



Midrex Global Solutions

Your Partner for Success

MIDREX
Designed for Today,
Engineered for Tomorrow™



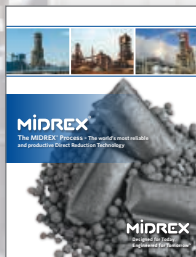
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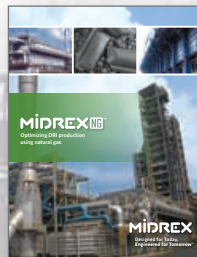
ENVIRONMENTAL, HEALTH AND SAFETY ASSURANCE

Midrex Technologies, Inc. recognizes the importance of protecting the environment and conserving natural resources. Throughout its history, Midrex has been proactive in increasing the efficiency, productivity, and reliability of its processes while reducing their environmental impact. **MIDREX® Plants** are designed to minimize water, noise, and air pollution, and to meet applicable World Bank standards, as well as local emissions and environmental standards regardless of location.

Maintaining a healthy and safe work environment is a top priority of Midrex and a daily goal of its employees. Midrex works with its Construction Partners and Process Licensees to implement and maintain an up-to-date safety program, with the goal of zero work-related injuries and illnesses. Midrex follows the regulations set forth by **Occupational Safety & Health Administration (OSHA) 1910 & 1926** and strives for excellence in safety by continuously reviewing and updating information pertaining to facilities and by training employees on a regular basis.



MIDREX® Process



MIDREX NG™



MXCOL®



Building DRI Plants



DRI Products & Applications



MIDREX ACT™



Midrex R & D



Midrex Global Solutions

Building on Cooperation

SINCE START-UP OF THE FIRST MIDREX® PLANT IN 1969, MIDREX'S GOAL HAS BEEN TO COOPERATE CLOSELY WITH MIDREX® PROCESS LICENSEES ON INNOVATIONS AND IMPROVEMENTS. THIS "FAMILY" APPROACH HAS RESULTED IN THE BEST PERFORMANCE IN THE DIRECT REDUCTION INDUSTRY.

Midrex has assembled a team of experienced engineers and operators plus a knowledge base of technical information, operating data, and hands-on experiences that keeps MIDREX® Direct Reduction Technology on the leading edge. This has provided clients the knowledge, training, and assistance to be successful. A key part of this effort is aftermarket equipment and services, which is known as Midrex Global Solutions (MGS).

Midrex Global Solutions embodies the Midrex spirit of innovation, opportunity, and cooperation. This begins with designing and supplying plant systems and process equipment and continues throughout the life cycle of the plant including operations, maintenance, and plant enhancements. The MGS team is uniquely capable of providing combinations of custom designed equipment and specialized, in-depth services to drive optimization of plant productivity, availability, product quality, and asset management. As a result, Midrex Global Solutions is the only plant services provider that can guarantee the solutions it provides are designed and manufactured to exact Midrex specifications.

MIDREX® PLANT LIFE CYCLE



Areas of Focus

MIDREX GLOBAL SOLUTIONS HAS THE CAPABILITIES TO PROVIDE NUMEROUS BENEFITS FOR MIDREX® PLANTS.

PRODUCTIVITY & AVAILABILITY IMPROVEMENTS

Productivity is the tons per hour produced and availability refers to the hours of operation per year. Optimization of both factors is essential for plant profitability. For instance, downtime for maintenance and remediation of water systems that become impacted with iron oxide fouling and/or calcium carbonate scaling result in lost production hours. What if the scaling and fouling levels were significantly reduced so that cleaning time each year dropped by 50-75%? Other areas for productivity and availability improvements include operator and maintenance staff training and equipment predictive maintenance.



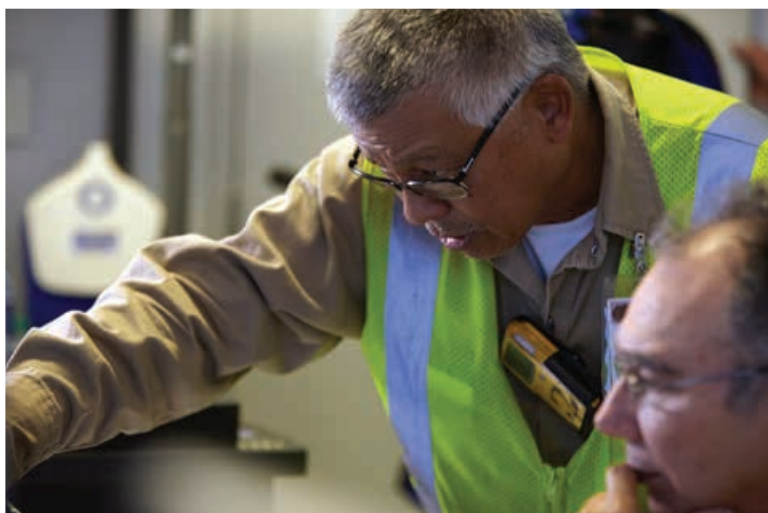
PRODUCT QUALITY ENHANCEMENT

Direct reduced iron (DRI) is a premium metallic product valued by steelmakers for its low impurities content and guaranteed, consistent quality. Through extensive technology development efforts and close cooperation with MIDREX® Process Licensees, Midrex has developed many methods to enhance product quality. The benefits include higher product metallization, hot DRI transported to the EAF melt shop, adjustable carbon content, and reduced fines generation.



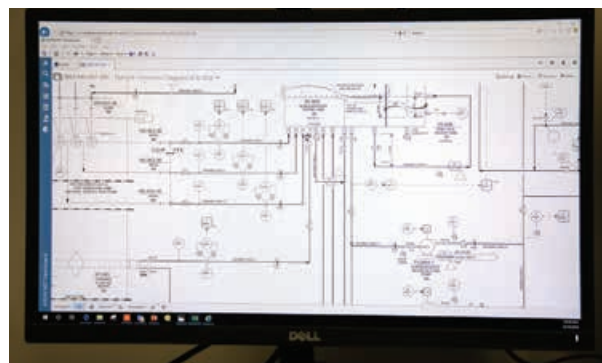
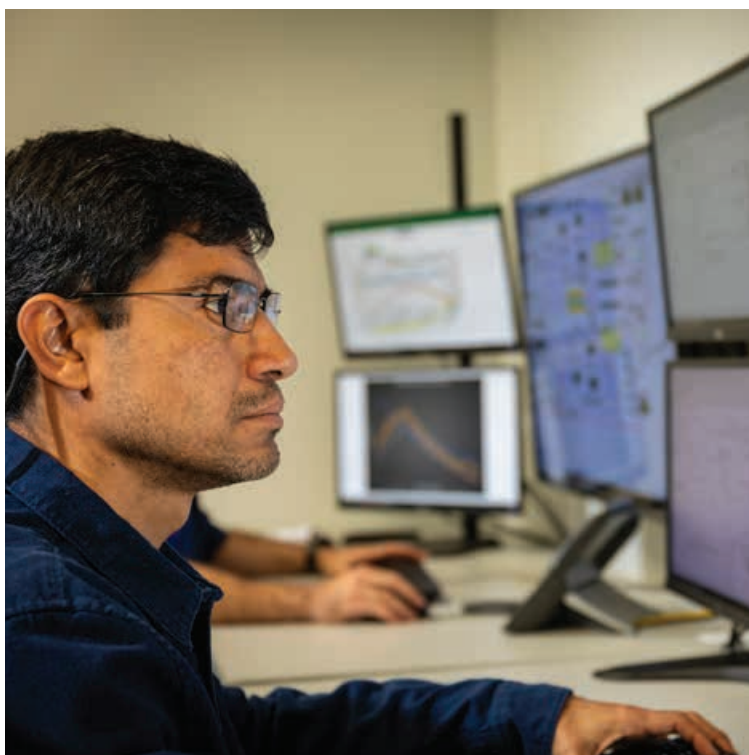
PLANT OPTIMIZATION & LONGEVITY

Optimization keeps a plant at peak operating efficiency and plant personnel at maximum effectiveness. How a plant is optimized can take many forms: minimizing process variation and human error, reducing waste, improving energy efficiency, ensuring equipment is operated properly, and upgrading the knowledge and skills of personnel. This requires frequent measurement of the performance of installed equipment, systems, and staff, and is used to determine recommended actions. Prudent operating practices enable the plant to operate at a superior level for decades.



ASSET & QUALITY MANAGEMENT

Enhancing and protecting assets and quality management go hand-in-hand. A plant operated and maintained by well-trained personnel will be more productive and less likely to require costly repairs. The use of guaranteed Midrex OEM parts, equipment, and materials is instrumental in keeping the plant running as designed at the lowest cost. The use of advanced monitoring and signaling devices allows plant personnel to gather and more quickly analyze large amounts of data on which to make critical decisions that can affect plant performance, safety, environmental integrity, and product quality.

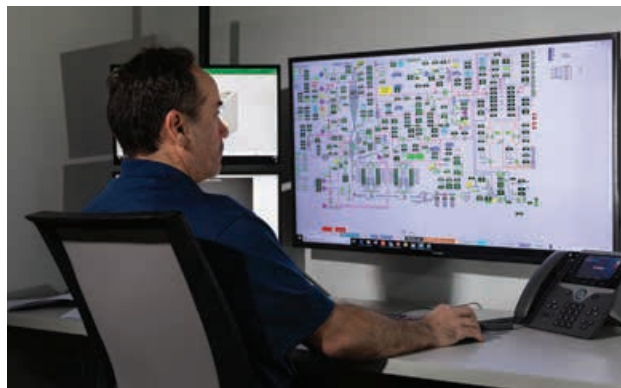


Range of Services

MIDREX IS COMMITTED TO BUILDING A CUSTOMIZED SOLUTION FOR EACH CLIENT USING THE COMPREHENSIVE SUITE OF SERVICES OFFERED BY MIDREX GLOBAL SOLUTIONS. THESE SERVICES ARE COMBINED AND TAILORED TO ADDRESS EACH CLIENT'S AREAS OF FOCUS AND LOCAL OPERATING CONDITIONS TO PROVIDE THE HIGHEST VALUE. THIS COLLABORATIVE PROCESS FACILITATES MIDREX'S ABILITY TO PROVIDE CONTINUING SUPPORT AS NEW CHALLENGES ARE IDENTIFIED.

REMOTE PROFESSIONAL SERVICES (RPS)

This client-assistance program reviews process and water system variables remotely and advises plant operators of critical system performance. By analyzing real-time, read-only data, Midrex experts can provide insights into plant performance in areas often outside the assigned responsibilities of client personnel. This information enables them to more effectively solve issues and optimize plant systems.



WATER TREATMENT

Midrex Global Solutions uses leading process indicators to recommend treatment strategies and optimize results according to design needs rather than using conventional "fit for use" strategies. This is done by integrating process water metrics into the RPS platform.



REFORMER MANAGEMENT

Midrex Global Solutions offers a solution for clients to optimize MIDREX® Reformer performance. Midrex personnel with extensive field experience can develop a program to manage the reformer using state-of-the-art practices.



TECHNICAL FIELD SERVICES

Midrex maintains a roster of highly qualified personnel world-wide with extensive experience in the various operating and administrative areas of MIDREX® Plants, who can support all plant functions including construction management, operations, maintenance, and purchasing.

ENGINEERED SOLUTIONS

The MGS team can assist in developing cost-effective, engineered solutions and equipment designs that increase plant productivity, reduce operating cost, and extend asset life. Examples include plant audits and de-bottlenecking studies, process automation upgrades, customization of equipment for local conditions, and incorporation of new technologies.



EQUIPMENT & MATERIALS SALES

Midrex Global Solutions understands the special requirements of replacement parts and consumables necessary during the life of a MIDREX® Plant. Relationships are maintained with outstanding manufacturers and vendors worldwide, which provide for global sourcing and delivery of essential spare parts and materials in a timely manner. Midrex serves as a plant's representative in dealing with suppliers, which frees up plant operations and administrative personnel for more important duties.

ANALYSIS AND DATA MANAGEMENT

MidrexConnect®

Midrex Global Solutions can access and analyze plant data needed to make fast, informed decisions regarding operations and maintenance from a centralized hub at the Midrex home office. MidrexConnect® provides Web-based viewing of process variables that impact plant performance and allows interaction with all areas of the production process.

Asset Management

An interactive digital portal allows plant personnel to access valuable information including engineering documents and data, training and operations manuals, maintenance records, and vendor documentation. The information is displayed in a 3D model, which creates an immersive plant experience. All these features enable plant personnel to make decisions that result in increased asset efficiency.

Operational Management

The status of plant equipment and systems can be reviewed on-demand, which provides staff a clear picture of the thousands of data points generated by the distributed control system (DCS), laboratory systems, and water quality system. The operational portal displays information arranged in apps that focus on key functional areas, enabling decisions to be made that result in increased plant production and reduced downtime.



Midrex Commitment

“TO DESIGN, DEVELOP, AND SUPPLY HIGH-PERFORMING, FLEXIBLE, RELIABLE, AND INNOVATIVE TECHNOLOGICAL SOLUTIONS FOR OUR CLIENTS THAT MEET THE HIGHEST SAFETY AND ENVIRONMENTAL STANDARDS.”

This commitment enables Midrex to provide sustainable value for its clients, achieved by following a set of principles that has served the Midrex family well over the years:

- Innovations and improvements must be relevant to client requirements.
- Designs must be simple, reliable and in step with technology advancements.
- Technology retains its advantage and relevance through interactive information flow.
- Empowering **MIDREX® Plant** staff to take ownership of ideas and responsibility for actions.

The active involvement of Midrex in plant design, supply, operation, and maintenance assures clients that their investment is protected, and their plants will have long and productive lives.

Midrex Global Solutions has the experience, knowledge, resources, and desire to be your partner in striving for excellence.





Midrex Global Solutions

Partnering with **MIDREX® Process Licensees** to keep
MIDREX® Plants operating at peak performance
in all parts of the world, under all conditions.

SLITS FOR 3.5" X 2"
BUSINESS CARD



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The processes and equipment depicted in this material are subject to multiple patents and patents pending in the U.S. and internationally.

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