

# Winter 2012 **Daman**40 ISSUE

CELEBRATING 36 YEARS OF CONTINUOUS IMPROVEMENT

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Outlook by Larry Davis

DAMAN FEATURE

# Spy eye ready to fly



**When the U.S. Air Force's giant surveillance blimp hovers over war zones in the Middle East next year, it will carry seven hydraulic control manifolds manufactured by Daman.**

DAMAN FEATURE

**T**he Blue Devil Block 2 airship carries little resemblance to the blimps often seen at sports events. Anything but blue, the giant white blimp tops out at nearly twice the length of the familiar Goodyear blimp. Its hull – longer than a football field – is seven times larger by volume than the corporate aerial icon.

Inside, the Blue Devil has room for the world's largest intelligence, surveillance and reconnaissance payload. The Air Force intends to use the unmanned airship in Afghanistan to capture and process data from various war zones. It is scheduled for deployment in mid-2012.

**Capturing activity on camera**

Unprecedented in its modular design, the Blue Devil's payload includes dozens of sensors on a single platform that is integrated with on-board processing and storage. A hive of nine cameras, each shooting at a slightly different angle, can map an area of up to 36 miles, the size of a small town.

The surveillance blimp is designed to stay aloft for up to seven days at an altitude of 20,000 feet. In contrast, most airships used today remain aloft for about a day at an altitude of

3,000 feet. They canvas a relatively limited area and transmit raw data to ground forces for analysis.

**Generating fluid power**

Diesel engines power the propellers along with hydrostatic transmissions for the air ballast system, according to the system designer.

Design specifications called for a lightweight, robust hydraulic package that could deliver hundreds of horsepower at pressures up to 5,800 psi.

"We proved pressure testing of the 7075 aluminum material in the prototype," explained Mike McIntyre, in distributor services. "The favorable results helped us expedite the order



Blue Devil at a glance

**World's largest multi-intelligence payload capacity**  
**Length: 370 feet**  
**Capacity: 1.4 million cubic feet**  
**Speed: 80 nautical miles per hour**  
**Endurance: 7 days**  
**Mission payload: 2,500-7,500 pounds**  
**Flight modes: autonomous, remotely piloted or manned**

and deliver on schedule for the initial start-up."

In addition, Daman provided necessary documentation to satisfy requirements from the Federal Aviation Administration and military officials.

It's not every day that Daman manifolds float. But when the helium-filled airship hovers over foreign soil next year, its payload – and power sources – will truly be lighter than air.



The helium-filled Blue Devil Block 2 surveillance airship can hold the world's largest intelligence, surveillance and reconnaissance payload.

## DAMAN PERSPECTIVE

## Lessons in customer service

**D**oing the right thing for the right reason comes naturally at Daman. It's instinctive. Recognizing the lessons learned from those actions can take more effort and determination.

When a distributor called last summer with quality concerns about a shipment of manifolds,

everyone knew what to do – troubleshoot, identify, fix the problem as quickly as possible. It's the Daman way.

This call came at a critical stage. The end user was ready to start up production, but quality inspections showed scratches on cartridge cavity surface finishes, torn O-rings and back-up rings, and chip contamination in the blocks.

Conference calls, emails, hallway discussions, even parts inspections couldn't identify the root cause of the problem. So Daman's quality team took the only logical course of action – field inspection.

### Problems solved

"We didn't know what had caused the damage to the parts originally, but we knew we were the

best ones to diagnose the problem," explained Mike McIntyre, Distributor Services.

During field inspection, McIntyre quickly recognized the problem. Cartridge valves, damaged during shipment to the machine builder, had deformed cavity finishes and created contamination. Daman immediately machined new parts to replace the unusable manifolds. And the end user successfully resumed start up with no other issues.

### Learning to improve

The story didn't end with the problem resolved. It never does at Daman. The Quality Team began its own inspection of the troubleshooting process. The mission – identify ways to improve customer service.

"We take a proactive approach to fixing quality issues," McIntyre explained. "We do whatever it takes to make it right."

Daman's quality system footprint stretches from production and distributor services to purchasing, maintenance and information technology. Even human resources and administrative services share responsibility for ensuring quality.

"We never want a customer to experience issues with a manifold at startup," said Gordon Weiler, national sales manager. "If issues come up, we do everything possible to help."

The Quality Team continues to probe, experiment and rethink how it assesses problems and identifies solutions. It's the only way to maintain a true course of continuous improvement. It's the Daman way.



## ENGINEERING SOLUTIONS

## Proving partnerships work

**C**ollaboration with a raw materials vendor and a renowned research facility could lead to a proprietary bank of data on the effects of hydraulic pressure on different wall thicknesses in steel, iron and aluminum manifolds.

As efficient hydraulic systems generate higher working pressures, the demands on manifolds to meet greater performance standards have steadily increased. Daman engineers and designers rely on a wealth of experience and knowledge to choose the best materials for the application, working pressure, weight and other variables.

But they continually search for more data.

That's why Daman joined with Dura-bar, a supplier of continuous cast iron bar stock, to add clarity to the materials selection process.

### Gathering and sharing intelligence

The two collaborators reached out to researchers at the Milwaukee School of Engineering (MSOE) to perform a series of performance tests on parts machined from carbon steel, ductile iron and two grades of aluminum.

"We are probably the first in our industry to conduct this type of a study," explained Gordon Weiler, Daman's national sales manager.

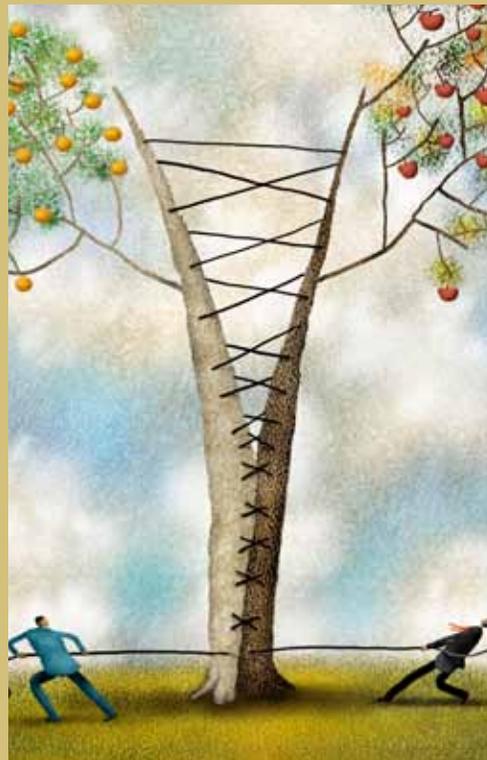
Data generated from the study will augment "tribal knowledge" about wall thickness standards, according to Weiler.

"We use wall thickness formulas today that have been around for as long as I can remember. This testing will provide the data to support our design decisions about manifold integrity."

### Proving the strength

Burst tests, completed in October 2011, set baseline pressures for fatigue tests.

"Currently, we don't have a way to help customers who have manifold pressure requirements that are slightly higher than what we publish," Weiler said. "This test data will help us tweak manifold designs to meet specific pressure requirements."



**Pressure on**  
In an ongoing study of mechanical properties, MSOE is conducting high-pressure burst and million-cycle tests of Daman parts machined from:

- 1045 carbon steel
- Dura-Bar 65-45-12 continuous-cast ductile iron
- 6061-T6 aluminum
- 7075-T651 aluminum

Weiler expects to share more intelligence with his collaborators after MSOE completes million-cycle fatigue testing in early 2012.

Daman's design engineers and materials specialists hope to use the results, coupled with finite element analysis, to better determine failure points of manifolds under various loading and stress conditions.

## Keeping up with business

A new horizontal machining center has helped Daman keep pace with a rapid increase in orders.

A buzz of activity generates from Cell B, which builds large standard and custom aluminum parts. Not only does the cell host a new horizontal machining center, it operates



the only expandable tool hive with leading edge enhanced software.

"We needed greater capacity," explained Dave Mischler, vice president. Orders are up 30 percent over last year — making 2011 a record-breaking year.

Cell B began installation of the Mazak HCN 6800 in May 2011. Its pallet size, high-speed technologies and tool capacity have helped to increase the cell's production capacity.

### A hive for tools

The greatest efficiencies come from the tool hive, according to Tim McIntyre, team leader.

"We can load and unload tools while we're working on other jobs," he explained. "That's reduced our setup time to virtually zero.

"Unlike chain-driven tool magazines, the hive and HCN operate separately. Team members enter data into the tool hive system in advance of production. Interactive programming allows the system to communicate job-specific tool requirements directly to the machining center.

The hive holds a maximum of 240 tools, twice as many as conventional magazines. Approximately 200 of the most commonly used tools now permanently reside in the hive.

"With double the tool capacity, our changeover times are more efficient," said McIntyre.

### Trickle down efficiencies

Capacity also increased by 33 percent in Cell D, where ductile iron stocked parts are built. Part of the floor reconfiguration called for moving machines from one cell to another. Now Cell D operates three machines instead of two.

"We added capacity to two cells with one machine," Mischler said.

Daman's leadership in operating the prototype software brought its own set of challenges, admitted Steve Ward, machine repair supervisor.

"We had to work through software issues, which caused downtime and delays," he explained.

By working closely with engineers from Mazak's U.S. and Japanese technology centers, the Daman team was able to incorporate modifications to the system that allowed better integration with Daman's processes.

"Now we're running at 100 percent efficiency," said Ward.

OUTLOOK

## When will you engage in the educational revolution?

By Larry M. Davis

**N**ews flash: We aren't educating our children to continue learning or to work. Instead, K-12 and university-level business schools are preparing our kids for a future that does not and will never exist. For those of us with continuous improvement in our DNA, this is unconscionable.

I understand why our school systems resist transformational change. After all, businesses avoid the challenge to develop continuously improving (CI) cultures even though they could achieve substantial sustainability and improved profits. Similarly, bureaucratic and monolithic school systems also avoid change. Instead, they focus on maximizing funding and meeting state and federal standards. Plus, our school systems are saddled with unions and tenure, two issues diametrically opposed to profound change.

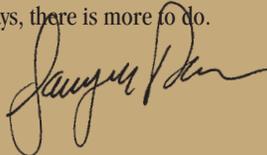
Certainly dramatically improved schools will not result from an internal revolution. So what will be the catalyst?

I think it resides with us, the business community. As a group, we have complained for decades about the poor skills of high school graduates. Complaining without solutions has proved useless.

Our education system will change when more businesses collectively embrace a CI culture. Only with a proven methodology to continuously improve will we believe that everything is in our span of control. As Henry Ford said, "Whether you think you can, or you think you can't – you're right."

Education reform is within our control. Let us find the burning platform that will drive us to influence and impact education now.

As always, there is more to do.




DID YOU KNOW

Recognizing passion and commitment

Our passion for helping to better educate young people in our area received recognition this fall. The South Bend Alumni Association honored Daman with its Contributions to Education Corporate Award. The award recognizes our support of the Fluid Power Challenge (see Spotlight below), as well as our strong belief in the Five Star program.

Our commitment to South Bend's New Tech High School also played an important role in distinguishing our contributions to education.



Up in the clouds

No one welcomes a disaster. But should one occur, our IT folks only need to reach into a cloud to recover critical data. Today, we store more than 80 percent of our data in a secure, virtualized cloud. And we use a form of cloud computing internally to store, manage, and process data every day. Our data clouds give us greater peace of mind, knowing data vital to our daily operations are safely stored in the cyberinfrastructure.

SPOTLIGHT: Set for a challenge

Junior high school students in north central Indiana used teamwork, ingenuity and their own style of communication to compete in a Fluid Power Challenge, sponsored by Daman and other local businesses in December 2011. Fourteen teams of four students each designed and built fluid power mechanisms that moved weighted objects.

Design engineers from Daman helped judge the teams' designs, teamwork, cooperation, technical skills and answers to interview questions.

"We see tremendous opportunities with the Fluid Power Challenge to help prepare students for the 21st century workplace," Matt Giloth, manager of Distributor Services, said. "Judging this competition has become one of the highlights of our year."



Local winners will compete in the national Fluid Power Challenge early next year.

The National Fluid Power Association originated the Fluid Power Challenge to expose middle school students to a learning environment where engineering and math are fun. Students develop teamwork and problem-solving skills as they are introduced to careers in the fluid power industry. Daman sponsors a Fluid Power Challenge each year for students in north central Indiana as a path to discovery through hands-on, applied use of theoretical knowledge.

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Manifold News

DAMAN WINWORK NEWS

## Track your shipments door to door

**D**id you know you now can receive tracking information on your shipments as soon as the parts leave our doors?

Thanks to an integrated shipping program implemented in August 2011, we can automatically send you an email with order and tracking information. Invoices also include tracking numbers. And when you receive your shipment, you'll see order labels on our shipping containers with fulfillment information, including item descriptions and quantities.

"Customers have been asking for quicker visibility of tracking information," Dave Jaeckel, IT Manager, said.

In the past, customers frequently called Daman to get tracking numbers for their orders. Now, the automated system generates electronic notification as soon as the carrier picks up shipments at the end of each day.

"We wanted to eliminate waste and potential errors," Jaeckel explained. That meant finding ways to reduce duplication of effort and manual entry.

Top on everyone's priority list – integrate the shipping solution into Daman's IT infrastructure. By modifying third-party shipping software, Jaeckel and his team linked customer purchase orders and inventory with shipping and delivery.

The shipping department uses a scanning system to verify that the correct order gets shipped to the right customer via the specified carrier. The system also generates an order

label and the carrier's shipping label for each package.

"We've achieved order fulfillment accuracy of over 99 percent," explained Jaeckel.

If you want to receive tracking information for your shipments from Daman, remember to include an email address with your next order.

