



Case Study:

SINGLE METAL STAMPED PART

Introduction

A leading car alarm manufacturer approached Micro with a challenge. The way their car alarms worked wasn't sensitive enough as originally designed. In fact, the entire design of the core sensor was illogical and inefficient. The brief was simple. Make it multi-axis and as sensitive as possible, so that if there is any kind of shock on any axis, the alarm will sound. The legacy design relied on a flexible PCB that was ill designed for the task and left the unit rough and fell short of the application's expectations.

The existing design housed a circuit board with a snake pattern cut out to add flexibility, and create motion that could be felt to signal the sensor. At the end of the snake pattern, there was a crude piece of metal and a dome (semi-circle) like a crane hanging off it. An optical laser would shoot light to the dome and if there was vibration, the dome would knock and be moved, hence knocking the optical laser out of alignment, and signaling the alarm. It was clear to us that this was not the most elegant or practical way for this to work.



Michael Tucci,
CEO and President

Micro in Action

We went to work creating a new solution, but the brief was clear – the unit cost couldn't increase. Instead of attempting to fix the existing design, we started from scratch. Because of the cost constraints, we only had so much metal we could work with so we started with that.

What could we do to make it much more sensitive?

At Micro, we already had superior capability in our ability to cut more precisely than any other, and so we looked to cut more thin slots into metal. We could come up with a design that was an inch square, also with a small dome attached, and concentric squares surrounding it, about 6/1,000ths of an inch thick. To accomplish this, we relied on decades old experience in designing zero clearance, hand lapped progressive metal dies that allowed us to cut super thin slots around the circumference of the part into a pattern, and each was held at one singular point to the square next to it. This in turn created a very sensitive, super vibratory, single piece of metal.

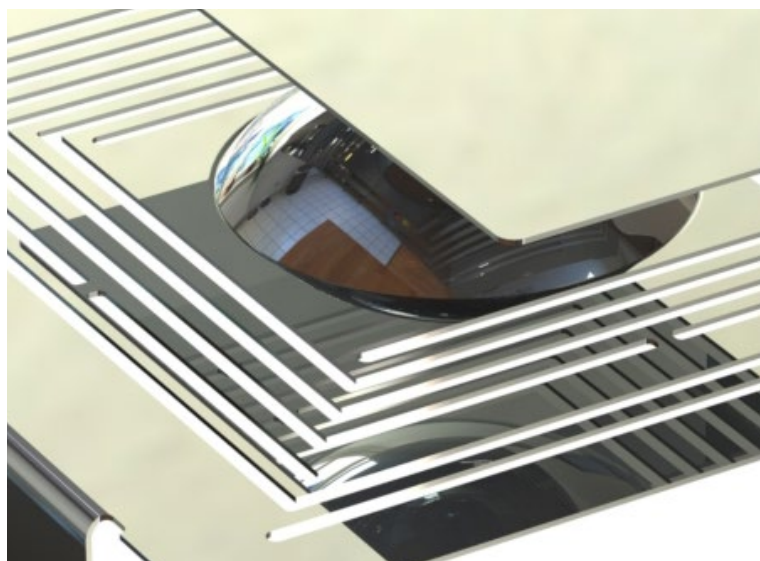
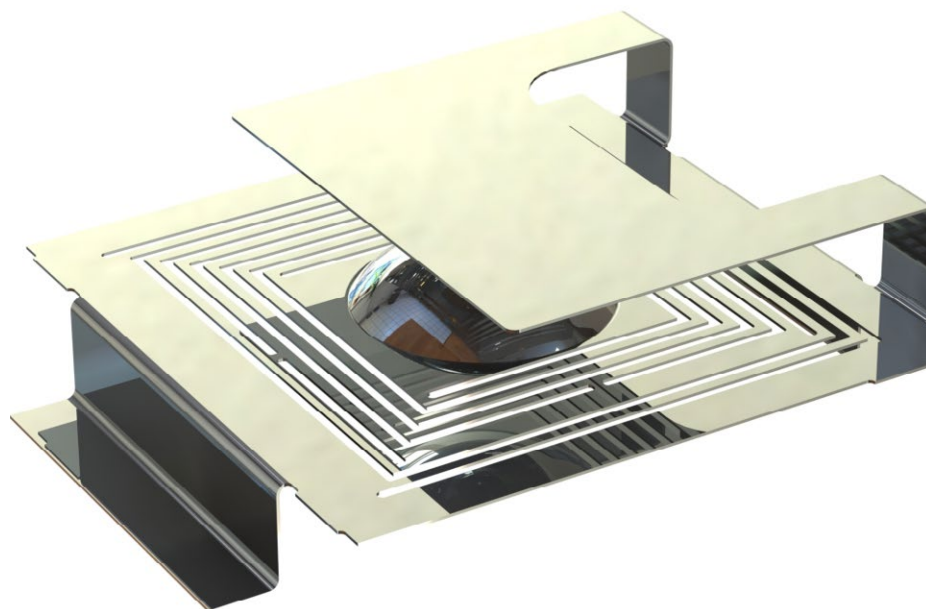
The outcome

It worked. In fact, it worked too well. We created something that was too sensitive, and the feedback we received was to make it less sensitive, which we did. As a team, Micro took something crude and for the same cost, exceeded the expectation of the client. Due to the fragility of the final product, we even designed and integrated the final product into a tape and reel delivery system enabled robotic pick and place systems at the client's side to improve efficiency and protect the product integrity.



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