

Draft Position Description and Candidate Specifications for SENIOR RESEARCH & DEVELOPMENT ENGINEER US SYNTHETIC

Reports To

Dr. Ken Bertagnolli, Director, Research & Development

Location

Orem, Utah

Company Overview

US Synthetic leads the industry in the development and production of polycrystalline diamond cutters (PDCs) for oil and gas exploration. Their uncompromising commitment to constant innovation, outstanding quality, and superior customer service allows them to meet the highest performance standards and match the requirements of the world's most demanding oil exploration and development projects.

US Synthetic is focused on the development of diamond inserts for use in drill bits for oil and gas exploration. The organization also provides a variety of diamond-enhanced components for use in downhole exploration and production.

US Synthetic employs 250 people and is located in Orem, Utah. US Synthetic is part of Dover Corporation (www.dovercorporation.com).

Company History

The US Synthetic story started in 1978, when Louis Pope founded a small diamond grit manufacturing company. Over the years, Louis and his team of synthetic diamond experts expanded and evolved the business by developing innovative proprietary cubic press technology for high-pressure, high-temperature diamond synthesis and manufacturing polycrystalline diamond cutters (PDCs) for the oil and gas exploration industry.

Throughout the 1990's, an unwavering commitment to innovation, quality and personalized customer service fueled US Synthetic's rapid growth and success. In 1993, US Synthetic became the first PDC manufacturer to become ISO 9000 certified. The company introduced many of the decade's most significant innovations and advances in the use of diamond for oil and gas drilling. By 1997, US Synthetic had become the industry's leading supplier of diamond products.

Today, US Synthetic is actively expanding this leadership position by developing innovative new diamond solutions and exploring new uses for diamond both inside and outside the oil and gas drilling industry. This includes finding new uses for diamond inserts in downhole drilling equipment and exploring innovative new gem enhancement technology.

US Synthetic was recently acquired by Dover Corporation, joining the Energy Products Group within Dover Resources.

Research & Development at US Synthetic

A dedicated group of experienced scientists, engineers, and technicians drives US Synthetic's efforts to perfect and enhance existing diamond solutions and develop innovative new technology and designs for the future.

Three accomplished scientists with more than 50 years' of combined diamond research experience lead research and development efforts. A separate team of application engineers works directly with customers to develop custom diamond solutions that make the best possible use of the latest technology. These engineers have years of experience with PDC design, and many have prior experience with bit companies. A staff of experienced technicians constantly evaluates and tests new products in the laboratory, so they know what to expect when products are taken into the field.

All of these experienced professionals work in state-of-the-art research and testing facilities. This includes a full metallurgical lab, an advanced computer-aided design center and a sophisticated testing lab. These facilities allow US Synthetic scientists and engineers to:

- Create and optimize new cutter designs using the latest solid modeling software.
- Model and analyze the thermal and mechanical performance of PDC cutters under simulated drilling conditions using finite element analysis tools.
- Quickly build prototype cutters in a dedicated R&D environment.
- Evaluate cutters using scanning acoustic microscopy (C-SAM), optical and scanning electron microscopy, and metallurgical analysis.
- Monitor and improve cutter performance with abrasion, impact resistance, and vertical turret lathe (VTL) testing.

At US Synthetic, all of these advanced research, development and testing capabilities come together to produce the most advanced, innovative and effective PDC's in the world.

US Synthetic Mission

US Synthetic is committed to their customers' success. This success is enabled by making clearly superior diamond products and by demonstrating excellence in:

- Customized engineering
- Technology
- Delivery
- Quality
- Customer service

US Synthetic Values

US Synthetic is a family-oriented company with a unique culture that fosters innovation, service and quality. The following are the top values that guide employees:

- Service
- Respect for every person in the organization
- Employee development, both personal and professional
- Trustworthiness
- Unity
- Effectiveness
- Openness and honesty
- Entrepreneurial spirit
- Innovation

Principal Responsibilities

US Synthetic seeks an exceptional and team-oriented senior engineer/scientist to conduct research and development associated with high-temperature/high-pressure (HTHP) sintering of diamond.

Candidate Requirements

- A minimum of 5 years' experience since obtaining undergraduate degree.
- Expertise in HTHP diamond synthesis and/or HTHP diamond sintering.

- Knowledge of cemented tungsten carbide applications in HTHP tooling and polycrystalline diamond products.
- Experience with research experimentation.
- Proven ability to generate new ideas.
- A demonstrated ability to work with a team.
- Candidates with experience developing superhard materials will be given special consideration.

Education

An advanced degree in material science, physics, or engineering is required.

For suggestions, nominations, and further information, please contact:

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