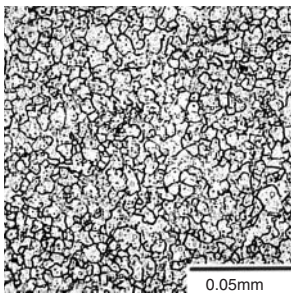
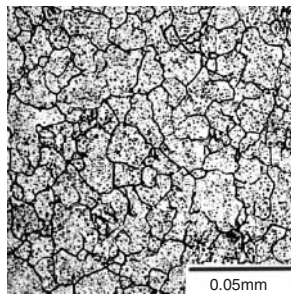


FA Tapered Roller Bearings

Achieve long life through grain refinement and carbonitriding technologies for bearing steel
Fine Austenite Strengthening: Grain refining and carbonitriding technologies for bearing steel

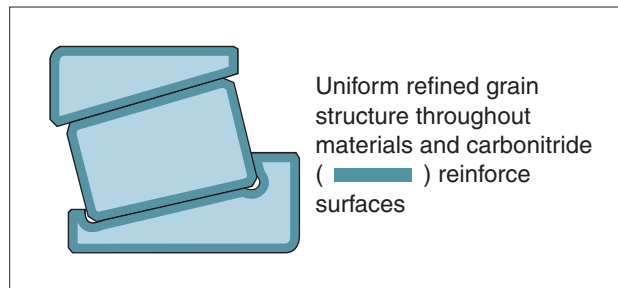


FA treated



Normal quenching

The prior austenite grain boundaries

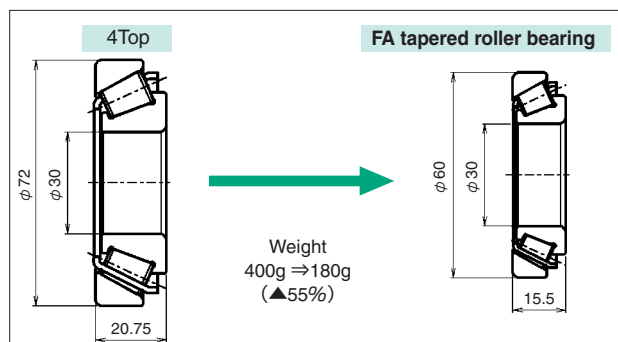


Performance (compared to NTN's 4Top series)

- Nearly 3 times longer life under lubrication with clean oil
- Nearly 14 times longer life under lubrication with contaminated oil
- Lower torque by 10%, or greater, within normal rotational range
- Improved seizure resistance by 25% in rotating speed and 200% in surface pressure
- Reduced preload loss by half
- Reduced assembly width settling rpm by half
- Improved indentation resistance by about 1.5 times

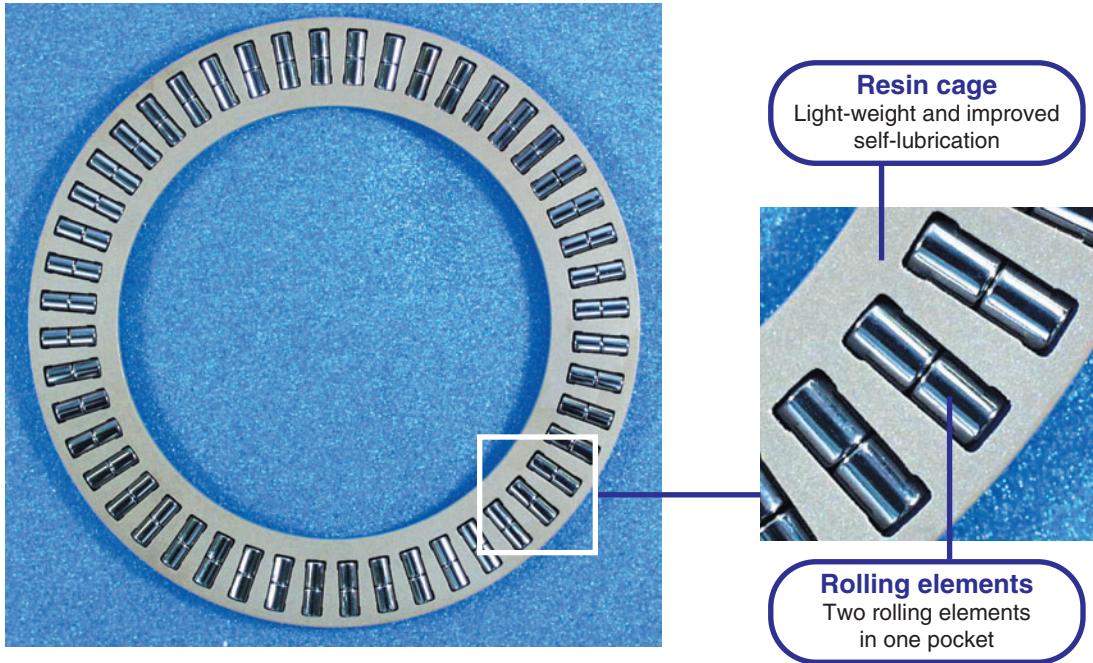
Compact body

- Compact structure by FA treatment and design optimization



Double-Row Thrust Needle Bearings for automobile air-conditioners and compressors

Achieve long life, low torque, and low noise through double-row rolling elements



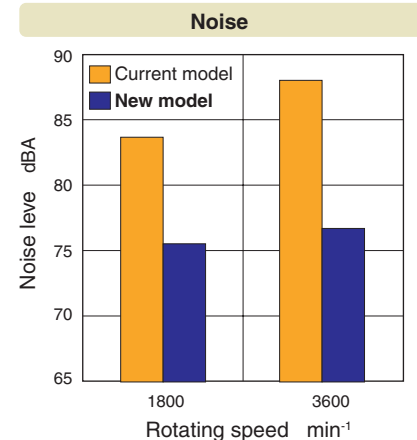
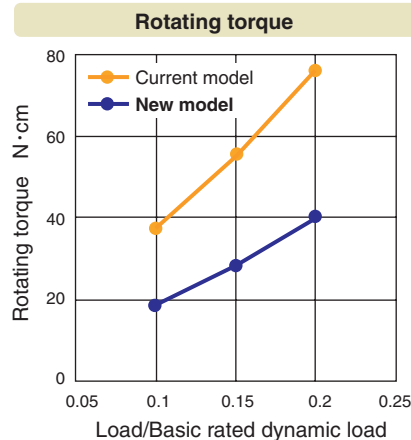
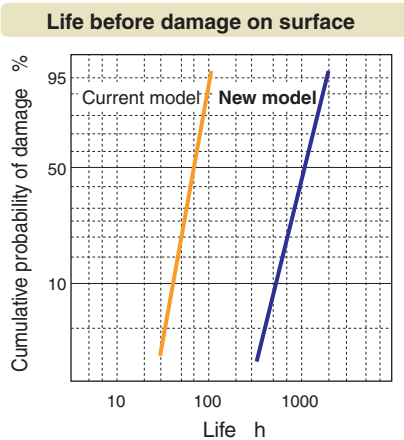
Features

- 12 times longer life (from damage originating on surface)
- 50% reduced rotating torque
- 8dBA reduced noise
- Lightweight resin cage

Applications

- Automobile air-conditioners and compressors

Performance (compared to current models)



FA Needle Bearings for rocker arms

Achieve longer life for rocker arm bearings through adoption of FA treatment
 Fine Austenite Strengthening: Grain refining and carbonitriding technologies for bearing steel



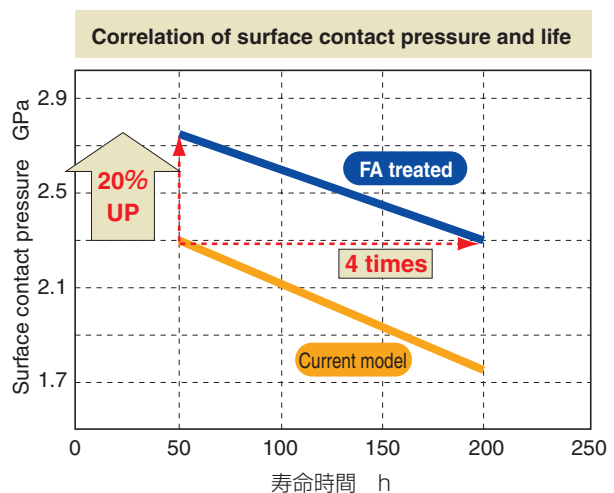
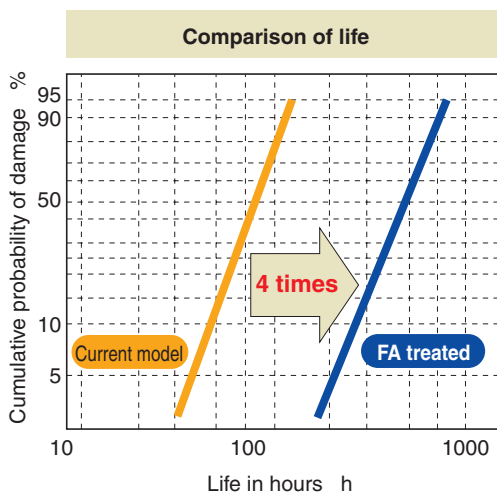
Features

- 4 times longer life
- 20% lighter weight by size reduction (through improved allowable surface pressure)

Applications

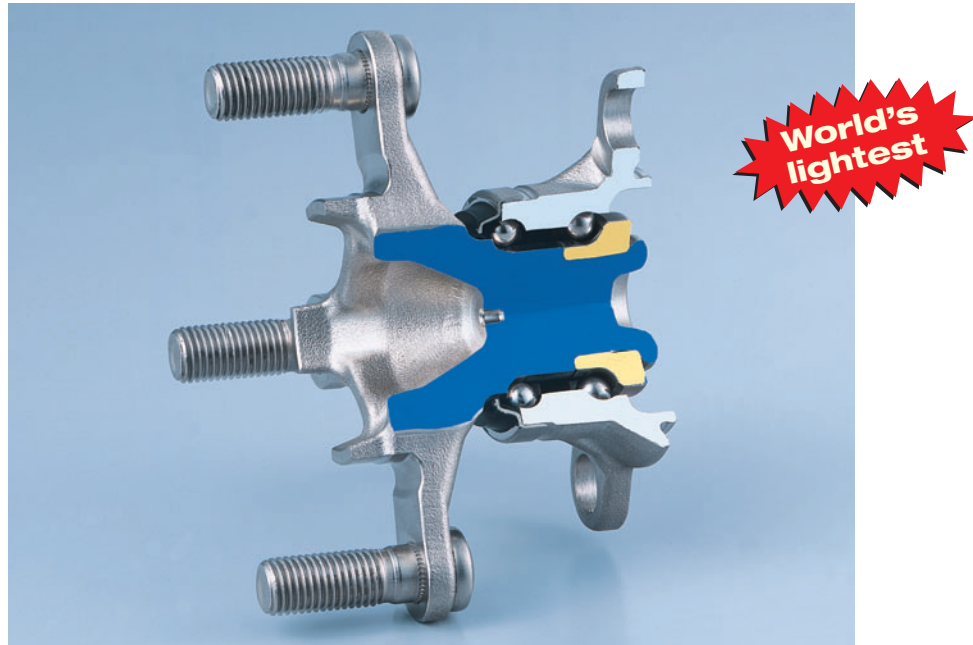
- Engines and rocker arms

Performance



Ultra-Light GEN3 Hub Bearings

Extremely light, “Mass weight of 1.0kg”, hub bearing for sub-compact automobiles



Features

- Lightweight
- Compact design
- High-strength carbon steel (newly developed material)
- Long-life grease
- Long service life

Applications

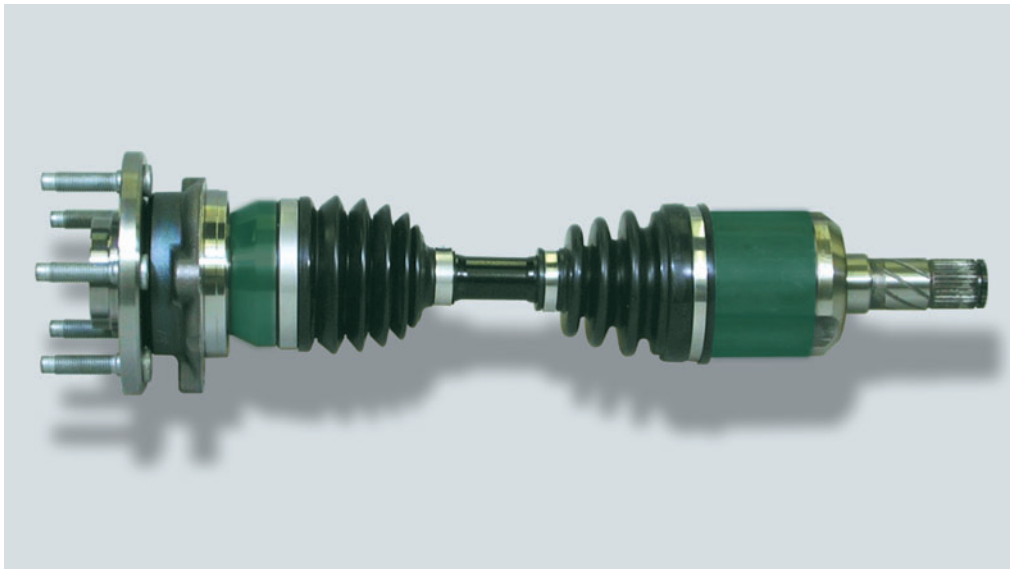
- Wheel bearings for sub-compact automobiles

Improved performance and fuel consumption

by reduced unsprung mass weight

GEN4 Hub Joints

Integrated new constant-velocity joint and GEN3 hub bearing,
Offering compact, lightweight, and easy-to-assemble GEN4 hub bearing with
Unique expansion crimp



Features

- **Lightweight**

Integration of the CVJ and bearing, adoption of a hollow joint shaft, and use of the new CVJ bearing tightening method reduces the weight by 10% or more.

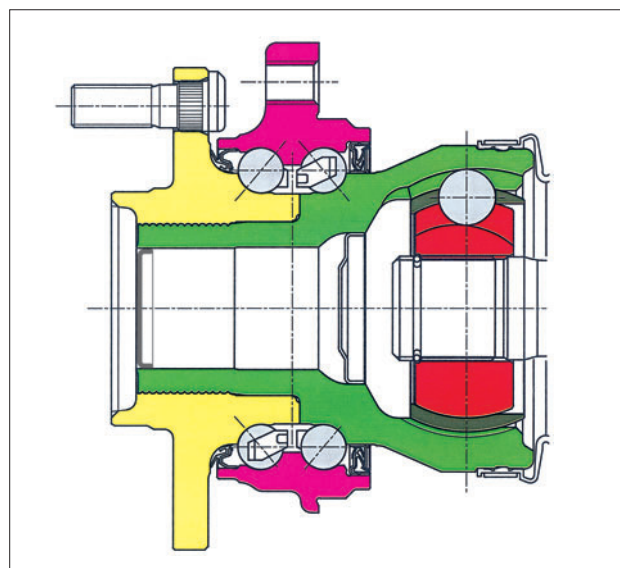
- **Smaller axial dimension**

Integration of the new constant-velocity joint and bearing reduces the axial dimension by 20% or more.

- **High efficiency and low heat generation**

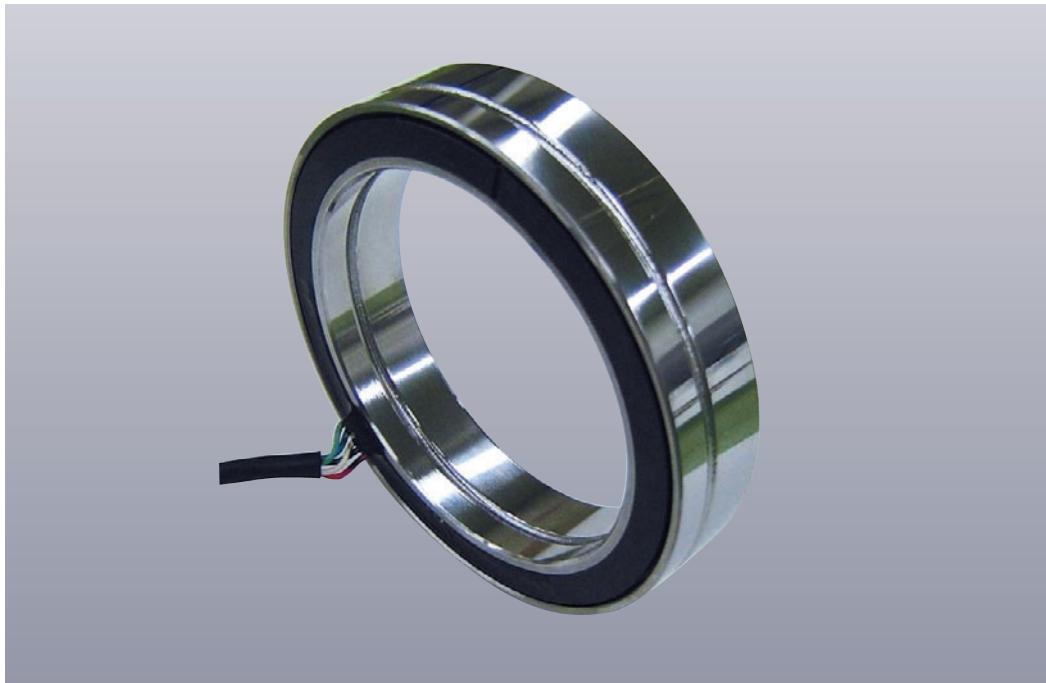
Adoption of the new E-series constant-velocity joint reduces torque loss by 30% during power conveyance. Heat generation has also been reduced by 20°C compared to the conventional type.

Structure

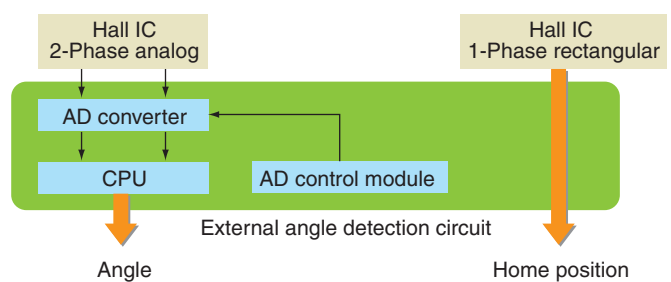
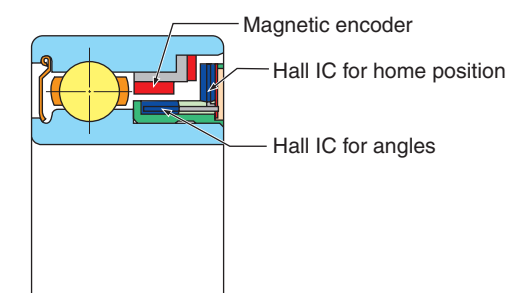


Integrated Sensor Bearing with Absolute Encoder (Hall IC type)

Integrated sensor bearing with built-in absolute type encoder (hall IC type) and high precision home position



Structure



Features

- Detects absolute angles
- Detects home position with high accuracy
- Lightweight/Compact

Applications

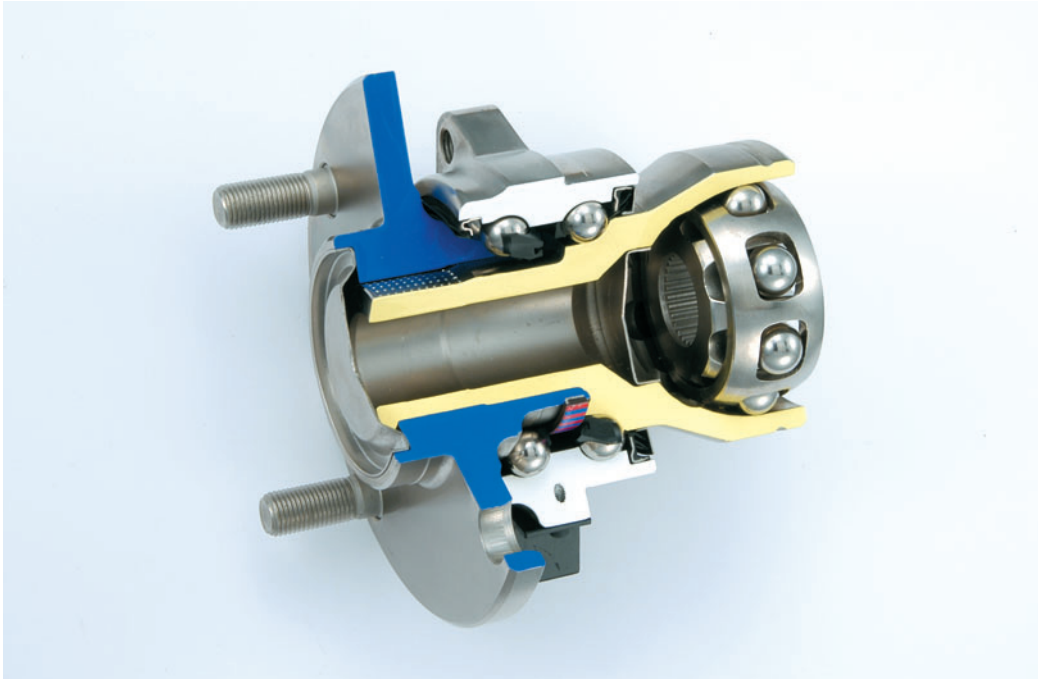
- Joints for robots
- Motors
- Locations of which absolute angles need detection

Specifications

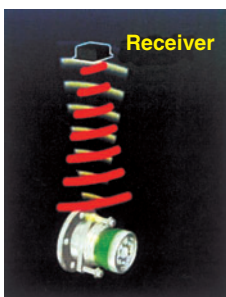
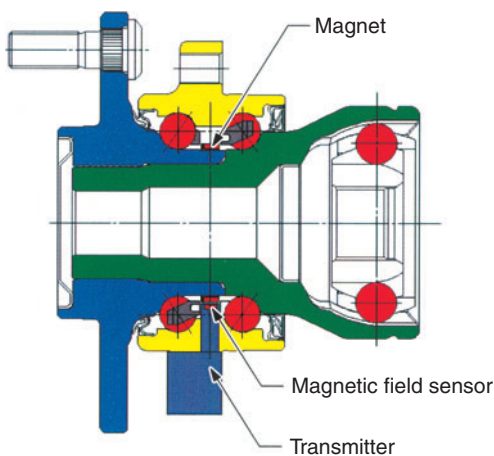
- Bearing number: #6811
- Sensor type:
Magnetic encoder + Hall sensor
- Angular accuracy: $\pm 6^\circ\text{C}$
- Home position repeatability:
0.05° or smaller
- Operating temperature range:
0~50°C

Zero-Speed Compatible Active Type Wireless ABS Sensor Unit

The wireless ABS sensor unit detects zero-speed and the direction of rotation of wheels by transmitting wireless feed to the active magnetic sensor and the sensor signal transmitter that are built in the hub bearing.



Structure



Features

- **Wireless feed**
- **Detects rotating speed of ultra low speed (zero-speed compatible)**
- **Detects direction of rotation**
Outputs rotating signals of different phases by 90° (A/B phases)
- **Lightweight/Compact**
- **Reduced assembly time**
- **Improved design flexibility**

Applications

- **Automobile axle units**

“The First Mono-Zukuri Product Creation Awards” Innovative Product Award

Fluid Dynamic Bearing Unit

Hydrodynamic pressure bearing utilizing oil-impregnated sintered alloy is unitized. “FDB Unit” realized low NRRO by radial/thrust hydrodynamic pressure effects.



Features

- **Non-contact spindle rotation due to hydrodynamic pressure effects**
High running accuracy
Extremely low noise
- **Sintered alloy bearing sleeve with press-formed dynamic grooves**
Superior manufacturability
- **Sintered alloy impregnated with lubrication oil**
Anti-seize features ensure long service life
- **Lead-free brass housing thrust bushing**
Environmentally sound design

Applications

- **HDD spindle motors**
(PC's, HDD video cameras, automotive navigation systems, etc.)
- **Spindle motors for high-density optical disks**
- **Polygon scanner motors, etc.**

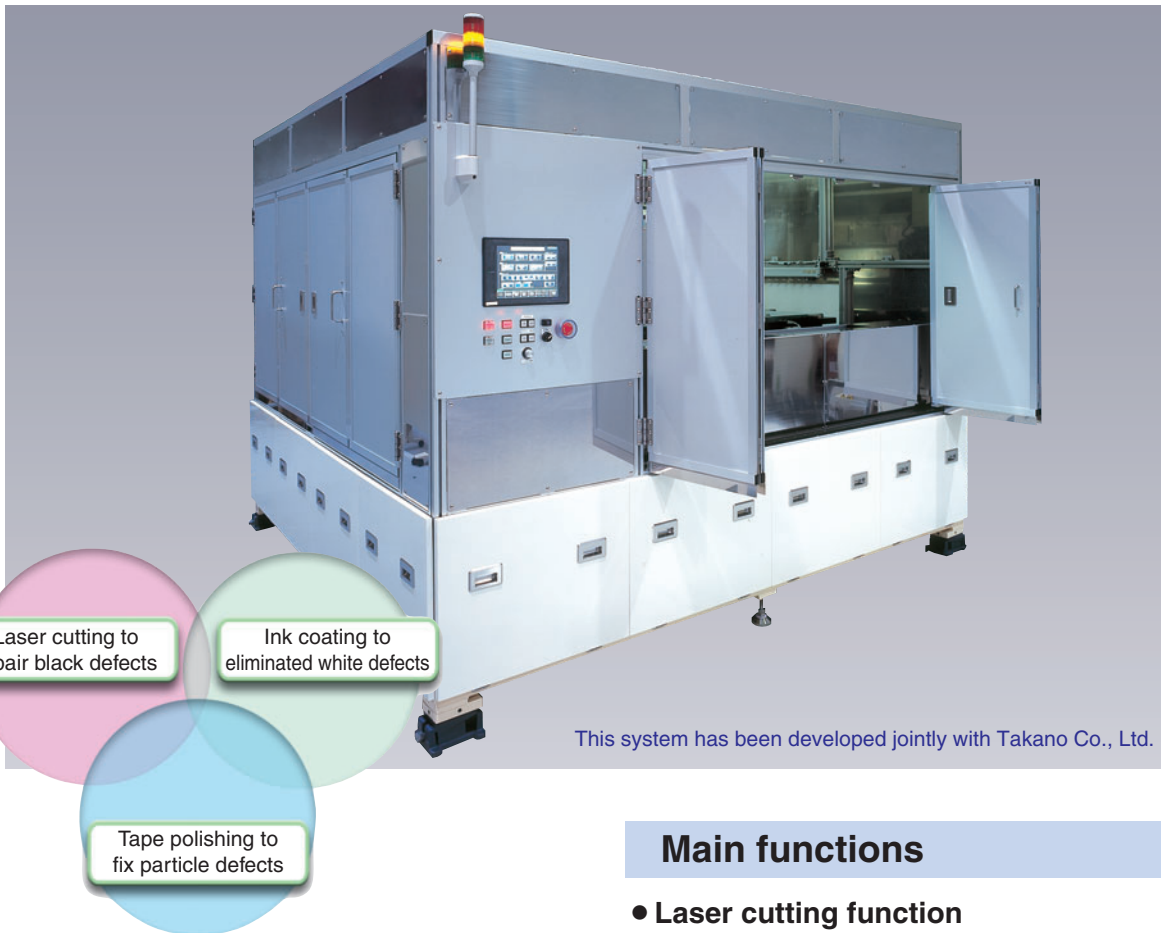
Thanks to NTN's unique product concept and the motor technology of Nippon Densan Co., NTN's "FDB Unit" won the "Innovative Product Award" at the "The First Mono-Zukuri Product Creation Awards" (sponsored by Nikkan Kogyo Shimbun, Ltd.).



Winner of ADY2004 <Display Testing Equipment Category> Grand Prix Award!

Multi-Repair System for LCD Color Filters

First in the industry, the Multi-Repair System consolidates all functions necessary to repair LCD color filters in one unit. This system dramatically improves productivity and quality in the manufacturing processes for LCD color filters.



This system has been developed jointly with Takano Co., Ltd.

Features

- Provides high quality repairs for a variety of color filter defects
- Greatly reduces equipment costs, required floor space, and overall repair time
- Can be built with an integrated inspection unit
- Can handle large glass color filter substrates up to seventh generation (1870 x 2200mm) display panels

Main functions

- **Laser cutting function**
Uses the second and third high-order YAG laser (equipped with the slit q function) to repair defects.
- **Ink coating function**
Coats ink on white defects with the coating needle (patented) (needle tip diameter: ϕ 30, ϕ 50, ϕ 70 μ m).
- **Tape polishing function**
Controls the polishing pressure while polishing particle defects to a uniform height (accuracy: \pm 0.5mm).
- **Height measurement function**
Measures particle height, using probe pressure of 1mN max., 0.1mm resolution, and measuring range of \pm 35 μ m.
- **Review function**
Uses a glass surface plate to emit reflected and transmitted light to make it possible to observe the state of defects.