

Automation to Lighten Your Load

New turnkey, 'off-the-shelf' Gleason 2700AR system automates larger-gear load/unload to speed throughput, optimize process flow – and take the weight off the operator.

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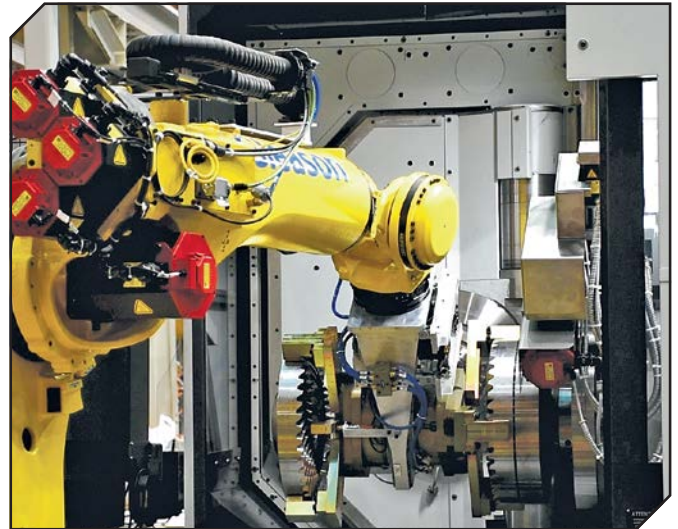
For many gear manufacturers today, small batch sizes and frequent part changeovers are the rule rather than the exception. For large part producers, manually handling workpieces is particularly burdensome. Finding a fast, economical and reliable solution to automate this operation has never been more critical.

A New 'Standard' for Large-Parts Automation. With a product portfolio that spans the complete range of gear solutions, Gleason has been keenly aware of the challenges that exist for manufacturers of all types of gears. At Gleason Automation Systems, we've worked hard to develop a turnkey load/unload automation solution that can be seamlessly, and economically, integrated with both Gleason, and non-Gleason, bevel and cylindrical gear machines producing parts weighing upwards of 150 kg. In the new 2700AR loader, we've achieved that objective. Now, for the first time, an automation system exists that uses standard, off-the-shelf components to automate the handling of larger workpieces.

Benefits of the 2700AR to the customer are truly significant. A labor-intensive process that would typically take the operator three or four minutes to perform, even with the assistance of an overhead crane, can now be completed in just 30 to 40 seconds using the 2700AR. The potential for human error resulting in product damage or misidentification of parts is eliminated, along with the possibility of operator injury that always exists when manually handling large parts. Now, the operator can be available for other tasks, while the 2700AR does all the heavy lifting.

Exceptional 'Plug and Play' Performance. In the past, achieving this automated capability would have required a customized solution only available to the customer at prohibitive cost. Now, through a combination of readily available robot and vision system components and Gleason Automation Systems 'know-how', the 2700AR is available as a 'plug-and-play' solution with truly remarkable capabilities. Here's how it works, in a typical large bevel gear cutting machine cell application:

Large-part blanks arrive at the machine on wooden pallets or plastic dunnage trays. Prior to picking up a gear blank a FANUC 6-axis robot uses FANUC 3DL Vision Guidance, consisting of camera and laser, to identify the part and establish its position and orientation. In this application, there are 14 possible parts, making accurate part identification critical. There is always the risk with customer dunnage that parts will arrive in a less than ideal arrangement, or even upside down. This system ensures that the robot can identify what part is being picked up, as well as being able to accurately grip the part to ensure proper orientation before loading it into the machine tool. If the system determines that the part is upside down, the part will be transported to a fixture where it can be placed and then re-gripped before transport to the machine tool in the correct orientation.



The end-of-arm tooling consists of multiple grippers. Each gripper has three Gleason-designed gripper fingers which apply frictional forces to grip the part firmly and accurately. The gripper fingers accommodate a wide range of parts, saving change-over time. When necessary, the gripper fingers can easily be replaced.

If plastic trays are used for the dunnage, when they become empty the robot gripper fingers pick and move them to the dunnage storage area. If plywood dividers are used instead, a special end of arm tooling is used that employs a vacuum head to pick the plywood divider sheets from the dunnage and store them in the dunnage storage area.

When the uncut blank is ready for transport to the machine tool, a network connecting the robot PLC and the machine CNC ensures that the robot/machine dialogue is intelligent. For example, the robot can tell the machine that it's ready to load a particular part number, rather than just a part. The machine tool can then determine if this particular part matches the summary that it has prepared to run for that part. This greatly reduces the risk of time-wasting, scrap-producing errors.

The robot is equipped with multiple grippers for unloading and loading the machine tool. This allows the robot to unload a finished part with one gripper, swivel around and load a raw part with a second gripper, thus improving productivity. In addition, the robot can be used to transport parts to and from other secondary, post-machining operations, including part marking, part gauging, the application of rust preventative solutions and more. ⚙️

For additional information on the new Gleason 2700AR, and the complete array of Gleason Automation Solutions, visit:

www.gleason.com/automation

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