COMPANY PROFILE POSITIONING AND PROPOSITION

Laser gear Technology Co., Ltd. was founded in late 2023. The company focuses on the design, research and development, manufacturing, sales, and machining services of advanced face gear transmission products. It is committed to providing customers with high-performance, reliable, and cost-effective innovative transmission products and technical solutions.

As a core high-end transmission technology, the design and manufacturing technologies and manufacturing equipment for high-performance face gear transmissions have long been subject to foreign embargoes, severely restricting the development of high-end, high-power-density transmission equipment in China's aviation (low-altitude aircraft), high-end equipment, and other fields. Leveraging its proprietary core face gear transmission technologies, Laser Transmission has established a complete technology and engineering application system with independent intellectual property rights, covering face gear transmission design, manufacturing, inspection, testing, and precision manufacturing equipment. Its overall technology ranks at an internationally advanced and domestically leading level. The company can provide users with mid-to-high-end transmission products and solutions featuring good interchangeability and maintainability, short transmission chains, high transmission efficiency, high power density, wide transmission ratio ranges, low vibration and noise, and easy installation and adjustment. These products and solutions meet various transmission needs in fields such as aviation (low-altitude aircraft), electric drive actuators or robot joint reducers, precision rotary platforms, ships, industrial face gearboxes, heavy-duty vehicles, construction machinery, and high-end agricultural machinery.

CORE TECHNOLOGY AND ITS ADVANTAGES: FACE GEAR DRIVE TECHNOLOGY

	Aspect	Bevel Gear Drive	Face Gear Drive
	Structural Characteristics	Both pinion and gear are bevel gears	Pinion is a cylindrical gear; gear is a face gear
	Design, Manufacturing & Assembly Requirements	Apex points of the two bevel gears must coincide	No such requirement
Performance Characteristics	Interchangeability	↓ Required — gears must be matched and manufactured as a set	↑ Not required — gears are fully interchangeable
	Transmission Smoothness	→ Moderately smooth; exhibits self-excited vibration	↑ Smoother; free from self-excited vibration
	Assembly & Contact Pattern Adjustment	↓ Difficult, time-consuming, labor-intensive; requires two-dimensional (2D) adjustment	↑ Convenient, time-saving, labor-saving; requires only one-dimensional (1D) adjustment (along the face gear axis)
	Structure & Axial Thrust	↓ Complex structure; high axial thrust loads	↑ Simple structure; no axial thrust; conducive to weight reduction
	Gear Ratio Range (i)	↓ Limited range; typically i = 2 ~ 5	↑ Wide range; transmission chain is short; maximum ratio can reach up to 100
	Transmission Efficiency	↓ Single-stage bevel gear efficiency: 95 ~ 98%	↑ High single-stage efficiency: up to 99%
	Shaft Angle Range	↓ Restricted; shaft angle is typically 90°	↑ Wide range: 0° < shaft angle < 180°
	Power Density (kW/kg)	↓ Poor interchangeability; unsuitable for multi-branch power transmission; power density is limited	↑ Excellent interchangeability; especially suitable for multi-branch transmission; significant weight reduction; high power density

LASER GEAR
FACEGEAR

Positioning Face Gear Transmission Solutions Provider

Business Product R&D & Manufacturing | Transmission System Solutions
Design & Machining Services | Inspection & Test Verification

Applications Aviation (Low-Altitude Aircraft) Reducers | Electric Drive Actuators
Robot Joint Reducers | Precision Slewing Reducers
Marine Right-Angle Face Gearboxes | Industrial Face Gearboxes
Heavy-Duty Vehicles | Construction Machinery
High-End Agricultural Machinery | Other Applications

Scientific and Technological Achievement Appraisal

Appraisal Conclusion: The overall face gear transmission technology of our team has reached the domestically leading and internationally advanced level. It has solved the technical challenges in the design and precision machining of high-power, large-diameter aviation face gears, and is of great military significance and social benefit.

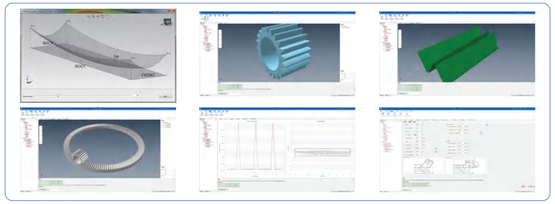
CORE TECHNOLOGIES AND EQUIPMENT CAPABILITIES ADVANTAGEOUS SELLING POINTS

Complete Technical System for Face Gear Transmission Design and Manufacturing

(1) Face Gear Design and Analysis Software

(Independently developed; complete range of face gear types; from components to systems)

Face Gear Transmission Design Software Interface



(2) Face Gear Machining Machine Tools

Precision Engraving and Milling Machine/Face Gear CNC Gear Hobbing Machine/Face Gear CNC Worm-Wheel Grinding Machine (China's First Domestic Set)



Precision Engraving and Milling Machine



Face Gear CNC Gear Hobbing Machine



Face Gear CNC Worm-Wheel Grinding Machine (China's First Domestic Set)



LASER GEAR

To Be the World's Leading Innovator in Advanced Face Gear Transmission Products

GAO ZHIXIN (SUZHOU) TRANSMISSION TECHNOLOGY CO., LTD.

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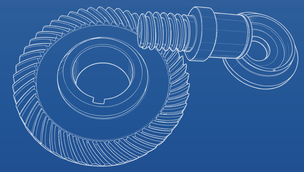
LASER GEAR

Face Gear Transmission Solutions Provider





High Transmission Efficiency High Power Density Low Vibration and Low Noise

(3) Face Gear Machining Processes, Gear Grinding Software, and Gear Inspection Instruments



Face Gear Worm Grinding Software Interface



Face Gear Machining Process Specification

(4) Gear Inspection Center



Face Gear Optical Measuring Instrument





Wenzel Gear Measuring Instrument (Measuring a Face Gear)

(5) Face Gear Transmission and Face Gear Reducer Test Rigs



Face Gear Fatigue Strength Test Rig (the first of its kind in China)



Electrically Closed-Loop Face Gear Reducer Test Rig

(6) Equipped with the capabilities for designing, manufacturing, and testing all types of face gears with grade 3–4 precision, as well as the capability for transmission product development, we can meet the demands of various industries for face gear transmission products featuring good interchangeability and maintainability, high efficiency, and high power density.



Orthogonal straight-tooth face gear drive (shaft angle = 90 °)



Orthogonal helical-tooth face gear drive (shaft angle = 90 °)



Offset face gear drive (skew axes / spatial crossed axes)



Non-orthogonal internal conical face gear (shaft angle > 90 °)



Non-orthogonal external conical face gear (shaft angle < 90 °)



Small shaft angle face gear (shaft angle 3 ° – 5 °)



Worm face gear pair

Application Areas and Product System

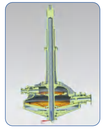
Face Gear Reducers for Manned Unmanned General Aviation Aircraft Low-Altitude Aircraft

Face Gear Reducers for Helicopters/Tiltrotors with Takeoff Weight (50–3000) kg, Single Engine/Single Motor, Single-Rotor / Coaxial Contra-Rotating Twin-Rotor / Tiltrotor.

Face Gear Main Reducers for Coaxial Contra-Rotating Twin-Rotor Helicopters with Takeoff Weight (3–6) tons, Dual Engine / Dual Motor / Hybrid-Electric Power.



155 kW ace Gear Main Reducer



127 kW Face Gear Main Reducer



150 kW Single-Input Face Gear Coaxial Contra-Rotating Main Reducer



Dual-Input Face Gear Coaxial Contra-Rotating Main Reducer

High-Efficiency, High-Speed Face Gear Electric Drives

Face Gear Right-Angle Electric Drive — Motor + Face Gear Transmission + Single-/Dual-Stage Planetary Transmission (Optional); features high transmission efficiency, good interchangeability, light weight, and easy assembly.

Worm Face Gear Electric Drive — Motor + Worm Face Gear Transmission + Cylindrical Gear Transmission (Optional); features high transmission efficiency, good interchangeability, light weight, and easy assembly, solving the overheating issue of existing products.



Face Gear Right-Angle Electric Drive



Worm Face Gear Electric Drive

High-Efficiency, High-Precision Face Gear Angle Drive Gearbox

Low-Backlash, High-Efficiency Precision Right-Angle Face Gearbox — Short transmission chain, high transmission efficiency, good interchangeability, easy assembly, and excellent stiffness, long service life, and stability.

High-Speed, High-Precision Face Gear Differential / Torque Regulator — Good interchangeability, high precision, high transmission efficiency, high power density, low noise, and lightweight design.



Low-Backlash, High-Efficiency Precision Right-Angle Face Gearbox



Face Gear Differential / Torque Regulator

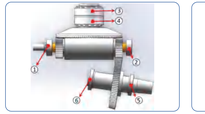
LASER GEAR FACEGEAR

High-Efficiency, High-Power-Density Marine Right-Angle Face Gearbox

Face Gear Azimuth Thruster — Short drivetrain, high efficiency and power density, good interchangeability, lightweight.
Small-Angle Marine Face Gearbox — Good interchangeability, short drivetrain, high efficiency and power density, lightweight.
Marine Face Gear Speed Increaser — Good interchangeability, short drivetrain, high efficiency, single-stage instead of two-stage, lightweight.



Face Gear Azimuth Thruster



Small-Angle Marine Face Gear Speed Increaser

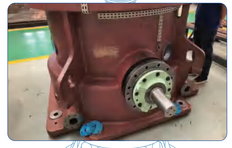


Face Gear Speed Increaser

High-Efficiency, High-Power-Density Industrial Face Gearboxes

General-Purpose Right-Angle Face Gearboxes for General Industry (Petroleum, Chemical, Mining) — Good interchangeability, short transmission chain, high transmission efficiency, easy assembly and maintenance, and long service life.





Mining Right-Angle Face Gearbox