ACECO American CRANE & EQUIPMENT CORPORATION

Cleanroom Cranes for the Semiconductor Industry



Cleanrooms process sensitive materials in a highly controlled and regulated environment. Utilizing cleanroom cranes allows for faster production and consistent product quality in a wide range of manufacturing processes. Industries that use cleanrooms include:













Cleanrooms have strict requirements, such as specially designed cleanroom equipment to ensure cleanliness and accuracy in a controlled setting. The semiconductor industry, in particular, has some of the highest cleanroom manufacturing standards. Cleanroom cranes are an integral part of the entire semiconductor ecosystem, providing invaluable materialhandling solutions.

American Crane & Equipment Corporation (ACECO) is an industry-leading supplier of cleanroom cranes for light-duty, heavy-duty, and versatile use. This eBook addresses standards for cleanroom semiconductor technology, the benefits of utilizing cleanroom cranes, and the applications that can benefit from cleanroom cranes and other stainless steel equipment across the semiconductor industry.

Standards for Cleanroom Semiconductor Technology

As the semiconductor industry rapidly evolves, the demand for faster, smaller, and less expensive manufacturing processes has grown exponentially. Cleanroom cranes provide an invaluable material handling solution, providing clean lifting and hoisting capabilities in a controlled setting.

These cranes help build and assemble equipment needed for various semiconductor manufacturing processes. Selecting the proper cleanroom crane increases efficiency and provides smooth, precise, and safe lifting of heavy components.

The Manufacture of a Cleanroom Crane

Manufacturing semiconductors must occur in a cleanroom setting due to the chips' extreme sensitivity to environmental contaminants. Similarly, manufacturing cleanroom cranes must be done in a controlled area free of dust and dirt. Assembling cleanroom cranes in these dedicated spaces allows the equipment to meet the semiconductor industry's stringent standards.



Cleanroom Qualifications and Requirements

In a cleanroom environment, every part needs a certification. ISO cleanroom specifications vary depending on the particle count, with ISO 1 specifying a requirement of fewer than 2 particles larger than 0.3 microns and zero particles larger than 1.0 microns per cubic meter. To eliminate the risk of contamination, semiconductors must get manufactured in a cleanroom that regulates the following factors:



- Airborne particles
- Airflow
- Humidity
- Lighting
- Noise
- Temperature fluctuations
- Vibration

All semiconductor manufacturing facilities must adhere to these parameters to optimize productivity and maintain the highest air quality standards. If a cleanroom does not have a properly functioning and well-designed HVAC system for proper air circulation, it could prove disastrous, as even a small dust particle can render a semiconductor chip useless. Other factors that can lead to disastrous consequences during manufacturing include:

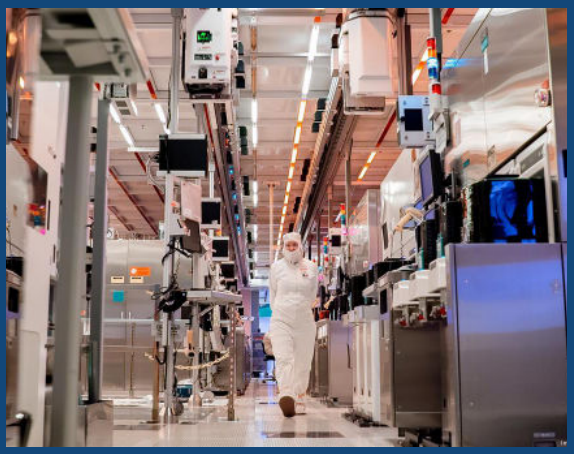
- Inability to control particulate matter
- Unacceptable levels of static
- Outgassing
- Equipment failure
- Power glitches
- Pressure malfunctions
- Fan motor failure
- Wafer-handling machine breakdowns

Selecting Your Cleanroom Crane

The experienced team at American Crane helps customers select cleanroom cranes that meet the demands of their specific semiconductor application. There are several types of cranes to consider, including light-duty, heavy-duty, and versatile-use cranes.

Light-Duty Cranes

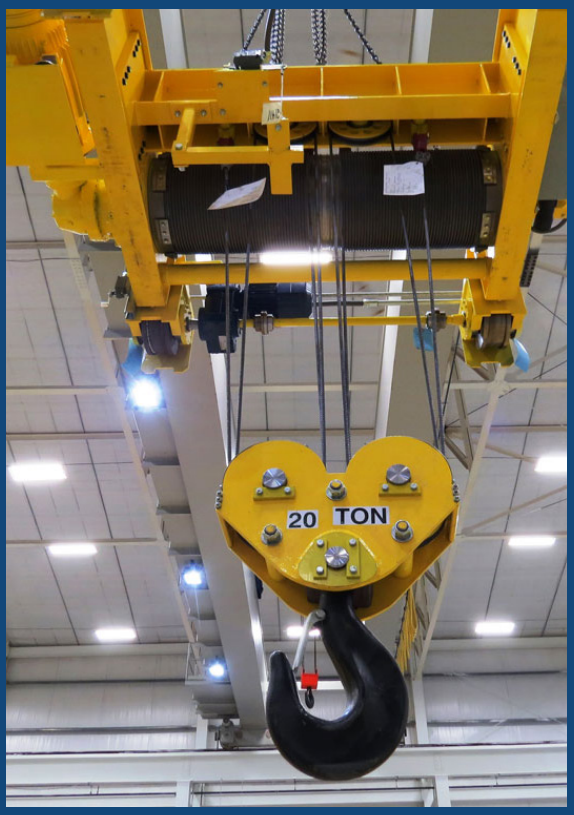
American Crane offers several types of light-duty cranes, each specifically designed to meet the needs of different applications. In semiconductor manufacturing, light-duty cranes can seamlessly assist in performing a variety of tasks, lifting and moving small- to mediumsize loads effortlessly.



Overhead lifting systems provide optimal material handling solutions since workers do not need to touch the product, as the cleanroom crane does the heavy lifting, reducing product damage and offering better control and precision. For lightduty lifting applications, we recommend a gantry crane, which is an overhead crane built on a movable framework with wheels that lets the structure move freely along a track or rail system.

Heavy-Duty Cranes

Heavy-duty cranes help move large loads in cleanroom environments. They consist of overhead lifting equipment such as cranes, hoists, hooks, magnets, and other devices to move, lift, or place loads within easy reach of operators.



Overhead lifting systems save valuable floor space within a manufacturing facility and help to minimize the physical demands placed on the labor force. Increasing direct-path transportation in semiconductor applications helps improve productivity, reduce human error, and limit downtime, saving overall time and money.

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Versatile Use Cranes

Applications requiring greater flexibility can benefit from a traditional jib crane with 360° rotating capabilities. The overhead lifting device can be mounted to the floor or wall and operated manually, electrically, or pneumatically.



A jib crane proves beneficial in semiconductor manufacturing since it can move materials in a circle or semicircle rotation. The equipment is efficient, safe, and versatile, especially for small enclosed spaces, such as a cleanroom environment.

Cleanroom Cranes From American Crane

American Crane offers a complete line of high-quality cranes that can meet the demands of any material handling application. All of our cleanroom cranes meet the stringent requirements of operating within a controlled environment and offer a wide range of benefits for the semiconductor industry, which include:

- Simple, safe operation
- Limit manual handling by workers
- Prevent work-related injuries
- Reduce product damage
- Eliminate human error
- Streamline workflow
- Easier maneuverability and control

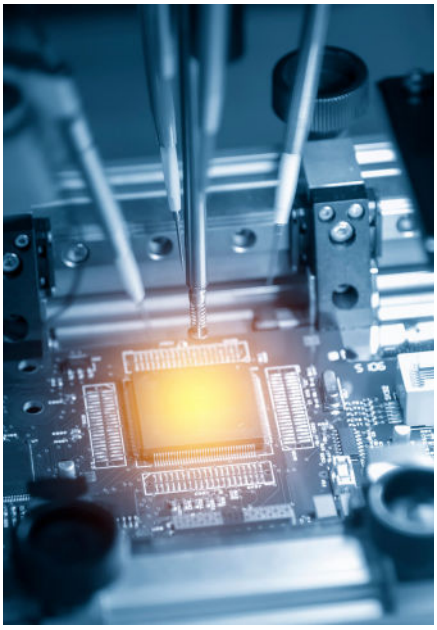
Utilizing cleanroom cranes can also eliminate the need for forklifts, reduce labor costs, and improve productivity in the manufacturing of semiconductors.

At ACECO, we have a dedicated testing area where we perform factory-functional and load testing before delivering the equipment to customers. This specialized bay for cleanroom equipment testing and assembly features an enhanced HVAC system with positive pressure and a special entry process to reduce particles and dust. This area also has an easy-to-clean epoxy floor that reduces residual dirt and dust.

These measures help us meet the needs of our customers who need cleanroom equipment, such as pharmaceutical, aerospace, food and beverage, and semiconductor manufacturers.

Choose American Crane For Your Semiconductor Industry Needs

American Crane offers turnkey material handling solutions for the semiconductor industry. We have a long-standing reputation as an industry-leading worldwide supplier of quality cleanroom equipment and remain passionate about meeting our customers' needs, putting integrity and perseverance into everything we do.



Cleanroom cranes provide invaluable material-handling solutions for the semiconductor industry. ACECO has the knowledge and expertise to guide customers through the selection process, ensuring the crane meets or exceeds their expectations and application requirements. Our team ensures reliable, safe, and efficient performance of all cleanroom equipment while providing exceptional customer service.

Request a quote for detailed pricing information or contact us to learn more about how American Crane can help you select a cleanroom crane that meets the demands of your semiconductor manufacturing application.



GRIT MATTERS™

ACECO American CRANE & EQUIPMENT CORPORATION

For more than 50 years, American Crane & Equipment Corporation has been a trusted manufacturer of cranes, hoists, and other material handling equipment, along with a variety of parts and components for standard, custom, and nuclear applications.

At ACECO, we understand the critical nature of the equipment we build. That's why we manufacture quality hoists, cranes, and related material handling equipment in-house with an emphasis on safety, innovation, scalability, and cost-efficiency. Contact us today for more information on our preventative maintenance program or to get your project started!

Contact Us **Resource Library**

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