditions, meaning that it had to be ATEX approved. This means that it cannot cause any spark that may ignite a possible explosive cloud of gas around the device. Not only that, it also had to survive a difficult round of testing, including repeated drops of one metre onto concrete at minus 5 degrees Celsius.

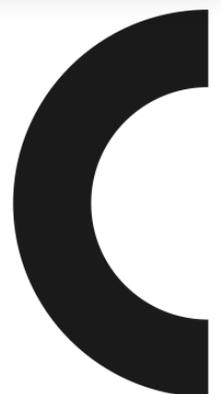
Initial prototypes of their new design had failed all the tests, and they were looking for help to achieve a good result without dramatically increasing costs.



Flexible thinking

We began the project, as we do most of our work, by modelling up all the interior functional parts. We then began to look at what the finished product to achieve in order to meet ATEX regulations and survive the brutal drop tests at low temperature.

Both problems appeared to suggest the same solution: turn the product into a rubber ball. In practice, this meant creating the casing using two shot mouldings. The first shot creates the durable inner housing to which all the parts are attached and case fixings located. The second





shot adds an external flexible skin that will prevent any friction (sparks) and cushion the housing in the event of a drop onto concrete at minus 5 degrees. The housing was also totally re-designed to maximise curved corners and smooth sides to further improve its chances of surviving the drop tests. Finally, the rubber outer skin also provided a good opportunity to integrate sealed function buttons and build in the necessary clip mountings and case fixings.

Not all plain sailing



Although initial trials were positive, the first production prototypes failed the drop tests due to issues related to the case fixings and sealing surfaces. All products require some development at the prototype stage and this was particularly true for the AirChek 3000 due to the extreme demands of the testing specification.

Following detailed development, the product finally passed all the tests with flying colours.

Adam Clatworthy, SKC's Technical Project Engineer comments:

"Crucible used their knowledge of two shot injection moulding to deliver a very successful solution to an exacting brief that required ATEX approval. They took a cooperative approach to the project and were always available for the discussions and meetings that are so important in a project like this."

About Crucible Design

Mike Ayre established Crucible Design Ltd in 1990. Crucible works across all areas of product design and development, with an emphasis on meeting specific client needs, including sales improvement, cost reduction, technical innovation and the sourcing of manufacturing partners.

This focus on the commercial benefits of good design has generated an excellent track record of successful projects and the practice has also won a number of design awards for appearance, innovation and technical expertise.

