

Feature: CAD

Safety product designer keeps pace despite global pressures

By Mike Edwards

PenSafe, a safety product designer that sells to harness and lanyard manufacturers, was safe – until 2003. The Stoney Creek, ON-based company then had “the five horsemen of the apocalypse show up to lay siege on the business.”

According to its president, John Leavitt, the “horsemen” were: technology, raw material costs, customer requirements, global competition and the Canadian dollar. So how has it stayed in business?

“We are trying to apply curiosity, imagination and learning in four areas,” said Leavitt, “end user requirements, industry standards, outsourcing, and design and engineering.”

Under design and engineering, Leavitt further identifies people, process, technology and R&D as key factors. The software technology PenSafe has adopted is SolidWorks mechanical CAD,

CosmosWorks finite element analysis and PDMWorks data management provided by value-added software reseller Javelin Technologies of Oakville, ON (javelin-tech.com).

Last year, PenSafe won Honourable Mention – Consumer Product Design in the Javelin “Cool Design” contest for its entry, “Connector for the Safety/Fall Arrest Industry” designed by Bob Claus at PenSafe.

The product, a connector for the safety/fall arrest industry, is designed to save lives. The design of the connector consists primarily of three stamped steel plates in which the centre locking plate is guided in its motion by two solid pins. The function of the connector requires four very



Designed in SolidWorks from the outset, the connector consists primarily of three stamped steel plates in which the centre locking plate is guided in its motion by two solid pins.

specific yet simple motions to open the gate of the connector. These four motions, initiated by the operators hand against the “thumb grip” on the outer edge of the centre lock plate are to push up, in, down and rotate to the open position.

The design was developed using SolidWorks from the very beginning. CosmosWorks was also utilized to maximize the strength requirements of the product while minimizing the material used to make it.

“Through utilization of these CAD tools, our Product Development Team has created a

The product is designed to save lives

product that is much stronger than traditional designs but, to the pleasure of end users, is achieved by utilizing thinner and lighter materials,” said Claus.

Leavitt said “prototype dies for a forge cost many thousands of dollars, so it is important to test the design (in software) before cutting to save time and money.

“We can do iterations in hours, not weeks, using software tools.”

Since the contest, the honored design is now available commercially in sheet stamped carbon steel material and is branded the High Strength Connector Model 8280 Pincer. It is rated in the cata-

log as 100% proof loaded to 3600 lb with a minimum tensile strength of 5000 lb and minimum gate strength 3600 lb with a minimum side load strength of 3600 lb. “We knew upfront there were no problems with its strength,” said Leavitt. “Testing was just done to satisfy organizations such as the CSA and ANSI, not the proof of concept.”

PenSafe also uses e-Drawings, the lightweight visualization file format integrated into SolidWorks. “We use e-Drawings extensively, from as early as the concept phase for initial feedback that is often the same day. But even as early as a couple of years ago we had to educate our suppliers about the tool,” said Leavitt.

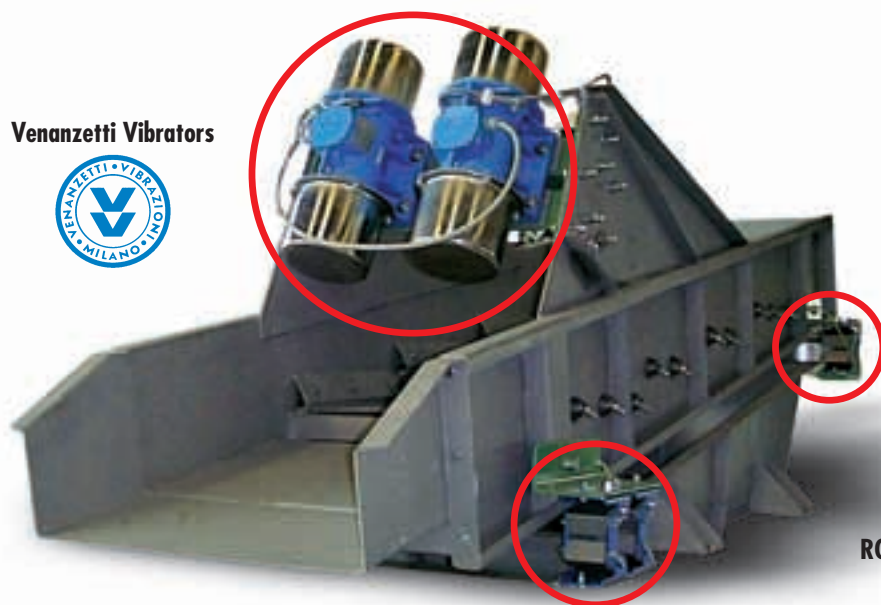
Under the company’s R&D initiative, it has partnered with a Toronto industrial design firm that also uses SolidWorks. PenSafe products can be used in both industrial equipment and mountain climbing equipment, “so we can still make our product more appealing aesthetically and more user-friendly,” said Leavitt. “And since the ID firm has the same software, we can easily share files.”

Leavitt added that he views Javelin Technologies more as a partner than as a consultant. “They have knowledge we couldn’t afford to maintain. The good ones learn your business and not just provide technical expertise.”

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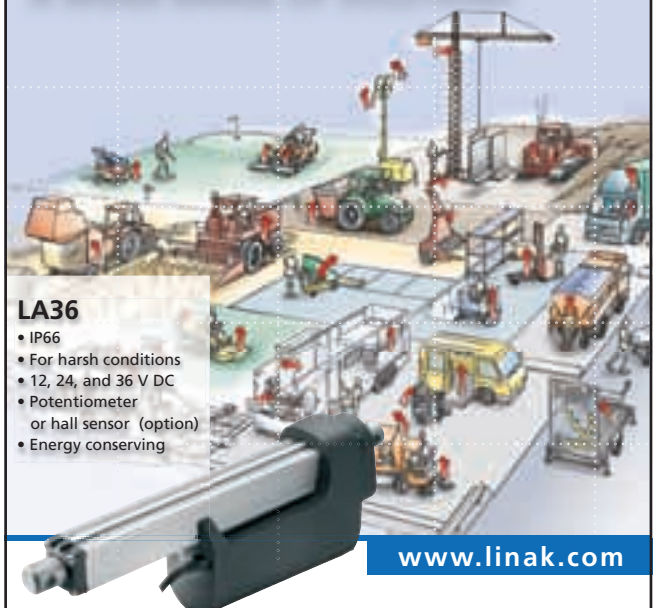
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