

DIRECT METAL LASER-SINTERING (DMLS) ENABLES SENTRILOCK

TO OVERCOME TEMPORARY BOTTLENECK

With little more than a week until the National Association of REALTORS conference and expo, SentiLock, LLC (Cincinnati, Ohio) had a winning product concept, but it did not have any production quality demonstration units. It was critical to announce its new REALTOR Lockbox at the expo, so SentiLock turned to Morris Technologies, Inc. (Cincinnati, Ohio) for mechanical engineering, design and prototyping. Relying heavily on Direct Metal Laser-Sintering (DMLS) from EOS, Morris Technologies delivered a functional prototype unit that spurred a successful product launch.

The REALTOR Lockbox is an electronic version of the mechanical lockboxes that have been used for years. Attached to the front door, the lockbox safeguards the key to the home while giving agents controlled access to the listed property. Unlike its mechanical predecessors, the REALTOR Lockbox logs activity, provides access with a smart card and ensures frequent changes to the access code. The product answered the demands of real estate agents, but SentiLock needed to demonstrate these features with a prototype that would be representative of a production product made of metal.



This prototype lockbox was needed in one week.



REALTOR Lockbox offers advanced electronic features.

Real estate agents from across the country would attend the annual conference and expo, so it was vital to show the REALTOR Lockbox at the event. As with many industry conventions, it was SentiLock's window of opportunity. However, lockbox system contracts are typically at least five years in length, so it was especially important for SentiLock to display a "real product" that would convince potential customers that they should hold off on re-signing with their existing vendor.

SentiLock selected Morris Technologies, a product development firm, for design and prototyping of the lockbox's eight die cast parts. It was a big challenge because the prototype units were needed in one week, and SentiLock specified that they must look, feel and function like a production unit. According to Greg Morris, COO of Morris Technologies, "A product such as this must have credible physical security. There is no way that REALTORS would have taken painted, plastic parts seriously. We had to produce a product that communicated strength and protection."

The eight piece assembly consisted of a two-piece outer housing, access covers and supporting pieces. When assembled the lock box was 10 inches long, 5 inches wide and 2 ½ inches deep. Although a few of the pieces

had simple designs, the others were fairly complex. According to Greg Morris, “There are features on the lockbox, such as deep channels and ribs with no fillets, that made it a tough job for machining, especially in the timeframe we were given.” In light of the constraints on the project, Morris Technologies elected to use the DMLS technology instead of its CNC machining centers. “Without this technology, I am certain that we wouldn’t have been able to meet SentiLock’s delivery deadline,” stated Greg Morris.

Like other layer-manufacturing technologies, DMLS systems build parts one layer at a time. The difference is that it laser-sinters powdered metal alloys and produces fully dense parts without secondary infiltration. Another advantage that Morris Technologies enjoys is that the 20 micron powder allows building with very thin layers, which in turn results in parts with a smooth surface. Greg Morris likens the surface of DMLS to a fine EDM finish that requires only minimal secondary work.

Morris Technologies nested the eight-piece assembly so that all components could be built in one run of the machine. The automated and unattended process took only 53 hours, which is just 2.2 days. Including part



Morris likens the unfinished surface of the DMLS parts to an EDM finish.

programming, Greg Morris estimated that CNC machining would have taken 10 working days, which would have been one full week more than the time that they had for the entire project. According to Greg Morris, “It sounds great to talk about 24/7, lights out machining, but it is not realistic for a prototype run

that hasn’t had the programming fully proven out. Therefore, evenings and weekends are lost. But with the DMLS technology, there is no need for operator intervention, so the machine runs around the clock.” With the aggressive deadline, this is the kind of productivity that the company needed for an on-time delivery.

Morris Technologies delivered the prototype REALTOR Lockbox in time for the National Association of REALTORS show, which proved to be a successful event for SentiLock. The company was extremely happy with Morris’ work and even happier with the sales results. Since the commercial release of the lockbox, SentiLock has sold more than 100,000 units that are used by more than 30,000 professional REALTORS.



The EOSINT systems gives Morris Technologies much needed productivity with unattended, round-the-clock operation.



The assembled prototype gave prospective buyers the look and feel of die cast parts.