

# **Harmonic Drive Precision Strain Wave Reducer Gearboxes and RV and RD Reducers: Market Shares, Strategies, and Forecasts, Worldwide, 2018 to 2024**

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## **Abstracts**

The 2018 study has 230 pages, 141 tables and figures. The leading vendors in the harmonic drive industry have invested in high-quality technology and processes to develop leading edge reducer strain relief gearbox capability.

Other vendors are working to catch up. Harmonic drive market driving forces relate primarily to the implementation of speed reduction capability for robots and wind turbines initially, providing industrial controls that are compelling. The harmonic drive is used in situations where smooth, efficient gear operation is needed. Initial applications are in robotics, aerospace and solar tracking, the materials used in these applications can wear and break if the gearing in a motor is rough. Harmonic gear vendors offer a unique gear tooth profile that optimizes the tooth engagement. Only the high end vendors are able to provide harmonic drives that work, the other units become trash within days.

Revenue for harmonic drives was \$838 million in 2017, and products are expected to generate revenue of \$3.517 billion by 2024. Strong growth is the result of increasing use in industrial robots as they become integrated and able to perform multiple functions sequentially in an automated manner. Harmonic drive reduction gearboxes are presented many new market opportunities from multiple types of applications. The VNTOL aircraft uses the drive reduction to enable vertical takeoff This lifts off like a helicopter and flies like an airplane. Demanding applications for the gear box include surgical robots. By application category, there was a substantial year-on-year increase in sales for industrial robots used on production lines for smartphones, tablet devices, household appliances, automobiles, and other products.

Sales for semiconductor manufacturing equipment increased due to rising capital investment against a backdrop of increasing demand for industrial equipment, automotive devices, and devices for data centers, among other factors. Sales for flat panel display manufacturing equipment increased due to high levels of investment to expand production capacity for LCD and organic EL panels. Semiconductor liquid crystal production equipment, photovoltaic equipment, optical instruments, precision machine tools and other cutting-edge areas provide target applications.

Japan manufactures reliable performance precision gears. Reliable performance of precision gear reducer manufacturing is not yet occurring at scale elsewhere, particularly in China. China with its huge investments in industrial robots would really like to be able to scale manufacture of harmonic drive precision strain wave reducer gearboxes. The market has just begun. Early adopters are the robot manufacturers. Suppliers of the precision gears, Japanese companies, address markets for industrial robots. While the Chinese would like to be the primary suppliers of Harmonic Drive Precision Strain Wave Reducer Gearboxes, it has not happened yet.

Harmonic gear reducers are used in aviation, aerospace, energy, navigation, shipbuilding, bionic machinery, commonly used ordnance, machine tools, instruments, electronic equipment, mining and metallurgy, transportation, lifting machinery, petrochemical machinery, textile machinery, agricultural machinery and medical Instruments. Japan's a precision reducer is used in industrial robots and airplane engines, wind turbines and for solar trackers.

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