

# D&K Engineering and 3D Systems, Inc. Develop the World's Best Laser Sintering Equipment

## Intro...

Large or small, plastic parts are a huge part of daily life. You find them everywhere: in the dashboard of your car, in airplane cabins in computers and laser printers, and in thousands of other applications. To accelerate part design and increase downstream manufacturing quality, companies worldwide use laser sintering techniques to create prototypes of these parts directly from digital CAD data. One of the most effective techniques is Selective Laser Sintering or SLS®, a registered trademark of 3D Systems Inc., a global leader in advanced solid imaging solutions. When 3D Systems decided to leverage its SLS technology to create a new, more advanced SLS system, they turned to D&K Engineering.



3DSYSTEMS®



## Partnering Delivers World-Class Results

After an extensive nationwide search, 3D Systems selected D&K Engineering to engineer and manufacture the Sinterstation® Pro SLS®. The results were spectacular. D&K Engineering assembled a multidisciplinary team and, in collaboration with designers from 3D Systems, delivered a turnkey system within tight budget constraints and in only 18 months — well ahead of the 4-year development time estimated by 3D

Systems. Even better, the system turned out to have world-class performance. According to Abe Reichental, 3D Systems' president and chief executive officer, "The data from testing demonstrates that the Sinterstation® Pro SLS® System is faster and provides cost-effective, functional parts for designers, engineers and marketers... We have certainly pushed the functionality and performance envelope."

## Innovative People Make it Happen

To develop, prototype, and test all aspects of this complex machinery, D&K Engineering pulled together a talented engineering team that could overcome significant engineering challenges in a tight timeframe. The team consisted of program managers, mechanical engineers, electrical engineers, and software engineers. Team members collaborated with 3D Systems in the design of all major subsystems, including the Sinterstation Pro, Offline Thermal Station, Rapid Change Module, Nitrogen Generator, Break Out Station, Integrated Recycling Station, and Intelligent Power Cartridge.

## About Us...

D&K Engineering is a global contract, R&D, engineering and manufacturing services company focused on developing and manufacturing complex electromechanical products and equipment. With a core set of best practices and industry knowledge that spans the entire product development lifecycle, D&K Engineering mobilizes the right people, processes, tools and infrastructure to create and deliver sustainable business value to organizations seeking to outsource the design, development and/or manufacturing of their equipment or products.

D&K Engineering enables organizations to decrease time-to-market, reduce cost and improve product quality.

*Simply put, D&K Engineering bridges the gap between concept and reality.*



The design and development process was characterized by innovative mechanism design, industrial design, rigorous thermal analysis, stress analysis, sophisticated electrical board design, and complex software control systems. A sophisticated and robust datum system was developed to ensure system accuracy despite large thermal gradients between components. Several patents resulted.

## Quality Results from a Quality Team

Once the design was complete, D&K Engineering put the design through D&K Engineering's proven New Product Introduction (NPI) process and quickly ramped the system into production. A supply chain was established by D&K for over 1600 components. Test procedures and quality control plans were put in place, as well as process analysis and data collection software, in order to optimize the manufacturing system to decrease work-in-progress (WIP) time and maintain exacting quality standards. In addition to assembly manufacturing, activities included; packaging, crating, inventory management, configuration control, field support, Field Replacement Unit (FRU) supply and management, field services personnel training, cost reduction efforts through supply chain management, cost reduction efforts through post-release design improvements, process control system implementation, process optimization plans, and end-of-line test optimization.

As a result, D&K Engineering was able to design, test, build and ship the Sinterstation® Pro SLS® System in only 18 months, instead of the 4 years estimated by 3D Systems had they relied solely on internal resources. The final system design proved to be reliable, serviceable, modular, and scaleable—and is recognized as the premier Laser Sintering equipment in the global solid imaging marketplace.

*"The data from testing demonstrates that the Sinterstation® Pro SLS® System is faster and provides cost-effective, functional parts for designers, engineers and marketers... We have certainly pushed the functionality and performance envelope."*

**—Abe Reichental, CEO, 3D Systems**