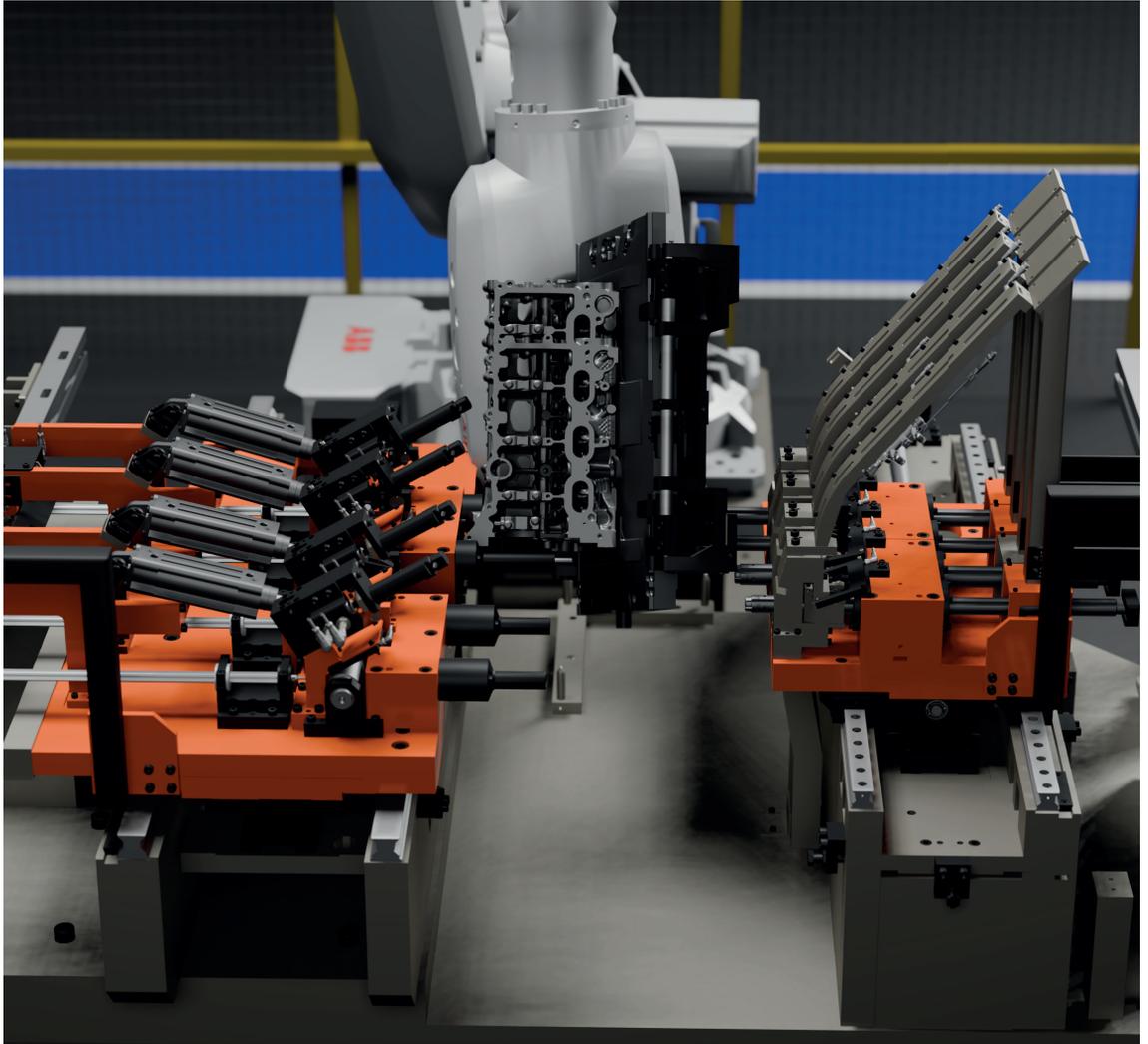


Assembly and pressing Solutions

Assembly and pressing solutions for plugs, spheres, valve seats, guides,
for cylinder head and plugs, threaded plugs and spheres for engine blocks



Assembly Line Solutions

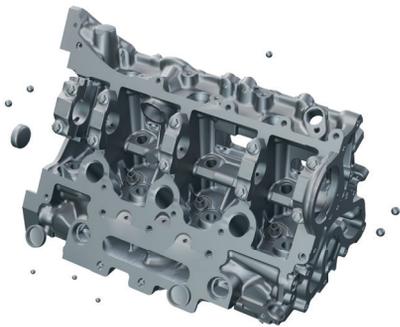
The assembly cells for seats, guides, plugs, and spheres in engine heads and engine blocks offer complete and automated solutions designed to meet the stringent standards of the automotive industry.

This advanced technology enables efficient assembly with full control and traceability, ensuring that each component mounted in the engine head and engine block meets the requirements of the automotive industry.

The plugs and spheres are critical components that ensure proper sealing and functionality of the engine, contributing to durability and thermal efficiency. With a focus on precision and efficiency, Nagel is certified according to ISO 9001 and ISO 14001 standards, ensuring not only high-quality assembly processes but also environmental responsibility.

Application

The assembly cells developed by Nagel are precise and effective in inserting seats, guides, plugs, and spheres into engine heads and engine blocks, ensuring the accuracy specified by the customer and necessary for optimal engine performance. These components are essential for the engine's operation, responsible for sealing, valve guidance, and fluid management, ensuring durability and thermal efficiency.

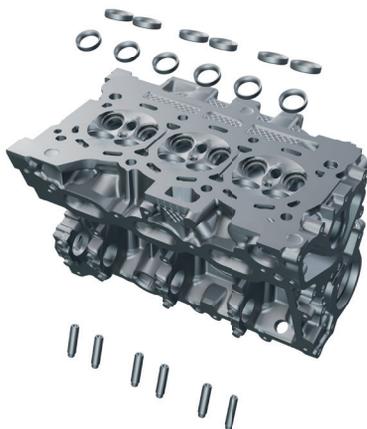


Assembly of Spheres, Plugs, and Threaded Plugs

The assembly/pressing of components can be performed in various ways: using a manipulator/robot to bring the engine head to the pressing station or even with the press in the robot's arm.

The plugs are installed in engine heads and engine blocks on specific lines, ensuring efficient sealing.

The spheres can be assembled in designated locations to ensure the proper functioning of the sealing mechanisms.



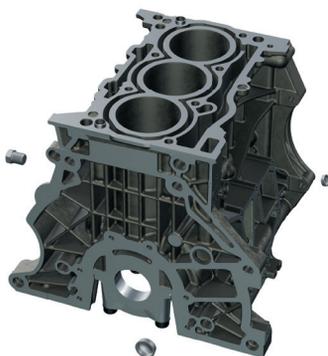
Assembly of Valve Seats and Guides

The robot holds the cylinder head and positions it in the press against a backing, allowing for the pressing of components:

Pressing of Plug: Precise installation of plugs that ensure effective sealing.

Pressing of Guide: Correct positioning of guides for valve operation.

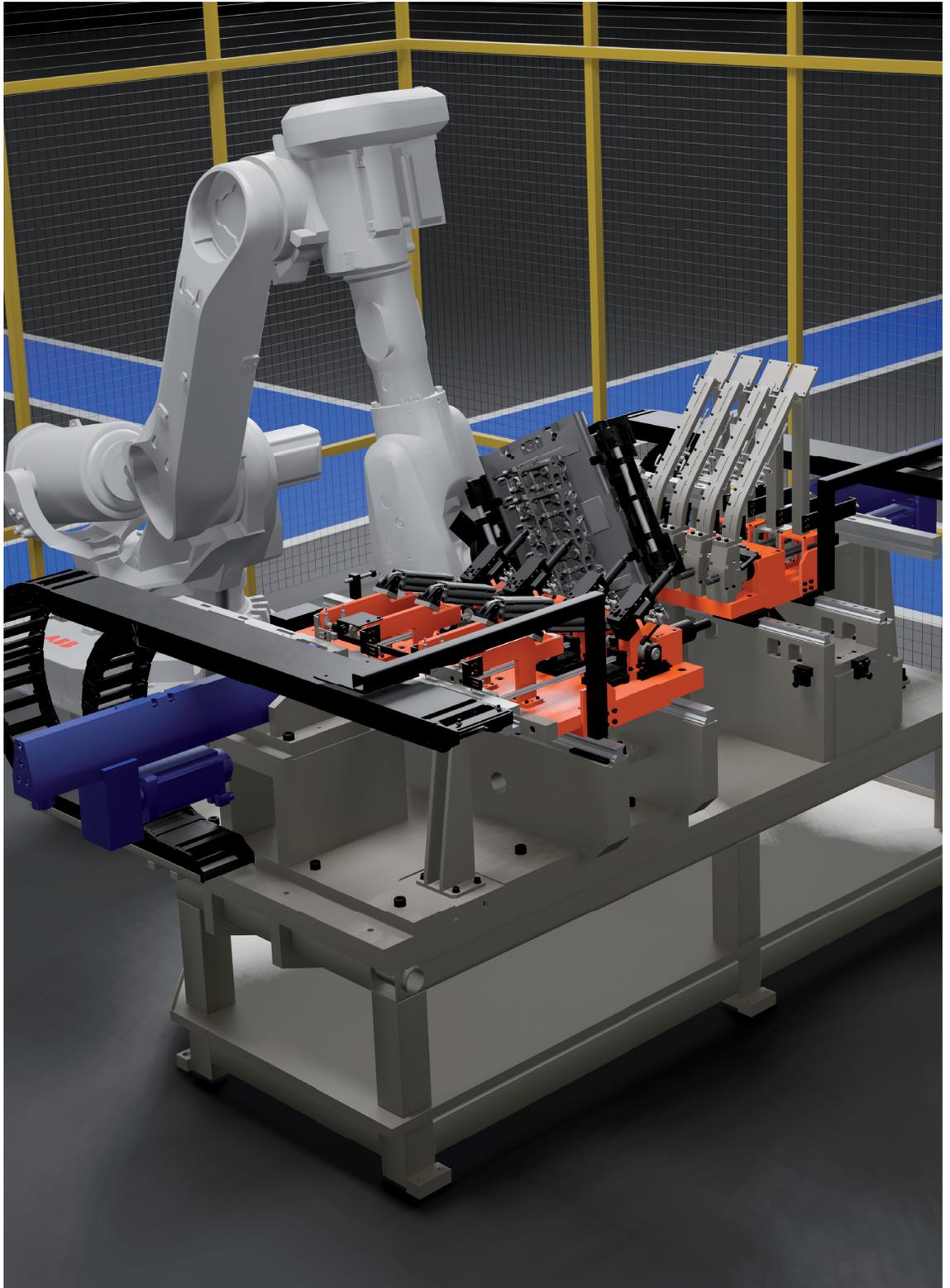
The components are automatically brought directly to the pressing punch, ensuring speed in the process and reducing cycle time.

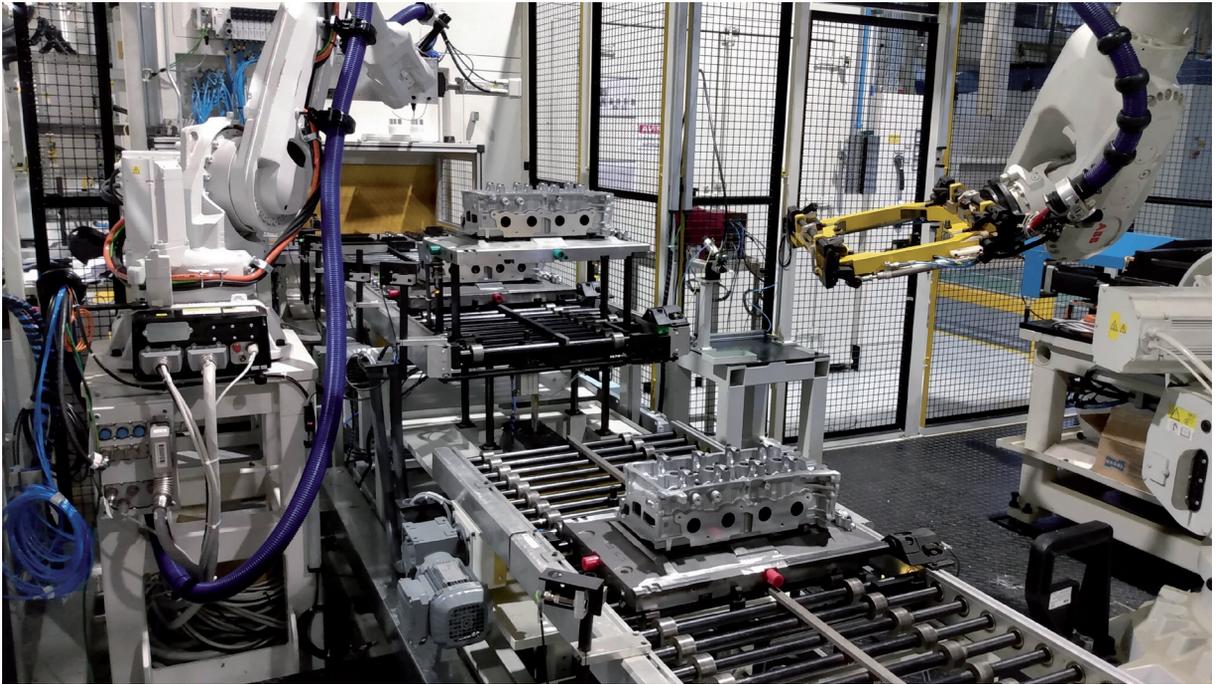


Sealing Components

The plugs and threaded plugs can be specifically assembled in engine heads and engine blocks on dedicated lines for each, ensuring that each type of component meets sealing and performance requirements.

Oil seals and valve seals, for example, are crucial for preventing leaks and maintaining engine efficiency.





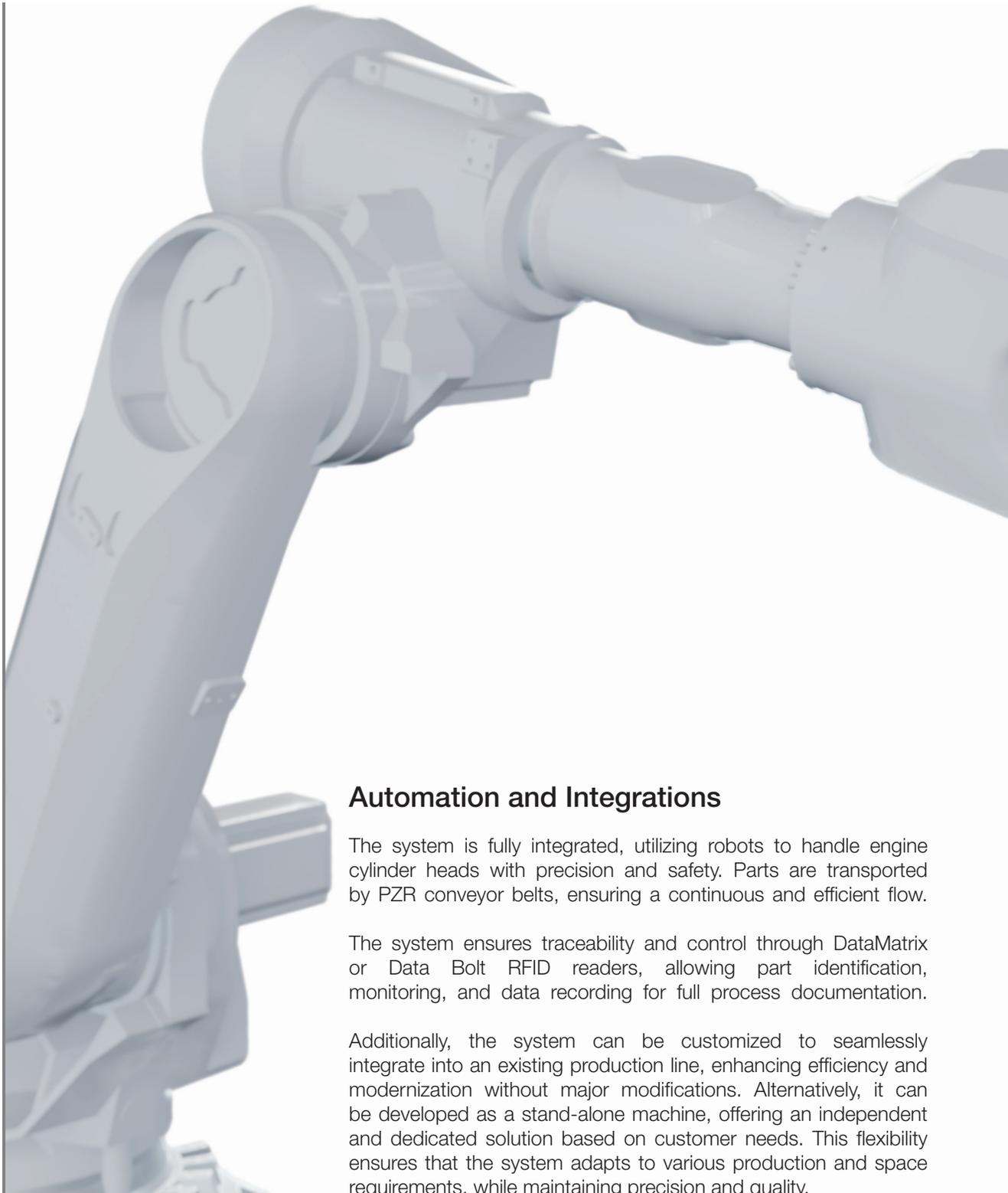
Operation

The system is highly automated and controlled by advanced technologies. The process begins with the product being supplied to the cell. Next, the component housing is lubricated to facilitate precise insertion.

The pressing process can be controlled by hydraulic, pneumatic, or electric systems with high precision, ensuring the correct seating of components.

The line also features a marking system for compliant and non-compliant parts, allowing immediate identification and classification for quality control.

The command and control are managed by a Siemens PLC with a touchscreen HMI, allowing real-time monitoring and precise adjustments, ensuring operational flexibility and ease.



Automation and Integrations

The system is fully integrated, utilizing robots to handle engine cylinder heads with precision and safety. Parts are transported by PZR conveyor belts, ensuring a continuous and efficient flow.

The system ensures traceability and control through DataMatrix or Data Bolt RFID readers, allowing part identification, monitoring, and data recording for full process documentation.

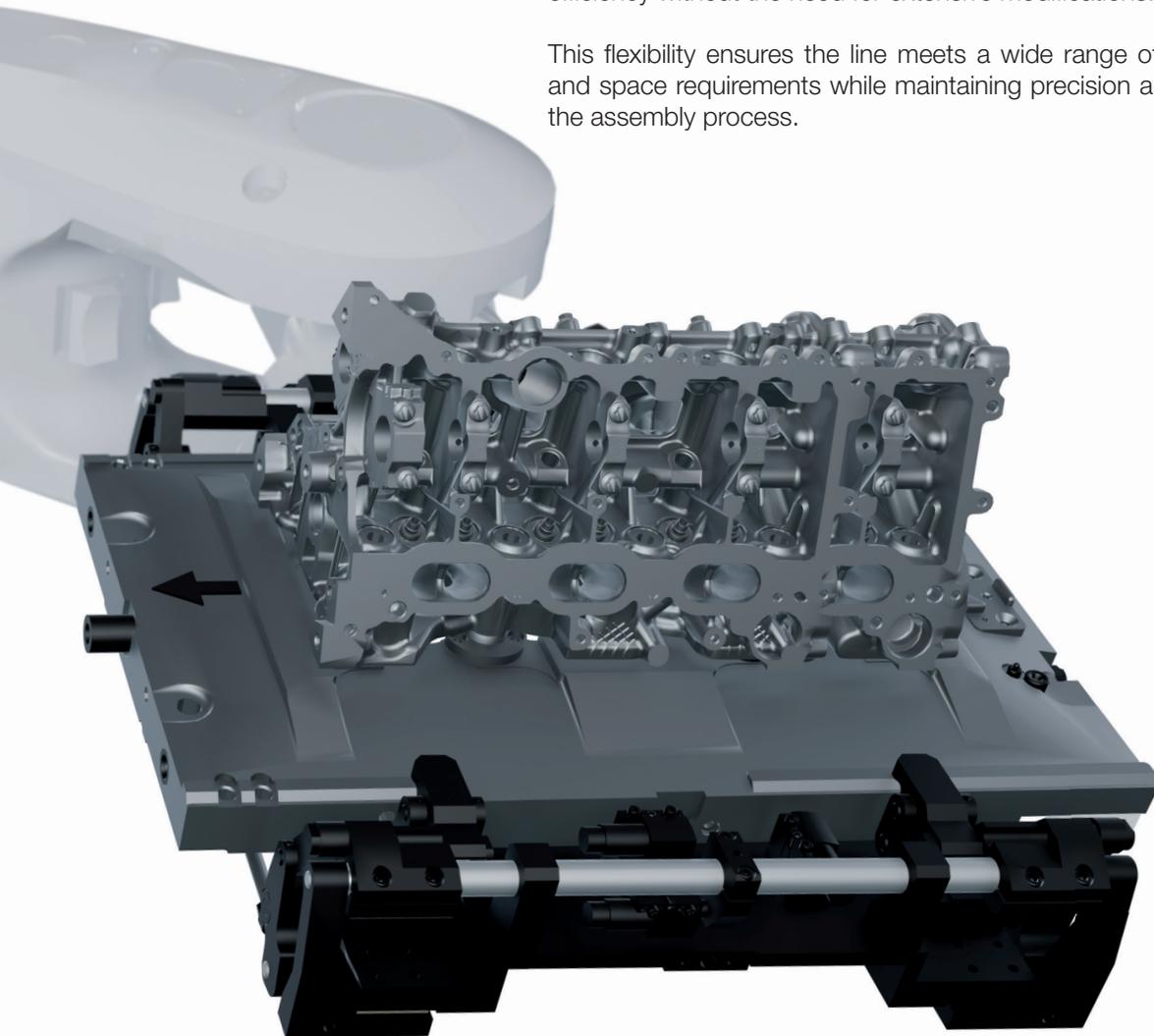
Additionally, the system can be customized to seamlessly integrate into an existing production line, enhancing efficiency and modernization without major modifications. Alternatively, it can be developed as a stand-alone machine, offering an independent and dedicated solution based on customer needs. This flexibility ensures that the system adapts to various production and space requirements, while maintaining precision and quality.



Customization

Furthermore, the assembly cells can be customized to integrate into an existing production line, providing modernization and increased efficiency without the need for extensive modifications.

This flexibility ensures the line meets a wide range of production and space requirements while maintaining precision and quality in the assembly process.



Support and Technical Assistance

Nagel offers specialized technical support for the machines. This includes operator training, preventive and corrective maintenance, and ongoing supply of spare parts. Our engineers are ready to adjust machines as needed, ensuring maximum production efficiency.



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