Memorandum

To: Executive Committee

cc: Prof. Frank Scott

From: [redacted]

Date: 1/1/2009

Re: Global ball & roller bearing industry

Industry Snapshot

The ball and roller bearing industry is very large, but mature. It affects everything from the production of space shuttles to household appliances, automobiles, dentist drills, roller skates and computer disk drives. The issues facing the bearing industry are both numerous and complex. As a secondary steel product manufacturing industry, it is in the middle of the production chain; however, policies favoring the steel industry may not be in the best interest of the bearing industry, and vice versa. The rolling bearing manufacturing companies are capital-intensive industries who compete in a global market place.

In 2007 global establishments involved in ball and roller bearing manufacturing employed a total of more than 92,000. Because bearings are vital components of machinery the industry is stable and nearly recession proof. World ball and roller bearing production is estimated to be around $37 billion.

Background

Since the invention of the wheel, the theory of bearing movement has been understood as a powerful phenomenon. The transfer of power to a rolling element has allowed societies to develop increasingly sophisticated structures and innovative machinery. As engines became

more advanced and technology and production techniques improved, bearing manufacturing itself became a high-precision trade[i].

Ball bearings are spherical in shape, whereas roller bearings are cylindrical and may be tapered on one end or flattened to resemble needles. Generally, a ball bearing is used when speed is important; a roller bearing is used more often when load is most important.

The manufacture of antifriction bearings starts from rod or wire. In a typical production process, pieces of wire are cut off in a press, placed between dies, and pressed into the shape of a ball or roller. Large rollers are produced by machining turning processes. The fin of surplus material that forms in the pressing process is removed between rotating file discs, and the diameter of the bearings is reduced through grinding and tumbling processes. The bearings are then hardened, tempered and given a high polish by further tumbling with a polishing agent. Finally, the elements are graded according to diameter[ii].

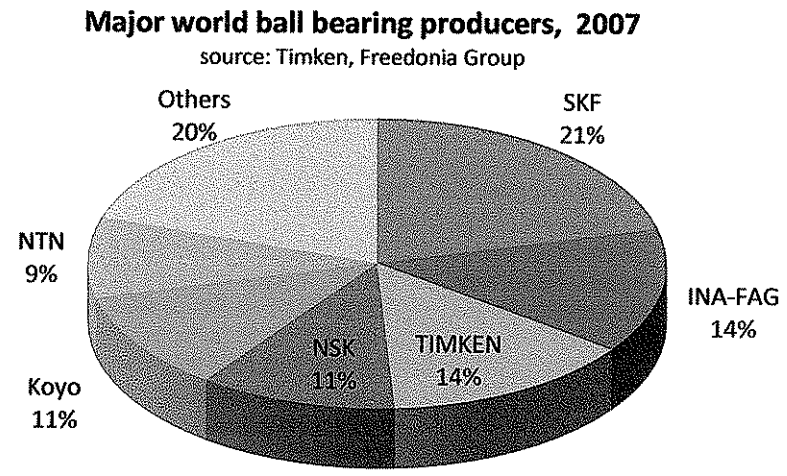
The production of ball and roller bearings is a mature industry and the basic technology for it has been in place for decades. The production entails significant economies of scales. Technological innovations in the industry in the late 1990's focused on the use of new and sometimes exotic materials, for the production of more efficient bearings, specifically designed for narrower market applications.[iii]

The primary materials consumed by the industry include alloy steel mill shapes and cold steel and iron forgings. Other material used include raw and composite ceramics, powdered metals, and copper wire, stainless steel sheets, carbon steel bars, and iron, steel and copper scrap.

The rolling bearing business

The bearing market is generally considered to be part of the power-transmission market, which includes automotive transmission systems. The bearing business is unusual because it is strictly a component manufacturing industry. The industry accommodates its markets by selling loose or packaged bearings that allow manufacturers to interchange complete bearing components, and has continued to evolve by developing new materials and lubricants and searching for alternative uses for bearings. Bearings have been found to have almost limitless applications and, since there are no close substitutes available, are expected to be in demand as long as machines are manufactured.

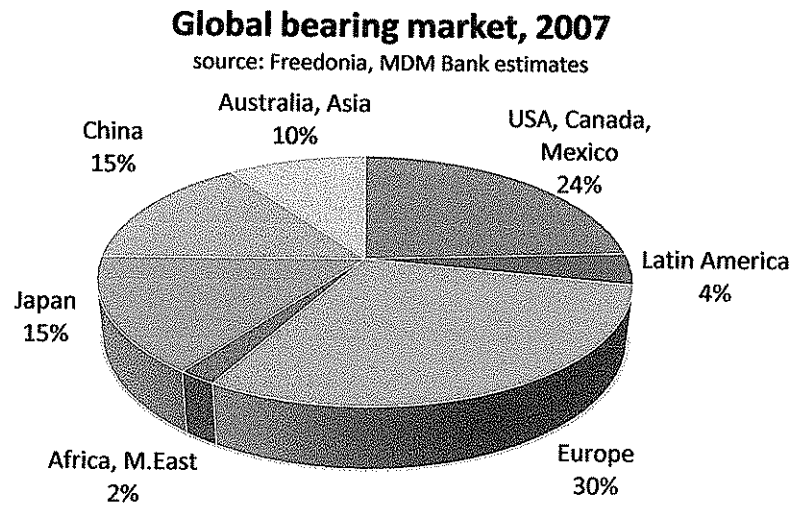
The world bearing markets are usually defined as the global sales of rolling bearings, which comprise ball and roller bearings of various designs. Globally, the production is highly concentrated: the six largest companies produce 80% of worldwide output, while the remaining 20% is produced by, literally, thousands of smaller players.



For all their value in machinery, the bearings business is highly susceptible to the threat of commoditization, in which manufacturers in low-cost economies take market share by selling cheap copies of basic products. At their most rudimentary, ball or roller bearings can be made for as little as a few tens of cents – an open invitation to dozens, if not hundreds, of

competitors. Today the key strategy for the big market players is the shift from commodity to customized production, and to service – related technologies. For example "customized" products now account for a third of SKF's sales, up from a quarter five years ago – a proportion that is likely to increase in future.

Asia now accounts for about 40% of the world market, rising from less than 30% over the last ten years. China and Japan each account for about 15%, India Thailand and the Republic of Korea are also recording high growth rates and have sizeable local bearing production. European markets make up more than 30% of the world total, while North America, including Canada and Mexico, represent less than 25%. In South America, Brazil is showing high growth rates and makes up more than 60% of the regional market.



The largest bearing producing countries are the U.S., Japan, and Germany. These three countries also represent the three largest markets for bearings in spite of growing demand in other European and Asian countries. In order to meet demand in developing countries the world's major bearing manufacturers are building facilities in these regions to take advantage of cheap labor and lower production costs.

The largest, and also the most rapidly expanding of the emerging markets, is China. It is a very fragmented market with many local manufacturers. Currently, there are nearly 2,000 bearing-manufacturing enterprises, in which there are 900 with sales revenue of 5 million RMB, ranking first worldwide in quantity. But most of them are small-sized, with low competitiveness and low risk resistance capacity. Considering the low proportion of high-precision, high-tech and high value-added products China lags far behind the industrial powers in bearing manufacturing. As a result, China has to import high-quality bearing to meet the great demand of the domestic market. In recent years, all the major international bearing companies have set up production in the country. The rush of foreign investment into the bearing industry intensifies competition.[iv] China, as well as India, in particular, is expected to see significant growth over the next few years both as a market and global supply base.[v]

If the world market for bearings is divided into customer segments such as passenger cars, trucks, the aftermarket, etc. then the Original equipment manufacturers (OEM) are accounting for 60% of the market and the rest 40% is aftermarket – maintenance / repair / operations (MRO).[vi]

Traditionally, manufacturers of motor vehicle and their parts and accessories are the largest consumer of the bearing industry output, often accounting for over 15% of the production. Thus the automotive industry buyer power is significant and gives to the automotive firms the right to negotiate purchase prices that extract profits from the bearing manufacturers. It is also significant the fact that buyers have low switching costs. The next leading sector is the industrial aftermarket accounting for up to 10% of the production, followed by railways, electrical industry and heavy industry. The ball bearing industry is a highly competitive

market and the mean operating margins are as low as of 6% for the automotive division, and 12% for the Industrial division.

Beginning in the mid-1980s and continuing through the mid-1990s, American and European bearing manufacturers were subjected to dumping[1] by foreign bearing manufacturers and various tactics designed to circumvent subsequent anti-dumping regulations[vii].

The industry operates in many business and geographical segments that are at different stages of the economic cycle. A general economic downturn at global level, or in one of the world's leading economies, could reduce the demand for bearings for a period of time. In addition, disturbances in worldwide financial markets could have a negative effect on the demand.

Industry Leaders

SKF is the world's largest bearing maker, followed by NSK Ltd, NTN Corp. and Koyo Seiko in Japan[viii]; Germany's Schaeffler Group, with its INA and FAG brands is the second largest in Europe while other European majors are Timken (which is industry leader in the US) and France's SNR.

Sweden-based **Aktiebolegat SKF** (also known as SKF), which was incorporated in 1907 entered the market motivated by its frustration with the poor quality and high cost of other bearings. Subsequently, the founder of SKF, Sven Wingquist, went to develop the double row, self-aligning ball bearing that introduced SKF as a leader and innovator of the industry. From the onset, SKF aligned itself with the automotive industry and pushed its operations into France and the UK to compete directly with German manufacturers. In 1988, SKF

[1] Dumping is a strategy that involves selling products in foreign countries at prices lower than the cost of manufacture in the parent country. The strategy is designed to allow a manufacturer to gain market share in a foreign country by providing a product at a price that is too low for competitors to match. Eventually competitors will be forced out of business, and the foreign competitor can dictate much higher prices because the competition has died

controlled 20% of the world market in bearings, which was more than twice the market share held by its closest competitors. In 2007 sales were $4.8 billion, and the company employed 41,645 people. Geographically, sales break down as follows: Sweden 4%; rest or Europe 50%; North America 20%; Asia-Pacific region 18%; and Latin America, the Middle East and Africa 8%. The company has operations in more than 140 countries, including 110 manufacturing facilities in around two dozen countries. The SKF business is organized into three divisions; Industrial, Automotive and Service. Each division serves a global market, focusing on its specific customer segments.[ix]

The **FAG** brand started with an ingenious idea. In 1883, Friedrich Fischer designed a ball grinding machine in Schweinfurt, Germany that, for the first time, made it possible to produce absolutely round steel balls by grinding. This invention is regarded as the foundation for the entire rolling bearing industry[x].

In 1946 brothers Wilhem and Georg Schaeffler, found **INA** in Herzogenaurach, Germany. The needle roller cage, developed by Georg Schaeffler, makes the needle roller bearing a reliable component for industrial applications. Since 2001, FAG has been part of the Schaeffler Group and has been active in all of the group's divisions – Aerospace, Automotive and Industrial. Together with INA's complementary product range, FAG has one of the widest product portfolios in the rolling bearing industry. INA and FAG become the world's second largest rolling bearing manufacturer. In 2003 INA, FAG and LuK form the "**Schaeffler Group**". [xi] The Schaeffler Group is managed as an integrated unit across company and national boundaries. Cross - company functions and standardized processes ensure consistent and rapid decisions. Sales subsidiaries and companies in all markets guarantee customer proximity. In 2007, approximately 66,000 employees at more than 180 locations worldwide generated turnover of 8.9 billion Euros, 60% of which were generated

in the automotive division. The Schaeffler Group is one of the largest privately-owned industrial companies in Germany.[xii]

FAG ball and roller bearings are manufactured as standard and special bearings in many designs and sizes with diameters ranging from 3 millimeters to 4.25 meters. Together with INA, FAG offers customers comprehensive support and services for the diagnosis, maintenance and mounting of rolling bearings and complete systems.[xiii]

NSK Ltd., of Tokyo Japan, is another world leader in the bearing market. Bearings used by the automotive, information technology, and electronics industry accounted for about 60% of the company's sales. The NSK group of companies includes about 50 subsidiaries in countries worldwide and employed 25,069 people as of March 2008. That year, total sales for the company were more than $7.7 billion (one year growth 7.6%). NSK inaugurated its business in 1916. Since the 1960's, NSK Ltd. has been aggressively developing its overseas markets. At present has 70 overseas sales operations in 24 countries and operates 12 international manufacturing locations in 37 overseas countries.[xiv]

Already a leader in the industry, **Timken** became the undisputed heavyweight of U.S. ball bearings with the 2002 acquisition of industry leading "The Torrington Co"[xv]. Timken founded in St. Louis in 1899 by Henry Timken after receiving patents for a tapered roller bearing, the company offered 26,000 different bearing combinations. Promoting itself as the world's largest tapered roller bearing producer, Timken attributes part of this success to international trade. Generally about 20% of Timken's sales come from the export market and bearings represent about 2/3 of Timken's total sales. In 2007 Timken had sales of more than $5.2 billion (one year growth 5.3%), has operations in 26 countries and employs nearly 25,000[xvi].

In late 1999, Timken announced a reorganization focusing on four basic industries rather than geographic areas. This reorganization is designed to cut across geographic boundaries. The new business lines are automotive, industrial, aerospace, and rail[xvii].

Current Conditions

There are some uncertainties in the positive bearing market. Falling prices countered steady sales since the late 1990s. The cost of raw materials, consumables, and wages is rising and there is a downright reorganization of the bearing industry. The industry was always extremely competitive, and it will get worse. Bearing manufacturers cannot easily expand their own output without stealing from competitors. This often elicits a competitive response that tends to intensify competition. Besides the industry has strong exit barriers and that prolong price wars, as firms struggle to survive instead of exiting. Consolidation via mergers and acquisitions was and remains an important trend in the bearings industry.

Until a few months ago industry reports were given expectations on bearing demand to grow by an average of 2% per year in the U.S.; 5.6% per year in Western Europe; 6.8% per year in Asia/Pacific region; and 9.9% per year in Canada and Mexico. According to Freedonia Group, Inc. market research "Global bearings demand will rise yearly through 2012 to $66 billion based on higher manufacturing production and rising aerospace and motor vehicle output. Market advances in the developing world will significantly outpace demand in the US, Europe and Japan. China will register the largest gains, with growth in India, Thailand and Brazil also strong."[xviii]

However due to the current economic recession we are facing decreased demand which directly influences the bearing industry.[xix] Right now capacity utilization is at 90% and falling. The US economic slowdown is expected to continue throughout the next fiscal thus

resulting in a reduced demand for the automotive and industrial manufacturers (and OEM bearing application sales, currently account for 4/5 of all demand). Hopefully, demand in high growth economies of Asia is expected to increase further.

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[i] "Bearing Industry Timeline" from the American Bearing Manufacturers Association (see Appendix A1)

[ii] Bearing (mechanical) , from Wikipedia, the free encyclopedia (see Appendix A2)

and

"The Manufacturing of a Ball Bearing", from the American Bearing Manufacturers Association (see Appendix A3)

[iii] "Beyond Bearings" by Bill Visnic, Ward's Auto World Aug 2007 pg.26 (see Appendix A4)

[iv] "In-depth Analysis of China's Bearing Industry 2008" - M2 Presswire, Aug. 7, 2008 (see Appendix A5)

[v] Industry Insight – Indian Bearings Feb. 2007 (see Appendix A6)

[vi] SKF Annual Report 1995 (see Appendix A7)

[vii] US Posts Antidumping Margins on ball bearings – The eBearing News Nov. 22,2007 ,
and
India issues final Dumping Ruling on ball bearings – The eBearing News Oct. 8,2004 ,
and
Notice concerning anti-dumping measures on imports of ball bearings originating in Japan – Official Journal of the European Communities 3.6.1998 (see Appendix A 8)

[viii] Market Share- Top five bearing makers in Japan (see Appendix A9)

[ix] SKF Annual Report 2007 (see Appendix A10)

[x] FAG Company history from the FAG official web site (see Appendix A11)

[xi] "Rolling Bearings and their contribution to the Progress of technology" ©1986 FAG Kugelfischer Georg Schaefer KGaA (see Appendix A12)

[xii] "Partners for Success: Schaeffler Group Presents 2006/2007 Suppliers of the Year Awards" by News Blaze October 10, 2008 (see Appendix A13)

[xiii] FAG Kugelfischer Georg Schaefer KGaA General Catalogue 41510GR

[xiv] NSK corporate Profile, from the company's official web site (see appendix A14)

[xv] "Timken Expand Market Share By Acquiring a Bearings Unit", by Andrew Ross Sorkin Published October 17, 2002 (see appendix A15)

[xvi] "Timken Reports Record Third-Quarter Earnings" - News Release , Canton, Ohio – Oct. 24,2008 (see Appendix A16)

[xvii] "Eye on the Ball" by Jennifer Pellet; CEO Magazine April/May 2008, pg 17

and

"Timken Co. is Reorganizing its Business", American Metal Market, 22 Nov. 1999 (see Appendix A17)

[xviii] The Freedonia Group 2006 US Bearing Industry Study , and
Freedonia Market Research Analyzes Global Bearings Industry , TransWorldNews, Cleveland 8/25/2008 –(see Appendix A18)

[xix] SKF Nine-month report 2008 – Press release (see Appendix A19)

excellent. very professionally done. good economic analysis. I saved yours for last because I knew it would be interesting to read. I was not disappointed!

A

APPENDICES

American Bearing Manufacturers Association ABMA

Search

Bearing Industry Timeline

2600 BC – The Ancient Egyptians use a form of roller bearings to help move massive bricks during construction of the Pyramids.

40 BC - Early example of a wooden ball bearing supporting a rotating table, was retrieved from the remains of a Roman ship in Lake Nemi, Italy.

1500 AD – Leonardo Da Vinci described a type of ball bearing.

1600 – Galileo describes caged ball bearing to prevent friction.

1794 – First patent for ball race by Phillip Vaughn of Carmarthen.

1866 – The Torrington Company (under the name Excelsior Needle Company) signs Article of Association to manufacture sewing machines needles and the machinery to produce the same

1880 – Rockwell Automation (under the name DODGE Manufacturing Company) incorporates, two years after Wallace H. Dodge began the manufacture of wood hardware specialties.

1883 – FAG begins grinding balls of equal size and roundness forming the creation of an independent bearing industry.

1898 – First patent issued for Timken Tapered roller bearings.

1907 – Sven Wingquist of SKF invents the modern self-aligning ball bearing

1912 – FAG originates single-row, barrel type, and spherical roller bearings

1913 - Hoover Steel Ball Company is founded by Leander J. Hoover in Ann Arbor, MI.

1916 - NSK inaugurated its business in 1916 and produced the first ball bearings made in Japan.

1917 – U.S. Bearing Manufacturers create an informal group to aid bearing manufacturing for World War I which led to the founding of ABMA.

1927 NTN Mfg. Co., Ltd. established with capital of 50,000 yen.

1928 – Fujikoshi Steel Industry Co, Ltd., (Nachi) was founded in Toyama City, Japan to manufacture cutting and machine tools.

1933 – Article of Incorporation ratified by United States bearing manufacturers to create AFBMA (Anti Friction Bearing Manufacturers Association.

1934 – AFBMA is incorporated as an organization in the state of New York.

1960 – Elasto-hydro-dynamic theory explains the mechanism of why bearings and gears work led to advances in grindings precision and ultrasonic equipment.

1969 –Three astronauts in a North American Rockwell "Apollo" spacecraft are launched by North American Rockwell rocket engines toward the moon.

1970 – Intel invents the microprocessor and consistent precision control of machine tools impacting both size and life of bearings.

1980's – Torrington bearings are used in the Space Shuttle and robot arm to launch and retrieve satellites in orbit.

1992 – ABMA celebrates its 75th anniversary.

1993 –ABMA officially changes its name from the AFBMA (Anti-Friction Bearing Manufacturers Association).

1993 – Leading Bearing Manufacturers from throughout the World meet for the first time in Key Largo, Florida.

2001 – The Schaeffler Group (INA) acquires FAG.

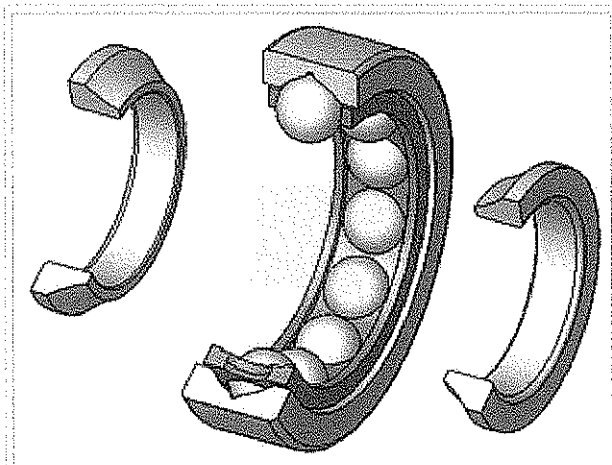
2002 – Timken Company acquires Torrington Company impacting the global bearing market with a variety of bearing products including tapered roller bearings, needle roller bearings and alloy steels.

2006 – ABMA partners with the American Gear Manufacturers Association (AGMA) for Joint Meeting in Tucson, AZ.

Bearing (mechanical)

From Wikipedia, the free encyclopedia

A **bearing** is a device to permit constrained relative motion between two parts, typically rotation or linear movement. Bearings may be classified broadly according to the motions they allow and according to their principle of operation as well as by the directions of applied loads they can handle.



An example of a four-point contact ball bearing

Contents

Bearing friction

Low friction bearings are often important for efficiency, to reduce wear and to facilitate high speeds. Essentially, a bearing can reduce friction by virtue of its shape, by its material, or by introducing and containing a fluid between surfaces.

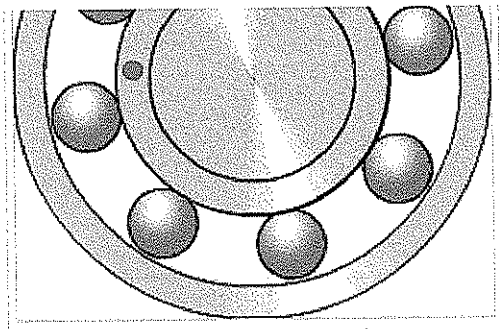
- **By shape**, gains advantage usually by using spheres or rollers.
- **By material**, exploits the nature of the bearing material used. (An example would be using plastics that have low surface friction.)
- **By fluid**, exploits the low viscosity of a layer of fluid, such as a lubricant or as a pressurized medium to keep the two solid parts from touching.
- **By fields**, exploits electromagnetic fields, such as magnetic fields, to keep solid parts from touching.

Combinations of these can even be employed within the same bearing. An example of this is where the cage is made of plastic, and it separates the rollers/balls, which reduce friction by their shape and finish.

Principles of operation

There are at least six common principles of operation:

- sliding bearings, usually called "bushes", "bushings", "journal bearings", "sleeve bearings", "rifle bearings", or "plain bearings"
- rolling-element bearings such as ball bearings and roller bearings
- jewel bearings, in which the load is carried by rolling the axle slightly off-center
- fluid bearings, in which the load is carried by a gas or liquid
- magnetic bearings, in which the load is carried by a magnetic field
- flexure bearings, in which the motion is supported by a load element which bends.



Animation of ball bearing

Motions

Common motions permitted by bearings are:

- Axial rotation e.g. shaft rotation
- Linear motion e.g. drawer
- spherical rotation e.g. ball and socket joint
- hinge motion e.g. door

Loads

Bearings vary greatly over the size and directions of forces that they can support.

Forces can be predominately radial, axial (thrust bearings) or moments perpendicular to the main axis.

Speeds

Bearings vary typically involving some degree of relative movement between surfaces, and different types have limits as to the maximum relative surface speeds they can handle, and this can be specified as a speed in ft/s or m/s.

For rotational bearings generally performance is defined in terms of the product 'DN' where D is the diameter (often in mm) of the bearing and N is the rotation rate in revolutions per minute.

Generally in terms of relative speed of the moving parts there is considerable overlap between capabilities, but plain bearings can generally handle the lowest speeds while rolling element bearings are faster, followed by fluid bearings and finally magnetic bearings which are limited ultimately by centripetal force overcoming material strength.

Life

Fluid and magnetic bearings can potentially give indefinite life.

Rolling element bearing life is statistical, but is determined by load, temperature, maintenance, vibration,

lubrication and other factors.

For plain bearings some materials give much longer life than others. Some of the John Harrison clocks still operate after hundreds of years because of the lignum vitae wood employed in their construction, whereas his metal clocks are seldom run due to potential wear.

Maintenance

Tapered steering head bearings for a motorcycle

Many bearings require periodic maintenance to prevent premature failure, although some bearings, such as fluid or magnetic bearings may require little maintenance.

Most bearings in high cycle operations need periodic lubrication and cleaning, and some require periodic adjustment to minimise the effects of wear.

History and development

An early type of linear bearing was an arrangement of tree trunks laid down under sleds. This technology may date as far back as the construction of the Pyramids of Giza, though there is no definitive evidence. Modern linear bearings use a similar principle, sometimes with balls in place of rollers.

The first plain and rolling-element bearings were wood, but ceramic, sapphire or glass can be used, and steel, bronze, other metals, and plastic (e.g., nylon, polyoxymethylene, teflon, and UHMWPE) are all common today. Indeed, stone was even used in various forms. Think of the "jeweled pocket watch", which incorporated stones to reduce frictional loads, and allow a smoother running watch. Of course, with older, mechanical timepieces, the smoother the operating properties, then the higher the accuracy and value. Wooden bearings can still be seen today in old water mills where the water has implications for cooling and lubrication.

Rotary bearings are required for many applications, from heavy-duty use in vehicle axles and machine shafts, to precision clock parts. The simplest rotary bearing is the **sleeve bearing**, which is just a cylinder inserted between the wheel and its axle. This was followed by the **roller bearing**, in which the sleeve was replaced by a number of cylindrical rollers. Each roller behaves as an individual wheel. The first practical caged-roller bearing was invented in the mid-1740s by horologist John Harrison for his H3 marine timekeeper. This used the bearing for a very limited oscillating motion but Harrison also used a similar bearing in a truly rotary application in a contemporaneous regulator clock.

An early example of a wooden ball bearing (see rolling-element bearing), supporting a rotating table, was retrieved from the remains of the Roman Nemi ships in Lake Nemi, Italy. The wrecks were dated to 40 AD. Leonardo da Vinci is said to have described a type of ball bearing around the year 1500. One of the issues with ball bearings is that they can rub against each other, causing additional friction, but this can be prevented by enclosing the balls in a cage. The captured, or caged, ball bearing was originally described by Galileo in the 1600s. The mounting of bearings into a set was not accomplished for many years after that. The first patent for a ball race was by Philip Vaughan of Carmarthen in 1794.

Friedrich Fischer's idea from the year 1883 for milling and grinding balls of equal size and exact roundness by means of a suitable production machine formed the foundation for creation of an independent bearing industry.

A patent, reportedly the first, was awarded to Jules Suriray, a Parisian bicycle mechanic, on 3rd August 1869.[1] The bearings were then fitted to the winning bicycle ridden by James Moore in the world's first bicycle road race, Paris-Rouen, in November 1869.[2]

Early Timken tapered roller bearing, with notched rollers

The modern, self-aligning design of ball bearing is attributed to Sven Wingquist of the SKF ball-bearing manufacturer in 1907.

Henry Timken, a 19th century visionary and innovator in carriage manufacturing, patented the tapered roller bearing, in 1898. The following year, he formed a company to produce his innovation. Through a century, the company grew to make bearings of all types, specialty steel and an array of related products and services.

Erich Franke invented and patented the wire race bearing in 1934. His focus was on a bearing design with a cross section as small as possible and which could be integrated into the enclosing design. After World War II he founded together with Gerhard Heydrich the company Franke & Heydrich KG (today Franke GmbH) to push the development and production of wire race bearings.

The Timken Company (Sale $4,973.4M, 2006), The SKF company($6,195.1M, 2005), the Schaeffler Group (Private), the NSK company($5,344.5M, 2006), and the NTN Bearing company($3,697.8M, 2006) are now the largest bearing manufacturers in the world.

Types

There are many number of different types of bearings.

Type	Description	Stiffness†	Speed	Life	Notes
Plain bearing	Rubbing surfaces, usually with lubricant	Good, provided wear is low, but some slack is normally present	Low to moderate (often requires cooling)	Moderate (depends on lubrication)	The simplest type of bearing, widely used, relatively high friction, although some use pumped lubrication and then similar to fluid bearings
Rolling element bearing	Ball or rollers are used to prevent or minimise rubbing	Good, but some slack is usually present	Moderate to high (often requires cooling)	Moderate (depends on lubrication, often requires maintenance)	Used for higher loads than plain bearings with lower friction
Jewel bearing	Off-center bearing rolls in seating	Low due to flexing	Low	Adequate (requires maintenance)	Mainly used in low-load, high precision work such as clocks

Fluid bearing	Fluid is forced between two faces and held in by edge seal	Very high	Very high (speed usually limited by seals)	Virtually infinite in some applications, may wear at startup/shutdown in some cases	Can fail quickly due to grit or dust or other contaminants. Maintenance free in continuous use.
Magnetic bearings	Faces of bearing are kept separate by magnets (electromagnets or eddy currents)	Low	Infinite	Indefinite	Often needs considerable power. Maintenance free.
Flexure bearing	Material flexes to give and constrain movement	Low	Very high	Very high or low depending on materials and strain in application	Limited range of movement, no backlash, extremely smooth motion

†Stiffness is the amount that the gap varies when the load on the bearing changes, it is distinct from the friction of the bearing.

See also

- Ball bearing
- Ball spline
- Bushing
- Combined bearing
- Fluid bearing
- Spherical bearing
- Hertz contact stress
- Hinge
- Journal bearing
- Main bearing
- Needle roller bearing
- Pillow block bearing
- Rolamite
- Rolling-element bearing

References

1. ^ French Wiki - 1869 in science (http://fr.wikipedia.org/wiki/1869_en_science)
2. ^ Bicycle History, Chronology of the Growth of Bicycling and the Development of Bicycle Technology by David Mozer (http://www.ibike.org/library/history-timeline.htm)

External links

- How Bearings Work (http://science.howstuffworks.com/bearing.htm) - Animations and functioning
- How Bearings Work - (http://www.mechanismen.be/mechanismen/lagers/losse-vaste-passing/lagers-losse-vaste-passing-01.htm) - Animations on www.mechanismen.be
- Early Bearing Failure Detection (http://www.reliableplant.com/article.asp?articleid=260) - Case study
- How to measure a bearing (http://www.bearing-king.co.uk/how-to-measure-a-bearing.php) - Practical information on how to measure a bearing

The Manufacturing of A Ball Bearing

Ball bearings are at the heart of almost every product with a rotating shaft.

Most bearing specifications and manufacturing tolerances are quantified in one-ten thousandths of an inch (1/10,000) by ABMA; every manufacturing process is 100% checked and feedback provided to ensure the integrity of the process and product.

Note: A ***micron*** (an abbreviation for ***micrometers***) is one-millionth of a meter, or, 25,400 microns equals one (1) inch.

Repeatability in the Manufacturing Process

Predictable uniformity, or repeatability, in the manufacturing process is crucial to ensuring consistent bearing performance. If variations occur in the manufacturing process from part to part, the production line may make bearings that fall within the complete spectrum of the allowable tolerance standards. That inconsistency-- producing parts that go from one end of the range to the other--can lead in turn to variations in the performance of each bearing, either individually or from lot to lot. The narrower the variation in each step of the manufacturing process, the greater the consistency of each bearing's performance.

Inner/Outer Ring Manufacturing Process

Manufacturing Flow Chart

Forged Rings (De-scaled) as Raw Material.
(SAE 52100 steel)

Turning Operation

↓

Center Less Grinding

↓

Heat Treatment

↓

Hardness testing

↓

Rough Grinding

↓

Finish Grinding

↓

Honing & Super Finishing

↓

Washing

↓

Application of rust preventive

↓

Ready for dispatch to assembly

Ball Bearing Materials

Ball bearings are generally made of high carbon steels, such as *AISI 52100 (fifty-two, one hundred)*. One of the factors that determine the life of the bearing steel (thus the bearing itself) is the purity or cleanliness of the steel. The 52100 steel are subjected to a rigorous purification process with stringent controls in order to meet the ever-increasing standards for cleanliness—eliminating nonmetallic inclusions or impurities. These impurities are removed through various processes such as *vacuum degassing* and *consumable-electrode vacuum melting (CEVM),* to name just two of the processes referred to when discussing the merits and cleanliness of bearing steel.

The hardening of the steel is achieved by a *heat treating* process in which the steel microstructure is manipulated by cycles of heating and quick cooling to obtain the optimum hardness range for the steel—usually on the order of 60 to 64 on the *Rockwell C Hardness* scale. Penetration hardness tests (such as Rockwell or Brinell) provide the means to estimate the actual hardness of metals.

Raw Material for bearings Races:

For Outer and inners the suggested raw material is SAE 52100 conforming to following chemical compositions:

Element	**C**	**Si**	**Mn**	**S**	**P**	**Cr.**
Minimum	.98	.15	.25	--	--	1.30
Maximum	1.10	.35	.45	0.025	0.025	1.60

Oxygen content; Not More than 15 ppm

Micro Inclusions

Inclusion type	**Series**	
	Thin	**Thick**
(A) Sulphides	2.5	1.5
(B) Alumina	2.0	1.0
(C) Silicate	0.5	0.5
(D) Globular Oxide	1.0	1.0

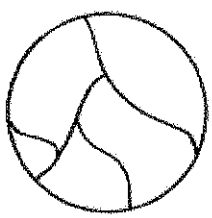
TURNING SECTION

Both the inner and outer rings are usually machined from the outer and Inner races are manufactured from SAE 52100 steel, the raw material used in the section has been considered as forged rings.

The turning operations are divided into various lathe operations, viz. O.D., face, track and Bore. All these operations are done on production lathe machines. These lathe machines offered in the project are production machines wherein individual job/ process sequence has to be set before every new batch is taken up.

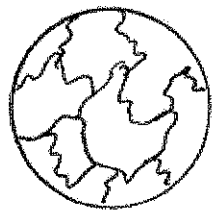
HEAT TREATMENT

Hardness is a function of and brittle structure. When slowly quenched it would form Austenite and Pearlite which is a partly hard and partly soft structure. When the cooling rate is the Carbon content of the steel. Hardening of steel requires a change in structure from the body-centered cubic structure found at room temperature to the face-centered cubic structure found in the Austenitic region. The steel is heated to Austenitic region. When suddenly quenched, the Martensite is formed. This is a very strong extremely slow then it would be mostly Pearlite, which is extremely soft.



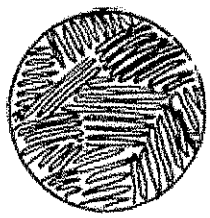
AUSTENITE

MARTENSITE



CEMENTITE

PEARLITE
COARSE



PEARLITE
FINE

Harden ability, which is a measure of the depth of full hardness achieved, is related to the type and amount of alloying elements. Different alloys, which have the same amount of Carbon content, will achieve the same amount of maximum hardness; however, the depth of full hardness will vary with the

different alloys. The reason to alloy steels is not to increase their strength, but increase their harden ability — the ease with which full hardness can be achieved throughout the material.

Usually when hot steel is quenched, most of the cooling happens at the surface, as does the hardening. This propagates into the depth of the material. Alloying helps in the hardening and by determining the right alloys one can achieve the desired properties for the particular application.

Such alloying also helps in reducing the need for a rapid quench cooling — thereby eliminate distortions and potential cracking. In addition, thick sections can be hardened fully.

Quench Media

Quenching is the act of rapidly cooling the hot steel to harden the steel.

Oil:
Oil is used when a slower cooling rate is desired. Since oil has a very high boiling point, the transition from start of Martensite formation to the finish is slow and this reduces the likelihood of cracking. Oil quenching results in fumes, spills, and sometimes a fire hazard.

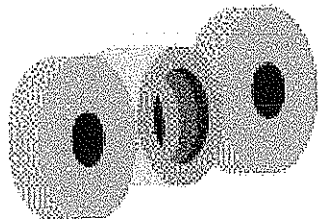
Quenches are usually done to room temperature. Most medium carbon steels and low alloy steels undergo transformation to 100% Martensite at room temperature. However, high carbon and high alloy steels have retained Austenite at room temperature. To eliminate retained Austenite, the quench temperature has to be lowered. This is the reason to use cryogenic quenching.

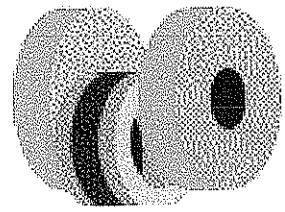
NITROGEN METHANOL SYSTEM

The above system comprise of Methanol Tank 200 liters SS 2.5 mm corrugated, Methanol Flow Meter 0.50 to 5.2 per hour, Solenoid Valve, Needle Valves, all interconnected by copper piping duly mounted on a stand with Nitrogen Pressure Regulator and Flow meter to read 2 to 5 m3/hr.

GRINDING SECTION

Track Grinding
Finish Grinding





Grinding the Outer Diameter of the Ring Faces

The next stage is grinding, in order to give the rings the right form and dimensions. The first operation on inner and outer rings is face grinding. Both faces are ground simultaneously to give the final width.

Then the outside diameter of the inner rings is ground to the final dimension in centreless grinding machines.

The final machining operations are carried out on parallel lines of grinding and finishing machines - one for inner and one for outer rings. Inner rings have the bores and raceways ground, while outer rings have only the raceways ground. This is carried out with form dressed grinding wheels using plunge-grinding techniques.

After honing, the rings are thoroughly washed with a water-based cleaning medium so that they are perfectly clean before assembly.

In-process measurement is common to all grinding machines. Automatic process control, by means of post-processors, and random checks in specially equipped measuring rooms are also used for additional monitoring of quality.

1. Rough O.D. grinding on centre less
2. Face grinding on Rotary table/duplex
3. Bore grinding
4. External track grinding
5. Internal track grinding
6. Finish O.D. grinding

Manufacturing Process

Flow Chart

Input Wire Rod as Raw Material.
(SAE 52100 Steel)

↓

Shearing & Heading operation
On Ball Header Machine

↓

Deburring on Vibro Benz Machine

↓

Flushing of excess material after the
Ball forged in cold header

↓

Heat treatment of ball

↓

Grinding of ball in rotary
Grinding machine (Flashing m/c)

↓

Lapping in Ball Lapping machine

↓

Inspection for checking
Hairline cracks

↓

Lapping of balls in
Tumbling barrel

↓

Magnetic Crack Testing

↓

Washing

↓

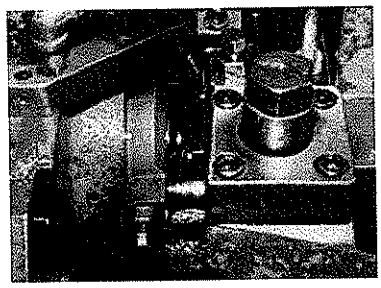
Application of rust preventive

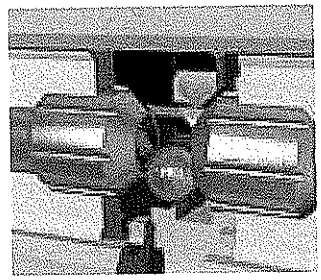
↓

Packing

The raw material used in the manufacture of balls is a specially formulated grade of steel wire.
The raw material is supplied from either wire or rod. It is then cut to length and the width is a small percentage larger than the width of the finished ball.

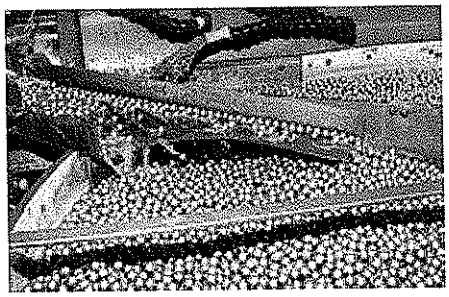
The wire or rod is then fed through a header. This cold forged process produces "slugs" at an incredibly high speed.
Wire is fed from decoilers into cold heading machines where it is cut into blanks, and then pressed into balls between hemispherical dies.

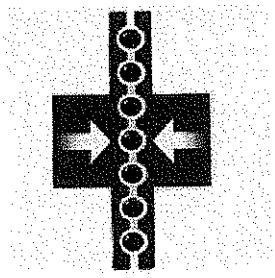




Heat Treating Balls

Ball Flashing Operation

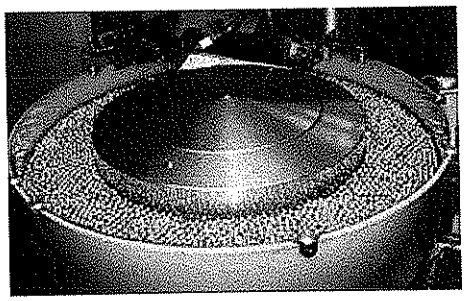




The flash around the balls produced during pressing is removed by filing plates in deburring machines.

These rough shaped balls have a ring around the middle. The next process is to remove this ring.

The balls are then machined in rill-filing machines, equipped with one fixed and one rotating cast iron rill-plate. Concentric grooves in the plates ensure that the whole ball surface is machined to the same extent and thus a spherical form is achieved.



Final inspection for size, form and surface finish is carried out on a sample basis by means of microscopes and other precision equipment. The balls are then cleaned and packed ready for bearing assembly operations.

The tiniest deviation in the roundness of bearing elements can have an impact on bearing quality. Periodic form deviations in the range of 1 angstrom 10^{-10} m may influence bearing quality.

CAGE MANUFACTURING

Flow chart

Raw material
(Narrow width CR sheet)

↓

Blanking &
Punching

↓

Forming (Pocketing)

↓

Inspection and batch checking

↓

Shot Blasting/ Virbro

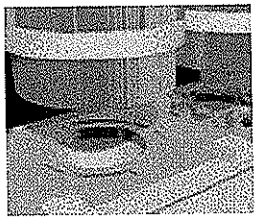
↓

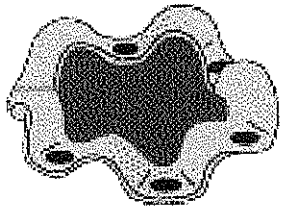
Assembly in Assy. shop

The cages for various bearings sizes are manufactured from Cold Rolled narrow width sheets IS 4397 cold rolled, cold annealed sheets, and The CR sheet is converted in the cage in Press machines in successive press operations:

Blanking, Punching, forming (pocketing) rivet holes and visual inspection is carried for any deformity.

Cages are manufactured from cold rolled steel strip. Presses with progressive or, alternatively, transfer tools are used to produce cages halves from the strip. The operational sequence consists of piercing and blanking, forming the ball pockets and piercing the rivet holes. After surface treatment and cleaning, the cage halves are coated with preservative and packed for transport to the assembly plant.





Rivet manufacturing

Flow Chart

Raw material
(Wire EN 8)

↓

Heading in Ball Header

↓

Deburring in vibro benz machine

↓

Rust Preventive Oiling

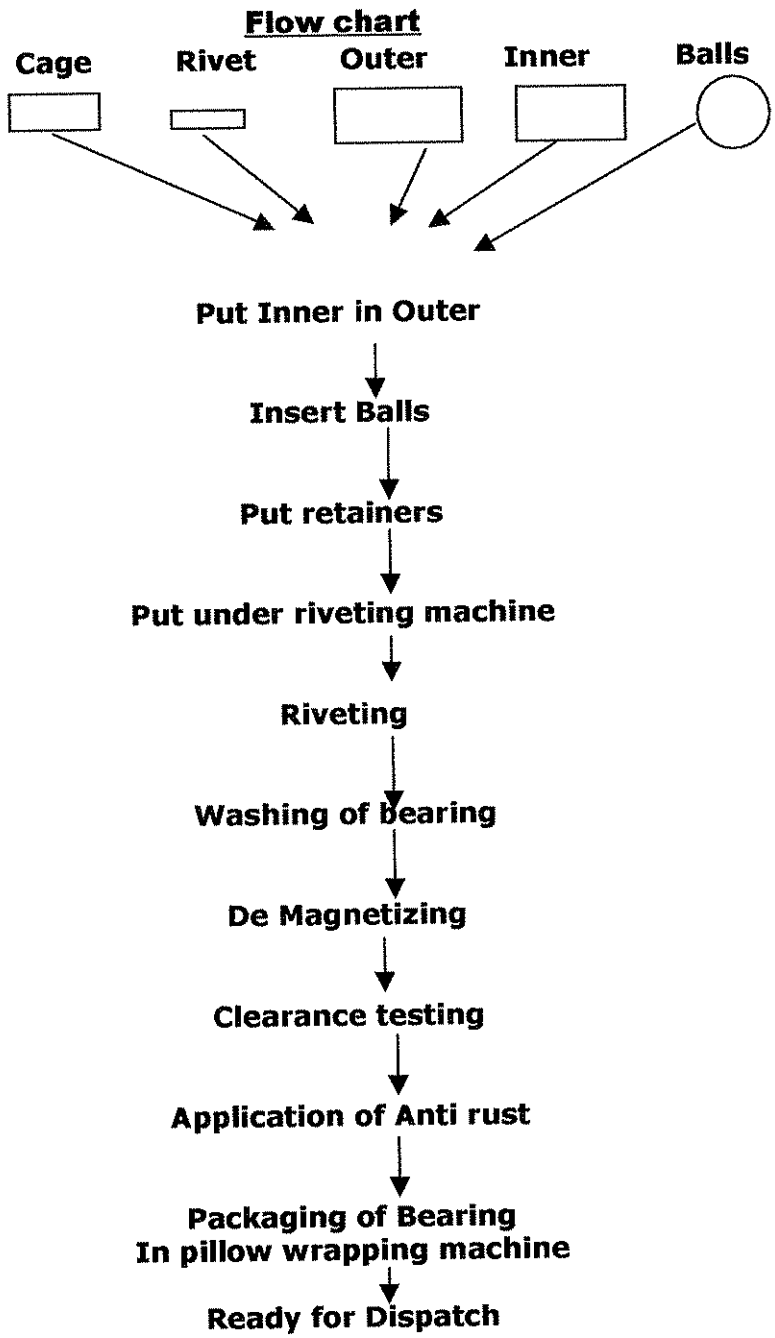
↓

Ready for Assembly

The rivets are manufactured from wire rods, the wires is cut in required size in rivet header machines, then in the vibro machines it is super finished. There is no grinding operation involved.

Raw Material EN 8 or EN9 Round Bars dia/3 mm to 6 mm

Assembly Section

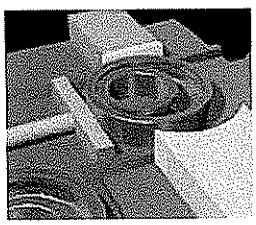


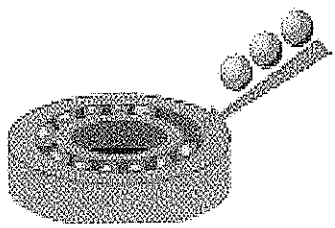
Finally the rings, balls and cage - which have been manufactured in different locations - come together for automatic assembly.

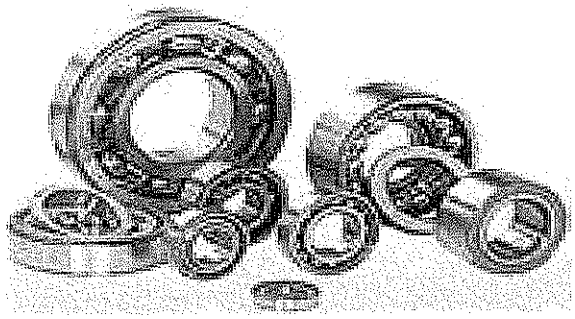
Raceway diameters of inner and outer rings are measured separately. By selecting suitable combinations of ring and ball sizes, the required internal clearance is obtained. Balls are fed between the rings and spaced equally before the two cage halves are fitted and then riveted together. Prior to automatic assembly the rings are optically inspected.

After washing, the final inspection sequence starts. This consists of a number of automated stations, which check running accuracy, vibration level, and outside and bore diameters, as well as radial clearance of the bearings.

The bearings are then automatically washed, coated with preservative, greased and fitted with seals or shields, before being packed according to customer requirements.







Beyond Bearings
Bill Visnic
Ward's Auto World; Aug 2007; 43, 8; ABI/INFORM Global
pg. 26

ELECTRONICS

Beyond Bearings

Timken shows fuel-saving electronic innovations

By Bill Visnic

The search for fuel-economy enhancements is pushing more than a few suppliers to open their lab doors to reveal projects they think may look a lot more appealing in an environment of $3-per-gallon gasoline.

Count longtime bearing maker Timken Co. in that crowd, as the company recently showed off a host of new ideas to generate incremental fuel-economy gains.

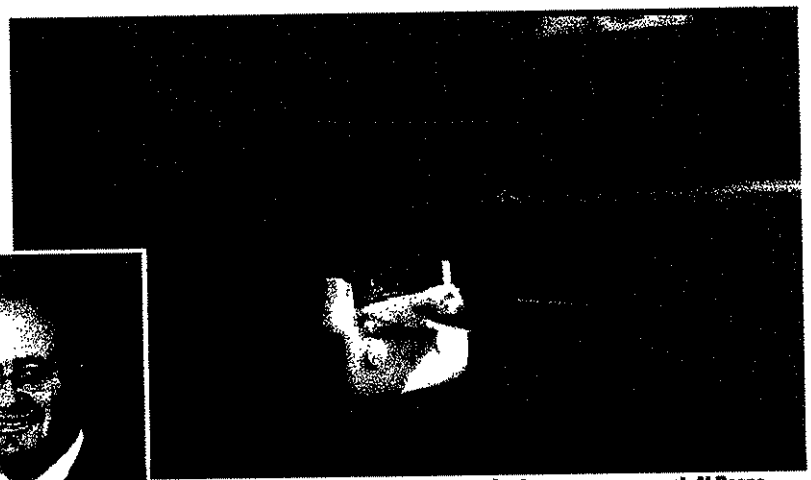
Some are based on maximizing the potential from its primary product, sophisticated roller and needle bearings that are already used throughout the vehicle, from wheel hubs to engines and transmissions.

But many of Timken's latest innovations demonstrate the company's new initiatives to expand beyond its mature products and into areas one might consider foreign to a supplier that's had bearings as its bread and butter since 1899.

Some of Timken's new thrust leverages products and advances gleaned from its acquisition of the Torrington Co. from Ingersoll-Rand Co. Ltd. in 2003.

In essence, Timken is extending to electronic controls and sensors to add new value to its experience in friction management and power-transmission components for numerous industries. The company hopes to meld new electronic advances with its deep expertise in things mechanical.

Perhaps most intriguing is Timken's shaft torque sensor, a new, non-contact system using Hall-effect technology to enable minute measurement of the amount of torque acting on a shaft. "We think it's game-changing," says Al Deane, senior vice president-technology.



Shaft-mounted sensor delivers ultra-precise torque measurement. Al Deane, *(left)* senior vice president-technology at Timken.

With little more than a magnetic disc and a microcontroller chip, the shaft-torque sensor enables all manner of potential advantages, Timken engineers say.

Place it in the transmission, and shift strategy can be optimized according to real-time torque information at the input or output shaft, helping to maximize fuel economy.

Or place the sensor directly on a half-shaft and traction-control and ABS sensing is taken to a new, more precise level, says Stephen Johnson, Timken's director-friction management technology.

Johnson says the sensor gives such precise torque information that it can determine the coefficient of friction under the tires at any given moment. "We can change the way a machine is controlled," with the shaft-torque sensor, Johnson says.

Deane cautions, however, the system "is not fully developed," although the chip already is being produced in automotive-type volumes.

Deane says Timken may have to license the technology to see it more quickly deployed in the auto industry, but "the way it's being done is very auto-market friendly."

Timken also shows at its technical center in Canton, OH, a similar sensor, its ASIC (application specific integrated circuit) steering torque sensor that engineers say can enable better electric power-steering systems.

By receiving and delivering more precise information about torque on the steering shaft, Timken says it can improve the "feel" of fuel-saving EPS, generating improved feedback to the driver.

Johnson says Timken constantly is refining its foundation roller-bearing products, as well; for example, working with Timken engineers from the design phase, Mercedes-Benz recently specified an advanced, low-friction rear-axle bearing for the E-Class line that measurably improves fuel economy.

And Timken is seeking to make future bearing assemblies more "intelligent" with potential incorporation of electronics.

"Bearings tend to occupy interesting real estate," Johnson says. Future advances in the engine and driveline dictate that "you need data; you need intelligent input. The bearing area is a good place to get that." ■

ProQuest

Databases selected: ProQuest Newspapers, ABI/INFORM Global, ProQuest Computing

Research and Markets: "In-depth Analysis of China s Bearing Industry 2008"

Anonymous. **M2 Presswire**. Coventry: Aug 7, 2008.

Abstract (Summary)

China is the world's fourth largest bearing producer behind the United States, the European Union and Japan, accounting for 10 per cent of the global bearing market. The total sales of China s bearing industry in 2007 was 80.5 billion yuan, an increase of 25.7 per cent year-on-year and produced various kinds of roller bearing 11,022 billion sets, an increase of 37.86 per cent year-on-year. In the first quarter of 2008 the total roller bearing was 2.46 billion sets, an increase of 13.01 per cent year-on-year.

The majority of bearings produced in China are small and mid-sized, the proportion of large-scale bearing is very small, less than 3 per cent of its total output, but, on the other hand, the price of the large scale bearing per set is relatively higher, in terms of output value that the large-sized bearing accounts for more than 35 per cent of the total. Presently, the small and mid-sized bearing is still dominated the Chinese bearing market, but the large-sized bearing has developed fast. In terms of the type of products that the ball bearing took majority, accounting for 79.8 per cent of the total output in 2006, roller bearings was in second place accounted for 10.58 per cent, oscillating bearing and auto-CVJ, which has a higher value but only took small proportions.

Indexing (document details)

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PREFACE

Indian bearings industry was worth US$33 billion in 2005, a CAGR of 19.78% between 2003 and 2005. While currently the domestic industry caters to 70% of the demand, balance 30% is met through imports.

A number of global bearing manufacturers have established their units in India through joint ventures or 100% ownership and more are expected to follow suit.

This report on Indian bearings industry covers overview of the industry, growth drivers, particularly the end users demand, foreign trade, profiles of major players and their performance, issues and challenges in the industry and future outlook for the industry.

The report is useful for bearings and component manufacturers, end user industries like automobile, machine tools, steel and equipment manufacturers ring, bearing component manufacturers, raw materials suppliers like steel industry, commercial and investment banks, investors, business analysts, consultants and students.

Table.2 **SKF sales by application field and geographical area, 1995**

Application field	%	Geographical area	%
Industrial users	29	Europe (excl. Sweden)	56
General machinery	17	Sweden	5
Cars	16	North. America	18
Trucks	8	Rest of the world	21
Heavy industry	8		
Electrical industry	6		
End users	6		
Vehicle replacement	5		
Aero-space	3		
Railways	2		
Total	100	Total	100

Source: SKF Annual Report, 1995.

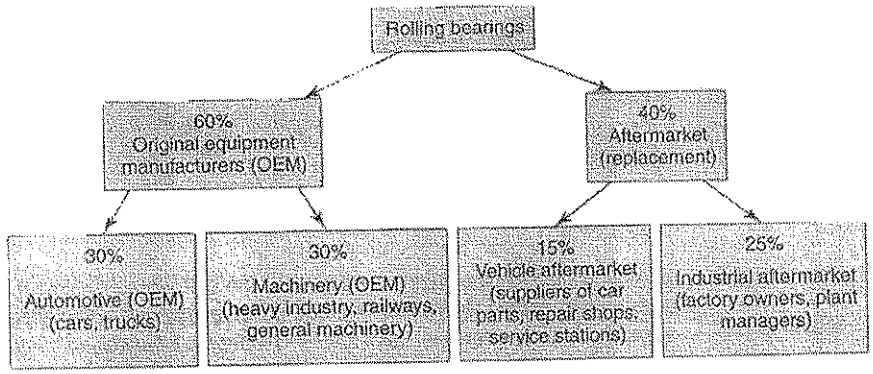

Figure 3
Segmenting customers for rolling bearings ▶

Figure 2, plate 30, show product examples from two application fields: trucks and the electrical industry.

If the world market for bearings is divided into customer segments such as passenger cars, trucks, the aftermarket, etc., SKF holds leading positions within all segments with the exception of electronic motors. In general, its customers can be grouped into different categories as shown in Figure 3 (the percentages in Figure 3 are proportions of SKF sales).

Traditionally, OEM customers have been given the highest priority by SKF because of their high-volume production standards. However, profit margins are low in the OEM sector and SKF is under constant pressure to keep price increases below the rate of inflation.

In the vehicle aftermarket the OEM customers (such as Mercedes, Volkswagen and Ford) may also be competitors through their own spare parts divisions. The specialist suppliers of car parts will typically buy SKF bearings and sell them under their own brand

The eBearing News
November 22, 2007

U.S. Posts Antidumping Margins on Ball Bearings

The U.S. Department of Commerce, International Trade Administration, Import Administration, has finalized the antidumping margins to be applied to Ball Bearings and Parts Thereof, for the period May 1, 2005 through April 30, 2006.

Manufacturers in countries covered by the order are: France, Germany, Italy, Japan, Singapore, and the United Kingdom. For Singapore, the period covered is May 1, 2005 through July 10, 2005.

The specific commerce antidumping case numbers involved are: A-427-801, A-428-801, A-475-801, A-588-804, A-559-801, and A-412-801. Specifically, it covers ball bearings and parts thereof, including all antifriction bearings that employ balls as the rolling element: antifriction balls, ball bearings with integral shafts, ball bearings (including radial ball bearings) and parts thereof, and housed or mounted ball bearing units and parts thereof.

Preliminary administrative review results were published on June 6, and invited comment. By request, a general hearing was held on July 17, and a Japan-specific hearing on July 18. In the review, KYK Corp. was removed from the order because the company did not ship any Japanese-made ball bearings to the U.S. during this period.

The preliminary results were revised and the results for several firms changed. This included programming and ministerial errors, and disregarding home-market sales that failed the cost-of-production test for a number of firms.

NOTE: the rates for Mori Seiki of Japan and Barden Corp / Schaeffler of the UK have been amended since the original list was published. Commerce amended the rates, citing errors in their calculations. The original rates have been removed and this table is correct as published.

The amended final results are:

Ball Bearings and parts thereof
Percentage Weighted Average Margins
May 1, 2005 through April 30, 2006

Country / Company	*Margin %*
France	
SKF France	8.99
SNR	13.32
Germany	
GRW	0.35
Schaeffler Germany	3.03
SKF Germany	3.06
Italy	

Schaeffler Italy	1.57
SKF Italy	8.83
Japan	
Aisin Seiki	6.15
Asahi Seiko	1.28
Canon	10.17
JTEKT (Koyo)	15.01
Mori Seiki	2.12
Nachi	11.46
Nankai Seiko	3.01
NPB	26.89
NSK	3.66
NTN	7.76
Osaka Pump	4.76
Sapporo	7.63
Singapore	
NMB / Pelmec	12.61
United Kingdom	
Barden / Schaeffler UK	0.68

The table can also be considered a reference of cash deposit rates.

- by Bruce A. Carr
from individual research,
tips and commercial sources.
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DEPARTMENT OF COMMERCE

International Trade Administration

A–428–801

Ball Bearings and Parts Thereof from Germany: Final Results of Antidumping Duty Changed–Circumstances Review

AGENCY: Import Administration, International Trade Administration, Department of Commerce.

SUMMARY: On May 7, 2008, we published the preliminary results of changed–circumstances review of the antidumping duty order on ball bearings and parts thereof from Germany. See *Preliminary Results of Antidumping Duty Changed–Circumstances Review*, 73 FR 25663 (May 7, 2008) (Preliminary Results). Interested parties were invited to comment on these preliminary results. After reviewing parties' comments, we have affirmed the preliminary results and find that myonic GmbH is the successor–in–interest to Miniaturkugëllager Gesellschaft mit beschrankter Haftung (MKL).

EFFECTIVE DATE: December 10, 2008.

FOR FURTHER INFORMATION CONTACT: David Dirstine or Richard Rimlinger, AD/CVD Operations, Office 5, Import Administration, International Trade Administration, U.S. Department of Commerce, 14th Street and Constitution Avenue, NW, Washington, DC 20230; telephone (202) 482–4033 and (202) 482–4477, respectively.

SUPPLEMENTARY INFORMATION:

Background

On May 7, 2008, the Department published a notice of preliminary results of its changed–circumstances review of the antidumping duty order on ball bearings and parts thereof from Germany in which it preliminarily determined that myonic GmbH is the successor–in–interest to MKL and should be accorded the same treatment previously accorded MKL with regard to the antidumping duty order on ball bearings and parts thereof from Germany. See *Preliminary Results*, 73 FR 25663.

On May 21, 2008, the petitioner, the Timken Company (Timken), submitted a case brief. Myonic submitted a rebuttal brief on June 17, 2008.

Scope of the Order

The products covered by this order are ball bearings and parts thereof. These products include all bearings that employ balls as the rolling element. Imports of these products are classified under the following categories: antifriction balls, ball bearings with integral shafts, ball bearings (including radial ball bearings) and parts thereof, and housed or mounted ball bearing units and parts thereof.

Imports of these products are classified under the following *Harmonized Tariff Schedules of the United States* (HTSUS) subheadings: 3926.90.45, 4016.93.00, 4016.93.10, 4016.93.50, 6909.19.5010, 8431.20.00, 8431.39.0010, 8482.10.10, 8482.10.50, 8482.80.00, 8482.91.00, 8482.99.05, 8482.99.2580, 8482.99.35, 8482.99.6595, 8483.20.40, 8483.20.80, 8483.50.8040, 8483.50.90, 8483.90.20, 8483.90.30, 8483.90.70, 8708.50.50, 8708.60.50, 8708.60.80, 8708.70.6060, 8708.70.8050, 8708.93.30, 8708.93.5000, 8708.93.6000, 8708.93.75, 8708.99.06, 8708.99.31, 8708.99.4960, 8708.99.50, 8708.99.5800, 8708.99.8080, 8803.10.00, 8803.20.00, 8803.30.00, 8803.90.30, and 8803.90.90.

As a result of recent changes to the HTS, effective February 2, 2007, the subject merchandise is also classifiable under the following additional HTS item numbers: 8708.30.5090, 8708.40.7500, 8708.50.7900, 8708.50.8900, 8708.50.9150, 8708.50.9900, 8708.80.6590, 8708.94.75, 8708.95.2000, 8708.99.5500, 8708.99.68, and 8708.99.8180.

Analysis of the Comments Received

All issues raised in the case and rebuttal briefs by parties to this changed–circumstances review are addressed in the "Issues and Decision Memorandum" (Decision Memo) from Stephen J. Claeys, Deputy Assistant Secretary, to David M. Spooner, Assistant Secretary, dated December 1, 2008, which is hereby adopted by this notice. A list of the issues which parties have raised and to which we have responded is in the Decision Memo and attached to this notice as an Appendix. The Decision Memo, which is a public document, is on file in the Central Records Unit (CRU), main Department of Commerce building, Room 1117, and is accessible on the Web at http://ia.ita.doc.gov/frn/index.html. The paper copy and electronic version of the Decision Memo are identical in content.

Final Results of Changed–Circumstances Review

After consideration of the comments, we continue to find that myonic is the successor–in–interest to MKL and, as such, is entitled to MKL's cash–deposit rate with respect to entries of subject merchandise. Consequently, we will instruct U.S. Customs and Border Protection (CBP) to apply the cash–deposit rate in effect for MKL to all entries of the subject merchandise from myonic that were entered, or withdrawn from warehouse, for consumption on or after the date of publication of the final results of this changed–circumstances review. See *Granular Polytetrafluoroethylene Resin from Italy: Final Results of Antidumping Duty Changed Circumstances Review*, 68 FR 25327 (May 12, 2003).

This determination and this notice are in accordance with sections 751(b)(1) and 777(i)(1) of the Act and 19 CFR 351.216.

Dated: December 1, 2008.

David M. Spooner,

Assistant Secretary for Import Administration.

Appendix

1. Changes to MKL
2. Totality of the Circumstances

[FR Doc. E8–29218 Filed 12–9–08; 8:45 am]

BILLING CODE 3510–DS–S

DEPARTMENT OF COMMERCE

International Trade Administration

A–552–801

Certain Frozen Fish Fillets from the Socialist Republic of Vietnam: Extension of Time Limit for the Final Results of the Expedited Sunset Review of the Antidumping Duty Order

AGENCY: Import Administration, International Trade Administration, Department of Commerce.

EFFECTIVE DATE: December 10, 2008.

FOR FURTHER INFORMATION CONTACT: Matthew Renkey, Import Administration, International Trade Administration, U.S. Department of Commerce, 14th Street & Constitution Avenue, NW, Washington, DC 20230; telephone: (202) 482–2312.

SUPPLEMENTARY INFORMATION:

Background

On July 1, 2008, the Department of Commerce ("the Department") initiated a sunset review of the antidumping duty order on certain frozen fish fillets from the Socialist Republic of Vietnam ("Vietnam") pursuant to section 751(c) of the Tariff Act of 1930, as amended ("the Act"). *See Initiation of Five–year ("Sunset") Review*, 73 FR 37411 (July 1, 2008). Based on an adequate response from the domestic interested party and an inadequate response from the respondent interested party, the Department is conducting an expedited sunset review to determine whether revocation of the antidumping duty order would lead to the continuation or

The eBearing News
October 8, 2004

India Issues Final Dumping Ruling on Ball Bearings

India's Ministry of Commerce and Industry, Directorate General of Antidumping and Allied Duties (DGAD), has made public its final ruling on a dumping (sales below fair market value) complaint filed by the Ball and Roller Bearing Manufacturers Association of India.

The original complaint, filed in 2002, argued that manufacturers and distributors in the Peoples Republic of China, Poland, Russia and Romania were engaged in dumping ball bearings on the market in India.

Specifically, the complaint involved unmounted ball bearings, mounted ball bearings, and component parts for ball bearings, 8mm through 50mm bore.

Although the manufacturers association complaint was for 8mm - 50mm ball bearings, it chose to base the information in its complaint on only four -- 6201, 6202, 6203 and 6204.

The DGAD followed up on the complaint and performed a preliminary investigation, covering the period January 1, 2001 through March 31, 2002. From that preliminary investigation, the DGAD ruled there was sufficient evidence of dumping and initiated a formal investigation.

• 2002 article: India launches dumping investigation

In mid-2003, the DGAD reviewed the investigation results and found, in a provisional decision, that dumping was taking place and damaging India's bearing market and manufacturers.

The DGAD issued a series of extremely high provisional duties. The provisional rates were put into place, effective through December 31, 2003, and then subject to a second review.

Rates were punitively high; commodity high-volume ball bearings which normally sell for pennies were hit with rates which essentially priced them out of the market. For example, a 6201 from China carried anti-dumping duty of USD $0.442, while other Chinese ball bearings carried an "all other" rate as high as $0.477. Affected ball bearings originating in or shipped from Russia carried a universal $0.522, Poland $0.461, and Romania, $0.432.

The DGAD did not find dumping on components, so they were not included in the final results.

Significantly, the anti-dumping duties also apply to bearings which are shipped from those particular countries, regardless of the bearings' country of origin. This attempt to deal with so-called "pass-through" shipments answers a secondary problem often created by the imposition of duties -- for example, U.S. producers long complained that exporters circumvented U.S. duties on bearings from certain countries, simply by bringing them into the U.S. via Canada or Mexico. In India, imports account for just over 29% of the Rs 2,300 crore bearing market.

• 2003 article: India institutes dumping duties -- includes table of duties

• the preliminary DGAD decision

The rates were put in place through December 31, 2003, or pending the results of a final

determination ordered by the DGAD.

The DGAD has now reversed itself, finding no injury to the Indian ball bearing industry.

In its final determination, the DGAD made a key distinction which affected the outcome of its calculations. Rather than treat China as a non-market economy (NME) as the United States and the European Union do in their antidumping calculations, the DGAD determined that the results of the information supplied by the Chinese bearing manufacturers represented a true market-based economy.

The DGAD's final determination (see link below) is a must-read, if only for that segment determining the market forces now at work in China (conclusion in paragraph 20), which states in part, China's HCH is, "operating under market conditions and not to be treated as from non-market economy."

In addition, the DGAD and the Chinese, Polish, Russian and Romanian vendors all found the focus on just four bearings -- 6201, 6202, 6203 and 6204 -- as somehow representative of the entire spectrum of 8mm - 50mm bearings was not a fair representation of the myriad of 8mm - 50mm bearings in all of their various configurations.

Finally, the DGAD found the Indian ball bearing industry had been performing rather well during the period it claimed dumping, which fatally undermined the entire complaint.

In its final ruling, the DGAD found there had indeed been dumping, as defined by the statutes, from China, Poland, Russia and Romania, but that there has been no injury to the Indian ball bearing industry from that dumping.

The DGAD report states in its "Conclusions on Injury:"

- The Authority concludes that though there is significant increase in the volume of the dumped imports from subject countries in absolute terms and also in relation to the production and consumption in India, the evidence of price undercutting has, however, been found only in respect of four models of the Ball Bearings covered by the product under consideration. The price underselling has also been found only in respect of four models of the product under consideration.

- The Authority is of the view that the effect of the dumped imports on the domestic industry is to be seen in terms of its performance as regards the product under consideration as a whole i.e. Ball Bearings above 8mm to 50mm as per Para (iv) of Annexure II of the Anti Dumping Rules. The impact of the dumped imports on the domestic industry cannot be seen with reference to a limited segment of the product under consideration. The domestic industry has shown improved performance in respect of the higher production, higher capacity utilization, improved sales performance, improved profitability, reduced inventory, improved productivity with regard to the product as described for the purpose of this investigation. Price undercutting and price underselling per-se in respect of some of the models of Ball Bearings covered by the product under consideration may not signify overall injury suffered by the domestic industry in respect of product under consideration. The decline in the market share of the domestic industry in demand of subject goods is not considered a significant indicator of injury when the overall demand is growing. The authority thus concludes that based on the available evidence, the domestic industry has not suffered material injury.

• the final DGAD decision

Accordingly, the DGAD rescinded the duty schedule and ordered that antidumping duties paid while the duties were in effect must be refunded.

An appeal is expected.

- by Bruce A. Carr
from individual research,
tips and commercial sources.
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Notice concerning anti-dumping measures on imports of ball-bearings with a greatest external diameter exceeding 30 mm originating in Japan

(98/C 168/04)

On 2 May 1995, Article 1 of Council Regulation (EEC) No 2849/92 [1] of 28 September 1992 modifying the definitive anti-dumping duty on imports of ball-bearings with a greatest external diameter exceeding 30 mm originating in Japan imposed by Council Regulation (EEC) No 1739/85 [2], was annulled by the Court of First Instance of the European Communities in joined cases T-163/94 and T-165/94 as far as the applicants Koyo Seiko Co. Ltd and NTN Corporation are concerned. By judgment of 10 February 1998 in case C-245/95 P the Court of Justice of the European Communities dismissed the appeal of the Commission against the judgment of the Court of First Instance.

As to definitive duties collected after the entry into force of the Regulation in question, importers may request their refund from national customs authorities with regard to products manufactured by Koyo Seiko Co. Ltd and NTN Corporation.

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[1] OJ L 286, 1.10.1992, p. 2.
[2] OJ L 167, 27.6.1985, p. 3.

French Government notice concerning Directive 94/22/EC of the European Parliament and of the Council of 30 May 1994 on the conditions for granting and using authorisations for the prospection, exploration and production of hydrocarbons [1]

(98/C 168/05)

(Text with EEA relevance)

Notice concerning an application for an exclusive licence for the prospection of liquid or gaseous hydrocarbons designated as 'Val des Marais Licence'

By application dated 17 December 1997, Coparex International, with headquarters at 135, rue Jean-Jacques Rousseau, 92138 Issy-les-Moulineaux (France) has requested for a period of five years an exclusive licence for the prospection of liquid or gaseous hydrocarbons, designated as 'Val des Marais Licence' over an area of approximately 841 square kilometres of the territory of the departments of Marne and Aube.

The perimeter of the area covered by this licence consists of the meridians and parallels joining the vertices whose geographical coordinates are specified below, the meridian of origin being the Paris meridian:

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[1] OJ L 164, 30.6.1994, p. 3.

RisingSunOfNihon.com

Market Share - Top Five Bearing Makers in Japan

by **BBelew57** on October 14th, 2007

Sales of domestic bearings in Japan increased 6.3% to Y490.4 billion.

Growing demand from:

1. construction equipment

2. machine tools

3. automakers

fueled the growth.

The market leader is NSK Ltd and their share is growing.

Second place Jtekt, a merger of Koyo Seiko and Toyoda saw their share shrink.

Third ranked NTN Corp's sales for large bearings for wind power generators and railway cars....but is still just barely behind number two.

The top five bearing makers in Japan.

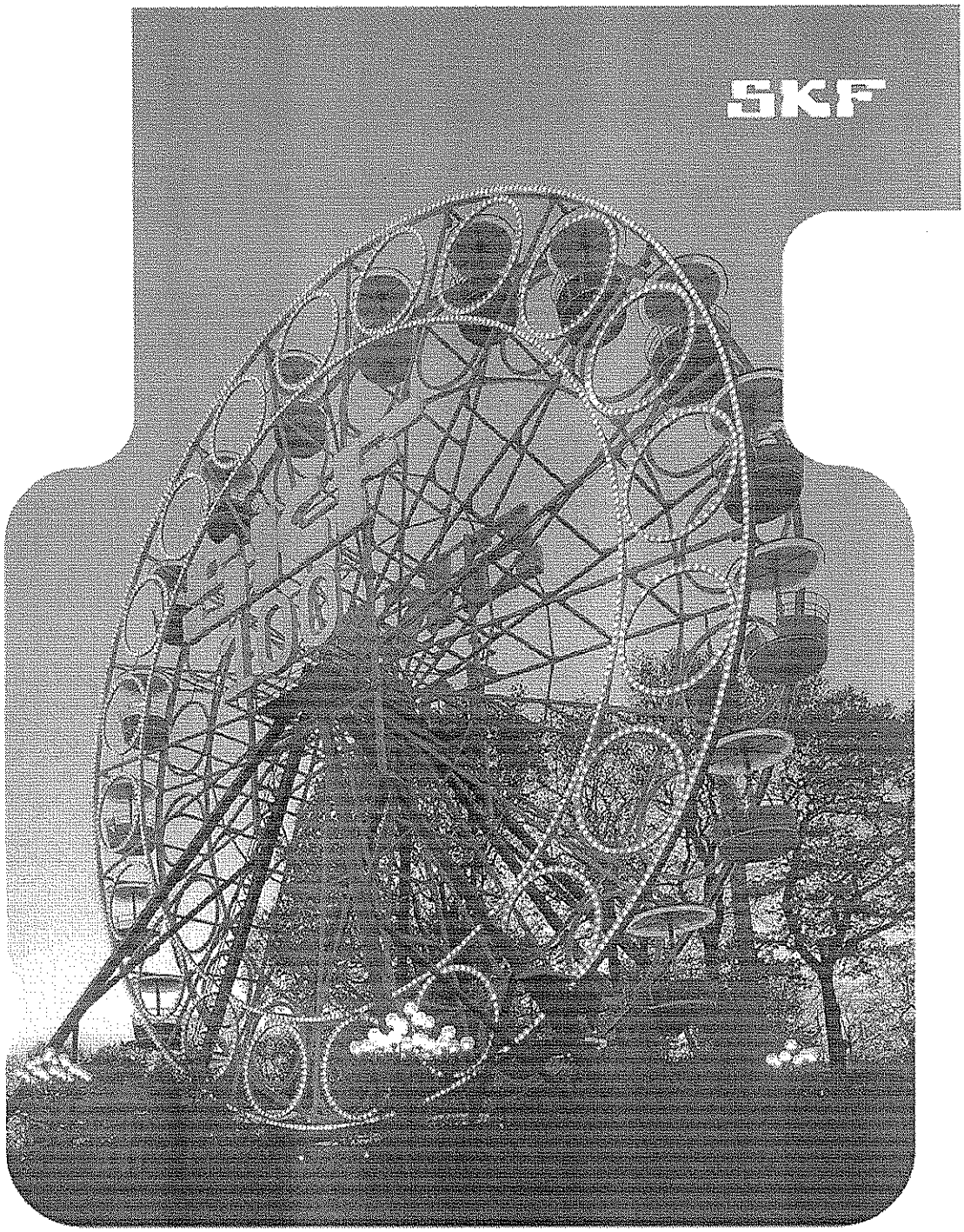
Bearings

Rank	Company	Share	Point Change
1	NSK	34.9	0.8
2	Jtekt	27.6	-0.6
3	NTN	27.3	0
4	Nachi-Fujikoshi	6.3	0.1
5	Minebea	2.9	-0.2

Total domestic sales: 490.4 billion yen (up 6.3%)
Sources: Japan Bearing Industrial Association; market shares estimated by Nikkei

Tags: 2960, 3365, bearings

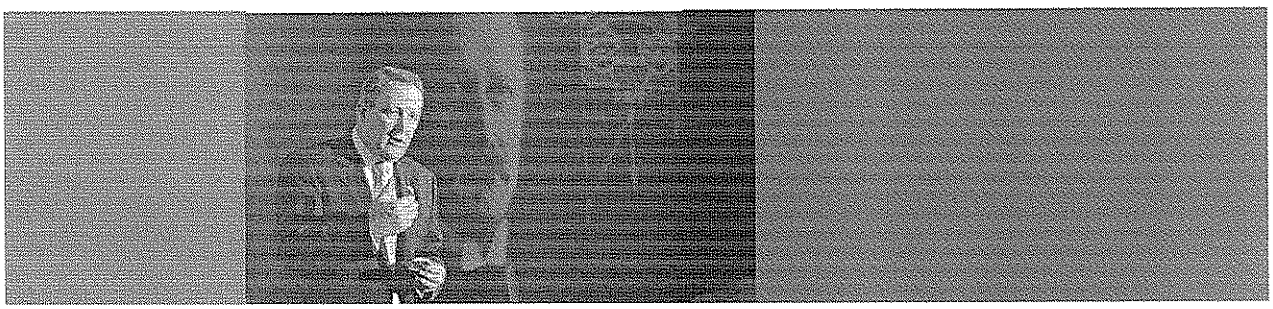
Be the first to rate this [?]



Annual Report 2007

including Sustainability Report

President's letter



The 100th anniversary of the SKF Group was celebrated in 2007 and a number of events took place during the year to commemorate this historic achievement. We were delighted that the King and Queen of Sweden could honour us with their presence at our gala dinner on 16 February, which we held with our key business partners and employees. It was a year filled with events and a separate section on this can be found on pages 4–5.

2007 was also a year of strong performance for the SKF Group and was the best year in our history – a good start to the second 100 years. Our diluted earnings per share increased by 6.6% to SEK 10.07. The Group's operating profit increased by over 12% to SEK 7,539 million, giving an operating margin of 12.9%, and our sales increased by 10.3% in SEK (13.2% in local currencies) to SEK 58,559 million. Cash flow was strong and even though over SEK 6.6 billion was returned to our shareholders during the year we remain with a healthy balance sheet. As a result, and based on the continued positive outlook for the Group, the Board will recommend to the shareholders meeting an additional distribution of SEK 5.00, which combined with the ordinary dividend will give a return of SEK 10.00 per share or SEK 4,554 million in total.

At the start of the year we announced new long-term financial targets for the SKF Group to have an operating margin of around 12%, a growth of 6–8% per annum in local currencies and a return on capital employed (ROCE) of 24%. In 2007 we clearly operated in line with our targets, despite the negative currency development and the higher costs and difficult supply situation we faced for raw materials and components.

The SKF Group has a clear strategy to become the knowledge engineering company and this we will achieve through our dedicated customer focus, our platform/segment approach to the market place, and by delivering strong and sustained financial results. These are the guiding lights for us in SKF today and tomorrow.

*

During the year we took very important steps to continue to strengthen our five platforms and to enable us to deliver knowledge-based solutions to our customers around the world. We invested around SEK 4 billion in organic growth, in acquisitions and in research and development in 2007.

We started production at three new factories in Asia, one in China and two in Korea. We increased our investment levels in a number of our existing operations particularly in Germany and Sweden and announced the investment in three new factories. Two of these will be in India, one for ball bearings in Uttarakhand and one for large size bearings in Gujarat to support this fast growing market for SKF. The third will be in Russia for the production of special wheel units for the Russian railroad.

Some very important acquisitions were made to strengthen the technologies for our platforms. In our mechatronic platform we acquired ABBA, a Taiwanese-headquartered manufacturer of linear guides and we completed the acquisition of S2M, a leading magnetic bearing company in which SKF previously had a 12% ownership. In our service platform a number of small acquisitions were made to strengthen our competence and local offering and to support our sustainability initiative. In particular, the acquisition of Baker Instruments brings us additional expertise to fully complement our existing knowledge in energy management for our customers.

We are increasing our focus on research, development and engineering in products, solutions and services that will help our customers achieve reduced energy consumption in their operations. During the year we announced our new energy-efficient bearings which help our customers reduce energy loss by at least 30% while having the same service life as standard ISO bearings. These have been well received by our customers and deliveries will start during 2008. The new energy efficient family of bearings combined with our SKF Explorer family gives our customers the most comprehensive range of bearings allowing a variety of possibilities to optimize load carrying, size and energy efficiency. In addition and as part of our service offer, we developed a new client needs analysis (CNA) tool for environment and sustainability to help our customers map and reduce their energy usage. Further development of products, solutions and services in this field are planned for 2008.

A number of new offers were launched during the year for our customers due to our focused platform/segment approach, bringing the number we have launched for the industrial

Report on the business 2007

The Group's net sales increased by 10.3% in 2007, from SEK 53,101 million to SEK 58,559 million. This rise was attributable to volume 7.7%, price/mix 2.4%, structure 3.1% and currency effects -2.9%. The operating profit was SEK 7,539 million (6,707). The profit before tax was SEK 7,138 million (6,387). Earnings per share stood at SEK 10.09 (9.48).

Compared with 2006, exchange rates for the full year 2007, including the effects of translation and transaction flows, had a negative effect on SKF's operating profit of around SEK 640 million.

The Group's net financial items were SEK -401 million (-320). Excluding the revaluation of share swaps, the figure was SEK -405 million (-355). SEK 798 million of the interest-bearing loans was amortized in 2007. Interest-bearing loans at year-end totalled SEK 7,735 million (8,053), while pension provisions amounted to SEK 4,840 million (4,731).

The cash flow after operating investments and before financial items for the year was SEK 2,126 million (2,158). The cash flow includes acquisitions of SEK 1,209 million (2,129). Return on capital employed for the 12-month period ended 31 December was 25.4% (24.7).

SKF's capital expenditure on property, plant and equipment amounted to SEK 1,907 million (1,933). Depreciation was SEK 1,518 million (1,476). The increase in capital expenditure in 2007 reflects the upgrading of existing operations and the addition of new factories and capacity, primarily in Asia, to support the strong growth in the region. Of the Group's total capital expenditure, SEK 166 million (105) was attributable to the improvement of SKF's environment both internally and externally.

Expenditure on research and development was SEK 900 million (875), corresponding to 1.5% (1.6) of annual sales. This does not include the customization of products and services or development expenditure on IT solutions. The number of first filings of patent applications was 186 (175).

Sales trend

Sales for the full year, calculated in local currencies, excluding structural effects and compared to last year, were significantly higher for the Group. Looking at regions, sales were significantly higher in Europe, Asia and Latin America. In North America sales were higher than last year. All the divisions had significantly higher sales compared to last year.

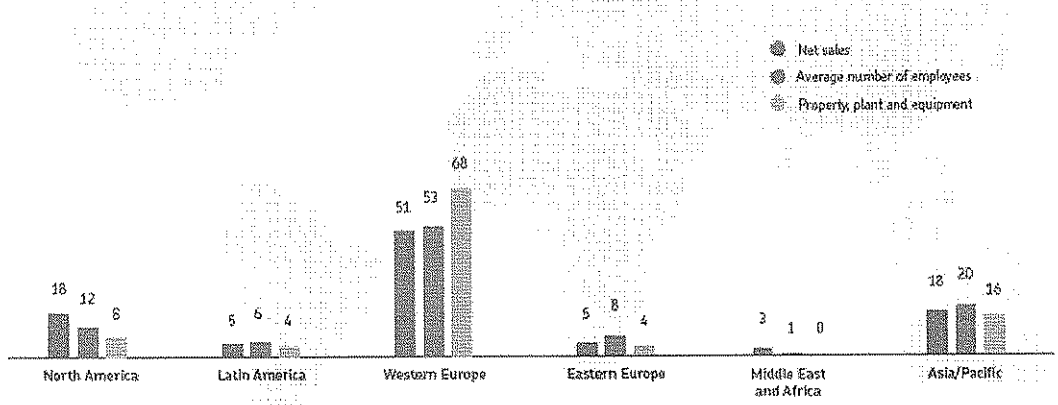
SKF's sales to certain sectors saw a strong performance over the year, in particular in the energy, heavy industrial machinery, off-highway vehicles, cars and light trucks, heavy trucks, vehicle service market, aerospace and railway sectors.

Most important factors influencing the financial results

The continued improvement in the SKF Group's financial results in 2007 can be attributed to a continued focus on delivering value to its customers, higher sales, improved pricing, increased productivity and cost control despite higher raw material costs. Another factor that also contributed positively to the results was the effect from the restructuring schemes undertaken in 2005 as well as in 2006.

The strong increase in raw material prices seen in recent years continued throughout 2007 and was addressed at an early stage by the Group, enabling it to offset the negative impact, as in previous years, by cost reductions, increased productivity and improved sourcing and pricing.

Geographic distribution of net sales, average number of employees and property, plant and equipment (per cent)



Financial objectives and dividend policy

Financial targets

SKF's long-term financial targets were announced in January 2007.

The targets are:

- an operating margin level of 12%
- sales growth in local currencies of 6–8% per annum
- a return on capital employed of 24%

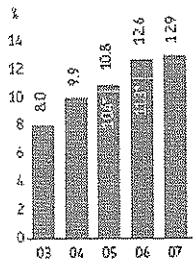
Strategy

SKF is continuing to implement its business strategy to achieve long-term profitable growth and to achieve its financial targets.

The strategy includes:

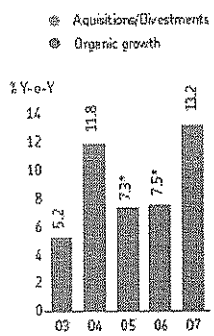
- a clear and dedicated customer focus
- developing new products, solutions and services with higher added value and improved price quality by applying the SKF platform and segment approach
- strengthening the product portfolio within the platforms through greater investment in R&D and through acquisitions
- focusing and investing in faster growing segments and regions
- reducing capital employed and fixed costs
- attracting, retaining and developing the right people.

Operating margin



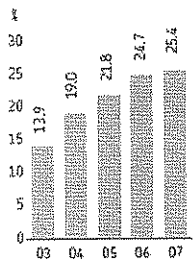
* Excluding income from the previously jointly controlled company Oy Ovako Ab

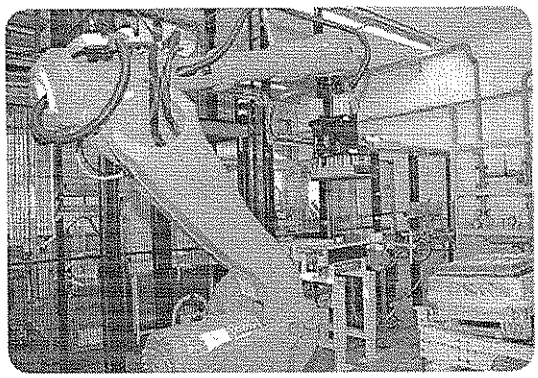
Sales growth in local currency



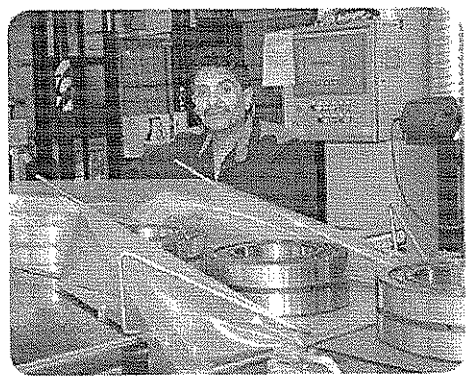
* Excluding effect from sale of Oy Ovako Ab
2005: 10.4%
2006: 10.1%

Return on capital employed





SKF is investing around SEK 600 million in its facilities at Göteborg to increase capacity. The investments include a new heat treatment plant, two new bearing channels, two roller channels, new machining equipment for the production of cages, and upgrading several bearing channels. In the picture is Jamal Ali Hossen, taken from one of the new bearing channels.



Financial risks

The SKF Group's operations are exposed to various types of financial risk. The Group's financial policy defines the main risks as being currency, interest rates, credit and liquidity and establishes responsibility and authority to manage these risks. The policy states that the objective is to eliminate or minimize risk and to contribute to a better return through the active management of risks. The management of the risks and the responsibility for all treasury operations are largely centralized at the SKF Treasury Centre, the Group's internal bank.

Currency risk

The SKF Group is subject to both transaction and translation exposure. The Group's principal commercial flows of foreign currencies pertain to exports from Europe to both North America, Asia and to intra-European business. SKF hedges 100% of the estimated net USD exposure for three to twelve months. This hedging corresponds to around 50% of the total net transaction flows. As of year-end, the lengths of the actual forward contracts conformed to the basic policy. Translation exposure on Group accounts is not hedged.

Interest rate risk

Liquidity and borrowing are managed at Group level. By matching the maturity dates of investments made by subsidiaries with the borrowings of other subsidiaries, the interest rate exposure of the Group can be reduced.

Credit risk

The Group's policy states that only well established financial institutions are to be approved as counterparties. Exposure per counterpart is continuously monitored.

Liquidity risk

In addition to its own liquidity, AB SKF had committed credit facilities of EUR 500 million at year-end.

More details about risk management and hedging activities can be found in the Consolidated Financial Statements, Note 30.

Sensitivity analysis

The following shows the magnitude of changes in respect of a number of factors influencing the Group's profit before tax. The assessment is based on the year-end figures. All the calculations have been made on the assumption that everything else is equal.

- The annual cost of purchasing raw material and components is around SEK 17,000 million. Of this amount, steel bars, tubes, components or oil-based products account for the majority. A change of 1% in the cost of raw material and components reduces/increases profit before tax by SEK 170 million.
- An increase of 1% in the cost of wages and salaries (including social security charges) reduces the profit before tax by SEK 152 million.
- A change of 1% in interest rates has no significant influence on the profit before tax, based on current position. The Group had a net short-term financial debt (short-term financial assets less total loans) of SEK 3,878 million on 31 December 2007.
- A weakening/strengthening of 10% in SEK against the USD has a positive/negative effect from net currency flows on the profit before tax of around SEK 400-500 million, excluding any effects by hedging transactions. For the commercial flows the SKF Group is primarily exposed to the USD and to US dollar-related currencies.
- A weakening/strengthening of 5% in the SEK versus all the major currencies has a positive/negative effect of the translation of profits in SEK of around SEK 300 million. The majority of the profit is made outside Sweden, the Group is therefore exposed to translational risks from all the main currencies.

Consolidated income statements

SEKm	Note	Years ended 31 December 2007	2006
Net sales	2	58,559	53,101
Cost of goods sold	5, 6	-43,172	-39,493
Gross profit		15,387	13,608
Selling expenses	6	-7,386	-7,104
Administrative expenses	6	-478	-513
Other operating income	7	320	316
Other operating expenses	7	-301	-338
Profit (+)/loss (-) from jointly controlled and associated companies	12	-3	738
Operating profit		7,539	6,707
Financial income	8	968	69
Financial expenses	8	-1,369	-389
Profit before taxes		7,138	6,387
Taxes	9	-2,371	-1,955
Net profit		4,767	4,432
Net profit attributable to:			
Shareholders of AB SKF		4,595	4,317
Minority interests		172	115
Basic earnings per share (SEK)	19	10.09	9.48
Diluted earnings per share (SEK)	19	10.07	9.45

Values by quarter

SEKm	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Full year 2007
Net sales	14,371	14,963	14,155	15,070	58,559
Operating profit	1,886	2,019	1,803	1,831	7,539
Profit before taxes	1,825	1,957	1,646	1,710	7,138
Basic earnings per share (SEK)	2.57	2.71	2.48	2.33	10.09
Diluted earnings per share (SEK)	2.56	2.70	2.48	2.33	10.07

Consolidated balance sheets

SEKm	Note	As of 31 December 2007	2006
ASSETS			
Non-current assets			
Intangible assets	10	3,516	2,586
Property, plant and equipment	11	11,960	11,388
Investments in jointly controlled and associated companies	12	70	54
Long-term financial assets	15	1,360	1,128
Deferred tax assets	9	989	948
Other long-term assets	20	339	247
		18,234	16,351
Current assets			
Inventories	13	11,563	9,939
Trade receivables	14	9,894	8,845
Tax receivables		112	108
Other short-term assets	16	2,164	1,609
Investment in jointly controlled company	12	3	48
Assets classified as held for sale	17	86	335
Other short-term financial assets	15	1,329	1,761
Cash and cash equivalents	15	2,946	7,242
		28,097	29,887
Total assets		46,331	46,238
EQUITY AND LIABILITIES			
Equity attributable to shareholders of AB SKF			
Share capital	18	1,138	1,138
Share premium		564	564
Available-for-sale reserve		367	35
Hedging reserve		27	39
Translation reserve		-633	-955
Retained earnings		16,124	18,152
Equity attributable to minority interests		768	634
		18,355	19,607
Non-current liabilities			
Long-term financial liabilities	22	7,301	7,007
Provisions for post-employment benefits	20	4,840	4,731
Deferred tax provisions	9	1,333	1,243
Other long-term provisions	21	1,484	1,464
Other long-term liabilities		186	141
		15,144	14,586
Current liabilities			
Trade payables		4,904	4,529
Tax payables		737	620
Short-term provisions	21	545	455
Other short-term financial liabilities	22	810	1,218
Other short-term liabilities	24	5,836	5,164
Liabilities related to assets classified as held for sale	17	-	59
		12,832	12,045
Total equity and liabilities		46,331	46,238

2 Segment information

Primary segment

The SKF Group is divided into three divisions, each focusing on specific customer groups worldwide. Previously published amounts have been reclassified to conform to the current Group structure in 2007.

The Industrial Division is responsible for sales to Industrial Original Equipment Manufacturer (OEM) customers and for the product development and production of a wide range of bearings (in particular spherical and cylindrical roller bearings, angular contact ball bearings, medium deep groove ball bearings and high precision bearings), lubrication systems, linear motion products, by-wire systems and couplings. The division has four specialized business areas: Aerospace & High Precision Bearings, Railways, Lubrication Systems, and Actuation & Motion Control.

The Service Division is responsible for sales to the industrial aftermarket, mainly via a network of around 7,000 distributor locations. In addition to the sales of products, the division supports customers with knowledge-based service solutions to optimize plant asset efficiency through consulting and mechanical services, predictive and preventive maintenance, condition monitoring, decision-support systems and performance-based contracts. SKF Logistics Services deals with logistics and distribution for both the SKF Group and external customers. The Service Division is also responsible for all Group sales in certain smaller markets.

The Automotive Division is responsible for sales to the manufacturers of cars, light trucks, heavy goods vehicles, buses, two-wheelers, household appliances, power tools and electric motors and for the vehicle service market. The division develops and manufactures bearings, seals and related products and service solutions. Products include wheel hub bearing units, tapered roller bearings, small deep groove ball bearings, seals, specialist automotive products and complete repair kits for the vehicle service market including a new product line of control velocity joints.

Other operations generally include business that have been disposed of in the comparative year as well as other minor operations.

	Net sales		Sales including intra Group sales	
SEKm	2007	2006	2007	2006
Industrial Division	19,266	17,176	29,318	26,698
Service Division	19,597	17,984	21,393	19,761
Automotive Division	19,617	17,869	23,795	21,807
Other operations	79	72	79	72
Eliminations	–	–	-16,026	-15,237
	58,559	53,101	58,559	53,101

	Operating profit		Depreciation, amortization and impairments	
SEKm	2007	2006	2007	2006
Industrial Division	3,430	3,027	788	831
Service Division	2,846	2,362	121	101
Automotive Division	1,154	946	855	897
Other operations	0	738	16	10
Eliminations and unallocated items	109	-366	-4	-5
	7,539	6,707	1,776	1,834

Operating profit for Other operations in 2006 includes primarily the SKF Group's income from the jointly controlled company Oy Ovako Ab.

Of the SKF Group's total income from jointly controlled and associated companies, SEK 0 m (738) was included in Other Operations, SEK -8 m (-2) in Automotive Division, SEK -2 m (1) in Service Division and SEK 0 m (-1) in Industrial Division. The remainder was reported as unallocated.

See Note 10 and 11 for further information about impairments, and Note 21 for restructuring expenses.

28 Fees to the auditors

Fees to SKF Group statutory auditors were split as follows (SEKm)	2007	2006
Audit fees	33	46
Audit related fees	7	0
Tax fees	2	2
Other fees to auditors	0	2
	42	50
The Parent company's share (SEKm)		
Audit fees	10	9
Audit related fees	0	0
Tax fees	0	0
	10	9

Auditing assignments involve examination of the annual report and financial accounting and the administration by the Board and the President, other tasks related to the duties of a company auditor and consultation or other services that may result from observations noted during such examination or implementation of such other tasks.

All other tasks are defined as other assignments. At the Annual General Meeting of Shareholders in 2005, KPMG Bohlins AB was elected auditor for AB SKF until the Annual General Meeting of Shareholders in 2009.

29 Average number of employees

	2007		2006	
	Number of employees	Whereof men	Number of employees	Whereof men
Parent company in Sweden	195	57%	169	56%
Subsidiaries in Sweden	2,978	82%	2,910	83%
Subsidiaries abroad	38,472	79%	36,701	80%
	41,645	79%	39,780	80%

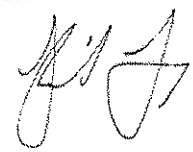
	2007		2006	
Geographic specification of average number of employees in subsidiaries abroad	Employees	Whereof men	Employees	Whereof men
France	4,257	83%	3,966	83%
Italy	4,580	79%	4,643	80%
Germany	5,859	87%	6,051	88%
Other Western Europe excluding Sweden	4,067	83%	3,856	83%
Central/Eastern Europe	3,394	62%	3,318	63%
USA	4,759	72%	4,539	73%
Canada	240	75%	229	78%
Latin America	2,569	82%	2,248	83%
Asia	8,349	81%	7,228	80%
Middle East and Africa	398	79%	623	79%
	38,472	79%	36,701	80%

2007. The factory will be built in the Gujarat region. First production is expected by the first quarter 2009. By doing this we are well positioned to support the strong Indian market, primarily for the energy and heavy industry segments.

To further satisfy the market growth for large size bearings, we have made significant capacity investment in our existing manufacturing sites in Europe and North America.

Moving forward

The division will continue to create and capture value in the industrial market through launching new market offers to new and current customers and through an enhanced key account management structure. The aim is to continue to grow both organically and via acquisitions. In 2008, the integration of both ABBA Linear Tech Co., Ltd. and S2M will continue, at the same time as new acquisitions will be targeted. In manufacturing, the drive for operational excellence will continue to further improve flexibility and reliability. Capacity will increase by both eliminating bottlenecks at existing factories and ramping up recently installed capacity invested in during 2007.



Henrik Lange

The SKF industrial market is divided into some 30 industrial customer segments. Those segments are for the OEM's sales grouped into eight main customer categories based on SKF's portfolio of platform offerings, see chart below.

General industry

Fluid power, industrial gearboxes and material handling.

Special industrial machinery

Food & beverage, machine tools, marine, medical & health care, printing & packing, and textile.

Aerospace

Bearings, structural components and seals to the aerospace markets with producers of both aero engines and airframes.

Heavy industrial machinery

Metalworking (steel), mining, pulp & paper

Railway

Axleboxes and sensorized bearing solutions for the railway industry, freight cars, locomotives, multiple units and high-speed vehicles.

Off-highway

Construction, farm & forestry, lift truck drives (so called non-public road vehicles.)

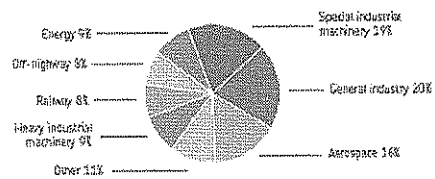
Energy

Renewable power (e.g. wind energy), oil & gas, and non-renewable energy industry machineries.

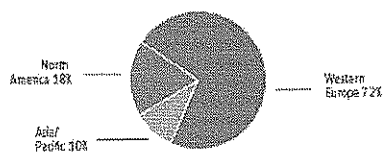
Other

Other businesses

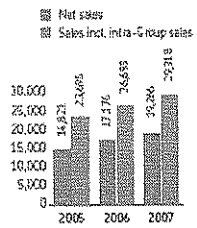
Net sales by customer segment



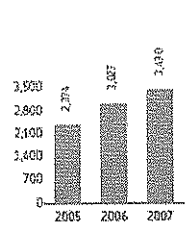
Net sales by geographic area



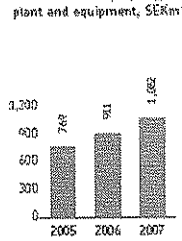
Sales, SEKm*



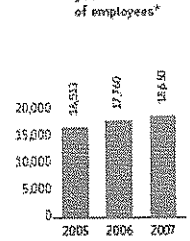
Operating profit, SEKm*



Additions to property, plant and equipment, SEKm*



Registered number of employees*



* Previously published figures have been reclassified to conform to Group structure 2007.

We have a strong position in India with the leading manufacturers Honda and Bajaj Auto Ltd. We also gained business over the year from Piaggio India for its renewed range of three-wheelers for passenger and goods transportation. Due to cooperation involving both the two-wheeler and car segments, we also gained business from Piaggio for wheel hub units for a four-wheeled light vehicle.

Ducati in Europe renewed several of their models during the year with a significant number of components from us.

Sealing solutions

The Automotive Division develops and produces sealing solutions for the automotive and industrial markets, as well as seals integrated into bearings.

In the automotive seals business, we have continued to develop business with key customers and to expand in Asia. Initial deliveries for a major order of bonded piston seals, which required an expansion of the factory in the Republic of Korea has started. We received a quality award from AW North Carolina Inc., a supplier of transmission parts to Toyota, for meeting stringent quality requirements for the past two years.

In the industrial seals business, the two acquisitions, SKF Polyseal Inc. and SKF Economos GmbH made in 2006, were successfully integrated, and have further strengthened SKF's market position. To meet growth, a major expansion of the manufacturing facility in Judenburg, Austria has been started. 2007 was the first full year of the launch of a range of rubber outer diameter shaft seals for industrial application in metric sizes, which has been very well received by the market.

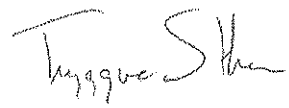
In the bearing seals business, we have continued to successfully meet the in-house demand for seals integrated into bearings, which has required both technological innovation and cost competitiveness.

Moving forward

We will continue our efforts to increase efficiency in the North American and European organization in 2008, while expanding in emerging markets, particularly Asia, in order to secure the full effect of investments. Another focus area is to expand the aftermarket business globally, including the continuous extension of the product line. We will continue to grow globally in the industrial seals business following the acquisition of the two seals businesses.

We are also aiming to further increase SKF's sales of value added solutions, by intensifying our work on product development and by fully leveraging our range in the different platforms.

Our range of energy-efficient bearings and solutions is constantly growing and we have a very strong focus on extending our range of innovative solutions that help reduce emissions and save energy.



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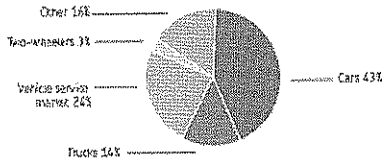
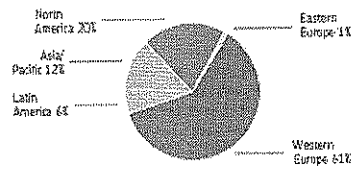
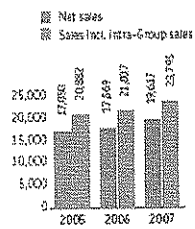
Net sales by customer segment



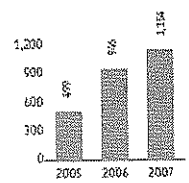
Net sales by geographic area



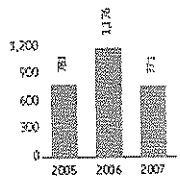
Sales, SEKm*



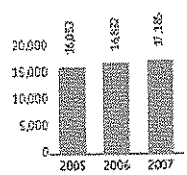
Operating profit, SEKm*



Additions to property, plant and equipment, SEKm*



Registered number of employees*



* Previously published figures have been reclassified to conform to Group structure 2007.

Three-year review of the SKF divisions/segments[1)]

SEKm unless otherwise stated	2005	2006	2007
Industrial Division			
Net sales	14,821	17,176	19,266
Sales incl. intra-Group sales	23,695	26,698	29,318
Operating profit	2,374	3,027	3,430
Operating margin[2)]	10.0%	11.3%	11.7%
Assets and liabilities, net	10,054	11,543	13,776
Registered number of employees	16,513	17,760	18,650
Service Division			
Net sales	16,419	17,984	19,597
Sales incl. intra-Group sales	18,080	19,761	21,393
Operating profit	2,120	2,362	2,846
Operating margin[2)]	11.7%	12.0%	13.3%
Assets and liabilities, net	3,359	3,437	4,342
Registered number of employees	5,025	5,279	5,780
Automotive Division			
Net sales	17,050	17,869	19,617
Sales incl. intra-Group sales	20,882	21,807	23,795
Operating profit	499	946	1,154
Operating margin[2)]	2.4%	4.3%	4.8%
Assets and liabilities, net	8,772	9,786	9,552
Registered number of employees	16,053	16,832	17,185

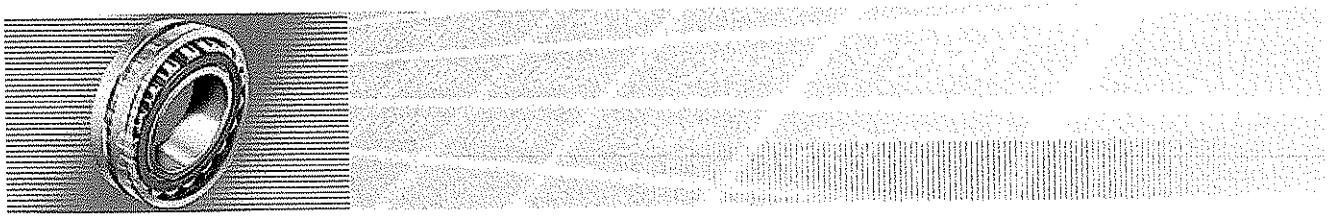
1) Previously published amounts have been restated to conform to the current Group structure in 2007. The structural changes include business units being moved between the divisions and from other operations to divisions.

2) Operating margin is calculated on sales including intra-Group sales.

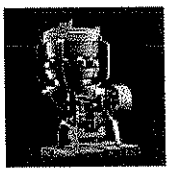
Search

History

Company history



from 1883 to 1914 | from 1915 to 1945 | from 1946 to 1984 | from 1985



1883

Friedrich Fischer designs the ball grinder. This machine allows steel balls to be ground to an absolutely round state for the first time – and in large volumes. Thanks to this innovation, he lays the foundation for the entire rolling bearing industry. Thus, the worldwide success story of the ball bearing begins in Schweinfurt.

Later, 1883 is officially declared the year in which the company was founded.

1896

Friedrich Fischer applies for permission to build a new plant near the train station in Schweinfurt – a step towards a new industrial dimension. The new plant produces 10 million balls per week. The company is incorporated one year later.

1899

Friedrich Fischer suffers a stroke and passes away at the age of 50 on October 2. He does not have any children. With the death of this innovator and entrepreneur, his 400 employees lose the driving force of the company. The company's financial situation worsens. This is also due to the persisting crisis in the ball industry, which is caused by overproduction, competitive pressure, protective duties, etc.

1905

On July 29, the FAG brand is registered with the patent office in Berlin. The registered trademark FAG, which stands for Fischers Aktien-Gesellschaft, is protected in over 100 countries today.

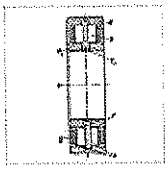
1909

Georg Schäfer takes over the "First Automated Cast Steel Factory, previously Friedrich Fischer, AG" ("Erste Automatische Gußstahlkugelfabrik, vormals Friedrich Fischer, AG") and converts it to a partnership by November 1.
Georg Schäfer's strong personal commitment and hard work make the industrial company internationally renowned. Exports increase – also due to the excellent quality of the rolling bearings supplied – to 40 percent before World War I.

1911

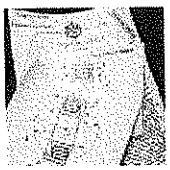
Rolling bearings are used in increasingly more automotive applications. Ray Harroun wins

the first Indy 500 race in Indianapolis driving a Marmon whose engine is equipped exclusively with FAG ball bearings.



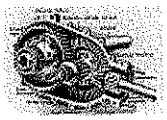
1911

G. u. J. Jaeger in Wuppertal, founded in 1868 and acquired by FAG in 1933, develops the first cylindrical roller bearing that proves reliable in a large number of heavily loaded rail vehicles.



1912

Johann Modler, an FAG engineer, develops the barrel roller bearing allowing angular adjustment (DRP no. 290 038 dated February 16, 1912).



1913

The first needle roller bearings supplied by Dürkoppwerke in Bielefeld are used in the rear axle gears of large trucks. Dürkoppwerke was founded in 1867 and taken over by FAG in 1962.

1913

The company celebrates its 30th anniversary. Colorful poster stamps are issued to commemorate the triumphant success of rolling bearings in automotive and industrial applications.

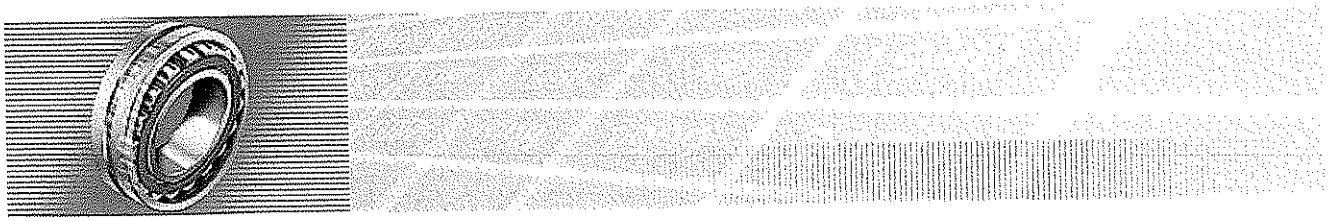
1914

At the start of World War I, the company has 1,000 employees.

Search

History

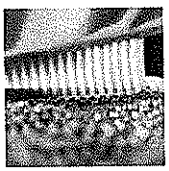
Company history



from 1883 to 1914 from 1915 to 1945 from 1946 to 1984 from 1985

1919

After the retirement of minority shareholders Kirchner and Kuffer, sole ownership of the company is passed onto Georg Schäfer and his associate Hermann Barthel.



1922

Ceramic grinding plates for in-house ball production are manufactured in-house for the first time.

1926

Tapered roller bearing production begins.

1929

A struggle for the company's independence. While nearly all other German rolling bearing manufacturers are bought up by the Swedish company VKF, FAG Kugelfischer remains independent. Large orders from Russia help the company survive.

1933

FAG purchases G & J Jaeger in Wuppertal, production focuses on railway bearings and large bearings.

1936

The first foreign subsidiary plant is established in Wolverhampton, UK.
The threat of war however, puts an abrupt end to the plant which was off to a good start. The staff have to be called back.

1940

Subsidiary plants are established in Eltmann and Ebern to which sectors of production are transferred in 1943 and 1944.

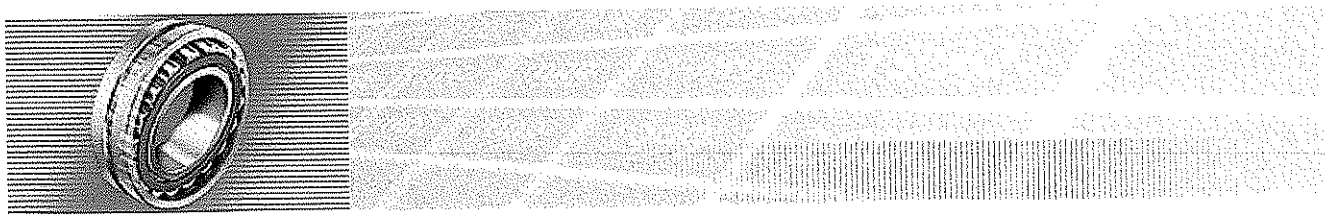
1943

15 serious bombing raids are carried out on the plant by the Allies from August until the end of the war.
83 percent of the Schweinfurt plant is destroyed where approximately 12,000 people are employed.

Search

History

Company history



from 1883 to 1914 from 1915 to 1945 from 1946 to 1984 from 1985

1946

After the end of the war the plant is completely demolished.
More than 4,000 machine units are dismantled, the end of "Kugelfischer Georg Schäfer & Co.", the name the company had received in 1941, seems imminent.

1948

Management is resumed by Georg and Otto Schäfer who are individually liable shareholders.

1950

The Elfershausen plant is purchased and extended to become a main production site for special rolling bearing types, adapter sleeves and extraction sleeves, nuts and thrust bearings.

1953

"Fischer Bearings Manufacturing Ltd." is founded in Stratford, Ontario, Canada. In November of the same year, the production plant is set up under the leadership of engineer Georg Schafer. The plant opens on May 26, 1954.

1955

Production of brake hydraulics parts for motor vehicles starts in the Ebern plant.

1957

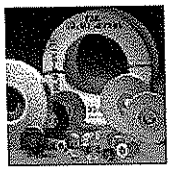
The Hammelburg plant becomes part of the company, where the production of textile machine accessories is later centralized.

1960

"Rolamentos FAG Ltda." is founded in Sao Paulo, Brazil. Construction of the plant begins in 1961.

1962

Kugelfischer takes over the majority of the shares of "Dürkoppwerke AG", founded in 1867 in Bielefeld.



1962

Abrasive wheel production is transferred from Ebern to the new plant in Gerolzhofen.

1966

The majority of the Portuguese production plant "ROL Rolamentos Portugueses S.A.R.L.", in Caldas da Rainha is acquired.

1968

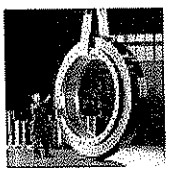
Kugelfischer acquires shares in the Indian rolling bearings company "Precision Bearings India Ltd." in Baroda.

1969

Take over of "Norma Hoffmann", Stamford, Connecticut, USA. After a period of adjustment, the company name is changed to "FAG Bearings Corp.". In 1970 production commences in the new plant in Joplin, Missouri.

1975

Dr. Georg Schäfer dies on January 27. Dr. Schäfer, born August 7, 1896, had been a shareholder since 1922.



1976

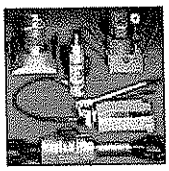
G. & J. Jaeger GmbH, Wuppertal, and Dürkoppwerke GmbH, Bielefeld, transfer the rolling bearing business to the parent company FAG Kugelfischer. The Wuppertal plant becomes the main production location for large and special bearings, the Künsebeck plant becomes the main production location for needle roller bearings.
Developing, manufacturing and distributing industrial sewing machines and conveyor systems remain at Dürkoppwerke GmbH, Bielefeld.

1979

FAG Bearings Ltd., Stratford, Ontario has been manufacturing in Canada for 25 years. The plant is extended, nearly doubling its usable space.

1980

A ready-to-use CAD system is introduced into operational scheduling.



1980

Frieseke & Hoepfner GmbH, Erlangen and its subsidiary company, Rotenburger Metallwerke GmbH, are taken over by FAG Kugelfischer.

1981

The new storage and distribution centers in Schweinfurt and Wels (Austria) are officially opened.

1983

FAG Kugelfischer Georg Schäfer & Co. changes from being a limited partnership to an association limited by shares. The entire share capital lies with the previous shareholders. The new shares are to be taken over by the leading banks of the future underwriting syndicate for the purpose of placement with the investing public.

1983

FAG commemorates the technological and historic event that it considers to be the starting point of its history with the following motto "100 years of industrial ball bearing production – 100 years of rolling bearing history".

1983

The FAG Kugelfischer Foundation is set up. It recognizes outstanding achievements in physics, mathematics, and dissertations in colleges and universities.

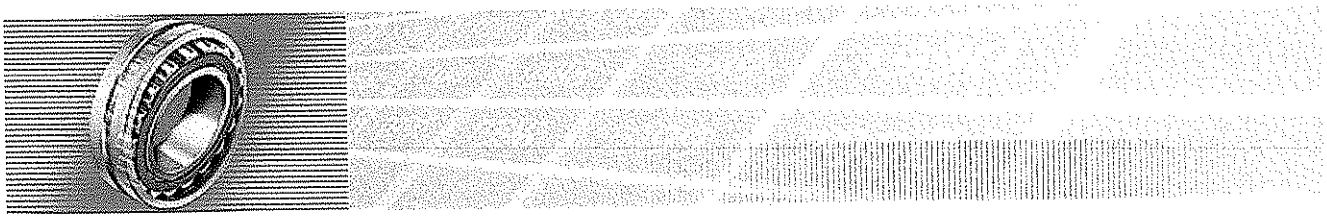
1984

FAG Georg Schäfer KGaA acquires a 50% share in Helmut Elges GmbH, Bielefeld. Elges and its approximately 500 employees primarily manufactures spherical plain bearings, rod ends and joint units. INA-Schaeffler KG holds the other 50%.

Search

History

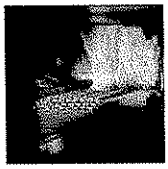
Company history



from 1883 to 1914 from 1915 to 1945 from 1946 to 1984 from 1985

1985

On the occasion of launching the company on the stock market, voting stock is offered at a nominal value of a total of 80 million DM from the share capital of 165 million DM. The share purchase price of a 50 DM share is set at 310 DM.
51.5% of the share capital and therefore, the majority of the shares remain the property of the Schäfer family.



1986

In Schweinfurt, a flexible central heat treatment system for rolling bearing rings is put into operation. As well as implementing modern heat treatment methods, the new heat treat department takes process safety, maintenance and environmental issues into consideration.

1989

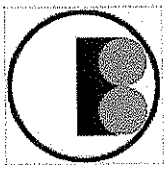
A modern storage and distribution center opens in Mississauga, Ontario in order to supply the Canadian market quickly and efficiently with FAG bearings. An Engineering and Sales Office responsible for Canada is added.

1990

A new bearing ring forge is put into operation in the Schweinfurt plant. The forge processes 300 metric tons of steel every working day, producing 240,000 drop-forge parts and 60,000 rolling bearing rings.

1990

In the Joplin plant and in Schweinfurt, new production lines for wheel bearing units, so-called hub units, go into operation.



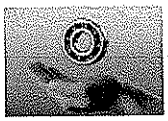
1990

FAG acquires The Barden Corporation, an American precision bearing manufacturer based in Danbury, Connecticut. This secures FAG's position on the North-American market.

1990

FAG Kugelfischer takes over DKF Deutsche Kugellagerfabriken AG in Chemnitz, with eight

plants in the new Federal states producing rolling bearings and rolling bearing components. The redevelopment plan up to 1995 involves investments of a total of 350 million DM.
DKF's markets in East Germany and Eastern Europe collapse and DKF becomes FAG's main loss-maker. The company is on the brink of collapse.



1993

Focus is turned to the main business of rolling bearings and the company is restructured. The radiometry, radiation metrology, hydraulics and control engineering, spindle units, brake hydraulics, abrasive wheels, measuring technology and textile machinery accessories manufacturing sectors and plants are all sold. The new customer-oriented company structure is reflected in the business units: automotive, industrial bearings, components as well as aerospace together with precision bearings.

1994

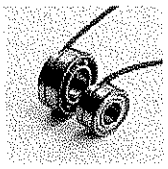
FAG supplies new bearings for the high-pressure turbo pumps for the Space Shuttle's rocket propulsion.

1996

Integrated bearing units made by FAG that have low component volume and therefore lead to lower weight and lower operating costs, come into operation in civil aviation for the first time.

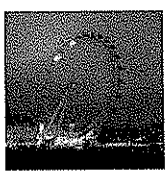
1998

A complex testing system for wheelset bearing application testing for rail vehicles is put into operation. Drive operation simulations for high-speed trains can also be carried out on this test stand, which is the world's most modern test stand.



1999

FAG makes a breakthrough in the field of mechatronics bearings. Approval is given for volume production for FAG mechatronic sensor bearings in converter-controlled asynchronous motors for electrical vehicle drives. Mechatronic bearings enable electric drives to be controlled and monitored in the smallest of design spaces.



2000

The Millennium Wheel, also called The London Eye, the world's largest and heaviest Ferris wheel is put into operation. The wheel is 135m high, has a circumference of 424m and a total weight of 2,100 metric tons. Two spherical roller bearings several meters wide and weighing several tonnes from FAG ensure the wheel turns smoothly.

2002

E1 spherical roller bearing.
They combine 90 years of experience with the latest developments in the areas of kinematics, materials and production methods.

2002

FAG Kugelfischer Georg Schäfer AG, Schweinfurt is taken over by INA-Holding Schaeffler KG. Together, INA and FAG become the world's second largest rolling bearing manufacturer.

2003

INA, FAG and LuK make up the "Schaeffler Group".

2003

INA and FAG decide on joint operations in the industrial sector. 2003 sees the first joint appearance of the Schaeffler Group at a trade show at the Hannover Messe Industrie.

2003

INA/FAG launch premium range of bearings: X-life.

2003

100% stake in FAG Bearings Korea.

2003

The Schaeffler Group Automotive research center opens in Troy (USA).

2005

Linear products as well as components for mechanical engineering and the automotive industry are manufactured in the new plant in Brasov (Romania).

2005

Maiden flight of the Airbus A380 with FAG bearings.
FAG supplies all engine bearing supports and numerous components for the Rolls Royce "Trent 900" engines for the world's largest passenger aircraft.

2005

The FAG brand celebrates its 100th anniversary.

2006

The german FAG Kugelfischer AG & Co. oHG and the INA-Schaeffler KG are integrated in

the Schaeffler Group.

2006

The first joint main catalog of the INA and FAG brands is published. The 1,500-page compendium comprises approximately 40,000 standard products.

2006

More than 100 customers from all over Europe visit the 2006 Innovation Days of Schaeffler Group Industrial in Schweinfurt.

2006

The Schaeffler Group establishes a "Schaeffler Endowed Chair for Automotive Engineering" at Tongji University in Shanghai.

2007

Joint action by INA, FAG and SKF in the fight against product piracy at FAG in Schweinfurt. Around 40 tons of counterfeit rolling bearings are destroyed.

2007

Hannover Messe Industrie. Among others, Federal Chancellor Angela Merkel and Federal Minister for Economics Michael Glos visit the booth of Schaeffler KG, which measures 930 m².

2007

Inauguration of the new R&D Center in Anting/China and the second plant in Taicang.

2007

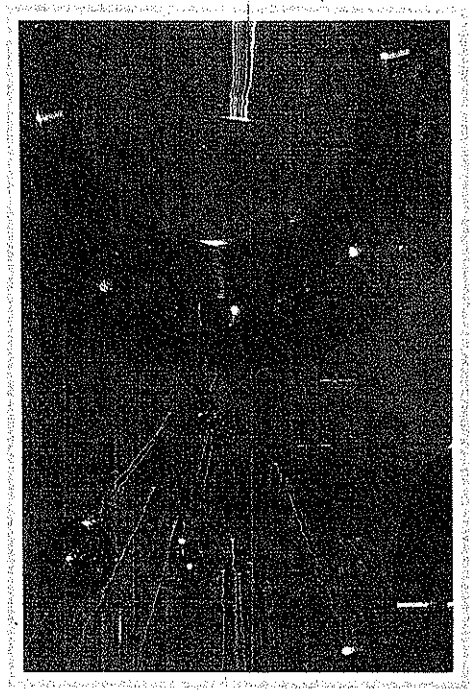
With the help of FAG bearings (cylindrical roller bearings, four point contact bearings and tapered roller bearings in traction motors and gearboxes), the V 150 high-speed train sets a new world record by travelling at 574.8 kilometers an hour.

2007

Inauguration of the new FAG plant in Debrecen/Hungary.

2007

Federal President Horst Koehler awards the 1st Class Cross of Merit of the Order of Merit of the Federal Republic of Germany to Maria-Elisabeth Schaeffler.



Rolling Bearings and their Contribution to the Progress of Technology

FAG Kugelfischer Georg Schäfer KGaA
Schweinfurt

1.10 One Hundred Years Ago, an Independent Rolling Bearing Industry was Born in Schweinfurt

The work involved in the development of the ball grinding and milling machines at times reached the limits of Fischer's physical and financial capacity, since the production of high-quality balls was not an easy task. But the results were indeed worth the effort. The quality and cost-effectiveness of the balls made by the Erste Automatische Gußstahlkugelfabrik (First Automatic Cast Steel Ball Factory) of Friedrich Fischer, in Schweinfurt, soon outdid all competitive products on the market. From 1886 on, at the latest, Fischer also supplied complete ball bearings (Figure 36). From the few documents which have survived it can be gathered that Fischer installed another six ball mills in 1887. His company expanded so fast that in 1889, 1892/93 and 1896 new production plants had to be set up. Simultaneously, the ball milling and grinding machines Fischer had conceived were continuously enhanced. They are patented under No. 55783 on July 17, 1890 (Figure 37), No. 62608 on September 12, 1891 and No. 104204 on May 15, 1898.

Figure 35 Ball milling machine of Friedrich Fischer, developed around 1890.

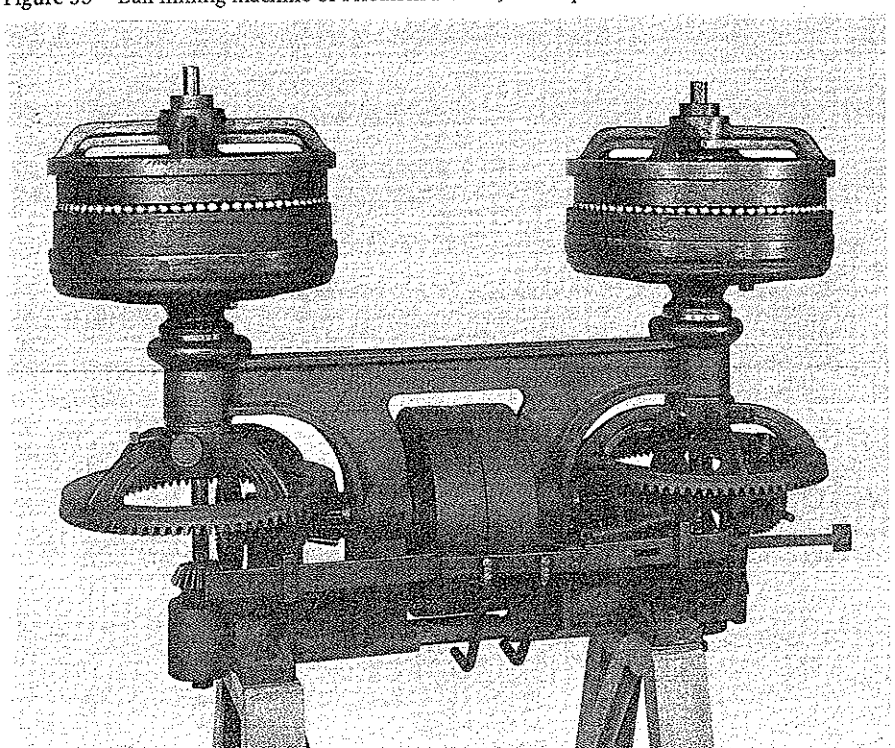
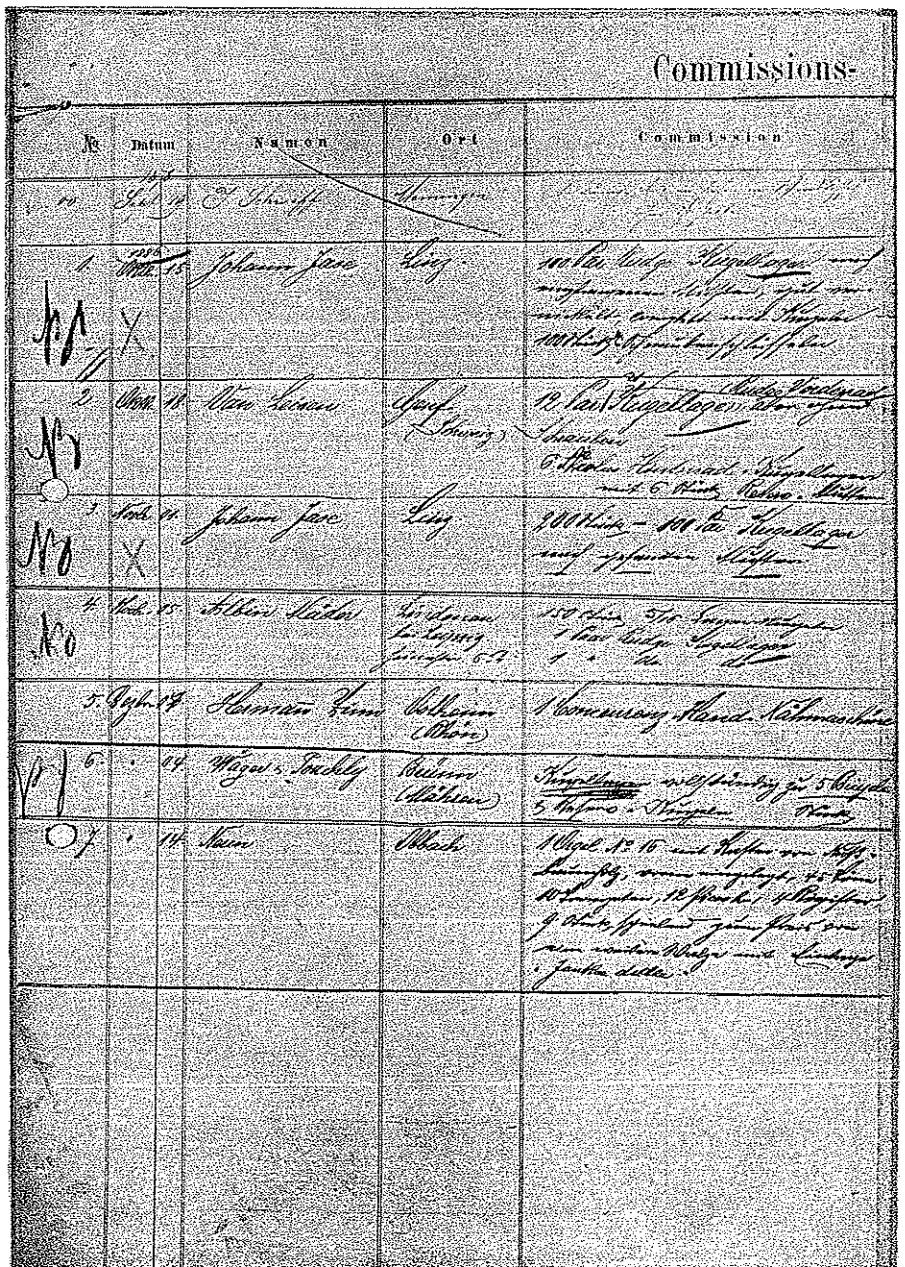
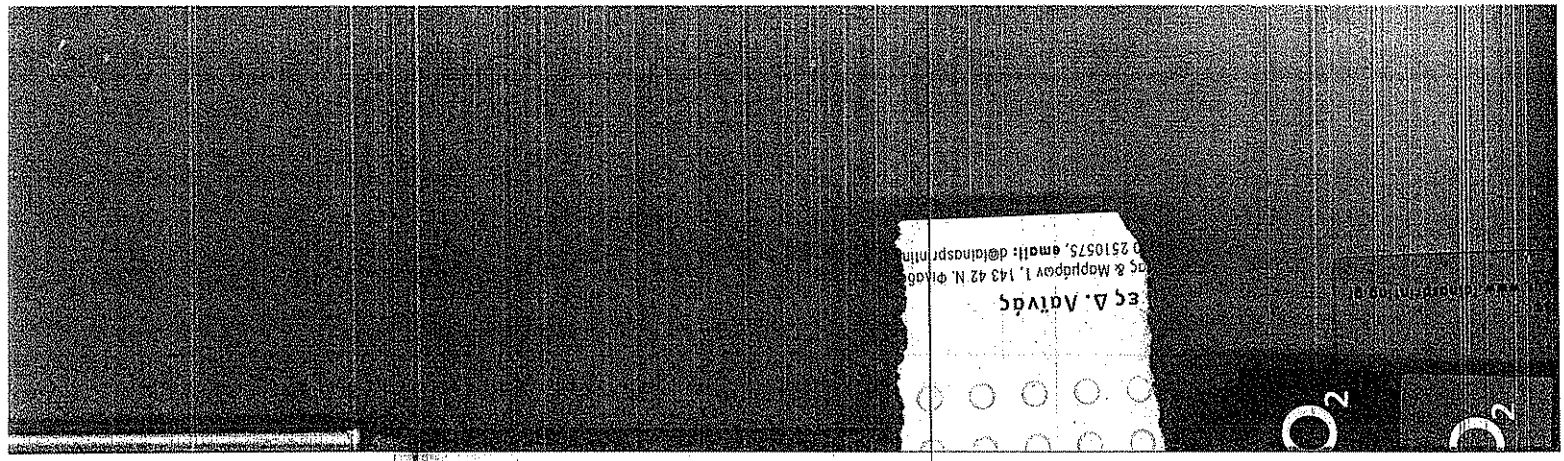
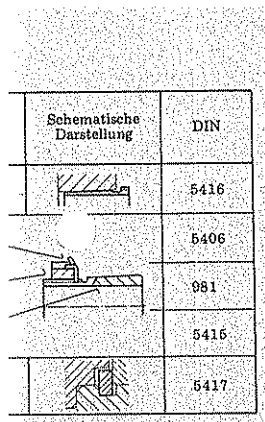
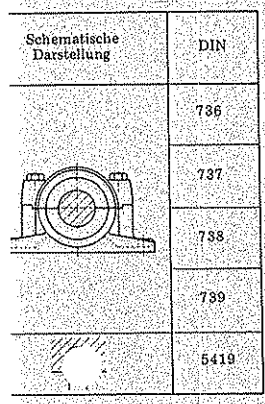


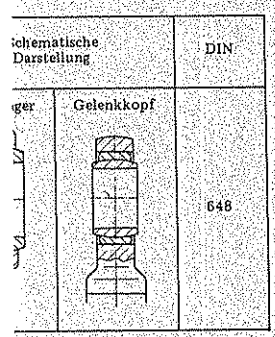
Figure 36 Copy of an actual document of 1886, on the supply of complete ball bearings. From the order book of Friedrich Fischer in Schweinfurt.











2.2.3 Standardization and Technical Progress

For decades the catalogues of the rolling bearing manufacturers have shown bearings in the same standardized dimensions (Figure 54). The consumers have got used to it. As a consequence, the production quantities have continuously increased; the result of cost-effective manufacturing and inspection methods (Figures 55 and 56) are low production costs and prices. If a rolling bearing must be replaced after many years, a replacement bearing is easily procured.
For example a ball bearing with the reference number 6206. Its dimensions

bore = 30 mm
outside diameter = 62 mm
width = 16 mm

have not been changed in the catalogues of 1934, 1950 and 1983 (Figure 54). The catalogues of 1934 and 1950 in comparison with that of 1983, represent only a certain period in time and could be supplemented by catalogues of other years.
Technical progress is best demonstrated in the increase of the load carrying capacity or the load rating C. When the load rating of bearing 6206 of 1934, 1950 and 1983 is specified in today's usual legal unit kN (Kilonewton) the comparison shows

1934 C = 9.6 kN; 100%
1950 C = 14.3 kN; ≈ 150%
1983 C = 19.3 kN; ≈ 200%.

The catalogues of 1934 and 1950 show the bearing 6206, like the other bearings of this series, only in the »standard design«, i. e. equipped with a sheet metal cage and normal radial clearance. It was up to the user to inquire for non-standard designs, such as different radial clearance, cage or precision, and to determine the delivery with the manufacturer. Since hundreds of combinations were possible (5 designs for the radial clearance, 3 or more cage designs, at least 18 precision designs), cost-effective stockkeeping was not possible. In the course of time, some designs turned out to be especially salable. These bearings were included in a »Standard Programme«. In the catalogue of 1983, 16 designs are listed for the bearing 6206, which are regularly manufactured in series thus ensuring availability for years. Apart from the »standard bearing« the following designs of identical dimensions are always available:

designs

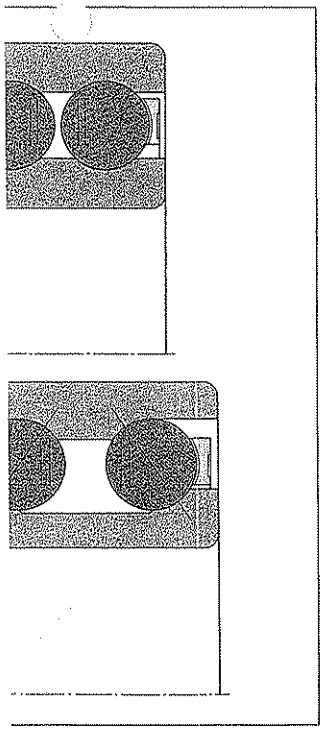
with larger radial clearance (C3),
with one or two shields (ZR, 2ZR),
with one or two seals (RSR, 2RSR),
with textile laminated phenolic cage (TB),
with increased precision and larger radial clearance (P63),
with circular groove for a snap ring (N),
suitable for high temperatures (Z52JN.790144) and
of stainless steel (Z15).

In the catalogue of 1950, there is an indication that bearings of series 62 are also supplied for use in agricultural machinery. Since then a bearing type has been designed especially

commodate thrust loads in either

, with moulded snap-type cage of

ots, with moulded snap-type cage



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ıgs (Figure 57 b) could thus be
of glass fibre reinforced poly-
do without guiding lips at the

The use of novel cage materials also triggered a boom in the development of other bearing types. Former designs of double row deep groove ball bearings and double row angular contact ball bearings featured a filling slot at one side which reduced the axial load carrying capacity of the bearing in one direction. The balls of the second row were inserted through the filling slot into the cage pockets. In the new design which takes up thrust loads in either direction, the balls are first inserted between the rings and the elastic »snap-type cage« of polyamide is then assembled from the side (Figure 58).
Conversions from an existing to an enhanced design depend on the feasibility and on cost-effectiveness. Bearings which are needed in large quantities generally assume a pilot function during conversion so that design changes in a bearing do not necessarily include all sizes simultaneously.

2.2.4 Market Shares of Various Rolling Bearing Types

The rolling bearing types listed in the standards and catalogues of the bearing manufacturers allow nearly any bearing problem to be solved.
The market shares, which the various bearing types have reached in the Federal Republic of Germany, are representative of a highly developed industrialized country, where all branches of mechanical engineering, vehicle and apparatus engineering are included and where the customer can select from a wide product range.
Figure 59 shows the shares in sales and turnover. The sales are specified in terms of volume, i. e. quantity of bearings sold, the turnover in terms of value. For sales as well as turnover, the deep groove ball bearings prevail. Therefore, it is understandable that people generally talk of the ball bearing industry instead of the rolling bearing industry, the ball bearing thus standing for all rolling bearings.
The great share in terms of volume of the deep groove ball bearing points out that it can be used for various applications, especially as a small and miniature bearing. Its share of sales is thus greater than its share of the turnover. – This applies, similarly, to needle roller bearings and needle roller and cage assemblies which are mainly used in vehicles.
Deep groove ball bearings and needle roller and cage assemblies are listed in the Standard Programme for shaft diameters from 3 mm upwards. The weight of these bearings is only 2 and 0.4 grams respectively. Cylindrical roller bearings and tapered roller bearings of standard designs are available from 15 mm bore with a weight of 47 and 55 grams respectively; spherical roller bearings with a 20 mm bore have a weight of 160 grams.
The roller bearings of a high load carrying capacity are made for accommodation of the high loads in heavy machines and vehicles; they are therefore required in large and very large dimensions. This is shown by their share in the turnover.
On machine tool spindles for which a high guiding accuracy and a clearance-free adjustment is required, angular contact ball bearings are preferred to deep groove ball bearings. The relatively great share of this bearing type indirectly shows the volume and importance of machine tool construction.
Other bearing types, such as self-aligning ball bearings, barrel roller bearings and thrust bearings of various types, have a relatively small share in the overall demand, even so a standard was necessary in order to produce them in economically reasonable quantities.

2.6 The Demand Defines the Product Programme

The user always expects the rolling bearing manufacturer to offer him the rolling bearing best suitable for his application at a reasonable price. For a »rolling bearing universalist«, whose product programme covers all rolling bearing types, selection is most objectively made according to technical aspects. He must also be in the position to develop and manufacture an appropriate bearing for the most simple and the most complicated application.

Figure 89 shows the turnover attained by the respective bearing designs as a percentage in a rolling bearing universalist's programme. From the representative chart (Figure 89 a) it can be gathered that 1 percent of all designs supplied already achieve a turnover share of about 30 percent. Figure 89 b, however, shows that 37 percent of the designs of the overall programme reach a turnover share of only 1 percent.

A system had to be found which allowed the allocation of the individual bearing designs to the individual programmes according to their market demand. A comprehensive market analysis made it possible to divide the total product programme into

standard programme
scheduled product programme and
custom-made product programme.

The standard programme, published in 1976 by FAG, is the vital part (shown in Figure 90 by the symbol of a ball). It comprises universally applicable bearings which are permanently in demand. These bearings are continuously manufactured and readily available at short term.

The scheduled product programme covers all bearings which are required in series for special applications (e. g. motor vehicle bearings). Bearings of the scheduled product programme are also available at relatively short notice.

The custom-made product programme consists of bearings which deviate in type and design from the »normal« bearings, but are absolutely necessary to solve particular application problems. Since the demand for these bearings cannot be anticipated, they are only manufactured to firm customer orders.

Figure 89 Typical distribut
Measured by 1, 5, 10 and 50 p

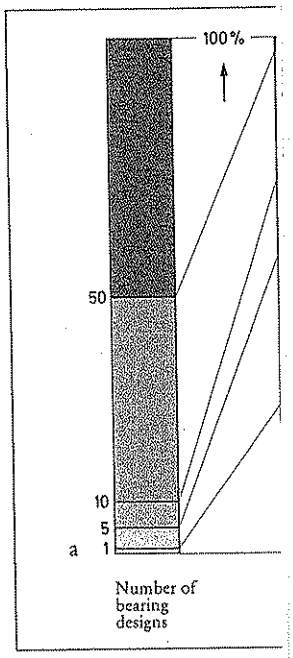
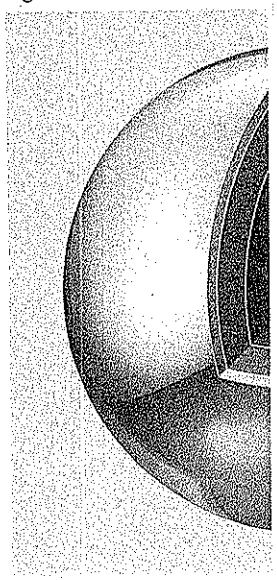


Figure 90 Distribution of



gramme

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Figure 89 Typical distribution of the number of rolling bearing designs and their turnover. Measured by 1, 5, 10 and 50 percent of the designs (a) or the turnover (b).

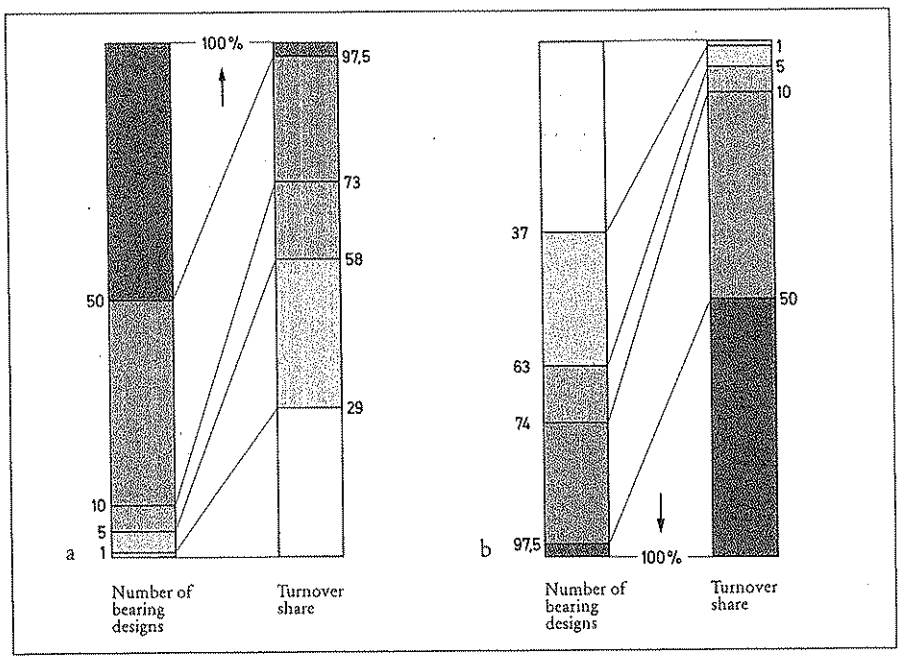
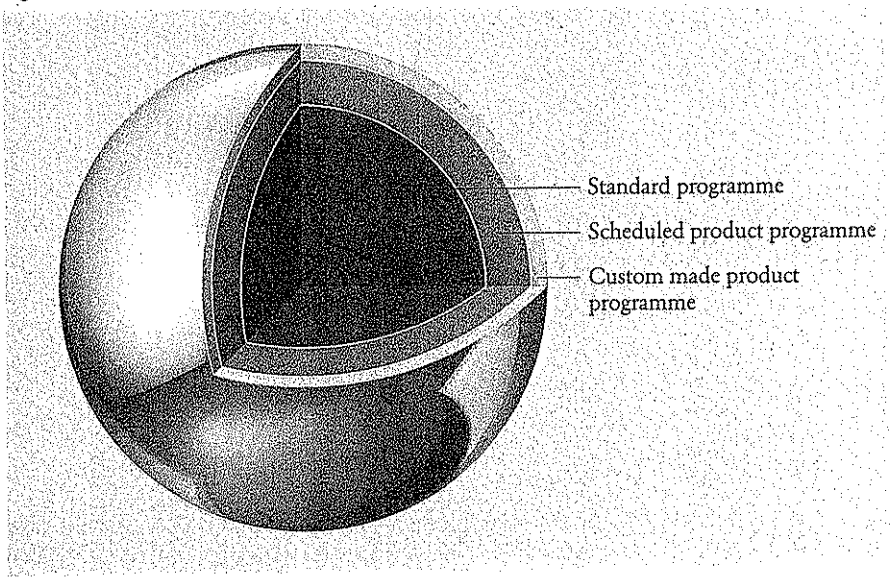
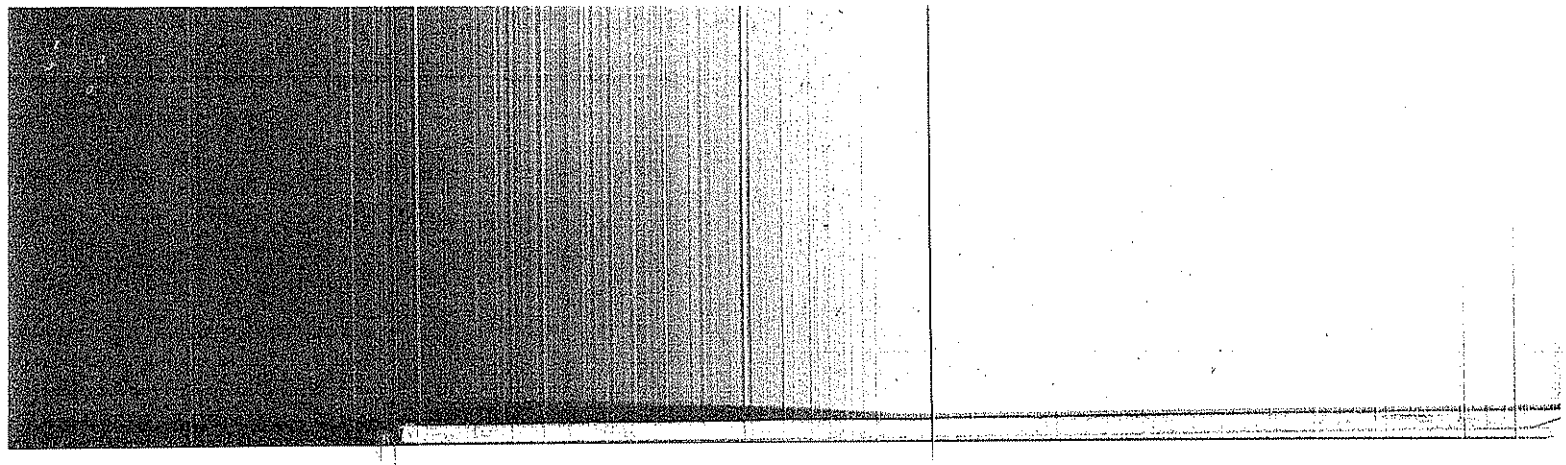


Figure 90 Distribution of the total rolling bearing programme.





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genommen. Er soll die Verbin-
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beabsichtigt, die ISO-Kurz-
urzzeichen einzuführen.

AFBMA Standards for Ball and Roller Bearings and Balls

Standard	Title
AFBMA Std. 1-1964	Terminology for Anti-Friction Ball and Roller Bearings and Parts
AFBMA Std.	Anti-Friction Bearings Maintenance Manual
Basic Standards	
ANSI/AFBMA Std. 4-1984	Tolerance Definitions and Gaging Practices
ANSI/AFBMA Std. 7-1972	Shaft and Housing Fits for Metric Radial Ball and Roller Bearings (Except Tapered Roller Bearings) Conforming to Basic Boundary Plans
ANSI/AFBMA Std. 9-1978	Load Ratings and Fatigue Life for Ball Bearings
ANSI/AFBMA Std. 11-1978	Load Ratings and Fatigue Life for Roller Bearings
ANSI/AFBMA Std. 20-1977	Metric Ball and Roller Bearings (Except Tapered Roller Bearings) Conforming to Basic Boundary Plans
Radial Bearings	
ANSI/AFBMA Std. 15-1982	Ball Bearings with Spherical Outside Surfaces and Extended Inner Ring Width (Includes Eccentric Locking Collars)
ANSI/AFBMA Std. 18.1-1982	Needle Roller Bearings – Radial, Metric Design
ANSI/AFBMA Std. 18.2-1982	Needle Roller Bearings – Radial, Inch Design
ANSI/AFBMA Std. 19-1975	Tapered Roller Bearings – Radial, Inch Design
Thrust Bearings	
ANSI/AFBMA Std. 21-1975	Metric Thrust Needle Roller and Cage Assemblies and Thrust Washers
ANSI/AFBMA Std. 21.2-1977	Thrust Bearings of Ball, Cylindrical Roller, Tapered Roller, and Needle Roller Types, Inch Design
Bearing Parts	
ANSI/AFBMA Std. 10-1983	Metal Balls
ANSI/AFBMA Std. 17-1980	Needle Rollers, Metric Design
Accessories	
ANSI/AFBMA Std. 8.2-1978	Ball and Roller Bearing Mounting Accessories, Inch Design
ANSI/AFBMA Std. 14-1979	Housing for Bearings with Spherical Outside Surfaces
Other Bearings	
ANSI/AFBMA Std. 12-1969	Instrument Ball Bearings
ANSI/AFMBA Std. 16.2-1978	Airframe Ball, Roller and Needle Roller Bearings, Inch Design
ANSI/AFBMA Std. 22-1976	Spherical Plain Bearings, Joint Type
Bearings, In General	
ANSI/AFBMA Std. 13-1970	Rolling Bearing Vibration and Noise (Methods of Measuring)

The collected knowledge concerning rolling bearings as a machine element has now become so extensive that even specialists find difficulty in keeping up-to-date with the most current trends in bearing applications.

This book therefore attempts to trace a general overview concerning the trends in the development of rolling bearings commencing with their historically technological significance.

To the bearing expert who knows more concerning specialized aspects of bearings than this book with its general form of presentation can possibly provide, the contents may prove of interest regarding other fields of application which are less commonly known to him.

Finally, this book should provide an overall indication to anyone interested in the economical significance of the rolling bearing as a machine element without becoming heavily weighed with specialized technical descriptions.

Also for this reason graphic or photographic presentations of illustrations have been selected where possible and advisable instead of technical drawings.

Published: October 10,2008

Partners for Success: Schaeffler Group Presents 2006 / 2007 Suppliers of the Year Awards

TROY, Mich., Oct. 10 /PRNewswire/ -- For the Schaeffler Group and its brands, INA, LuK and FAG, a trusting partnership with high performance suppliers is the basis for success and continuous growth.

"We are dependent on supplier partnerships that function well," said Maria-Elisabeth Schaeffler, partner of the Schaeffler Group, at the Supplier Conference that takes place every two years at the company's headquarters in Herzogenaurach, Germany.

The company's goals can only be achieved with a supplier network that extends globally. And that is why the top 50 nominated suppliers for the "2006 / 2007 Suppliers of the Year" awards came from 15 countries. The eight honored suppliers who received awards during the event were companies from Germany,Austria,Switzerland,Romania andthe United States.

"The Schaeffler Group invests several hundred million euros annually in order to maintain and strengthen its position as a technological leader in the automotive, industrial, aviation and aerospace sectors," said Dr. Juergen M. Geissinger, president and chief financial officer of the Schaeffler Group. "Our holding in Continental has opened up new potential for future technologies and our suppliers can be an important part of the process, as long as the expansion is based on quality."

"In the Schaeffler Group, we have a zero defect target," Geissinger continued. "We want to pass this requirement to our suppliers. To work together successfully, our suppliers must understand this."

Dr. Gerhard Schuff, who recently took over responsibility for the newly created purchasing section within the Executive Management Board, was able to report on improvements in this area (the number of defects has been cut nearly in half in the past few years). Nevertheless, a further significant reduction of complaints is achievable. Proof that this is possible comes from a spring supplier, which provides the Schaeffler Group with around 40 million springs per year and has had only one complaint in the last four years.

The most important assessment criteria for the Supplier Awards are quality, delivery reliability, innovation, willingness for globalization and costs that meet market requirements. The following companies were presented awards for their exceptional performance in these areas: Baumann Feder AG from Rueti (Switzerland); Wienstroth Warmebehandlungstechnik GmbH from Goch (Germany); Guhring oHG from Albstadt (Germany); FESTO AG from Esslingen (Germany); MIBA Sinter Austria GmbH (Austria); COMPA IT from Sibiu (Romania); and HUSCO International Inc. (USA). Die Camillo Krejci Polymertechnik GmbH (Austria) received the Schaeffler Group "Supplier of the Year" award for the third time.

About the Schaeffler Group

The Schaeffler Group, and its brands INA, FAG and LuK, is a renowned supplier to the automotive industry as well as a leading manufacturer of rolling

bearings worldwide. The Schaeffler Group, and its approximately 66,000 employees at more than 180 locations worldwide, distributes precision components and systems for automotive engineering, industry as well as aviation and aerospace. The Schaeffler Group generated sales of 8.9 billion euros in 2007, 60 percent of which were generated in the automotive division. The Group has more than 29,000 employees in Germany.

To serve the North American automotive market, the Schaeffler Group operates a 78,000-square-foot North American Automotive Tech Center inTroy, Mich. This facility employs 165 engineers and technicians and houses a 30,000-square-foot, state-of-the-art test lab outfitted with multiple test cells capable of performing test simulations for engine and engine components. Schaeffler Group Automotive has headquarters inFort Mill, S.C. and manufacturing facilities inSouth Carolina,Missouri,Ohio andOntario, Canada. For more information, please visit www.schaefflergroup.com .

SOURCE Schaeffler Group

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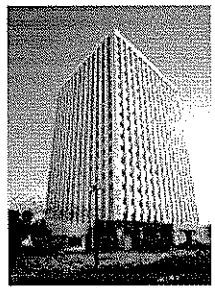
Tags: ,AUT,MAC,AWD,MI-Schaeffler-Group

CORPORATE PROFILE



Company Name	NSK Ltd.
Established	November 8, 1916
Capital	67 Billion Japanese Yen (as of March 31,2007)
Head Office	Nissei Bldg., 1-6-3 Ohsaki, Shinagawa-Ku, Tokyo, 141-8560, Japan
Phone	+81-3-3779-7111
Representative	Seiichi Asaka, President & CEO
Number of Employees	25,069 (as of March 31,2008)
Annual Sales	772 billion Yen (Year ended Mar. 31,2008)

"NSK" inaugurated its business in 1916 and produced the first ball bearings made in Japan. Since then, NSK Ltd. has developed a full range of bearings, which has been sold throughout the world and has contributed greatly to the development of industries and the advancement of technology.

The company has used its expertise in precision machining technology, refined through years of bearing manufacturing to diversify into automotive products, precision machinery and parts, and mechatronic products. Since the 1960's, NSK Ltd. has been aggressively developing its overseas markets. At present, we have 70 overseas sales operations in 24 countries and operate 12 international manufacturing locations in 37 overseas countries.

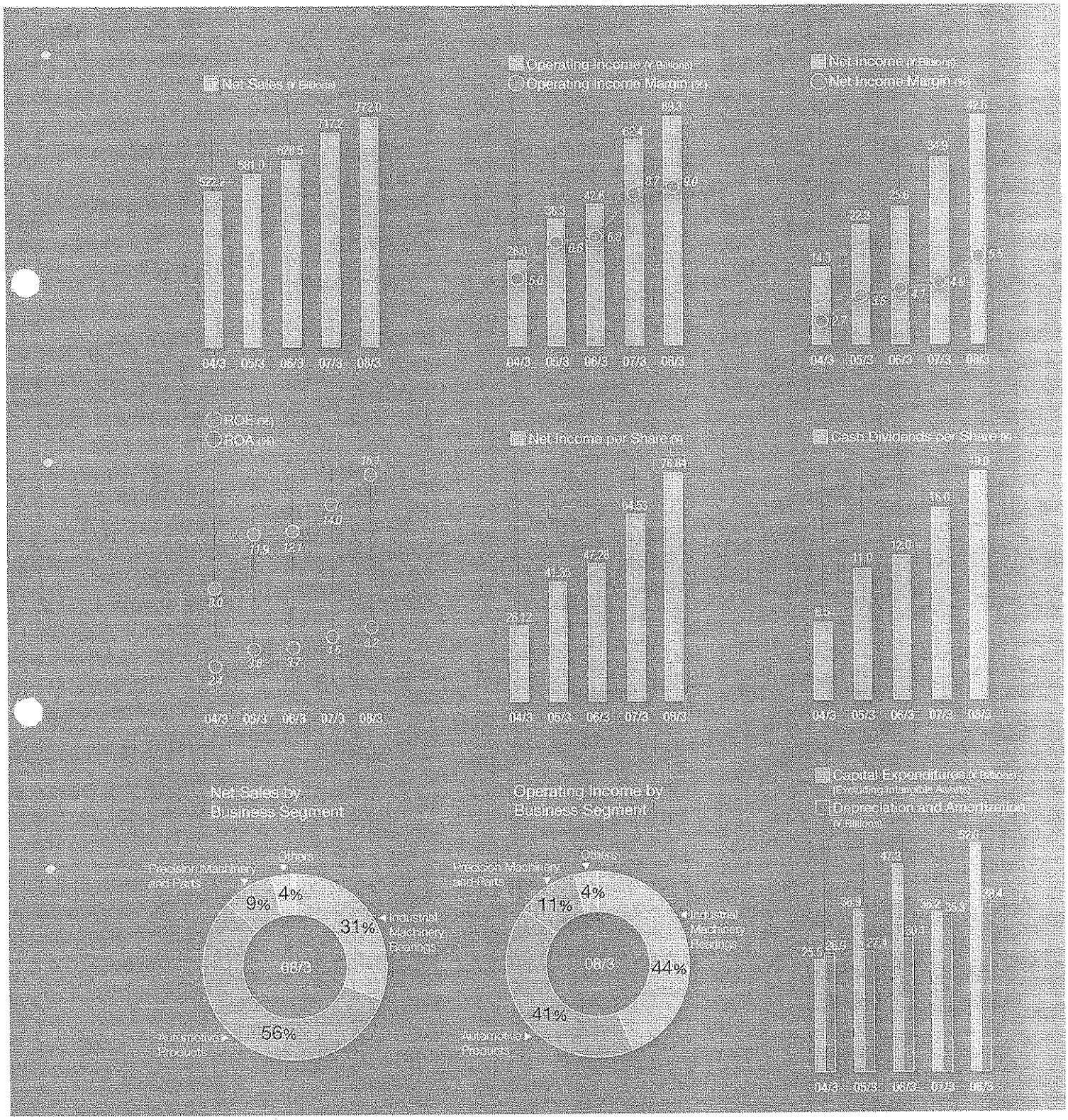
Financial Highlights

NSK Ltd. and Consolidated Subsidiaries

For the years ended March 31	Millions of yen (Unless otherwise specified) 2008	2007	Percent change 2008/2007	Thousands of U.S. dollars (Unless otherwise specified) 2008
For the year:				
Net sales	¥772,936	¥717,225	7.8%	$7,729,360
Gross profit	178,299	166,155	7.3	1,782,990
Operating income	69,343	62,383	11.2	693,430
Net income	42,613	34,853	22.3	426,130
Capital expenditures (excluding intangible assets)	51,971	36,216	43.5	519,710
Depreciation and amortization	38,380	35,316	8.7	383,800
R&D expenditures	10,240	10,100	1.4	102,400
At year-end:				
Total assets	828,580	815,788	1.6	8,285,800
Net assets	283,775	278,727	2.5	2,837,750
Interest-bearing debt	264,413	255,557	3.5	2,644,130
Number of employees (persons)	25,059	23,413	—	—
Cash flows:				
Cash flows from operating activities	69,236	64,153	7.9	692,360
Cash flows from investing activities	(23,187)	(64,600)	—	(231,870)
Cash flows from financing activities	(5,923)	20,929	—	(59,230)
Cash and cash equivalents at end of the year	113,226	73,319	54.4	1,132,260
Per share (¥ or U.S. dollars):				
Net income	78.84	64.53	—	0.785
Net assets	495.61	485.62	—	4.956
Cash dividends	19.0	16.0	—	0.190
Ratios:				
Operating income margin	9.0%	8.7%	—	—
ROA	5.2%	4.5%	—	—
ROE	16.1%	14.0%	—	—
Net D/E ratio (times)	0.56	0.63	—	—

Note: The amounts represented in dollars appearing in this annual report refer to U.S. currency. Yen amounts have been translated at the rate of ¥100=U.S. $1.00, the approximate exchange rate on March 31, 2008, solely for the reader's convenience.

For more detail, please refer to Eleven-year Summary on page 34.


Net Sales
Operating Income
Net Income
Net Sales by Business Segment
Operating Income by Business Segment
Capital Expenditures (Excluding Intangible Assets)
Depreciation and Amortization
Cash Dividends per Share
Net Income per Share
ROE
ROA
Precision Machinery and Parts
Others
Industrial Machinery
Automotive Products
04/3
05/3
06/3
07/3
08/3

Eleven-year Summary

NSK Ltd. and Consolidated Subsidiaries

Year ended March 31	2008	2007	2006	2005
For the year:				
Net sales	¥772,036	¥717,225	¥628,474	¥580,989
Cost of sales and SGA expenses	702,692	654,842	585,922	542,706
Operating income	69,343	62,383	42,552	38,283
Other income (expenses)	(5,730)	(5,346)	516	(3,251)
Income (loss) before income taxes and minority interests	63,613	57,037	43,068	35,031
Income taxes	19,173	20,198	16,412	11,601
Net income (loss)	42,613	34,853	25,586	22,349
Capital expenditures (excluding intangible assets)	51,971	36,216	47,293	36,912
Depreciation and amortization	38,380	35,316	30,099	27,435
R&D expenditures	10,240	10,100	9,728	9,806
Cash flows from operating activities (A)	69,236	64,153	66,332	57,987
Cash flows from investing activities (B)	(23,187)	(64,600)	(62,386)	(31,638)
Free cash flows (A)+(B)	46,049	(447)	3,946	26,349
At year-end:				
Current assets	404,412	389,067	313,569	278,678
Non-current assets	424,167	426,721	429,462	349,905
Total assets	828,580	815,788	743,032	628,583
Current liabilities	294,318	297,489	266,834	234,300
Long-term liabilities	250,486	241,571	228,373	194,420
Net assets	283,775	276,727	247,823	199,861
Total liabilities and net assets	828,580	815,788	743,032	628,583
Number of employees	25,069	23,413	22,639	20,737
Per share (Yen):				
Net income (loss)	¥ 78.84	¥ 64.53	¥ 47.28	¥ 41.35
Net assets	495.61	485.62	436.48	349.07
Ratios:				
Gross profit margin	23.1%	23.2%	22.4%	22.5%
Operating income margin	9.0	8.7	6.8	6.6
SGA expenses/net sales	14.1	14.5	15.6	15.9
Net income margin	5.5	4.9	4.1	3.8
Return on average assets (ROA)	5.2	4.5	3.7	3.6
Return on average shareholders' equity (ROE)	16.1	14.0	12.1	11.9
Ratio of net worth to total capital	32.3	32.2	31.7	30.0
Asset turnover (times)	0.94	0.92	0.92	0.93
Inventory turnover (times)	7.5	7.0	6.9	7.4
Net D/E ratio (times)	0.56	0.69	0.73	0.89
Interest coverage (times)	11.0	11.3	15.0	11.3

Millions of yen
(Unless otherwise specified)

2014	2003	2002	2001	2000	1999	1998
¥ 522,217	¥ 522,820	¥480,902	¥533,144	¥486,539	¥472,614	¥493,151
496,245	504,972	476,954	507,303	471,837	459,622	470,380
25,972	17,847	3,947	25,841	14,701	12,992	22,771
479	(19,974)	(14,271)	(2,528)	(6,101)	(21,312)	(35,166)
26,451	(2,127)	(10,324)	23,312	8,599	(8,319)	(12,395)
11,473	970	7,181	11,132	4,932	(3,696)	2,872
14,293	(2,670)	(17,696)	11,425	2,798	(4,094)	(15,173)
25,502	23,010	36,183	33,872	26,701	24,157	33,373
26,909	28,812	27,536	26,210	26,349	26,155	26,073
8,722	8,307	8,036	9,268	8,777	13,800	12,700
37,889	30,961	30,331	24,444	20,371	—	—
(16,958)	(16,223)	(34,372)	(19,714)	15,244	—	—
20,931	14,738	(4,041)	4,730	35,615	—	—
295,491	285,749	291,490	321,575	392,459	389,091	417,188
326,386	307,349	351,332	358,881	247,631	257,212	257,361
621,877	593,098	642,823	680,457	640,090	646,303	674,549
245,588	227,314	239,378	261,952	262,719	243,544	289,046
175,548	183,481	182,455	179,749	160,951	199,395	169,766
200,739	182,302	220,989	238,755	196,419	203,362	215,736
621,877	593,098	642,823	680,457	640,090	646,303	674,549
19,772	20,351	22,337	23,283	24,295	22,482	22,322
¥ 26.12	¥ (5.22)	¥ (31.79)	¥ 20.35	¥ 4.98	¥ (7.27)	¥ (26.92)
349.83	316.27	378.03	405.12	333.57	353.29	387.18
21.5%	19.6%	18.1%	19.7%	19.1%	19.3%	20.7%
5.0	3.4	0.8	4.8	3.0	2.7	4.6
16.5	16.2	17.3	14.8	16.1	16.6	16.1
2.7	(0.5)	(3.7)	2.1	0.6	(0.9)	(3.1)
2.4	(0.4)	(2.7)	1.7	0.4	(0.6)	(2.2)
8.0	(1.4)	(8.1)	5.5	1.5	(2.0)	(7.0)
30.3	28.8	32.4	33.4	29.3	30.7	31.1
0.86	0.85	0.73	0.81	0.76	0.72	0.72
6.6	5.8	4.8	5.2	4.6	4.3	4.7
0.99	1.22	1.04	0.88	1.07	1.20	1.29
6.1	4.1	4.2	2.5	2.0	—	—

Six-year Segment Information

NSK Ltd. and Consolidated Subsidiaries

Millions of yen

Year Ended March 31	2008	2007	2006	2005	2004	2003
•Sales by Business Segment *1, *2						
Industrial machinery bearings	¥239,058	¥216,338	¥195,556	¥185,473	¥176,299	—
Automotive products	435,705	397,863	353,124	316,169	265,830	—
Precision machinery and parts	68,186	77,719	65,831	64,186	47,072	—
Others	29,087	25,303	13,962	15,160	13,015	—
Total	772,036	717,225	628,474	580,989	522,217	—
•Sales by Business Segment (Previous Segments) *1						
Bearings	—	—	—	—	¥332,826	¥321,960
Automotive components	—	—	—	—	129,303	150,663
Precision machinery and parts	—	—	—	—	47,072	34,898
Others	—	—	—	—	13,016	15,297
Total	—	—	—	—	522,217	522,820
•Increase/Decrease from Previous Year *1						
Industrial machinery bearings	10.5%	10.6%	5.4%	5.2%	—	—
Automotive products	9.5	12.7	11.7	10.6	—	—
Precision machinery and parts	–12.3	18.1	2.6	36.4	—	—
Others	15.0	81.2	–7.9	16.5	—	—
Total	7.6	14.1	8.2	11.3	—	—
•Increase/Decrease from Previous Year (Previous Segments) *1						
Bearings	—	—	—	—	3.4%	6.5%
Automotive components	—	—	—	—	–14.2	17.6
Precision machinery and parts	—	—	—	—	34.9	2.7
Others	—	—	—	—	–14.9	–6.7
Total	—	—	—	—	–0.1	8.7
•Sales by Region (Based on Customer Location)						
Japan	¥388,929	¥364,395	¥330,062	¥310,247	¥278,646	¥279,261
The Americas	107,321	105,111	92,367	82,279	74,885	81,785
Europe	133,853	121,698	98,165	93,625	85,391	81,418
Asia	141,933	126,021	107,880	94,838	83,295	80,356
Total	772,036	717,225	628,474	580,989	522,217	522,820
•Increase/Decrease from Previous Year						
Japan	6.7%	10.4%	6.4%	11.3%	–0.2%	8.4%
The Americas	2.1	13.8	12.3	9.9	–8.4	6.9
Europe	10.0	24.0	4.8	9.6	4.9	5.8
Asia	12.6	16.8	13.8	13.9	3.7	15.1
Total	7.6	14.1	8.2	11.3	–0.1	8.7

*1 NSK has reorganized its corporate structure from a product-oriented to a customer-oriented organization. In line with this change, the Company changed its business segmentation effective the year ended March 31, 2005.

*2 Sales by business segment for the year ended March 31, 2004 have been restated in accordance with the change of segments.

Chapter 1 Company dossier

Company name

NSK Ltd

Business activity

NSK Ltd, headquartered at Tokyo, Japan, through its subsidiaries, engages in the development, manufacture and sale of bearings and automotive products worldwide. In addition, the company manufactures automotive components such as electric power steering (EPS), automatic transmission (AT) and precision machinery and parts such as linear guides and ball screws. The company classifies its business into four segments, namely, Industrial Machinery Bearings segment; Automotive Products segment; Precision Machinery and Parts segment; and Others segment. The Industrial Machinery Bearings segment manufactures various bearings, which include standard ball bearings comprising of miniature, small-sized and normal-sized ball bearings; bearings for general industrial use, such as tapered and cylindrical roller bearings and large-sized ball bearings. The Automotive Products segment offers hub unit bearings, needle roller bearings, small-sized tapered roller bearings, standard ball bearings, steering columns, electric power steering systems and automatic transmission components. The Precision Machinery and Parts segment provides ball screws, linear guides, XY tables, megatorque motors and photofabrication equipment for liquid crystal display color filter production. These products enable the production of various devices, including semiconductors and liquid crystal production equipment, machine tools, injection moulding machines, medical and biotechnology equipment and industrial robots. For the year ended 31 March 2008 (FY 2007/08), NSK posted net sales of JPY772,036m (US$7,774.4m)*, an increase of 7.6% over the sales registered in FY 2006/07.

Note: * Conversion rate employed is JPY 1 = US$ 0.01007 (Source: Oanda.com)

Stock symbol

NSK's common stock is listed and traded on the first section of Tokyo Stock Exchange (TSE) under the code number 6471.

Key executives

Seiichi Asaka, president and chief executive officer (CEO)

Hisashi Machida, senior executive vice president

Norio Otsuka, senior executive vice president

Mitsuo Degawa, executive vice president (EVP), head of Automotive Products segment

Michio Hara, EVP

Masao Shoji, EVP

Akira Tanikawa, senior vice president (SVP)

Nobuyoshi Abe, SVP

Toshihide Shimbo, SVP

Ryoichi Saito, SVP

Yukio Takebe, SVP, head of Industrial Machinery Bearings segment

Shuichi Kobayashi, SVP, head of Precision Machinery and Parts segment

Yoshio Shoda, SVP

Tsutomu Komori, SVP

Kazuo Matsuda, SVP

Summary financials

In millions of JPY	FY 2005/06	FY 2006/07	FY 2007/08
Net sales	628,474	717,225	772,036
Operating income	42,552	62,383	69,343
Ordinary income	38,916	57,595	64,854
Net income	25,586	34,853	42,613

Fiscal year ended 31 March
Source: NSK

Key competitors

NSK competes with Japan-based JTEKT Corporation, Minebea Co Ltd and NTN Corporation; Sweden-based AB SKF and the US-based Timken Company in the bearings category. In the AT category, NSK competes with Japan-based NTN Corporation and Canada-based Magna International. In the EPS systems category, NSK competes with Japan-based JTEKT Corporation; the US-based TRW Automotive and Delphi Corporation and Germany-based Robert Bosch.

Key customers

NSK's major automotive original equipment manufacturer (OEM) customers include General Motors, Daimler, Chrysler, Renault/Nissan, Toyota, Honda and BMW. The company also has some Tier 1 customers, such as Aisin Seiki.

Outlook

NSK had formulated some key strategies as part of its mid-term plan (2006-2008), such as, improving profitability, increasing investments on plants and improving productivity of the plants through advanced production systems (APS). In order to improve its overall quality, NSK strengthened its manufacturing and product development capabilities. The company is focussing on improving profitability from overseas operations, enhancing global management capability and improving its IT systems worldwide. As part of its plan to improve manufacturing capability, the company will concentrate on improving operating efficiency of existing equipment, stabilise processing capabilities, shorten lead-time and improve inventory turnover. NSK will continue further with its cost reduction initiatives and strive towards stabilising its procurement process by strengthening its supplier partnerships. One of the key strategies in the area of new products development will be to raise the sales percentage of the new products. NSK plans to restructure its operations in the North American region. As far as the Asian region is concerned, NSK will increase its production output, especially in its Chinese sites. In the ASEAN region, it plans to focus on motorcycle and automotive production and on the aftermarket.

For FY 2008/09, the company forecasts a 3.6% year on year increase in the net sales to JPY800,000m. The company expects an operating income of JPY71,000m, an increase of 2.4% as compared to the previous fiscal. The company expects its net income to increase by 3.3% to JPY44,000m. The company expects robust demand to continue in the machine tools and industrial machinery markets. In the automotive markets, the company predicts the domestic sales to decrease slightly, while the production for export vehicles is expected to increase a little in FY 2008/09, thus resulting in a flat production year on year. On a geographical basis, the US economic slowdown is expected to continue throughout the fiscal, thus resulting in a reduced demand from the automotive manufacturers. However, demand in high growth economies of Asia and Central Europe is expected to increase further.

The New York Times
Monday, December 8, 2008
Business

Timken Expands Market Share By Acquiring a Bearings Unit

By ANDREW ROSS SORKIN
Published: October 17, 2002

The Timken Company, which makes steel alloys and roller bearings, agreed yesterday to acquire the Ingersoll-Rand Company's precision bearings and motion-control components and assemblies unit for $840 million in cash and stock.

For Timken, the acquisition of the unit, called Torrington, will turn it into the world's third-largest bearings company with about $3.6 billion in annual revenue, with $1.1 billion coming directly from Torrington. The addition of Torrington's set of cylindrical, spherical, needle roller and ball bearings to Timken's tapered roller bearings and alloy steel products group will give it a more complete range of products.

Under terms of the agreement, Ingersoll-Rand will receive $700 million in cash and $140 million in Timken shares. As part of the arrangement, Ingersoll-Rand has agreed not to sell the shares it will receive -- about 11 percent of the company -- for six months after the transaction closes.

Timken, based in Canton, Ohio, said it expected the acquisition to add at least 10 percent to earnings per share in 2003. The company said it also expected to save about $80 million a year by the end of 2005, with about $20 million coming by the end of the first year by reducing manufacturing and administrative costs.

The $700 million cash component of the deal is being financed by a public offering of senior notes underwritten by Bank of America, Merrill Lynch & Company and Morgan Stanley, all of which acted as Timken's financial adviser, and Key Bank. The proceeds from a public offering of 11 million Timken shares will also be used to pay for the transaction.

Separately, Timken reported third-quarter earnings of $10.7 million, or 17 cents a share, excluding restructuring and reorganization charges, compared with a loss of $1.8 million, or 3 cents a share, in the period a year earlier. The latest results beat analysts' estimates of 14 cents a share. Revenue rose to $629 million, from $578 million.

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TIMKEN
Where You Turn

NEWS RELEASE

Timken Reports Record Third-Quarter Earnings

Company reaffirms record full-year earnings outlook

CANTON, Ohio – Oct. 24, 2008 – The Timken Company (NYSE: TKR) today reported record third-quarter sales of $1.48 billion, an increase of 18 percent over the same period a year ago. During the quarter, the company benefited from the favorable impact of surcharges, pricing and currency, as well as acquisitions that serve the aerospace and energy market sectors. Strong sales in global industrial markets largely offset the impact of weaker automotive demand.

Third-quarter income from continuing operations was $130.4 million, or $1.35 per diluted share, compared to $41.2 million, or $0.43 per diluted share, in the third quarter a year ago. Excluding special items, income from continuing operations increased 179 percent to $135.8 million, or $1.41 per diluted share, in the third quarter of 2008, compared to $48.6 million, or $0.51 per diluted share, in the third quarter of 2007. Third-quarter earnings exceeded the company's prior estimate of $1.00 to $1.10, principally due to the impact of last-in, first-out (LIFO) accounting, resulting from projected lower raw-material costs, and the timing of raw-material cost recovery.

The record quarterly earnings benefited from raw-material surcharges, pricing and mix, as well as income from LIFO. These benefits were partially offset by higher manufacturing, logistics and material costs in the quarter compared to a year ago. Third-quarter special items, net of tax, included manufacturing rationalization, impairment and restructuring charges totaling $5.4 million, compared to $7.4 million of similar charges in the third quarter of 2007.

The Timken Company

Media Contact: Jeff Dafler
Manager – Global Media & Government Relations
Mail Code: GNW-37
1835 Dueber Avenue, S.W.
Canton, OH 44706 U.S.A.
Telephone: (330) 471-3514
Facsimile: (330) 471-7032
jeff.dafler@timken.com

Investor Contact: Steve Tschiegg
Director – Capital Markets & Investor Relations
Mail Code: GNE-26
1835 Dueber Avenue, S.W.
Canton, OH 44706 U.S.A.
Telephone: (330) 471-7446
Facsimile: (330) 471-2797
steve.tschiegg@timken.com

For Additional Information:
www.timken.com/media
www.timken.com/investors

"Our strategy of shifting our portfolio toward more attractive global industrial markets is clearly delivering results," said James W. Griffith, Timken's president and chief executive officer. "While the economy today is unsettled, we still see strong demand for our products from aerospace, energy and heavy industry market sectors, as well as growth in Asia. We continue to take actions to deal with declining automotive demand. Our company is well-positioned to navigate the uncertain markets we face."

During the quarter, the company:

- Invested $14 million in a new thermal treatment facility at its steel plant in Canton, Ohio, that will increase capacity primarily suited for use in the energy and industrial market sectors;
- Began production of large-bore bearings at its plant in Wuxi, China, to serve customers in key market sectors including cement, mining, wind energy and rail; and
- Received an improved corporate debt rating from Moody's Investors Service of "Baa3" (investment grade), reflecting the company's strong financial performance and balance sheet.

Total debt at Sept. 30, 2008, was $739.2 million, or 25.1 percent of capital. Net debt at Sept. 30, 2008, was $644.5 million, or 22.6 percent of capital, compared to $693.0 million, or 26.1 percent of capital, at Dec. 31, 2007. The decrease in net debt reflects strong operating cash flow.

In addition to cash and cash equivalents of $94.7 million at Sept. 30, 2008, the company has liquidity available under a $500 million senior credit facility and a $200 million accounts-receivable securitization program. Availability under these committed facilities totaled $563.5 million at Sept. 30, 2008. The company expects to generate positive free cash flow for the remainder of the year and to end 2008 with lower net debt and leverage than last year, providing additional financial capacity to pursue strategic investments.

For the first nine months of 2008, sales were $4.45 billion, an increase of 14 percent from the same period in 2007. Income from continuing operations per diluted share for the first nine months of 2008 was $3.15, compared to $1.79 last year. Special items, net of tax, in the first nine months of 2008 totaled $3.3 million of expense compared to $9.7 million of expense in the prior-year period. These special items included charges related to restructuring, rationalization and impairment, partially offset by a gain on a real-estate divestment associated with a prior plant closure. Excluding special items, income from continuing operations per diluted share in the first nine months of 2008 increased 69 percent to $3.19, versus $1.89 in the same period a year ago.

During the first nine months of 2008, the company benefited from strong industrial market demand, pricing, surcharges, mix and currency, which were partially offset by higher raw-material costs and related LIFO charges, and the impact of lower automotive demand.

Bearings and Power Transmission Group Results

The Bearings and Power Transmission Group had third-quarter sales of $1.00 billion, up 8 percent from $918 million for the same period last year. The group benefited from strong markets within its Process Industries and Aerospace and Defense segments, while Mobile Industries markets were weaker. The group benefited from the favorable impact of the Purdy acquisition, pricing and currency, which were partially offset by weaker demand in the Mobile Industries segment.

Bearings and Power Transmission Group earnings before interest and taxes (EBIT) for the third quarter were $98.8 million, up 123 percent from $44.2 million in the third quarter of 2007, benefiting from strong global industrial demand, pricing, shifting capacity to more profitable segments and currency, which were partially offset by high material costs and weakness in automotive markets. The group also experienced higher manufacturing costs associated with serving strong industrial demand, compared to the year-ago period.

For the first nine months of 2008, Bearings and Power Transmission Group sales were $3.11 billion, up 10 percent from the same period a year ago. EBIT for the first nine months of 2008 was $282.4 million, or 9.1 percent of sales, compared to EBIT of $165.9 million, or 5.9 percent of sales, in the first nine months of 2007.

Mobile Industries Segment Results

In the third quarter, Mobile Industries sales were $539.0 million, a decrease of 8 percent from $586.7 million for the same period a year ago. Sales declined as a result of lower demand from the North American and European light-vehicle market sectors. Stronger demand in the heavy-truck and off-highway market sectors and pricing partially offset the drop in light-vehicle demand.

Third-quarter 2008 EBIT was $4.7 million, down 55 percent from $10.4 million in the third quarter of 2007. Results benefited from pricing and mix, which were more than offset by higher material and logistics costs, and the underutilization of manufacturing capacity due to lower demand. In addition, the company continued to increase its accounts-receivable reserves for automotive customers. During the quarter, the company further reduced total employment levels and temporarily idled factories beyond normal seasonal shutdowns in response to weakness in demand.

For the first nine months of 2008, Mobile Industries sales of $1.80 billion were down 1 percent from the same period a year ago. EBIT for the first nine months of 2008 was $45.6 million, or 2.5 percent of sales, compared to EBIT of $55.9 million, or 3.1 percent of sales, in the first nine months of 2007.

The company expects fourth-quarter 2008 Mobile Industries performance to be below the prior-year period, as lower demand in the light-vehicle and rail market sectors and higher raw-material costs are anticipated to more than offset strong pricing compared to 2007. The company expects full-year results to be below 2007 levels for the Mobile Industries segment.

Process Industries Segment Results

Process Industries had third-quarter sales of $346.3 million, up 33 percent from $260.7 million for the same period a year ago. The increase was driven by strong

demand across broad industrial market sectors, which was supplied through new capacity coming online and shifting capacity from other market sectors. In addition, the company benefited from strong pricing and currency.

Third-quarter EBIT was $81.7 million, up 144 percent from $33.4 million in the prior-year period. EBIT benefited from strong volume, increased capacity for large-bore products and pricing, partially offset by higher raw-material and manufacturing costs.

For the first nine months of 2008, Process Industries sales were $987.3 million, up 27 percent from the same period a year ago. EBIT for the first nine months of 2008 was $205.1 million, or 20.8 percent of sales, compared to EBIT of $98.8 million, or 12.7 percent of sales, in the first nine months of 2007.

Timken expects to see increased sales and earnings in the Process Industries segment during the fourth-quarter of 2008 compared to 2007, driven by end-market demand, increased capacity and improved pricing.

Aerospace and Defense Segment Results

Aerospace and Defense had third-quarter sales of $110.0 million, up 56 percent from $70.4 million for the same period last year. Approximately half of the increase in sales was driven by the Purdy acquisition, completed in the fourth quarter of last year, with the remainder due to strong demand and favorable pricing.

Third-quarter EBIT was $12.5 million, up significantly from $0.4 million in the prior-year period. Performance benefited from the Purdy acquisition, pricing, volume and improved manufacturing productivity, partially offset by investments in capacity expansions, including the aerospace and precision products plant in Chengdu, China.

For the first nine months of 2008, Aerospace and Defense sales were $317.8 million, up 45 percent from the same period a year ago. The Purdy acquisition accounted for approximately 60 percent of the sales increase. EBIT for the first nine months of 2008 was $31.8 million, or 10.0 percent of sales, compared to EBIT of $11.1 million, or 5.1 percent of sales, in the first nine months of 2007.

Timken expects aerospace demand to remain strong during the fourth quarter and earnings to be comparable with the same period last year.

Steel Group Results

In the third quarter, sales for the Steel Group, including inter-group sales, were $536.5 million, an increase of 41 percent from $381.1 million for the same period last year. The increase was driven by raw-material surcharges, the impact of the Boring Specialties acquisition completed in the first quarter of 2008, and favorable mix as a result of higher demand across all market sectors, except automotive.

Third-quarter EBIT was $133.8 million, up 156 percent from $52.3 million in the prior-year period. Compared to the same period a year ago, results benefited from the timing of surcharges in excess of raw-material costs, and better mix. The rapid decline in material costs at the end of the third quarter resulted in LIFO income, compared to LIFO expense in the third quarter of 2007. These factors more than offset weaker automotive demand and the impact of inflation.

For the first nine months of 2008, Steel Group sales were $1.48 billion, up 25 percent over the first nine months of last year. EBIT for the first nine months of 2008 was $267.5 million, or 18.1 percent of sales, compared to EBIT of $183.7 million, or 15.5 percent of sales in the same period last year.

The company anticipates fourth-quarter Steel Group performance to be below the prior-year period due primarily to raw-material costs not fully offset by surcharges during the quarter and the impact of lower automotive production volumes. The negative impact from material cost recovery is due to timing, as the company benefited from surcharges in excess of its material costs in the third quarter of 2008.

Outlook

The global economic outlook continues to soften, while credit markets are expected to remain constrained. The company is seeing weakness in its North American and Western European markets, while demand in Asia continues to grow

at a slower pace. Demand for the company's products in aerospace, energy and heavy industry markets remains relatively strong on a global basis.

The company expects earnings per diluted share for 2008, excluding special items, to be $3.35 to $3.45 for the year and $0.16 to $0.26 for the fourth quarter, compared to $2.40 and $0.51, respectively, for the same periods in 2007. Fourth-quarter expectations are below the company's previous estimate due primarily to the timing of raw-material cost recovery in the Steel Group, which benefited the third quarter, and weaker automotive demand for both Steel and Mobile Industries. The company has reaffirmed its expectation for record full-year earnings.

Conference Call Information

The company will host a conference call for investors and analysts today to discuss financial results.

Conference Call:	Friday, Oct. 24, 2008 9 a.m. Eastern Time
Live Dial-In:	800-344-0593 or 706-634-0975 (Call in 10 minutes prior to be included.) Conference ID: 24735640 Replay Dial-In through Nov. 3, 2008: 800-642-1687 or 706-645-9291
Live Webcast:	www.timken.com/investors

About The Timken Company

The Timken Company (NYSE: TKR, http://www.timken.com) keeps the world turning, with innovative friction management and power transmission products and services, enabling our customers to perform faster and more efficiently. With sales of $5.2 billion in 2007, operations in 27 countries and approximately 25,000 employees, Timken is Where You Turn™ for better performance.

Certain statements in this news release (including statements regarding the company's forecasts, estimates and expectations) that are not historical in nature are "forward-looking" statements within the meaning of the Private Securities Litigation Reform Act of 1995. In particular, the statements related to expectations regarding the future performance of the specific reporting segments and the company's financial performance, including the information under the heading "Outlook," are forward-looking. The company cautions that actual results may differ materially from those projected or implied in forward-looking statements due to a variety of important factors, including: the finalization of the company's financial

statements for the third quarter of 2008; fluctuations in raw-material and energy costs and their impact on the operation of the company's surcharge mechanisms; the impact of the company's LIFO accounting; the company's ability to respond to the changes in its end markets that could affect demand for the company's products, especially in the automotive industry; changes in the global economic and financial markets; changes in the financial health of the company's customers; changes in the expected costs associated with product warranty claims; the impact on operations of general economic conditions, higher raw-material and energy costs, fluctuations in customer demand; and the company's ability to achieve the benefits of its future and ongoing programs and initiatives, including, without limitation, the implementation of its Mobile Industries Segment restructuring program and initiatives and the rationalization of the company's Canton bearing operations. These and additional factors are described in greater detail in the company's Annual Report on Form 10-K for the year ended Dec. 31, 2007, page 40 and in the company's Form 10-Q for the quarter ended June 30, 2008. The company undertakes no obligation to update or revise any forward-looking statement.

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(Unaudited)

CONDENSED CONSOLIDATED STATEMENT OF INCOME

(Dollars in thousands, except share data)	AS REPORTED Q3 2008	AS REPORTED Q3 2007	AS REPORTED Nine Months 2008	AS REPORTED Nine Months 2007	ADJUSTED (1) Q3 2008	ADJUSTED (1) Q3 2007	ADJUSTED (1) Nine Months 2008	ADJUSTED (1) Nine Months 2007
Net sales	$ 1,482,684	$ 1,261,239	$ 4,452,903	$ 3,894,983	$ 1,482,684	$ 1,261,239	$ 4,452,903	$ 3,894,983
Cost of products sold	1,075,595	1,005,448	3,388,291	3,072,631	1,075,595	1,005,448	3,388,291	3,072,631
Manufacturing rationalization/reorganization expenses - cost of products sold	333	5,382	2,575	27,945	-	-	-	-
Gross Profit	$ 406,756	$ 250,409	$ 1,062,037	$ 794,407	$ 407,089	$ 255,791	$ 1,064,612	$ 822,352
Selling, administrative & general expenses (SG&A)	194,027	169,989	566,517	511,942	194,027	169,989	566,517	511,942
Manufacturing rationalization/reorganization expenses - SG&A	(369)	852	1,690	2,831	-	-	-	-
(Gain) loss on divestitures	-	152	(8)	468	-	-	-	-
Impairment and restructuring	3,330	11,840	8,013	32,870	-	-	-	-
Operating Income	$ 209,768	$ 67,576	$ 485,825	$ 246,296	$ 213,062	$ 85,802	$ 498,095	$ 310,410
Other (expense)	(683)	(3,933)	(8,325)	(10,753)	(683)	(3,933)	(8,325)	(10,753)
Special items - other (expense) income	(558)	983	19,987	3,355	-	-	-	-
Earnings Before Interest and Taxes (EBIT) (2)	$ 208,527	$ 64,626	$ 497,487	$ 238,898	$ 212,379	$ 81,869	$ 489,770	$ 299,657
Interest expense, net	(9,630)	(8,317)	(29,357)	(24,886)	(9,630)	(8,317)	(29,357)	(24,886)
Income From Continuing Operations Before Income Taxes	198,897	56,309	468,130	214,012	202,749	73,552	460,413	274,771
Provision for income taxes	68,484	15,066	164,309	42,914	66,922	24,954	153,317	93,972
Income From Continuing Operations	$ 130,413	$ 41,243	$ 303,821	$ 171,098	$ 135,827	$ 48,598	$ 307,096	$ 180,799
Income from discontinued operations net of income taxes, special items (3)	-	-	-	665	-	-	-	-
Net Income	$ 130,413	$ 41,243	$ 303,821	$ 171,763	$ 135,827	$ 48,598	$ 307,096	$ 180,799
Earnings Per Share - Continuing Operations	$ 1.36	$ 0.43	$ 3.18	$ 1.81	$ 1.42	$ 0.51	$ 3.21	$ 1.91
Earnings Per Share - Discontinued Operations	-	-	-	0.01	-	-	-	-
Earnings Per Share	$ 1.36	$ 0.43	$ 3.18	$ 1.82	$ 1.42	$ 0.51	$ 3.21	$ 1.91
Diluted Earnings Per Share - Continuing Operations	$ 1.35	$ 0.43	$ 3.15	$ 1.79	$ 1.41	$ 0.51	$ 3.19	$ 1.89
Diluted Earnings Per Share - Discontinued Operations	-	-	-	0.01	-	-	-	-
Diluted Earnings Per Share	$ 1.35	$ 0.43	$ 3.15	$ 1.80	$ 1.41	$ 0.51	$ 3.19	$ 1.89
Average Shares Outstanding	95,878,978	95,029,369	95,574,420	94,494,531	95,878,978	95,029,369	95,574,420	94,494,531
Average Shares Outstanding-assuming dilution	96,468,621	96,095,860	96,314,814	95,483,420	96,468,621	96,095,860	96,314,814	95,483,420

BUSINESS SEGMENTS

(Dollars in thousands) (Unaudited)	Q3 2008	Q3 2007	Nine Months 2008	Nine Months 2007
Mobile Industries Segment				
Net sales to external customers	$ 538,967	$ 586,736	$ 1,802,457	$ 1,828,688
Adjusted earnings (loss) before interest and taxes (EBIT) (2)	4,673	10,401	45,599	$55,905
Adjusted EBIT Margin (2)	0.9%	1.8%	2.5%	3.1%
Process Industries Segment				
Net sales to external customers	$ 345,482	$ 260,062	$ 985,198	$ 774,676
Intergroup sales	784	600	2,063	1,451
Total net sales	$ 346,266	$ 260,662	$ 987,261	$ 776,127
Adjusted earnings before interest and taxes (EBIT) (2)	81,678	33,414	205,056	$98,837
Adjusted EBIT Margin (2)	23.6%	12.8%	20.8%	12.7%
Aerospace and Defense Segment				
Net sales to external customers	$ 109,987	$ 70,429	$ 317,795	$ 218,513
Adjusted earnings before interest and taxes (EBIT) (2)	12,489	425	31,792	$11,117
Adjusted EBIT Margin (2)	11.4%	0.6%	10.0%	5.1%
Total Bearings and Power Transmission Group				
Net sales to external customers	$ 994,436	$ 917,227	$ 3,105,450	$ 2,821,877
Intergroup sales	784	600	2,063	1,451
Total net sales	$ 995,220	$ 917,827	$ 3,107,513	$ 2,823,328
Adjusted earnings before interest and taxes (EBIT) (2)	98,840	44,240	282,447	165,859
Adjusted EBIT Margin (2)	9.9%	4.8%	9.1%	5.9%
Steel Group (3)				
Net sales to external customers	$ 488,248	$ 344,012	$ 1,347,453	$ 1,073,106
Intergroup sales	48,291	37,100	133,002	109,067
Total net sales	$ 536,539	$ 381,112	$ 1,480,455	$ 1,182,173
Adjusted earnings before interest and taxes (EBIT) (2)	133,802	52,278	267,499	183,692
Adjusted EBIT Margin (2)	24.9%	13.7%	18.1%	15.5%
Unallocated corporate expense	(19,039)	(14,370)	(54,767)	(48,124)
Intergroup eliminations income (expense) (4)	($1,224)	($279)	($5,409)	(1,770)
Consolidated				
Net sales to external customers	$ 1,482,684	$ 1,261,239	$ 4,452,903	$ 3,894,983
Adjusted earnings before interest and taxes (EBIT) (2)	$ 212,379	$ 81,869	$ 489,770	$ 299,657
Adjusted EBIT Margin (2)	14.3%	6.5%	11.0%	7.7%

(1) "Adjusted" statements exclude the impact of impairment and restructuring, manufacturing rationalization/reorganization and special charges and credits for all periods shown.

(2) EBIT is defined as operating income plus other income (expense). EBIT Margin is EBIT as a percentage of net sales. EBIT and EBIT margin on a segment basis exclude certain special items set forth above. EBIT and EBIT Margin are important financial measures used in the management of the business, including decisions concerning the allocation of resources and assessment of performance. Management believes that reporting EBIT and EBIT Margin best reflect the performance of the company's business segments and EBIT disclosures are responsive to investors.

(3) Discontinued Operations reflects the Dec. 8, 2006 sale of Timken Latrobe Steel. Steel Group Net sales and Adjusted EBIT have been changed to exclude Timken Latrobe Steel for all periods. Income From Discontinued Operations Net of Income Taxes, Special Items includes the gain on sale.

(4) Intergroup eliminations represent intergroup profit or loss between the Steel Group and the Bearings and Power Transmission Group.


TIMKEN
Corporate Summary

2007 Financial Highlights*

(*dollars in thousands, except per share data)

Net sales	$ 5,236,020
Net income	$ 220,054
Earnings per share, diluted	$2.30
Dividends per share	$ .66

The Timken Company is a leading global provider of highly engineered bearings, power transmission solutions and high-quality alloy steels. We serve a wide range of industries through our Bearings and Power Transmission Group business segments – Aerospace and Defense, Process Industries and Mobile Industries – and our Steel Group.

Major Products and Services

- Aerospace components and services
- Alloy steel bars and tubing
- Bearings, assemblies and related parts
- Bearing maintenance tools
- Condition monitoring systems and services
- Engineering and technical services
- Grease and lubricators
- Helicopter transmissions and rotorhead assemblies
- Precision steel components
- Repair and refurbishing services
- Sensor products
- Training

Fast Facts

- Established in 1899
- Total number of associates worldwide: 25,000
- Total number of facilities: 62 plants and 104 sales offices, technology centers and distribution warehouses located in 27 countries on six continents
- Paid 342nd consecutive quarterly dividend in 2007
- Listed on the New York Stock Exchange since 1922

Technology

Timken's technology footprint spans the globe. Our 12 technology centers are located in Bangalore, India; Brno, Czech Republic; Colmar, France; Künsebeck, Germany; Ploeisti, Romania; and the United States in Canton and North Canton, OH; Greenville, SC; Lebanon and Keene, NH; Manchester, CT; and Mesa, AZ.

Quality

Quality is the cornerstone of our brand promise and a key to our global competitiveness. Timken associates are trained in quality processes to ensure that customers receive consistent and excellent quality in our products and services.

- As of 2007, Timken received more than 300 customer quality awards.
- As of 2007, Timken's plants and distribution centers received 105 quality certifications under ISO 9001, ISO/TS 16949, AS9100, M-1003 and other quality certifications.

Global Citizenship

Operating with ethics and integrity is one of our core values. Making ethical business decisions and treating people with respect are embedded in the company's culture.

Our values are the foundation for how we interact with the world.

Timken has a long tradition of supporting the communities in which it operates. Each year, Timken contributes millions of dollars to social and educational programs. Associates are encouraged to volunteer their time to local efforts.

Just as we act to sustain healthy communities, we also are committed to sustaining the environment.

- As of 2007, 28 plants received ISO 14001 environmental certification.
- We melt nearly 600,000 tons of shredded scrap each year to make steel. The scrap consists of a 50/50 blend of autos and appliances.
- Through our wastewater recycling program in Canton, OH, approximately 8 billion gallons of water are reused each year.

Recent Acquisitions

- Boring Specialties, Inc. assets, Houston, TX
  Deep-hole oil and gas drilling and extraction products and services.
- Purdy Corporation assets, Manchester, CT
  Design, manufacturing, testing, overhaul and repair of helicopter transmissions, rotorhead assemblies and other aircraft components.

Locations

	Offices	Plants	Distribution/ Service Centers	Technology Facilities
ARGENTINA				
Buenos Aires	■		■	
AUSTRALIA				
Ballarat	■		■	
Brisbane	■			
Melbourne	■			
Perth	■			
Sydney	■			
BRAZIL				
São Paulo	■	■■	■	
CANADA				
Bedford		■		
St.Thomas		■		
Mississauga (Toronto)	■			
CHINA				
Beijing	■			
Chengdu	■	■		
Guangzhou	■			
Hong Kong	■			
Shanghai	■		■	
Shenyang	■			
Wuxi	■	■■■		
Yantai		■		
CZECH REPUBLIC				
Brno				■
Olomouc	■	■		
Prague	■			
ENGLAND				
Coventry	■		■	
Leicester	■			
Northampton	■	■		
Pontefract	■			
Wolverhampton	■	■■		

	Offices	Plants	Distribution/ Service Centers	Technology Facilities
FRANCE				
Cachan	■			
Colmar	■	■	■	■
Maromme	■	■		
Moult	■	■		
Strasbourg	■		■	
Vierzon	■	■		
GERMANY				
Haan	■			
Künsebeck	■	■	■	■
Stuttgart	■			
HUNGARY				
Budapest	■			
INDIA				
Bangalore	■			■
Chennai		■		
Jamshedpur	■	■		
Kolkata	■			
New Delhi	■			
Pune	■			
ITALY				
Brescia	■	■		
Milan	■			
JAPAN				
Yokohama	■			
KOREA				
Seoul	■			
LUXEMBOURG				
Luxembourg	■			
MEXICO				
Mexico City	■		■	
NETHERLANDS				
Medemblik	■	■	■	

	Offices	Plants	Distribution/ Service Centers	Technology Facilities
POLAND				
Sosnowiec	▪▪	▪		
Warsaw	▪			
ROMANIA				
Ploiesti	▪	▪		▪
RUSSIA				
Moscow	▪			
SINGAPORE				
Singapore	▪		▪	
SOUTH AFRICA				
Benoni	▪	▪	▪	
SPAIN				
Bilbao	▪	▪	▪	
Madrid	▪			
TAIWAN				
Taipei	▪			
TURKEY				
Istanbul	▪			
UNITED STATES				
Altavista, VA		▪		
Atlanta (Dacula), GA	▪			
Bettendorf, IA	▪			
Boca Raton, FL	▪			
Bucyrus, OH		▪	▪	
Cairo, GA		▪		
Canton (Ball Ground), GA		▪		
Canton, OH	▪	▪▪▪▪▪▪		▪
Carlyle, IL		▪		
Charlotte, NC	▪			
Chicago (Romeoville), IL	▪			
Cleveland, OH	▪			
Columbus (Tryon Peak), NC		▪		
Dahlonega, GA		▪		

	Offices	Plants	Distribution/ Service Centers	Technology Facilities
UNITED STATES (continued)				
Detroit, MI	▪			
Eaton (St. Clair), OH		▪		
Gaffney, SC		▪		
Greenville, SC				▪
Honea Path, SC		▪		
Houston, TX	▪▪	▪		
Iron Station (Lincolnton), NC		▪		
Irving (Dallas), TX	▪			
Keene, NH	▪	▪		▪
Lebanon, NH	▪	▪		▪
Lenexa, KS		▪		
Los Alamitos, CA	▪	▪		
Manchester, CT	▪	▪		▪
Mascot (Knoxville), TN	▪	▪		
Mesa, AZ	▪	▪		▪
Milwaukee, WI	▪			
New Philadelphia, OH		▪		
Niles, OH		▪		
North Canton, OH				▪
Ogden, UT		▪		
Peoria, IL	▪			
Philadelphia, PA	▪			
Pittsburgh, PA	▪			
Pulaski, TN		▪		
Randleman (Asheboro), NC		▪		
Rutherfordton (Shiloh), NC		▪		
South Bend, IN		▪		
Spartanburg (Duncan), SC			▪	
Sylvania, GA		▪		
Tucson, AZ		▪		
Union (Tyger River), SC		▪		
Walhalla, SC		▪		
VENEZUELA				
Caracas	▪			
TOTAL	77	62	15	12

Eye on the Ball
Jennifer Pellet
Chief Executive; Apr/May 2008; 233; ABI/INFORM Global
pg. 17

entirely different set of customers—to what we do in Germany or France or Australia isn't an easy concept."

In addition to forging a corporate culture capable of embracing the local cultures of LexisNexis outposts across the globe, Prozes faced the challenge of shifting the company's business focus. "We've essentially taken the information we have and added technology-based workflow tools to allow, typically, legal practitioners, but other information practitioners as well, to do their jobs better and more quickly," he explains.

Much of that additional technology came to LexisNexis through a series of acquisitions—35 over the past nine years—which had to be integrated into the company's offerings and sold to a client base spread out over more than 100 countries.

"Lawyers all over the world need to handle their practices, get new clients, handle litigation, apply for patents and so on," says Prozes. Delivering such information-based solutions to lawyers across the globe comprises the bulk of LexisNexis' total revenue—about 75 percent.

While the U.S. market still accounts for a hefty two-thirds of that revenue, the balance is beginning to shift. LexisNexis already has significant business in the U.K., France, Canada, Australia and Germany, and Prozes expects "explosive growth" in markets like India, Taiwan, Korea and China.

In addition to that global growth, he's banking on the fast-growing sector of risk information analysis (RIA) to continue to drive LexisNexis' profits going forward.

"RIA has grown dramatically, and continues to grow in the double digits," says Prozes, who says the credit card boom and security concerns are the principal drivers of that growth. "Laws about [privacy] are much more stringent here in the U.S. and in the U.K., which means that you have to rely much, much more on news articles to verify that people are who they say they are—and we have by far the largest database of news articles of anybody else on the face of the Earth." ▲

Eye on the Ball

Ward J. "Tim" Timken, chairman of Canton, Ohio-based **Timken Co.,** once got a major dose of brand affirmation by pulling into a Kansas filling station. When the gas station attendant recognized the name on Timken's credit card, he disappeared into the back of the garage to retrieve a greasy bearing. "He slapped it down in front of me and said, 'I just pulled that off the back end of my pickup truck. I could have put it right back in there and it would have run for another 200,000 miles!'" recounts Timken.

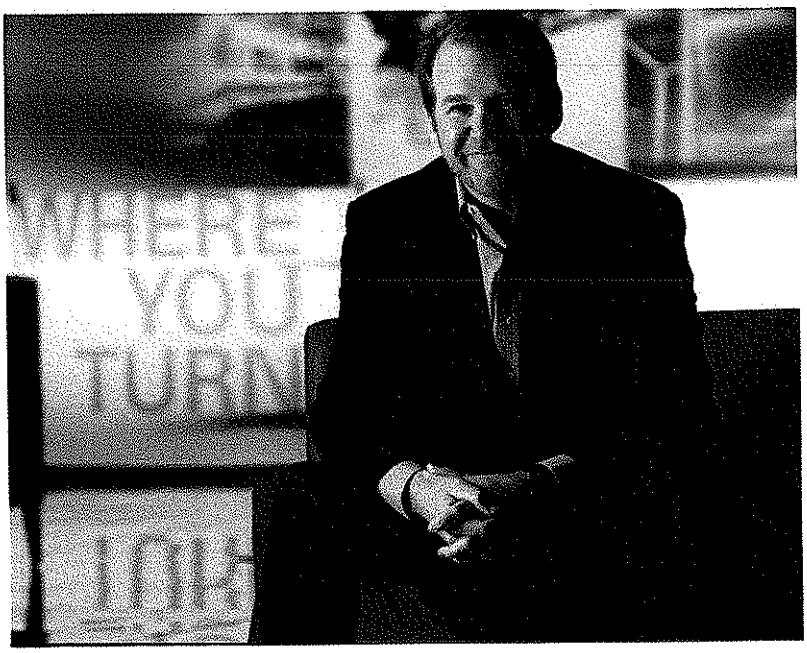
As the fifth chairman of the $5.2 billion friction management and power transmission solutions company that his family took public in the 1920s, Timken continues to follow a business credo set by his great-great-grandfather: "If it's got the Timken brand on it, it will do exactly what we said it would." Yet, a great deal else about Timken Co. has changed dramatically since Henry Timken founded the company to manufacture the tapered

roller bearing he invented in 1899—and most of that change took place over the past decade.

"Six years ago when we had a new management team coming in, we looked at the market potential of selling tapered roll bearings and steel and we said, 'It's not good enough,'" explains Timkens, who notes that at the time, the industry overall was struggling through a period of dampened demand and consolidation. "We stepped back and said, "'What are we really good at that we can create value doing?'"

The answer? Managing friction and transmitting power—in other words, the knowledge behind the bearings and steel products Timken Co. was best known for producing rather than simply the products themselves. "We've been making bearings for more than 100 years, and steel for 80," says Timken. "Marry those two together and we're uniquely positioned to understand what happens to that bearing inside of your application—whether that's wind energy, an airplane or a rolling mill—because we touch all of those industries and have done so for an awfully long time."

That expanded view of its role in the marketplace led to a transformation period for the company, which began to make inroads into new industrial markets, expand globally and make productivity improvements, as well as pursue strategic acquisitions (most recently Boring Specialties in February and The Purdy Corp. in 2007) and divestitures. "Investing for the long term by driving productivity, investing in technology, knowing what we're good at and not getting into things we're not good at is how we've been able to put together year-over-year growth and improvement," notes Timkin, who reports that over the past decade energy consumption per ton of steel produced has dropped by 35 percent.



Timken Co.'s Tim Timken

At the same time, infrastructure buildouts in emerging economies of China and India have been driving an increase in demand within the aerospace, oil and gas, and mining sectors that Timken Co. and competitors like Sweden's SKF and Germany's Schaeffler Group service. In fact, Timken Co.'s own international sales have doubled, jumping from 15 to 30 percent over the past 10 years.

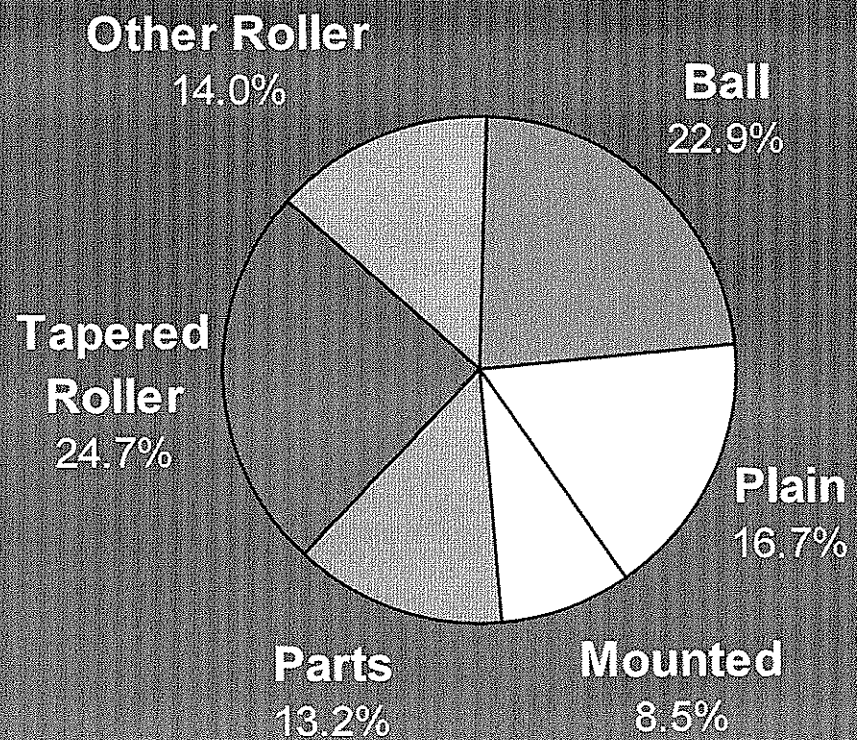
"There's a fundamental shortage of capacity around the world right now," says Timken, who shrugs off the suggestion that the company could suffer a setback due to the looming threat of a U.S. recession. "Everybody's broad-brushing industries with this subprime crisis, but it's not fact-based. As long as we continue to see 10 to 12 percent growth in China and an increasing growth rate in India, things will remain relatively firm."

In fact, over the next five years, Timken expects the pace of international growth to intensify. "If you're not growing at 20 to 25 percent in Asia, you're doing something wrong," he says. "I expect 45 percent of our sales to be coming from outside the U.S. within five years. An economy is being created before our very eyes, and a lot of what we do enables that growth. We provide the bearings that make the steel mills and concrete plants run and the wind energy work. That's what we're all about." ▲

PHOTO/WWW.KEITHBEBER.COM

US Bearing Industry Size, 2006

Shipments by Type ($8,440 million)



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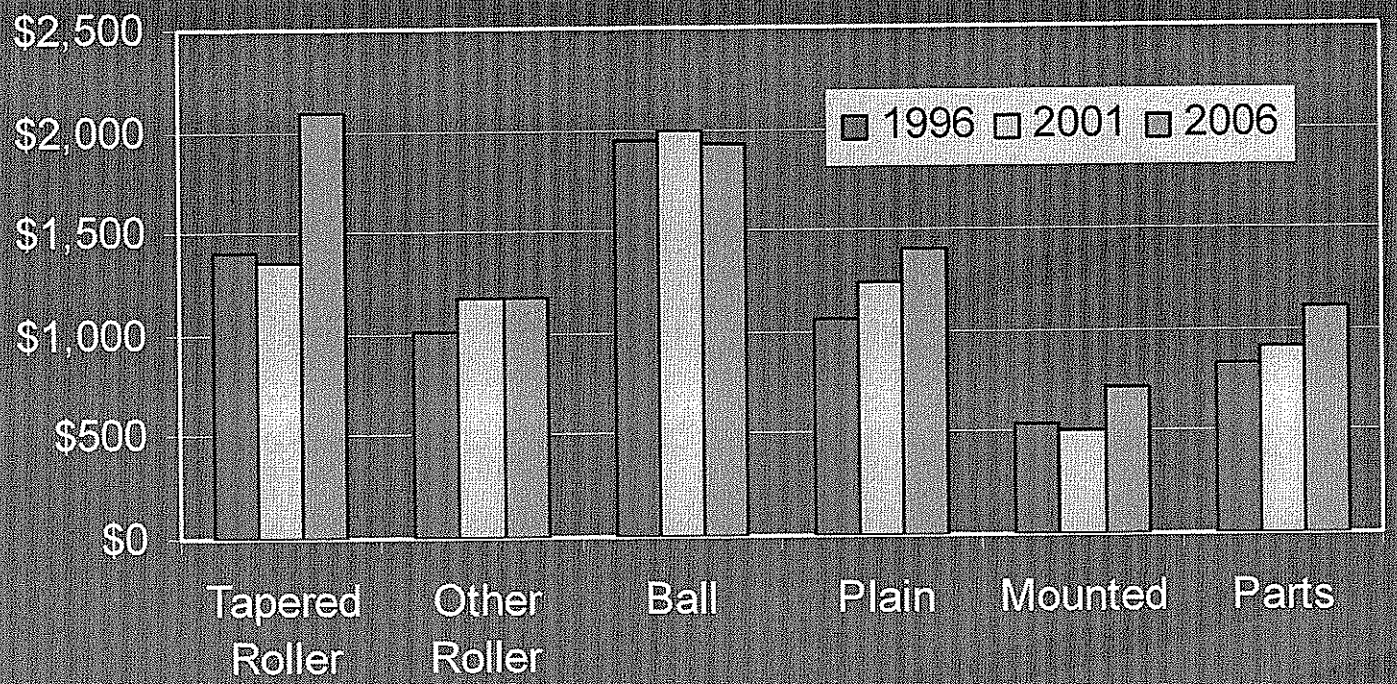
Freedonia 2006 US Bearing Industry Study 4

US Bearing Industry Growth, 1996-2006

Shipments (Millions of Dollars)



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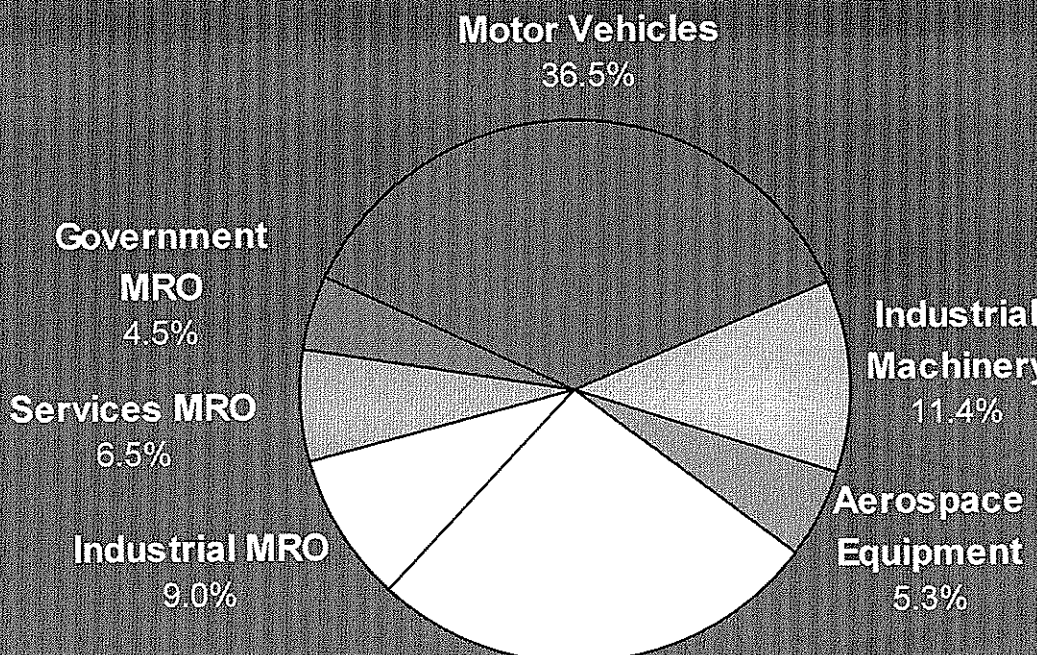
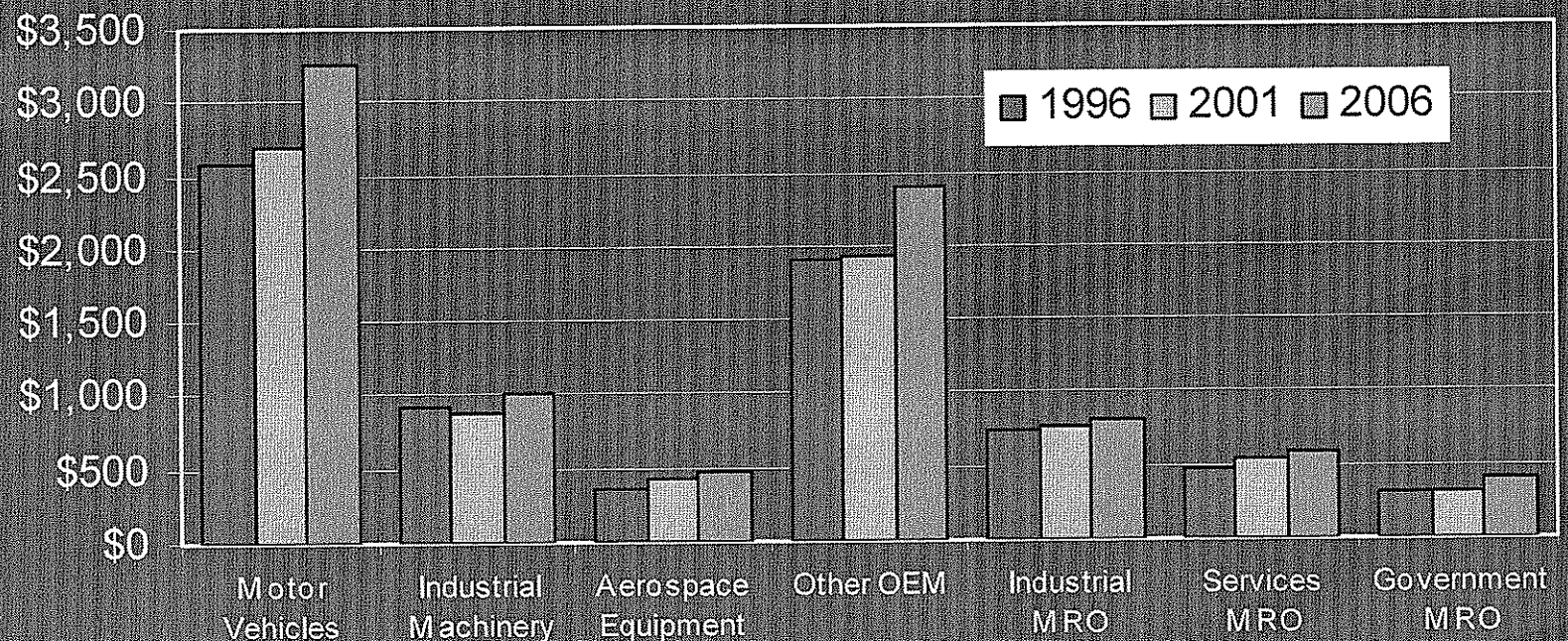
Major Bearing Markets, 2006

Demand by Market ($8,920 million)



Sales Growth by Major Market, 1996-2006

Demand (Millions of Dollars)



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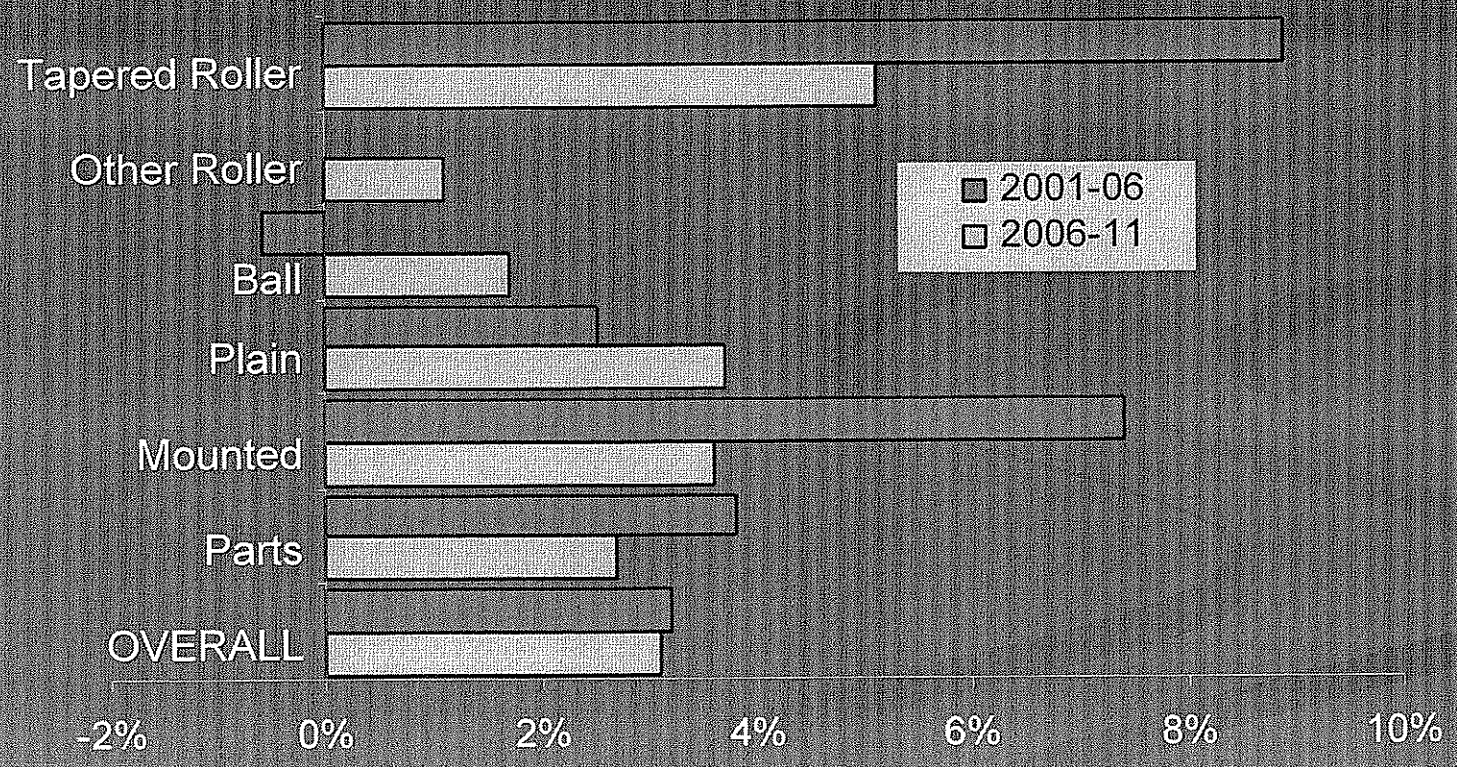
Projected Growth in US Bearing Shipments

Average Annual Percent Change



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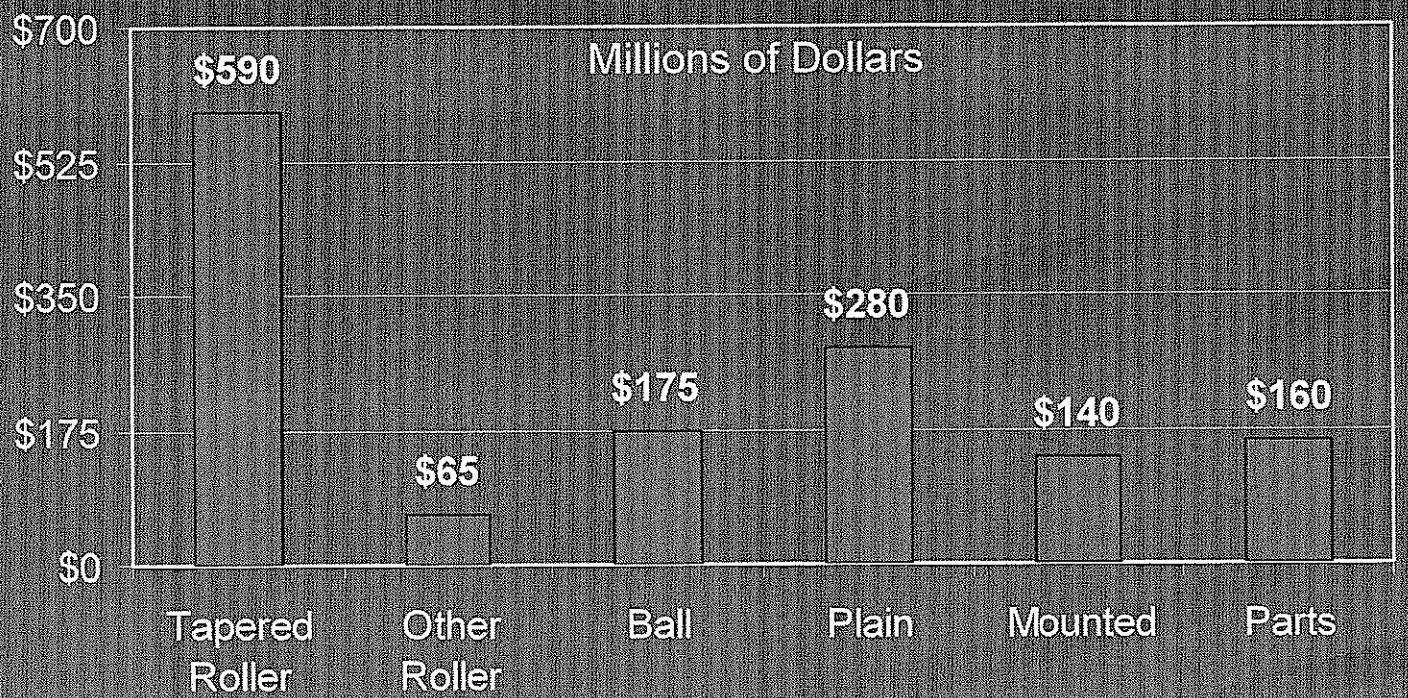
Projected Growth in US Bearing Shipments

Additional Bearing Shipments – 2011 Versus 2006 ($1,410 million)



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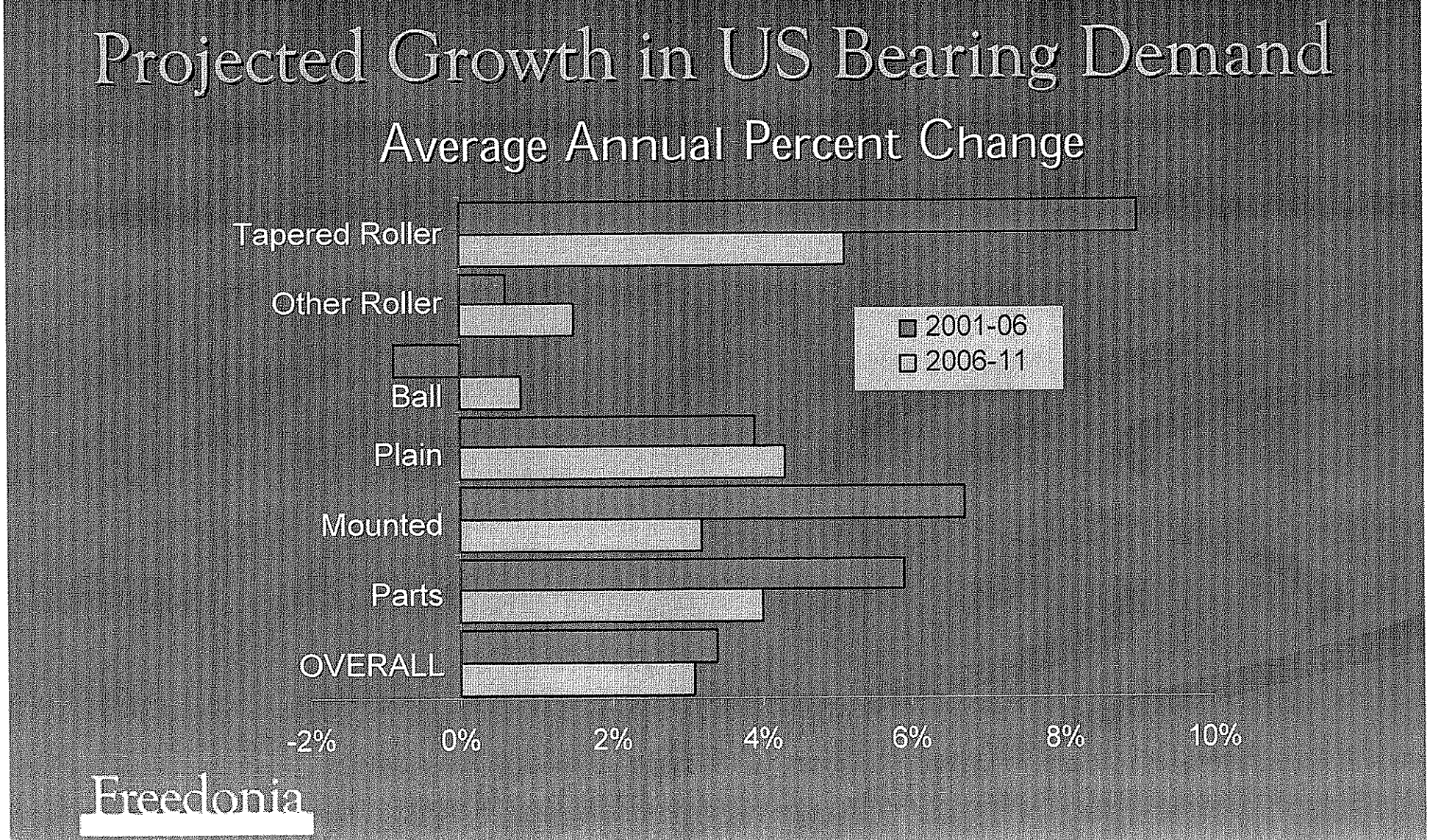
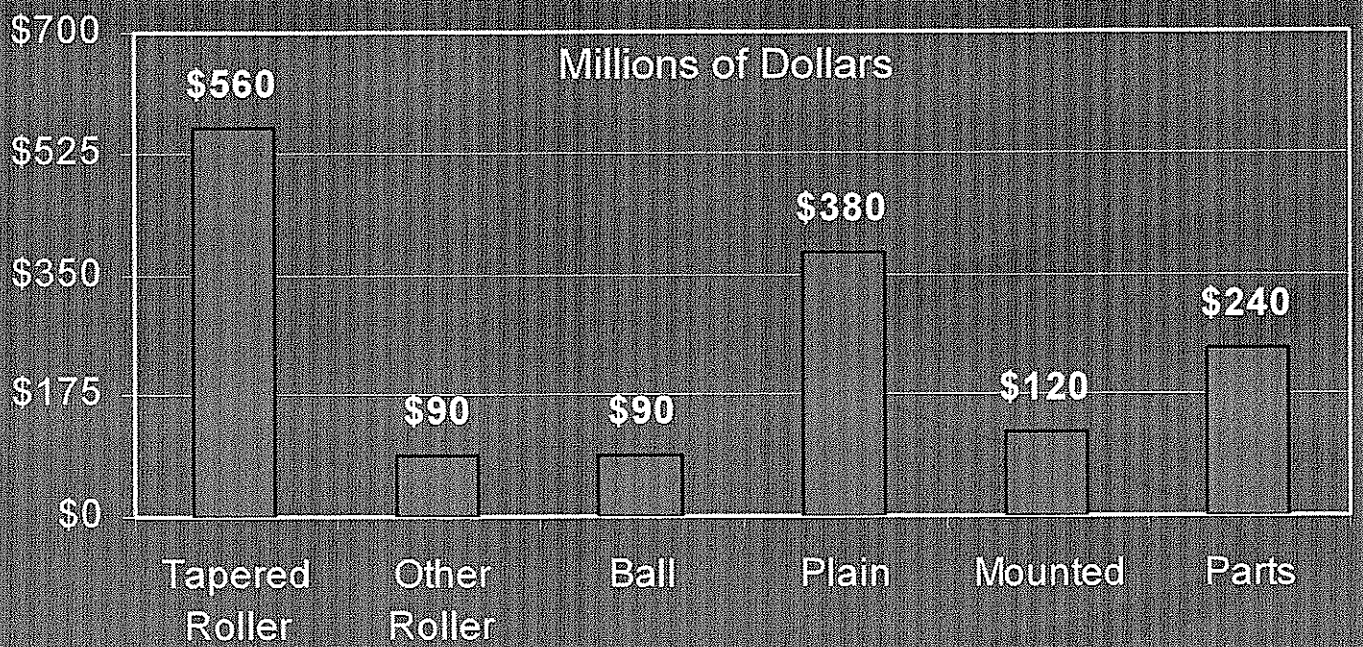
Projected Growth in US Bearing Demand



Projected Growth in US Bearing Demand

Additional Bearing Demand – 2011 Versus 2006 ($1,480 million)



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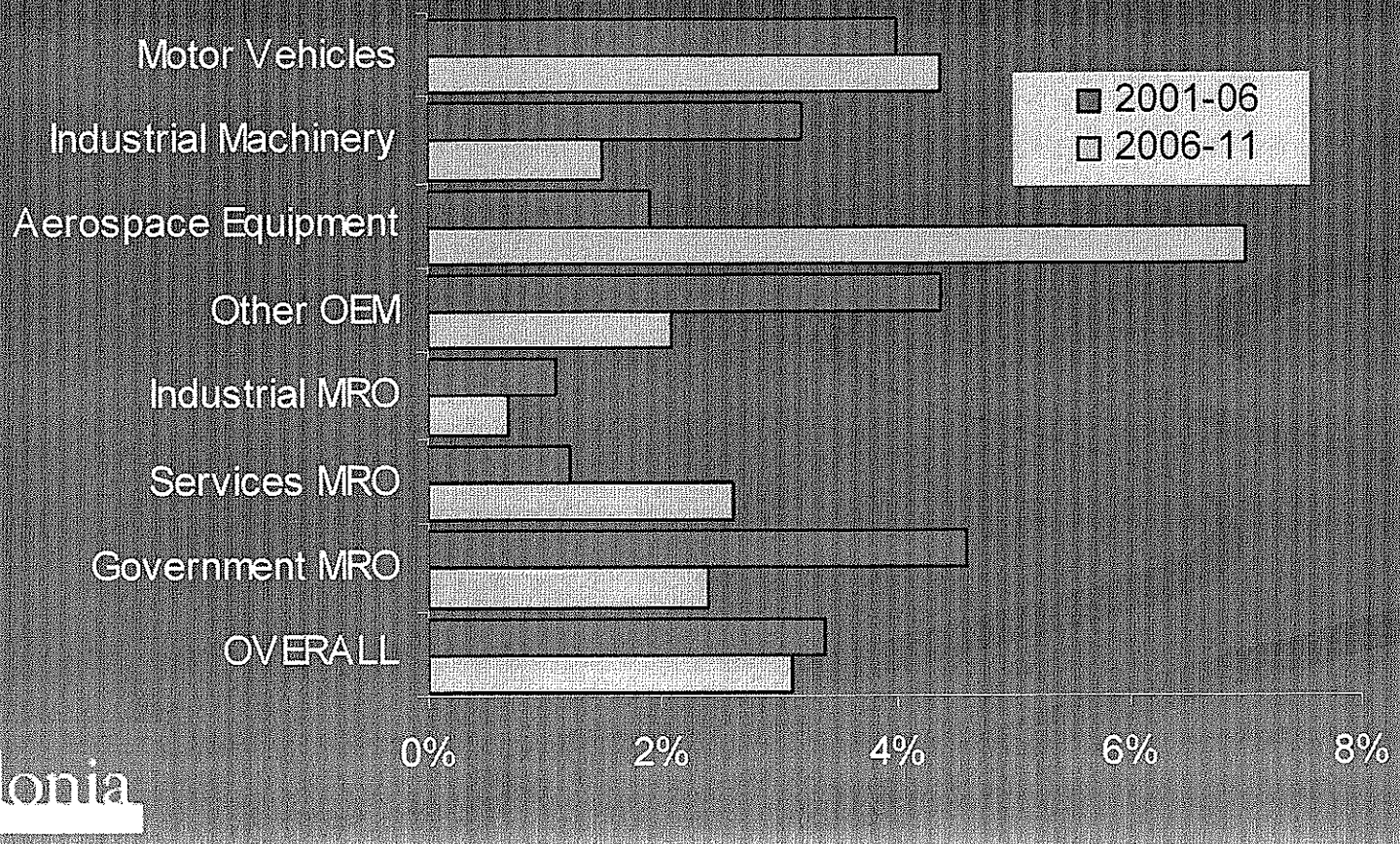
Projected Growth in US Bearing Demand

Average Annual Percent Change



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Markets With Above-Average Growth Prospects Through 2011

- Aerospace equipment
- Nonaerospace, nonautomotive engines
- Light vehicles
- Turbines
- Mining and oilfield machinery
- Construction machinery
- Industrial trucks and tractors
- Nonautomotive transportation equipment repair

Forecast Summary

- Growth in US bearing industry shipments and product demand will slow modestly through 2011
- US bearing shipments will keep pace with increases in domestic demand, stimulated by:
  - Generally healthy US market conditions
  - Rising bearing demand in a number of export markets
- Growth in US bearing demand will be fueled by:
  - Largely favorable economic conditions
  - An acceleration in aerospace equipment output growth and an upturn in motor vehicle production
  - A pickup in nonresidential fixed investment, bolstering demand for bearings used in both OEM and MRO applications

Science and Technology News

Freedonia Market Research Analyzes Global Bearings Industry

Cleveland 8/25/2008 07:09 µµ GMT
(TransWorldNews)

Global demand for ball, roller and plain bearings is forecast to climb 6.4 percent annually through 2012 to $66 billion. Market gains will be driven by ongoing economic growth, higher manufacturing output, greater fixed investment activity and rising motor vehicle production. The aftermarket will be limited to some extent by increases in average bearing life. However, growing demand for more expensive, better performing units will provide a counterbalance, supported in part by high energy prices, which are making highly efficient bearings a more attractive investment. These and other trends, including market share and company profiles, are presented in ***World Bearings,*** a new study from **The Freedonia Group, Inc.**, a Cleveland-based industry market research firm.

Product demand in developing parts of Asia, Eastern Europe, Africa/Mideast and Latin America will outpace sales in the US, Western Europe and Japan through 2012. Market advances in developing areas will be fueled by healthy economic growth, ongoing industrialization efforts and rising personal income levels, bolstering manufacturing output and fixed investment expenditures. **China, which recently surpassed the US to become the largest national market for bearings, will account for 48 percent of all additional demand through 2012**. India and Russia will also record strong gains, while increases in bearing demand in Brazil will approximate the global average. Sales growth is expected to be healthy as well in a number of lower-volume markets, including Thailand and Indonesia.

Bearing demand in the US, Western Europe and Japan will rise as well. Advances will be spurred by largely favorable economic climates and higher per capita income, resulting in increased manufacturing activity and consumer spending for durable

goods. Although representing mature markets, these areas -- along with Australia and Canada -- will remain the most intensive users of bearing products because of the advanced industrial and technological nature of their economies. The large numbers of bearing-containing equipment in use will also help bolster aftermarket bearing demand.

Bearings used in non-automotive, non-industrial machinery settings will post the most robust sales gains through 2012, benefiting from the favorable outlook for a number of products included here. Industrial machinery bearing demand is also expected to be healthy, stimulated by increases in global manufacturing activity, helping to spur associated fixed investment expenditures.

The Freedonia Group is a leading international business research company, founded in 1985, that publishes more than 100 industry research studies annually. This industry analysis provides an unbiased outlook and a reliable assessment of an industry and includes product segmentation and demand forecasts, industry trends, demand history, threats and opportunities, competitive strategies, market share determinations and company profiles.

pr@freedoniagroup.com
www.freedoniagroup.com

Press release

SKF

SKF Nine-month report 2008

Strong sales, operating profit and margin in the third quarter

Tom Johnstone, President and CEO:
"We delivered a very strong third quarter result. However, towards the end of the quarter, with the dramatic events in the financial markets, we had lower volumes particularly in our automotive business, while volumes in our industrial business were strong. For the fourth quarter we expect slightly lower demand both compared to the third quarter this year and the fourth quarter last year. As a result of this we have intensified our actions addressing the cost and capital situation in the Group".

	Q3		YTD	
	2008	**2007**	**2008**	**2007**
Net sales, SEKm	15,381	14,155	47,054	43,489
Operating profit, SEKm	2,085	1,803	6,260	5,708
Operating margin, %	13.6	12.7	13.3	13.1
Profit before taxes, SEKm	1,859	1,646	5,761	5,428
Net profit, SEKm	1,257	1,174	3,922	3,662
Basic earnings per share, SEK	2.67	2.48	8.39	7.76
Diluted earnings per share, SEK	2.67	2.48	8.38	7.74

The increase of 8.7% in net sales for the quarter, in SEK, was attributable to: volume 2.7 %, structure 0.5 %, price/mix 6.4 % and currency effects -0.9 %.
For the first nine months, the increase of 8.2% in SEK, was attributable to: volume 4.5 %, structure 1.1 %, price/mix 4.6 % and currency effects -1.9 %.

Development in the third quarter 2008
(calculated in local currencies excl. structural effects and compared to the same period last year)
Sales were higher for the Group in total as well as for Europe and North America, for Asia and Latin America they were significantly higher. For the Industrial Division and the Service Division sales were significantly higher. For the Automotive Division sales were relatively unchanged.

The manufacturing level for the third quarter of 2008 was unchanged compared to the second quarter 2008 and slightly higher compared to the third quarter last year.

Outlook for the fourth quarter of 2008
The demand for SKF products and services, based on current assumptions, is expected to be slightly lower in the fourth quarter both compared to the third quarter this year (seasonally adjusted) and the fourth quarter last year. In Europe and North America the demand is expected to be slightly lower, in Latin America higher and in Asia significantly higher. From a divisional viewpoint, the demand is expected to be higher in the Industrial Division, slightly higher in the Service Division and significantly lower in the Automotive Division.

The manufacturing level for the Group in the fourth quarter will be lower to reflect this new demand situation and to reduce inventory.

Financial

The financial net in the third quarter of 2008 was SEK -226 million (-157), including revaluation of share swaps of SEK -7 million (-13). The financial net for the first nine months was SEK -499 million (-280), which includes the revaluation of share swaps amounting to SEK -10 million (45).

Key figures for the first nine months 2008 (first nine months 2007):
- Inventories, % of annual sales, 21.9% (19.3)
- ROCE for the 12-month period, 26.8% (25.9)
- ROE for the 12-month period, 28.6% (25.8)
- Equity/assets ratio, 34.5% (37.8)
- Gearing, 47.7% (41.4)
- Net debt/equity 76.6% (53.4)
- Registered number of employees on 30 September, 45,035 (42,393)

Cash flow, after operating investments and before financial items (i.e. excluding the effect of financial investments) was SEK -526 million (1,274) for the third quarter and SEK 215 million (1,509) for the first nine months. The cash flow includes acquisitions of SEK 1,054 million for the quarter and SEK 1,116 million for the first nine months.

Exchange rates for the third quarter of 2008, including the effects of translation and transaction flows, had a negative effect on SKF's operating profit of about SEK 90 million. Based on current assumptions and exchange rates, it is estimated that the positive effect for the fourth quarter of 2008 will be around SEK 100 million and for the full year a negative effect of around SEK 270 million.

Raw material and component prices are significantly higher for the Group for the first nine months of this year due to major increases at the start of the year and surcharges primarily related to scrap prices. SKF has been able to offset these higher costs through a combination of actions in sourcing, reducing costs in the operations and improved pricing. Scrap prices have been reducing recently affecting the surcharges but are still volatile. It is expected that the raw material and component prices in the fourth quarter will remain significantly higher than in the corresponding period last year but that these will also be offset.

Highlights in the third quarter

SKF

- announced it will be investing around SEK 400 million in its facilities in Göteborg, Sweden for a further increase of capacity for large size bearings. The new production line is expected to be ready for production during 2010.
- completed the acquisition of PEER Bearing Company (PEER) and its manufacturing operations in China and Thailand. The purchase price amounted to around USD 150 million. PEER's sales in 2007 amounted to around USD 100 million and the number of employees was about 1,600. PEER will be a wholly owned subsidiary of SKF Group and continue to operate independently on the market. The business will be reported outside the divisions. In the third quarter the acquisition is reported as other non-current asset.
- signed an agreement to acquire GLO s.r.I and its manufacturing operation in Italy. The acquisition is subject to certain conditions of closing and requires approvals by relevant authorities.

Automotive News Europe

Economic forecast for suppliers in Europe: Dark and stormy

Bettina Mayer Automotive News Europe
December 15, 2008 06:01 CET

MUNICH — Jean-Christophe Quemard is worried. The PSA/Peugeot-Citroen purchasing director keeps a list of struggling parts makers. There are 45 companies on that list. That is twice as many as last year.

Quemard has good reason to be concerned. Suppliers arguably are facing the worst crisis in their history.

Lars Holmqvist, CEO of the European suppliers organization CLEPA, estimates that 500 parts makers will go out of business in the next three months. That is about 10 times more than in an average year. "And that is a very conservative figure," he added.

The health of the supply chain is crucial because 75 percent of the parts in an average European car come from components makers.

Suppliers are hurting because automakers are reducing orders by as much as 50 percent, and banks are raising rates on loans or cutting back on lending completely.

Tough times

Here is what some parts makers in Europe have done to cope with big cuts in auto production.

Bosch
- Extend holiday plant shutdown
- Reduce length of workday at plants

Continental
- Halt investments that are not urgent
- Extend holiday shutdown by 1-4 weeks
- Reduce length of workday and workweek

Delphi Europe
- Extend holiday plant shutdowns
- Temporarily lay off full-time workers

Faurecia
- Shut most of its 37 plants in France for most of this month

Haldex
- Cut 700 jobs

Schaeffler Group
- Cut temporary workers
- Halt production on certain days

Valeo
- Shut most of its sites in France for 2-3 three weeks this month

Massive job loses

Holmqvist said that about 10 percent of the European auto sector's 12 million jobs will be lost this year.

Germany will be hit hardest. Willi Diez, director of the Institute for Automotive Research at Nuertingen University in Germany, said the country could lose as many as 50,000 jobs by the middle of 2009. He estimates that 20,000 of those jobs will come from suppliers.

The French auto suppliers group, FIEV, expects employment in the country's sector to drop below 110,000 workers in 2008 from 114,500 at the end of 2007.

Supplier jobs in central Europe also will be cut. As many as 10,000 positions are at risk in the Czech Republic, while Poland will lose at least 2,200 jobs.

A number of automakers are trying to help their suppliers by doing things such as temporarily paying more for parts.

Despite those steps, many industry watchers say things will get worse.

"I am absolutely sure that we will see some plant closures in the first quarter," said Marcus Berret, an analyst with Roland Berger Strategy Consultants in Stuttgart.

Big suppliers fighting to survive include Germany's Getrag. The transmission maker is undergoing a restructuring.

Stankiewicz GmbH, a German supplier of acoustic insulation, was rescued from bankruptcy recently with help from banks, customers and its suppliers. Roughly 2,200 jobs were at risk.

Parts makers are taking steps to protect themselves from the dramatic production cuts. Many have or will soon halt production for the rest of 2008.

Banks under fire

Juergen Geissinger, vice president of the German auto industry association VDA and CEO of the Schaeffler Group, blames the problems that parts makers are having on the reluctance of banks to give loans.

"If banks continue to shirk their responsibilities, very soon there will be massive insolvencies among suppliers which, in turn, will have massive effects on the banking business," he told *Automobilwoche*, a German publication of Crain Communications Inc.

Roland Berger's Berret was asked to predict when the industry will begin to recover. He said: "We need to see a recovery by the end of 2009, but no one would bet on that. Things we thought were unlikely a few months ago now are happening 10 times a day."

Douglas A. Bolduc, Lyle Frink, John Revill and Lawrence J. Speer contributed to this report

"If banks continue to shirk their responsibilities, very soon there will be massive insolvencies among suppliers," said Juergen Geissinger, VDA and Schaeffler Group.

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SKF sheds 2,500 jobs as slowdown hits demand

Robert Anderson. **FT.com**. London: Dec 10, 2008.

Full Text (448 words)

SKF, the world's biggest bearings producer, will cut 2,500 jobs - 6 per cent of its workforce - in response to a plunge in sales in the fourth quarter, particularly from the struggling auto industry.

The Swedish engineering company forecast sales would fall 15 per cent year-on-year in the fourth quarter, a sharp deterioration from the previous quarter in which it increased sales by 9 per cent. Sales from its auto division will fall by up to 30 per cent, analysts predict.

SKF's announcement underlines the collapse of industry confidence over the past few months. Bearings are used in a wide range of products and sales react very quickly to demand, making SKF's order book a much watched bellwether.

"The fourth quarter will be dire for capital goods companies," said Johan Trocm, a capital goods analysts at Nordea bank in Stockholm. "The magnitude of the change in direction, that's unprecedented."

SKF's shares rose more than 4 per cent by early afternoon because investors had feared even worse news. Mr Trocm said the announcement was a source of relief because it removed uncertainty.

SKF said demand from the automotive sector in the fourth quarter was significantly weaker than it had foreseen. Moreover, many customers have announced extended plant shutdowns over Christmas and New Year, which has had an "immediate" effect on the company, according to Tom Johnstone, chief executive.

The fall in demand has spread to other industrial segments and is also broad-based geographically, the company said.

"In other industries which we supply - including industrial OEMs and the aftermarket business - we see a significant change from this quarter compared to last quarter," Mr Johnstone said. The main exceptions he said were the energy, railways and aerospace sectors, where demand, though less than anticipated, was holding up well.

SKF announced that it now expected fourth quarter operating profit to range between Skr1.6bn and Skr1.7bn, down from Skr2.1bn in the same period last year.

Mr Johnstone said profits would be more resilient than sales, largely because SKF had been able to maintain prices and become less reliant on the auto sector. He pointed out that the share of sales to car and truck manufacturers - which have lower margins - was less than 20 per cent of total sales.

SKF will cut 1,200 jobs outside Sweden - mainly in the automotive division - lay off 1,300 temporary workers and put 2,400 staff on short-time working.

It will book a restructuring and impairment charge of around Skr470m, of which Skr340m will be taken in the fourth quarter. The restructuring should have a positive effect of Skr250m per year when fully implemented by early 2010.

Credit: By Robert Anderson in Stockholm

Indexing (document details)

People:	Johnstone, Tom
Companies:	SKF USA Inc (**Duns:**00-229-7661)
Author(s):	Robert Anderson

Timken Extends Holiday Furlough To Hundreds
Manufacturing.Net - December 17, 2008

CANTON, Ohio (AP) -- Northeast Ohio bearings and specialty metals maker Timken Co. will furlough 200 to 300 hourly workers for two weeks to trim production as the economy slows.

Steelworkers Local 1123 President Randy Feemster says the furloughs at the Canton-based company will begin on Monday.

Timken spokeswoman Lorrie Paul Crum says the furloughs are seasonal in nature reflecting holiday shutdowns by Timken customers, with some extended for economic reasons.

Timken has nearly 4,800 employees in Canton and Stark County, and more than half are members of Local 1123.