



## Shingo Prize Recipient 2011

US Synthetic Corporation

[www.ussynthetic.com](http://www.ussynthetic.com)

801-235-9001

### Company:

US Synthetic (USS) is the leading provider of polycrystalline diamond cutters (PDCs) for oil and gas exploration, and provides solutions for a variety of additional engineering challenges using the unique material properties of diamond. Thanks to constant innovation, proven quality, and superior customer service, more of the world's energy suppliers rely on US Synthetic than any other PDC manufacturer. US Synthetic has spent more than two decades perfecting its products to drill faster and last longer, in conditions that test the limits of the most durable drilling equipment. The company was founded in 1978 and has customers throughout the world. US Synthetic employs more than 650 people and is located in Orem, Utah. The company is part of the Dover Corporation (NYSE: DOV).

### Products:

USS supplies its customers with innovative diamond products, including:

- Drill bit inserts or PDCs
- Oil and gas wear parts
- Process-lubricated bearings (USS Bearings)
- Underground mining tools (Brady Mining)
- Wire drawing dies (USS Wire Die)
- Natural gem diamond color enhancement (Suncrest Diamonds)

### Continuous Improvement Philosophy and Results:

US Synthetic focuses on delivering value to its customers, and has aggressively utilized the scientific method to foster big gains in the way its employees think, act and lead. This is accomplished through:

- Continuous improvement in products, processes and work methods.
- Making all employees responsible for problem solving.
- Deployment of company strategy, so everyone knows their part.
- Connecting all employees to the customer, with an understanding of value.
- Working with our customers and vendors across organizational boundaries to deliver value and eliminate waste.
- A quality philosophy of hitting the target with minimal variation.
- A performance culture created by regular coaching and a dedicated training cell.

Examples of Lean manufacturing results at US Synthetic include:

- Replaced batch processing with flow cells, which reduced flow time from 4-17 days to 15 minutes.
- Reduced inventory buffers between processes from 4,000 parts to 6 parts.
- Expanded capacity by 75% on some existing equipment through waste elimination.
- Immediate feedback from flow-cell adoption generated a 10% yield improvement on the company's lowest-yielding product.
- Implemented a dedicated training cell which delivers fully cross-trained employees as needed.
- Improved knowledge of how and why we do each job to deliver maximum value.
- Improved the number of implemented suggestions from under 100 per year to over 14,000 per year.
- Reduced batch size from 300-500 to a maximum of 24 (with a majority of areas running single-piece flow—building to exact customer quantity and variety).

### Highlights & Awards:

- World's leading producer of PDC drill bit inserts for more than 10 years.
- Deep scientific knowledge delivered with customized applications expertise.
- First company in diamond industry to achieve ISO Certification, in 1993.
- ISO 9001: 2008 Certified.
- Senior leadership team with more than a century of combined industrial diamond and drill bit insert experience.



1995, 1996, 1997,  
1998, 1999, 2007



Voted "Best Place to Work  
in Utah" - 2007



Spotlight on New  
Technology Award -  
2009



Utah Valley Entrepreneurial Forum  
Social Entrepreneur of the Year - 2009



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### **Continuous Improvement Philosophy and Results (continued):**

Additional examples of Lean manufacturing results at US Synthetic:

- Reduced the flow time for obtaining experimental results by 85%, from 21 days to 3.
- Reduced customer quality findings by 50% over the past 18 months.
- Reduced one customer's most expensive inventory item (50% of total inventory) to zero inventory cost.
- Improved delivery times with simultaneous reduction of finished goods inventories (internally, and in customer locations).
- Grew revenues by 23% annually, while maintaining the industry's best lead times. Headcount grew by only 16% and building space by only 17%, over the same period.

### **Safety and Environment:**

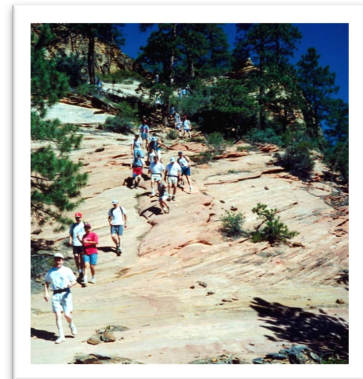
Continuous improvement efforts include safety programs and environmental responsibility, such as:

- In-house safety training and DuPont Safety for Supervision adoption.
- OSHA recordable injuries down 30% from 2008.
- Only 1 lost time injury in the last 4 years.
- Plant-wide recycling and reuse of industrial byproducts, such as cleaning solvents and grinding agents.
- Reduced emissions and improved energy efficiency.

### **People:**

USS views its employees as family and as its most important asset. The company values are openness, trust, respect, fun, growth and service. USS provides its people:

- Generous compensation and benefits that align individual effort with company success.
- Attractive careers which improve lives and help individuals grow (evidenced by a 4% employee turnover rate and high internal promotion rate).
- A culture where employees enjoy spending time working, serving, and playing together at USS sponsored activities.
- The opportunity to contribute to problem solving across the enterprise.



US Synthetic employees on a monthly company hike

### **Community:**

USS recognizes that a large part of its mission is to improve lives—in the local community and globally. To that end, the company and its employees:

- Donate regularly to local charitable efforts including food banks, high school scholarship programs, school drives, Sub for Santa, Habitat for Humanity, and the Boy Scouts of America.
- Sponsor and support humanitarian efforts in impoverished nations through CHOICE Humanitarian, Yehu Microfinance, Coast Coconut Farms, and other organizations.

In addition to donations of time and money, US Synthetic employees actively teach principles of Lean manufacturing and continuous improvement in their humanitarian service, and in local businesses and schools.



Humanitarian organizations trained by US Synthetic employees in continuous improvement principles