

Cold call

Christine Velarde meets the team behind Microsys's Cold Gas System, design engineer Daniel Wang and product manager Colin Williams

■ Airbags are conventionally tested using inflators, but research undertaken by Microsys Technologies Inc has suggested that this is not the most effective means of testing. Microsys' design engineer Colin Williams lists the problems with using inflators as: "Poor repeatability, no flexibility, high cost, and long lead times."

The solution? The Cold Gas System (CGS). "There are many variables when designing an airbag module," states design engineer Daniel Wang. "By removing the high variability of the inflator and adjusting the Cold Gas System output, the design of the other elements can be fine-tuned with much higher certainty, which greatly reduces design time and cost, resulting in a better product."

"Engineers trying to optimize airbag designs are looking for small performance improvements," continues Williams, "which can be difficult to see when the inflator itself may vary by 10%. It's the same when experimenting with cushion folding methods."

So in what sort of test applications can the system be used? "The CGS is suited to a number of applications related to airbag testing, such as airbag module R&D, cushion validation, cushion fold evaluation, and cover integrity," explains Williams.



Colin Williams, Microsys

"Automotive interiors companies have also been using the CGS as a repeatable, adjustable, and low-cost inflator replacement to test instrument panels."

Both Williams and Wang are keen to stress the various benefits of the CGS. "There are several advantages," Williams begins. "The output of the CGS can be easily adjusted, which allows engineers to test the limitations of their designs. This makes it possible to experimentally determine which aspects of the design or manufacturing process require improvement. Of particular interest to many companies is the use of CGS to determine which aspects of the design or manufacturing process may be simplified in order to reduce cost."

"For example," adds Wang, "the CGS output can be increased well beyond the maximum inflator output in order to determine the product's strong points and weak points. The weak points can be improved, and the strong points may indicate areas of potential materials savings or design simplifications. This capability is new to the safety industry."

"The CGS can also help to reduce the time to market, by eliminating the long lead times of prototype inflators," continues Wang. "Months of experimental development testing can be greatly reduced, as the CGS gas output can be adjusted in just a few minutes. Of course, the 1% repeatability is attractive, as it allows engineers to truly and accurately measure the performance of their product without the uncertainty that is characteristic of real inflators."

"The low operating cost of the CGS is an obvious and highly measurable benefit," adds Williams. "To perform a test with the CGS typically costs only a few dollars; inflators range from US\$20 to \$200 or more."

There are also benefits to the safety industry. "The CGS has the potential to help the safety industry improve its effectiveness, ultimately benefiting the consumer," Williams explains. "One example is to use the CGS to help settle 'finger-pointing'



Daniel Wang, Microsys

"To perform a test with the CGS typically costs only a few dollars; inflators range from US\$20 to US\$200 or more"

disputes between makers of airbags and interior components such as seats and IPs. What I mean is that the CGS can make it easier and faster to determine which product is misbehaving in instances of system failure. It can be used to validate the airbag using a reference inflation profile, and the interior component can be validated in a similar fashion."

Wang adds, "Some OEMs have begun to use the CGS to define product requirements more stringently to their Tier 1 occupant safety suppliers. The CGS can also be used to provide data to make CAE models more accurate. These applications will help to improve the crashworthiness of a vehicle."

Since its release a year ago, the occupant safety industry has had time to form opinions on the CGS. "Interest in the CGS has been extremely high," states Williams. "Each level of the occupant safety industry has started using the CGS, including OEMs, IP manufacturers, airbag module makers, and cushion suppliers. A number of these CGS users are working with Microsys to establish the CGS as a standard test reference. Industry acceptance has been even better than we had hoped for, especially considering that the CGS is a new testing technology." ■