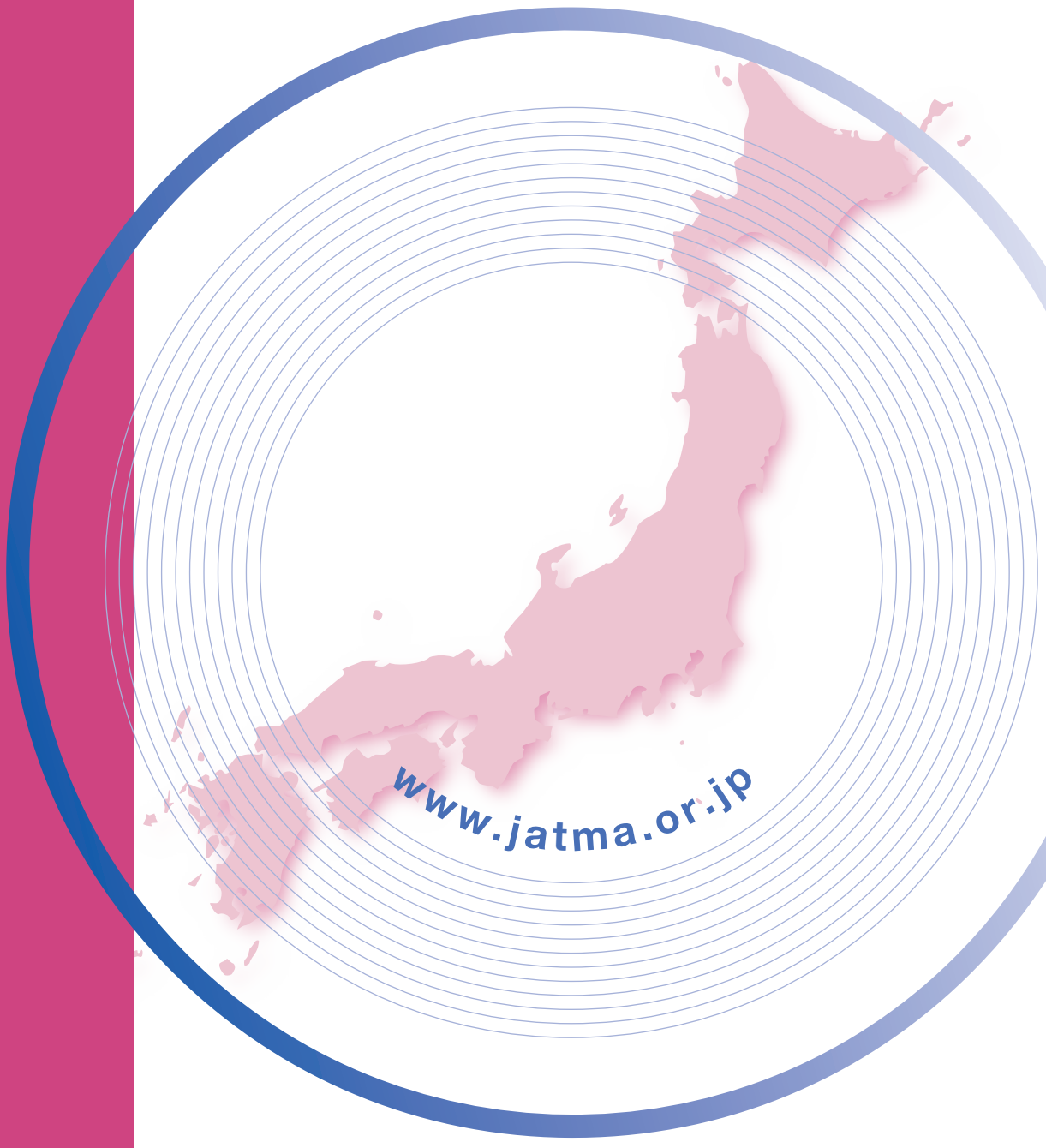
JATMA
THE JAPAN AUTOMOBILE TYRE MANUFACTURERS ASSOCIATION, INC.

TYRE INDUSTRY OF JAPAN

2018



TYRE INDUSTRY OF JAPAN *2018*

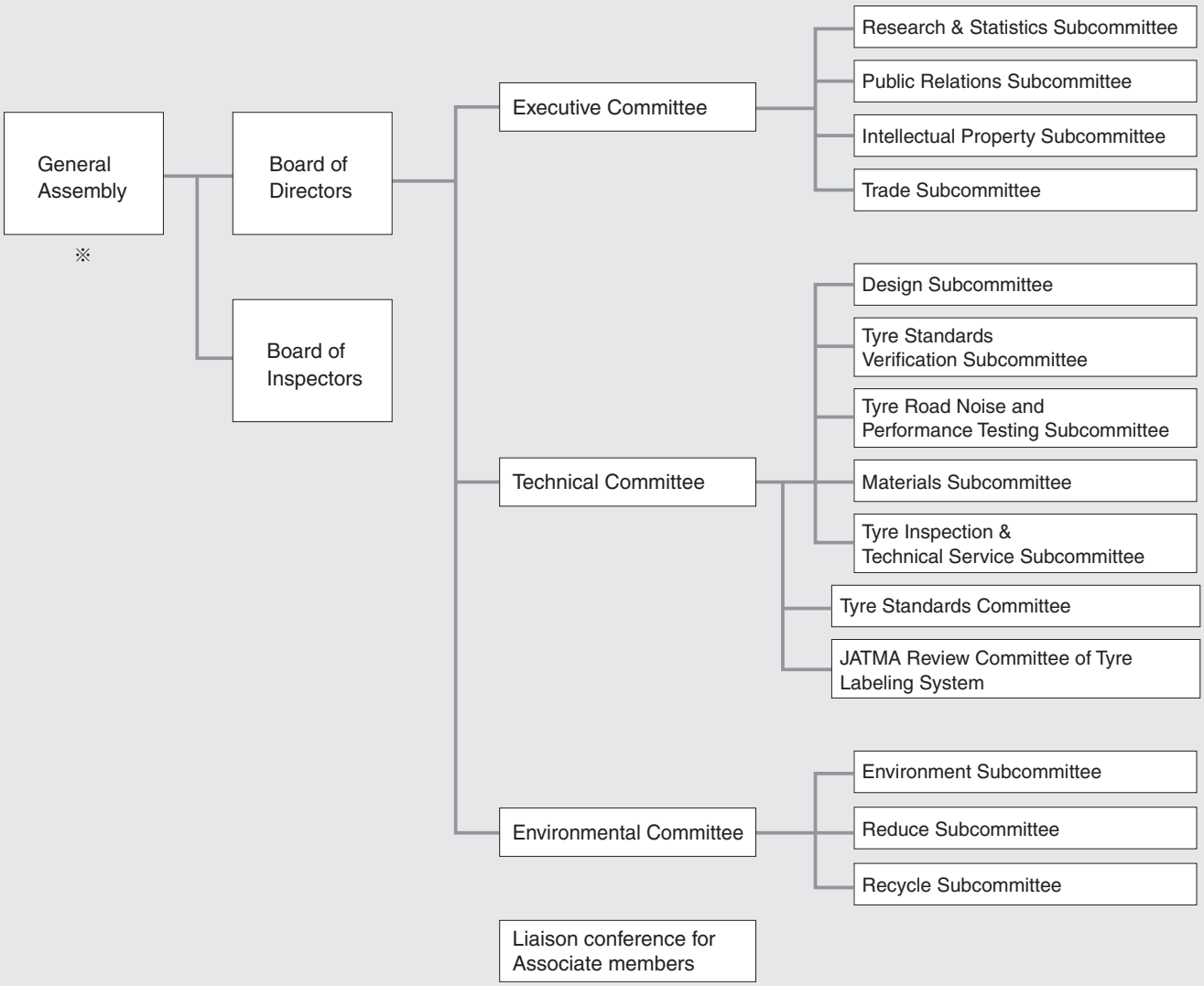
Contents

The Japan Automobile Tyre Manufacturers Association, Inc.

Chairman: Takashi Shimizu, President, Toyo Tire Corporation
Vice-Chairman: Masaaki Tsuya, Chairman of the Board, CEO and Representative Executive Officer, Bridgestone Corporation
Executive Director: Kenji Kurata
Established: September 1947 (incorporated in December 1968)
Head Office: Toranomon No. 33 Mori Bldg., 8F, 8-21, Toranomon 3-chome, Minato-ku, Tokyo 105-0001, Japan
Tel.: 03 (3435) 9091 Fax: 03 (3435) 9097
Members: [Full member]
Bridgestone Corporation
Sumitomo Rubber Industries, Ltd.
The Yokohama Rubber Co., Ltd.
Toyo Tire Corporation
[Associate member]
Nihon Michelin Tire Co., Ltd.
Goodyear Japan, Ltd.

Organization

Under General Assembly and Board of Directors, three committees are established: Executive Committee, Technical Committee, and Environmental Committee. The committees have relevant subcommittees which promoting their activities such as surveys and studies.



※ Associate member:
By getting certification of the Board of Directors, an Associate member can attend the General Assembly Meeting as an observer without voting right.

JATMA Member Firms

[Full member]

Bridgestone Corporation

President Masaaki Tsuya

Established: March 1, 1931

Capital: ¥126,354 million
(as of the end of December 2017)

Annual sales: (consolidated) ¥3,643,427 million
(fiscal year ending December 2017)

Employees: (consolidated) 142,669
(as of the end of December 2017)

Head office: 1-1, Kyobashi 3-chome,
Chuo-ku, Tokyo 104-8340
Tel.: 03 (6836) 3001
https://www.bridgestone.co.jp/

Sumitomo Rubber Industries, Ltd.

President Ikuji Ikeda

Established: March 6, 1917

Capital: ¥42,658 million
(as of the end of December 2017)

Annual sales: revenue* (consolidated) ¥877,866 million
(fiscal year ending December 2017)

Employees: (consolidated) 36,650
(as of the end of December 2017)

Head office: 6-9, Wakinohama-cho 3-chome, Chuo-ku,
Kobe, Hyogo Prefecture 651-0072
Tel.: 078 (265) 3000
http://www.srigroup.co.jp/

*International Financial Reporting Standards (IFRS) has been applied from 2016.

The Yokohama Rubber Co., Ltd.

President Masataka Yamaishi

Established: October 13, 1917

Capital: ¥38,909 million
(as of the end of December 2017)

Annual sales: (consolidated) ¥668,000 million
(fiscal year ending December 2017)

Employees: (consolidated) 25,439
(as of the end of December 2017)

Head office: 36-11, Shimbashi 5-chome,
Minato-ku, Tokyo 105-8685
Tel.: 03 (5400) 4531
http://www.y-yokohama.com/

Toyo Tire Corporation

President Takashi Shimizu

Established: August 1, 1945

Capital: ¥30,484 million
(as of the end of December 2017)

Annual sales: (consolidated) ¥404,999 million
(fiscal year ending December 2017)

Employees: (consolidated) 11,759
(as of the end of December 2017)

Head office: 2-13, Fujinoki 2-chome, Itami,
Hyogo Prefecture 664-0847
Tel.: 072 (789) 9100
http://www.toyo-rubber.co.jp/

[Associate member]

Nihon Michelin Tire Co., Ltd.

President Paul Perriniaux

Established: June 10, 1975

Capital: ¥100 million
(as of the end of December 2017)

Employees: 600
(as of the end of December 2017)

Head office: 13F., Shinjuku Park Tower, 7-1,
Nishi-Shinjuku 3-chome, Shinjuku-ku,
Tokyo 163-1073
Tel.: 03 (5990) 5600
http://www.michelin.co.jp/

Goodyear Japan, Ltd.

President Yujiro Kanahara

Established: January 10, 1952

Capital: ¥2,336 million
(as of the end of December 2017)

Employees: 128
(as of the end of December 2017)

Head office: 3F., Sankaido Bldg., 9-13,
Akasaka 1-chome, Minato-ku,
Tokyo 107-0052
Tel.: 03 (5572) 8235
http://www.goodyear.co.jp/

I History of the Japanese Tyre Industry

1. Brief History of the Japanese Tyre Industry

The production scale of the automobile tyre industry of Japan steadily increased from the second half of 1990s to 2008, supported by generally firm demand in the domestic market and active export. It declined severely in 2009 due to the world economic crisis. Though it was recovered to a certain extent in 2010, thereafter it has been gradually decreasing and one of the causes is globalization of the production system.

Number of tyre production in 2017 was 144.92 million (tyres). This is the amount of 1.03 million tons of rubber, which accounts for more than 80% of the domestic rubber production (newly produced rubber).

Brief history of the tyre industry of Japan in chronological order is as below:

(1) 1940s-1950s

The industry restructured after World War II, following the destruction of facilities and equipment. In the early 1950s, after the long-term government regulation and during the Korean War, the industry enjoyed special procurement and improved tyre demand. However, after the Korean War, deflationary pressures affected the Japanese economy. Demand for tyres decreased sharply, and the tyre market experienced considerable difficulty.

(2) 1960s

Around 1960, full-fledged motorization, including increased automobiles on the road and the advent of expressways, spurred the industry toward a technological revolution, including expansion and automation of equipment, as well as changes in the raw materials for tyres, and enjoyed a high-growth phase.

(3) 1970s

From 1970, the industry suffered demand downturns temporarily as a result of the first oil crisis. However, exports led the growing Japanese economy. Tyre production expanded, as a result of an increase in the number of vehicles produced and registered, and product diversification spurred demand.

(4) 1980s

Low economic growth under the worldwide recession following the second oil crisis (1979) combined with the progress of radial tyres, which caused demand downturns, forcing the Japanese tyre industry into a period of extreme difficulty. In 1983, however, a turnaround was seen owing to economic recovery in Japan and in principal nations worldwide. In September 1985, however, tyre demand dropped, influenced by the strong yen. Then in December 1986, the Japanese economy started to grow steadily, backed by solid consumer spending and capital investment. As a result, the volume of rubber consumption reached the 1-million-ton mark in 1989.

(5) 1990s

With the collapse of Japan's "bubble economy," the stock market crashed, corporate profits declined, the job environment became uncertain, consumer spending and capital investment slowed, and the yen appreciated causing further deepening of economic stagnation. Signs of recovery were seen in 1995, but in 1997 Japan entered a recession. In 1998 and 1999, large-scale restructuring in the financial sector and the introduction of foreign capital into the automotive industry arose as serious concerns. On the other hand, the global economy in general remained steady despite economic difficulties in Southeast Asia, supported by the robust U.S. economy. In this environment, the Japanese tyre industry grew overall, although rubber consumption fell below the 1-million-ton mark in 1993. Supported by brisk exports, Japanese tyre production volume increased to 1.13 million tons in 1999, a record high.

(6) 2000s

The Japanese economy was on a trend of gentle recovering, and although it was still suffering from such problems as continuing high prices of raw materials, it continued the biggest economic growth after the Second World War owing to improved corporate earnings and increased capital investments. Global economy continued strong as a whole until 2007 owing to supports by the robust economy of the United States, Europe, Middle East and BRICs countries, and tyre rubber production volume marked a record high every year from 2002 and it reached 1.36 million tons in 2007.

However, tyre production volume took a downward turn in 2008 after seven years due to the serious worldwide economic crisis from September 2008 and decreased by 360,000 tons, then declined to 990,000 tons under 1 million tons after fifteen years.

(7) 2010-2017

Japanese economy seemed recovered once supported by the government's economic policies etc.; however it turned in negative growth in 2011 due to the Great East Japan Earthquake and the record appreciation of the yen. After 2013, although there was also the rise of consumption tax in April 2014 and the growth has been weakened temporarily, it has continued its gradually increase by the effect of high stock prices and depreciation of the yen. The world economy was gradually recovering from the after effect of the financial crisis. In addition to the United States where stable growth continues, and Europe that turned into positive growth since the second half of 2013, emerging economies also remained robust in general due to recovery in resource prices and other factors. In this demand environment, tyre production amount in Japan has increased that is exceeded the previous year for the first time in 6 years to 1.03 million tons in rubber consumption in 2017.

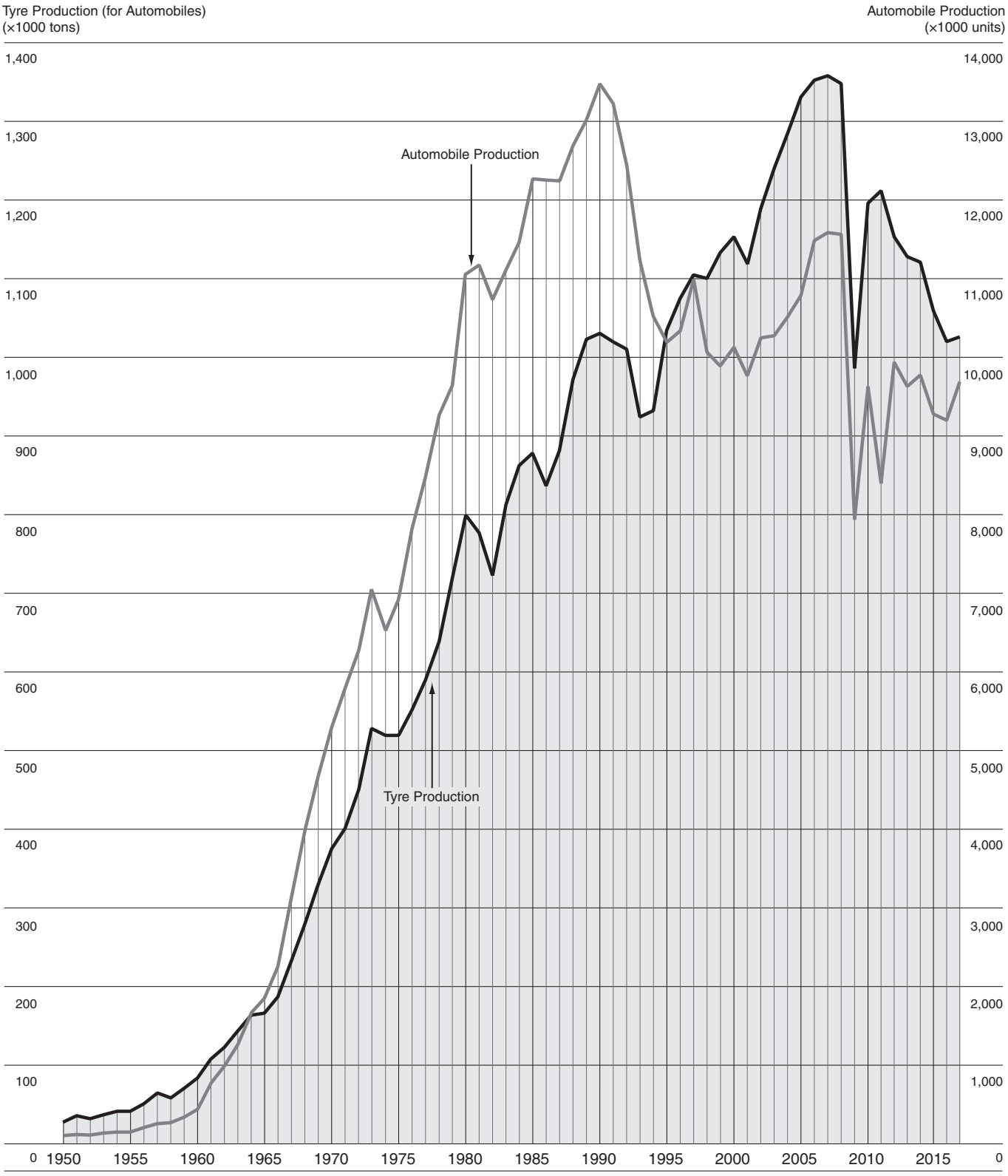
2. Changes in Production Volume of Tyres and Automobiles

Table 1: Changes in Production Volume of Tyres and Automobiles

	1950	1960	1970	1980	1990	2000	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Tyre Production (for Automobiles) (×1000 tons)(quantity of rubber)	14	83	369	784	1,031	1,153	1,348	986	1,196	1,212	1,147	1,128	1,121	1,058	1,020	1,026
Automobile Production (×1000 units)	32	482	5,289	11,043	13,487	10,141	11,576	7,934	9,629	8,399	9,943	9,630	9,775	9,278	9,205	9,691

Source: JATMA

Figure 1: Changes in Production Volume of Tyres and Automobiles



II The Japanese Tyre Industry Today

1. Overview

The proportion of tyre production (fig. 2 and 3) in the rubber product industry decreased by 0.6 points from the previous year to 79.5% in raw material consumption (the amount of newly produced rubber) and decreased by 1.1% from the previous year to 51.2% in the sales amount. (Source: Ministry of Economy, Trade and Industry current survey of production)

The proportion of tyre production in the rubber product industry in 2017 (excluding cart tyres, tubes and flaps)

Figure 2: Raw material consumption (the amount of newly produced rubber)

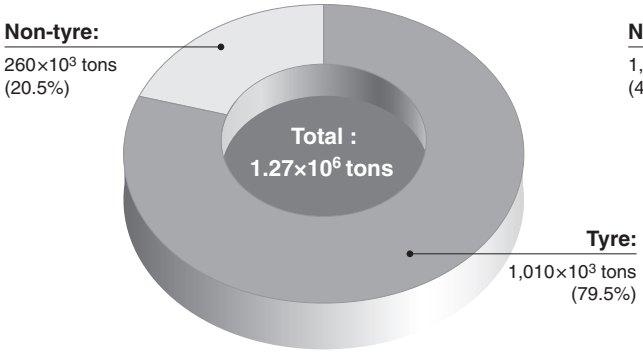
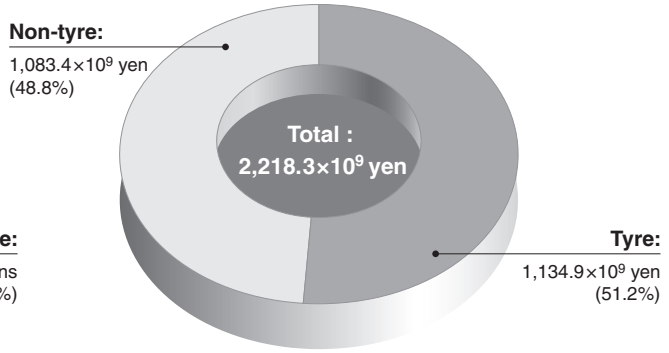
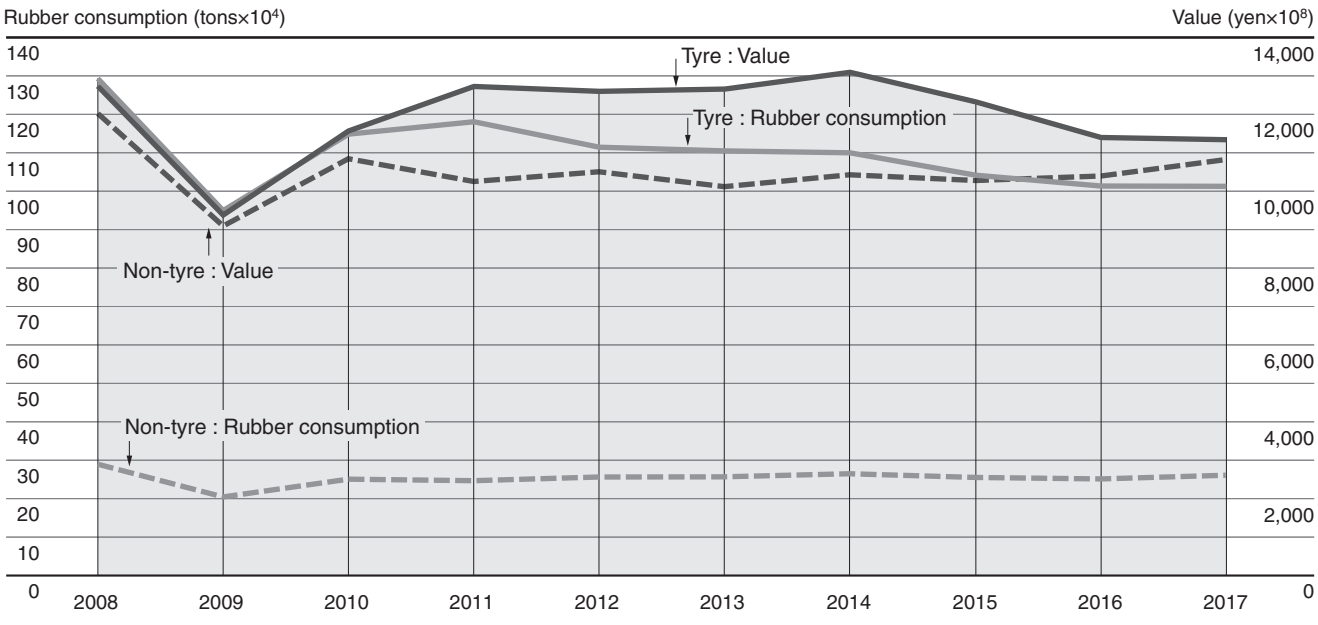


Figure 3: The sales amount



Source: Ministry of Economy, Trade and Industry current survey of production

Figure 4: Changes in the raw material consumption (the amount of newly produced rubber) and the sales amount of the tyre industry of Japan



Source: Ministry of Economy, Trade and Industry current survey of production

2. Trends in Production by Tyre Category

The production volume of automobile tyres decreased by 1.0% to 144.92 million tyres in 2017, decreased from the previous year for three consecutive years. Due to the decrease in export, passenger car tyres and light truck tyres decreased by 1.6% and by 1.2% from the previous year. Due to the increase in domestic and exports, truck & bus tyres increased by 6.2% from the previous year.

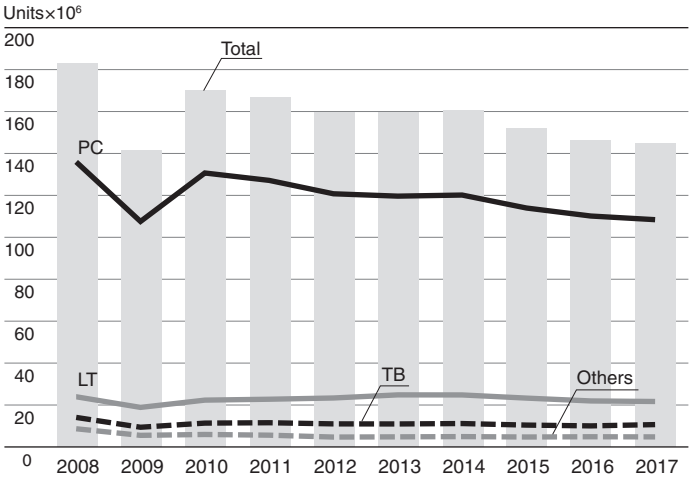
Table 2: Automobile tyre production in 2017

	Production	
	Units($\times 10^3$)	2017/2016(%)
Passenger car tyres	108,258	98.4
Light truck tyres	21,527	98.8
Truck and bus tyres	10,499	106.2
Others	4,639	98.7
Total	144,923	99.0

N.B.: 1. "Others" are off-the-road tyres, industrial tyres, agricultural tyres, cart tyres, and motorcycle tyres.
2. Figures of some domestic manufacturers that are non-member of JATMA are included.

Source: JATMA

Figure 5: Trends in automobile tyre production



3. Trends in Sales of Original Equipment Tyres

The sales volume of original equipment tyres increased by 4.4% to 46.50 million tyres in 2017, increased from the previous year for the first time in three years.

Due to the increase in domestic new car sales and export, the sales volume of passenger car tyres increased by 4.9% from the previous year. Due to the increase in domestic new car sales, truck & bus tyres increased by 1.5% from the previous year. Light truck tyres also increased by 0.4% from the previous year.

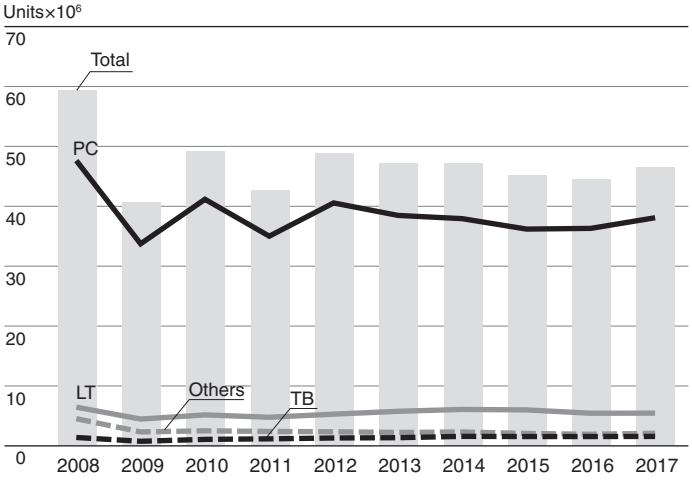
Table 3: Sales of original equipment tyres in 2017

	Sales	
	Units($\times 10^3$)	2017/2016(%)
Passenger car tyres	37,907	104.9
Light truck tyres	5,285	100.4
Truck and bus tyres	1,393	101.5
Special vehicle tyres	806	103.6
Motorcycle tyres	1,108	112.6
Total	46,499	104.4

N.B.: 1. Special vehicle tyres include off-the-road, industrial, agricultural, and cart tyres.
2. Figures of some domestic manufacturers that are non-member of JATMA are included.
3. Imported tyres manufactured outside Japan by Japanese manufacturers are included.

Source: JATMA

Figure 6: Trends in sales of original equipment tyres



4. Trends in Sales of Replacement Tyres

The sales volume of replacement tyres increased by 2.5% from the previous year to 74.63 million tyres in 2017 and increased from the previous year for the first time in three years.

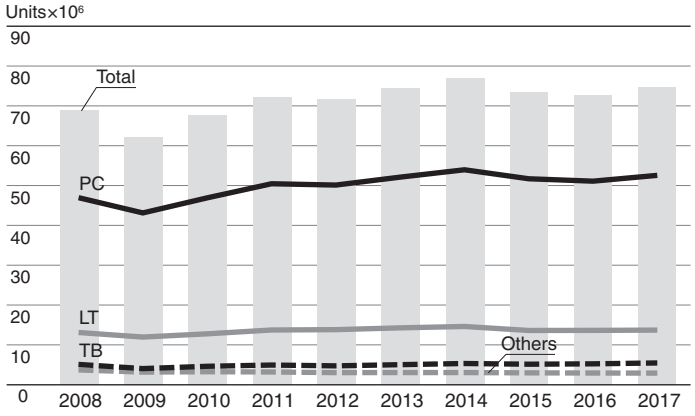
Table 4: Sales of replacement tyres in 2017

	Sales	
	Units($\times 10^3$)	2017/2016(%)
Passenger car tyres	52,558	103.0
Light truck tyres	13,707	100.6
Truck and bus tyres	5,458	104.3
Special vehicle tyres	800	101.5
Motorcycle tyres	2,109	98.8
Total	74,632	102.5

N.B.: 1. Special vehicle tyres include off-the-road, industrial, agricultural, and cart tyres.
2. Figures of some domestic manufacturers that are non-member of JATMA are included.
3. Imported tyres manufactured outside Japan by Japanese manufacturers are included.

Source: JATMA

Figure 7: Trends in sales of replacement tyres



Trends in Sales of Summer Tyres and Winter Tyres for Replacement (for Four-Wheeled Vehicles)

The sales volume of summer tyres (normal tyres except snow tyres) increased by 0.3% from the previous year to 47.42 million tyres in 2017. Passenger car tyres slightly increased by 0.4% from the previous year, and light truck tyres slightly decreased by 0.9% from the previous year. Truck & bus tyres increased by 2.0% from the previous year.

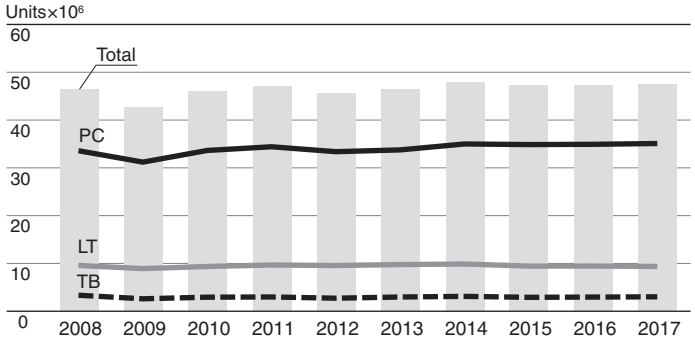
Table 5-1:
Sales of summer tyres for replacement (for four-wheeled vehicles) in 2017

	Summer tyres		
	Units($\times 10^3$)	2017/2016(%)	Summer tyre rate(%)
Passenger car tyres	35,072	100.5	66.7
Light truck tyres	9,346	99.1	68.2
Truck and bus tyres	3,002	102.0	55.0
Total	47,420	100.3	66.1

N.B.: 1. "Summer tyre rate" indicates a percentage of summer tyres in total number of replacement tyre sales.
2. Imported tyres manufactured outside Japan by Japanese manufacturers are included.
3. All-season tyres are included in this category.

Source: JATMA

Figure 8-1: Trends in sales of summer tyres for replacement (for four-wheeled vehicles)



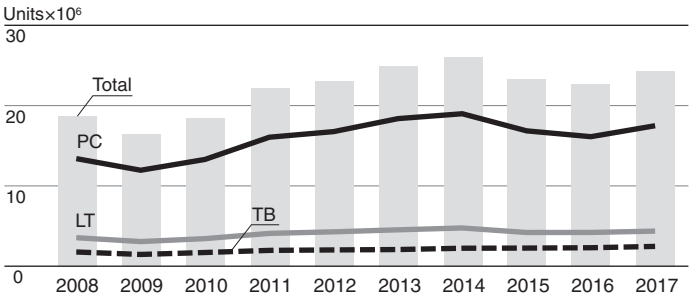
The sales volume of winter tyres increased by 7.5% to 24.30 million tyres in 2017, increased from the previous year for the first time in three years.
Due to the increase in domestic new car sales and the influence that December was colder than in the previous year, the production volume of the all types increased from the previous year, respectively, passenger car tyres, light truck tyres, and truck & bus tyres increased by 8.5%, by 4.0%, and by 7.2%.

Table 5-2:
Sales of winter tyres for replacement (for four-wheeled vehicles) in 2017

	Winter tyres		
	Units($\times 10^3$)	2017/2016(%)	Winter tyre rate(%)
Passenger car tyres	17,486	108.5	33.3
Light truck tyres	4,361	104.0	31.8
Truck and bus tyres	2,456	107.2	45.0
Total	24,303	107.5	33.9

N.B.: 1. "Winter tyre rate" indicates the percentage of winter tyres in total number of replacement tyre sales.
2. Imported tyres manufactured outside Japan by Japanese manufacturers are included.
Source: JATMA

Figure 8-2: Trends in sales of winter tyres for replacement (for four-wheeled vehicles)



5. Trends in Sales of Export Tyres

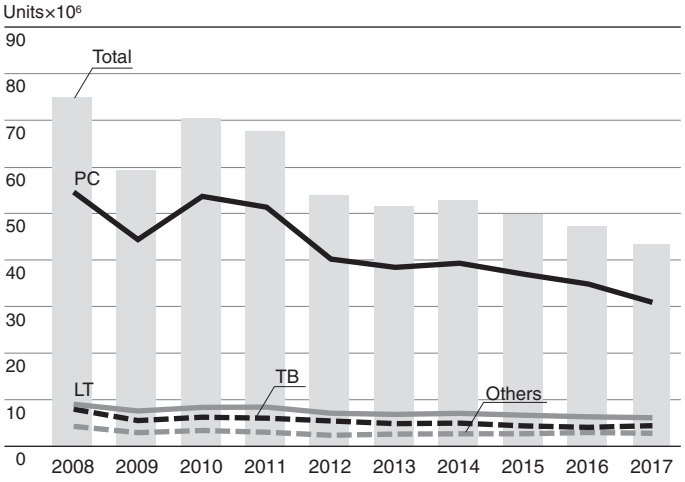
The export volume of automobile tyres decreased by 8.4% to 43.30 million tyres in 2017, decreased from the previous year for three consecutive years. Passenger car tyres and light truck tyres decreased by 11.4% and by 3.4% from the previous year. Truck & bus tyres increased by 9.3% from the previous year.

Table 6: Sales of export tyres in 2017

	Sales	
	Units($\times 10^3$)	2017/2016(%)
Passenger car tyres	30,661	88.6
Light truck tyres	5,891	96.6
Truck and bus tyres	4,192	109.3
Others	2,558	93.5
Total	43,302	91.6

N.B.: 1. "Others" are off-the-road tyres, industrial tyres, agricultural tyres, cart tyres, and motorcycle tyres.
2. Figures of some domestic manufacturers that are non-member of JATMA are included.
Source: JATMA

Figure 9: Trends in sales of export tyres



6. Exports by Region of Destination

The export volume of automobile tyres in 2017 (on customs clearance basis of Ministry of Finance) decreased by 8.0% to 44.96 million tyres in quantity basis from the previous year, increased by 4.6% to 526.5 billion yen amount of money from the previous year, and decreased by 0.4% to 1.08 million tons in product weight basis from the previous year.
By region (in quantity basis), all regions except South & Central America exports decreased and resulted in decrease from the previous year in total.

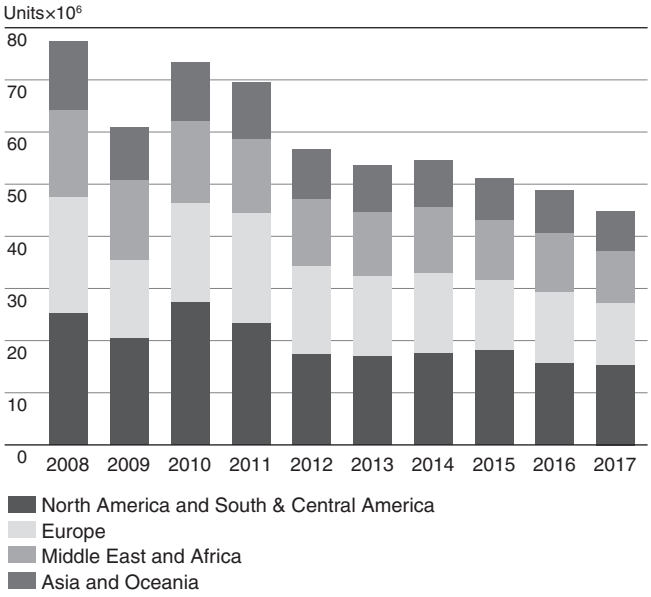
Table 7: Exports by region of destination in 2017

	Tyre Units($\times 10^3$)				2017/2016 (%)	Value (FOB) (yen$\times 10^6$)	2017/2016 (%)
	PC	TB&LT	Others	Total			
North America	10,309	1,778	427	12,514	95.4	135,027	99.9
South & Central America	1,891	924	193	3,008	114.4	57,969	115.7
Europe	9,628	684	1,429	11,741	86.9	105,256	99.6
Middle East	5,565	2,182	40	7,787	86.1	66,026	90.6
Africa	1,130	1,007	56	2,193	95.5	28,282	100.1
Asia	4,303	897	356	5,556	99.6	75,982	117.0
Oceania	1,535	506	119	2,160	79.9	58,001	124.2
Total	34,361	7,978	2,620	44,959	92.0	526,543	104.6
Weight(tons)	432,656	322,542	326,294	1,081,492	99.6		

N.B.: 1. Exchange rates are averages of spot rates for Tokyo interbank trade.
2016: 1dollar = 109yen
2017: 1dollar = 112yen
2."Others" doesn't include Aircraft tyres and Bicycle tyres.

Source: Ministry of Finance customs records

Figure 10: Export trend by region



7. Imports by Region of Origin

The import volume of automobile tyres in 2017 (on customs clearance basis of Ministry of Finance) increased by 6.2% to 29.31 million tyres in quantity basis from the previous year, increased by 12.7% to 122.0 billion yen amount of money from the previous year, and increased by 7.4% to 0.26 million tons in product weight basis from the previous year.
By region (in quantity basis), mainly imports from Asia and Europe increased and resulted in increase from the previous year in total.

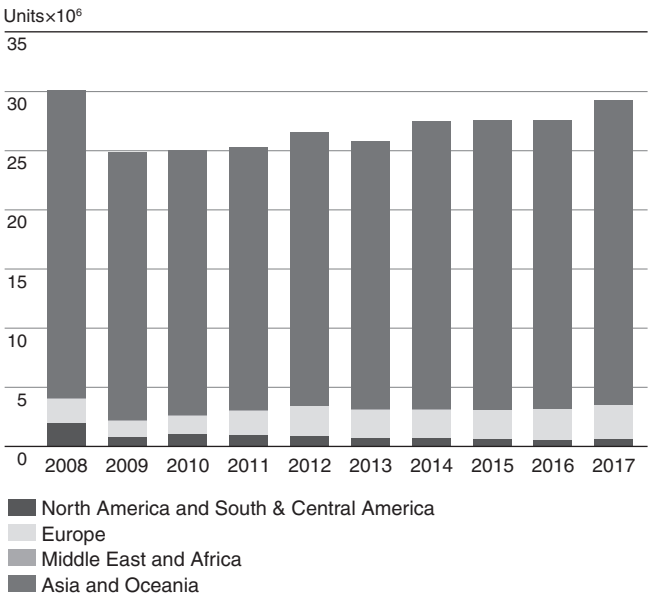
Table 8: Imports by region of origin in 2017

	Tyre Units($\times 10^3$)				2017/2016 (%)	Value (CIF) (yen$\times 10^6$)	2017/2016 (%)
	PC	TB&LT	Others	Total			
North America	563	3	20	586	114.5	6,189	118.2
South & Central America	17	1	59	77	105.0	1,045	136.9
Europe	2,407	138	249	2,794	109.8	25,370	116.0
Middle East	25	0	2	27	82.5	235	101.5
Africa	5	0	0	5	276.4	47	173.7
Asia	20,840	1,852	3,124	25,816	105.6	89,120	111.3
Oceania	0	0	0	0	0.0	1	—
Total	23,857	1,994	3,454	29,305	106.2	122,007	112.7
Weight(tons)	190,445	42,175	27,471	260,091	107.4		

N.B.: "Others" doesn't include Aircraft tyres and Bicycle tyres.

Source: Ministry of Finance customs records

Figure 11: Import trends by region



III Measures for Tyre Safety

1. Safety Standards for Automobile Tyres

Various standards have been specified regarding tyres from the viewpoint of automobile safety because tyres are automobile's important parts.

Each Individual state has its own legislation specifying the standards and the tyres are requested to satisfy the standards of the state where the tyres are to be used. In Japan we have the Safety Regulations for Road Vehicles and their detailed items, enacted by the Ministry of Land, Infrastructure, Transport and Tourism.

In addition to these regulations, the guidelines for the items to be complied in usage and maintenance of automobile tyres are specified in "Standards for Selection, Usage and Maintenance of Automobile Tyres" by JATMA to ensure and enlighten the tyre safety.

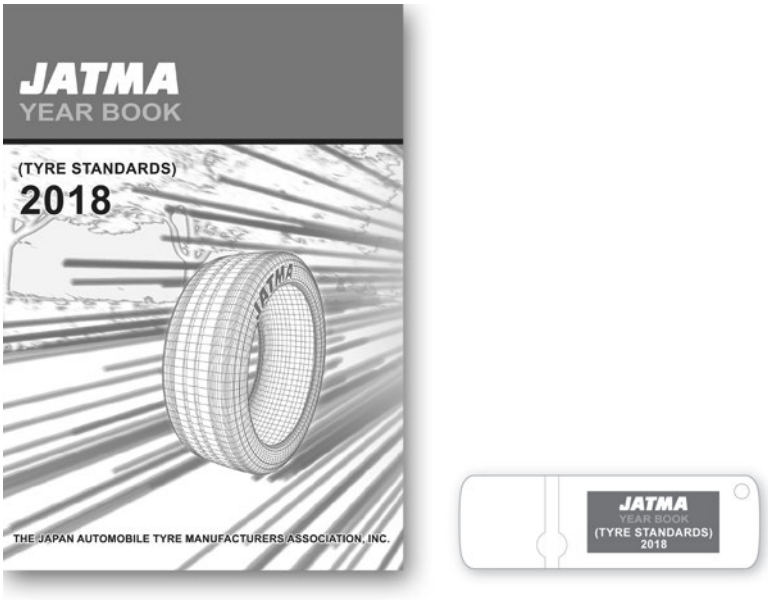
2. Tyre Standards

Besides the safety standards, standards for specifications of automobile tyres, rims and valves are set by the Tyre Standards Committee which comprises representatives from tyre manufacturers and vehicle manufacturers, and government ministries concerned and published in book form as JATMA YEAR BOOK annually by JATMA. JATMA YEAR BOOK is designed to promote standardization, simplification, and unification of tyre use within Japan, and is contributing to rationalization of production and use of fair tyres while ensuring the interchangeability.

The JATMA standards are quoted in the Federal Motor Vehicle Safety Standards and Regulations of U.S., applied to tyres exporting to Canada, Australia and so on; and recognized as one of authoritative guidelines such as the ETRTO standards of Europe and TRA standards of US.

The JATMA standards cover the following tyre categories:

- passenger car tyres,
- light truck tyres,
- truck and bus tyres,
- off-road vehicle tyres,
- agricultural equipment tyres,
- industrial vehicle tyres, and
- motorcycle tyres.



3. Legal Limits on Tread Wear

Worn tyres could be a threat to road safety. They're easier to slip especially on wet roads because of the degradation of their braking performance, comparing to new tyres. Thus the Ministry of Land, Infrastructure, Transport and Tourism prescribed requirements for tyre groove depth (minimum groove depth) in its Safety Regulations for Road Vehicles, and proscribed the use of tyres of insufficient groove depth on roads. (see table 9 and 10 (table 10 for high-speed driving)). Shown in figure 12 is the result of actual inspection on in-service vehicles conducted by JATMA. As it is shown, the number of improper inflation pressure tyres, uneven wear tyres, and insufficient groove depth tyres are notably high.

4. Product Inspection

In 1954, JATMA started its tyre inspection activity at its branch offices.

Defective or damaged tyres are now observed and checked at seven offices according to the requests from their consumers to find causes of the damages and to provide advice to them regarding correct usage of tyres.

Table 9: Wear limit for automobile tyres

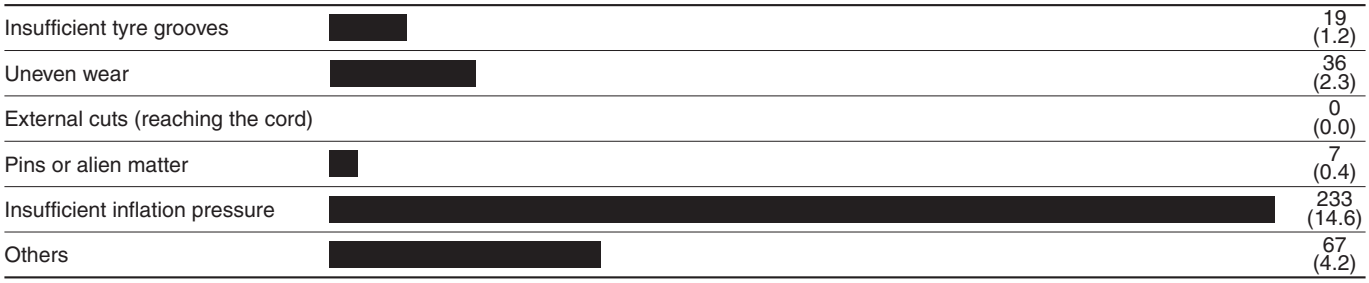
Tyre type	Groove depth limit
Passenger car tyres	1.6 mm
Light truck tyres	1.6 mm
Truck and bus tyres	1.6 mm
Motorcycle tyres	0.8 mm

Table 10: Wear limit for automobile tyres in high-speed driving

Tyre type	Groove depth limit
Passenger car tyres	1.6 mm
Light truck tyres	2.4 mm
Truck and bus tyres	3.2 mm

Figure 12: Breakdown of tyre defects

(Parentheses show defect rates)



Notes:

1. Multiple tyre defects per vehicle are possible, thus the number of tyre defects does not correspond to the number of vehicles with tyre defects.

2. The defect rate is the number of defects divided by the number of vehicles inspected.

3. Tyre inspections were carried out a total of 36 times (14 times on expressways and 22 times on ordinary roads) in 2017.

Ⅳ Consideration for Environment

1. Tyre Labeling System

The need for further improvement of energy efficiency in the transport field is globally discussed as IEA (International Energy Agency) made a proposal at G8 Summit. In the circumstances, the Japanese government established “the Fuel-Efficient Tyre Promotion Council” in order to study promotion of fuel-efficient tyres etc. JATMA took part in it and the discussions focused on concrete measures had been made over and over from January 2009. And eventually, in January 2010, JATMA launched their voluntary standard “Tyre Labeling System” by displaying performance levels of fuel efficient tyres on the labels plainly for consumers, for the purpose of further promotion of fuel efficient tyres.

Principal contents of the system

- **Scope :** Summer tyres for passenger car that are purchased as replacement tyres by consumers at tyre dealers etc.
- **Grading System :**

  Rolling Resistance Coefficient (RRC)

  ·····A range of five grades (Grade AAA to C)

  Wet Grip Performance

  ·····A range of four grades (Grade a to d)

Unit (N/kN)

RRC	Grade
RRC ≦ 6.5	AAA
6.6 ≦ RRC ≦ 7.7	AA
7.8 ≦ RRC ≦ 9.0	A
9.1 ≦ RRC ≦ 10.5	B
10.6 ≦ RRC ≦ 12.0	C

Unit (%)

Wet Grip Performance (G)	Grade
155 ≦ G	a
140 ≦ G ≦ 154	b
125 ≦ G ≦ 139	c
110 ≦ G ≦ 124	d

- **Performance requirements for fuel efficient tyres :**

  Rolling Resistance Coefficient

  ·····9.0 and below (Grade AAA to A)

  Wet Grip Performance

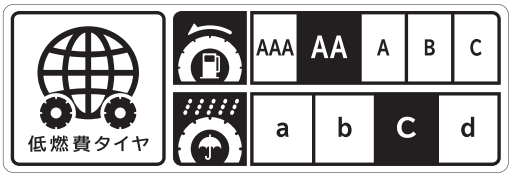
  ·····110 and above (Grade a to d)

- **Date of application :**

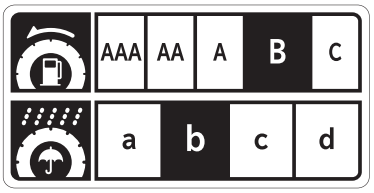
  The application shall begin from January 2010 in voluntary stages.

- **Labeling method (Display)**

(Fuel efficient tyre)



(Non fuel efficient tyre)



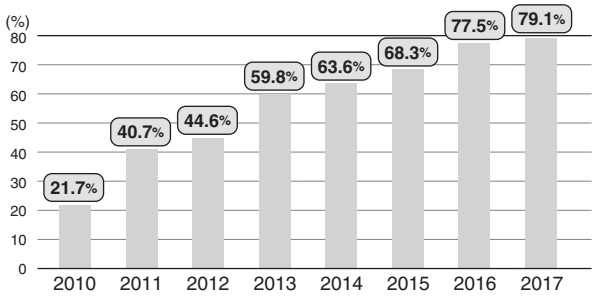
: Uniform mark of fuel efficient tyres

: Rolling Resistance Performance

: Wet Grip Performance

- **The spread of fuel efficient tyres :**

Fuel efficient tyres are on the increase year by year, and most tyres sold at tyre dealers etc. are fuel efficient tyres now.



2. Approach to Reduce CO_2 Emissions

In the lifecycle of a tyre (raw material procurement, manufacturing, distribution, usage, recycling and disposal), over 80% of CO_2 emissions occur in the usage stage. By decreasing rolling resistance of tyres, fuel efficiency is improved and lead to the reduction of CO_2 emissions of automobile.

According to the results of investigating CO_2 emissions in the usage stage for all passenger car tyres (including both original equipment and replacement tyres, available as summer and winter tyres) sold domestically by JATMA members in 2016, total amount of the reduction in CO_2 emission compared with 2006 was 2,972,000 tons, 34.1kg (13.9%) per tyre.

*Above calculations are made according to “Tyre $LCCO_2$ calculation guidelines Ver. 2.0”

Figure 13: CO_2 emission amount during tyre usage stage (per tyre)

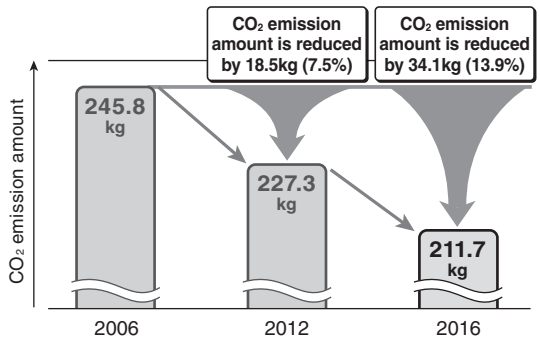
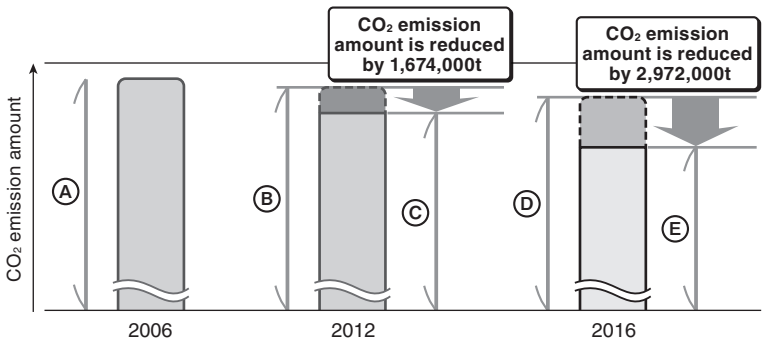


Figure 14: Reduction in CO_2 emission amount during tyre usage stage



Ⓐ : CO_2 emission amount of tyres sold in 2006 (245.8kg/tyre) × number of tyres sold in 2006
Ⓑ : CO_2 emission amount of tyres sold in 2006 (245.8kg/tyre) × number of tyres sold in 2012
Ⓒ : CO_2 emission amount of tyres sold in 2012 (227.3kg/tyre) × number of tyres sold in 2012
Ⓓ : CO_2 emission amount of tyres sold in 2006 (245.8kg/tyre) × number of tyres sold in 2016
Ⓔ : CO_2 emission amount of tyres sold in 2016 (211.7kg/tyre) × number of tyres sold in 2016

3. Effort to "Reduce"

A new concept, "Reduce Index (Re Index)" which focusing on longer wear life and weight saving has been adopted. Taking this concept as the benchmark on tyre product design and development, endeavor to reduction of scrap tyres generation (target 10%, actual reduction of 3-5% is expected) by promoting monitoring of the Re achievement rate.

Table 11: Monitoring of Re Achievement Rates

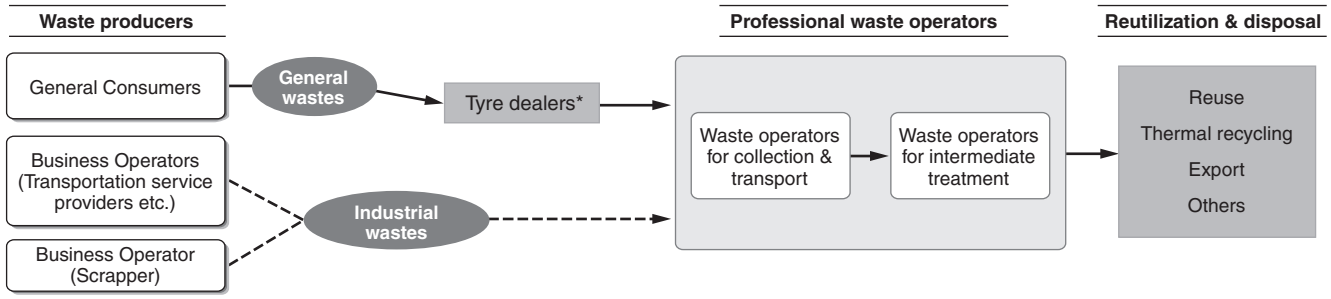
Category	Monitored Size	Classification	Re Achievement Rate				
			2013	2014	2015	2016	2017
Passenger car tyres	155/65R13	Summer tyres	117	113	120	111	114
		Studless tyres	110	93	97	100	111
Passenger car tyres	175/65R14	Summer tyres	121	110	104	105	113
		Studless tyres	101	93	97	103	111
Passenger car tyres	195/65R15	Summer tyres	110	119	108	126	107
		Studless tyres	94	93	96	103	111
Passenger car tyres	215/45R17	Summer tyres	115	113	101	123	107
		Studless tyres	104	93	97	102	111
Light truck tyres	145R12 (145/80R12)	Summer tyres	–	96	–	–	126
		Studless tyres	133	152	105	–	–
Light truck tyres	185R14 (185/80R14)	Summer tyres	–	–	–	–	–
		Studless tyres	140	148	104	–	–
Light truck tyres	205/70R16	Summer tyres	118	119	–	125	–
		Studless tyres	–	111	105	–	–
Truck and bus tyres	225/80R17.5	Summer tyres	116	–	100	100	126
		Studless tyres	102	–	–	–	106
Truck and bus tyres	245/70R19.5	Summer tyres	112	104	100	100	122
		Studless tyres	120	–	–	–	100
Truck and bus tyres	11R22.5	Summer tyres	107	–	100	96	119
		Studless tyres	112	–	–	–	100

N.B.: 1. Re Index = Wear Life Index (L) ÷ Weight Index (W)
Re Achievement Rate = Re Index × 100
where Wear Life Index (L) = [Wear life on design specification of new product (km) ÷ Wear life on design specification of old product (km)] × 100
Weight Index (W) = [Weight of new product (kg) ÷ Weight of old product (kg)] × 100
2. Tyres monitored : Representative 10 sizes selected in advance from replacement tyres for the domestic market.
3. 245/70R19.5 (Truck and Bus tyres) is adopted for monitoring as the replacement of 7.50R16 (Light Truck tyres) from 2007.

Source: JATMA

4. Current Status on Scrap Tyre (Used Tyre) Recycling

Figure 15: Processing flow of scrap tyre recycling



*Any tyre sellers such as tyre retailers, tyre shops, auto-supply shops, gas stations, car dealers, car repair shops, and so on.

(1) Volume of scrap tyres generated

The sum of scrap tyres (used tyres) generated at the time of "tyre replacement" and "vehicle scrapping" in 2017 (January to December) was 97 million tyres in quantity, 1,034,000 tons in weight increased by 3 million tyres from the previous year, increased by 37,000 tons in weight from the previous year.

① At "tyre replacement"

The volume of newly scrapped tyres at "tyre replacement" was 83 million tyres in quantity, and 897,000 tons in weight, both the unit and the weight increased compared with the previous year.

This is the effect of increase in the number of sales of commercial tyres overall, and especially the increase in the number of truck & bus tyres sales increased remarkably.

② At "vehicle scrapping"

The volume of newly scrapped tyres at "vehicle scrapping" increased from the previous year to 14 million tyres in quantity and increased in weight to 137,000 tons from the previous year. With the increase in the volume of scrapped vehicles, both the quantity and weight increased.

(2) Current status of the recycling

The total recycled volume increased by 62,000 tons from the previous year to 965,000 tons in 2017, and the recycling rate was 93%, increased by 2 point.

(3) Others

In recent years, some users of scrap tyres whose required amounts for their production cannot be satisfied by the scrap tyres generated within Japan have been purchasing cut/shredded tyres from foreign countries.

The importing volume of 2017 was 88,000 tons, 110,000 tons in 2013 is the peak and it is decreasing year by year. But it increased by 22,000 tons from the previous year for the first time in 4 years.

The recycling status provided here is based on the calculations of scrap tyres generated within the country, not including the scrap tyres imported from overseas.

Figure 16: Recycling of scrap tyres in 2017

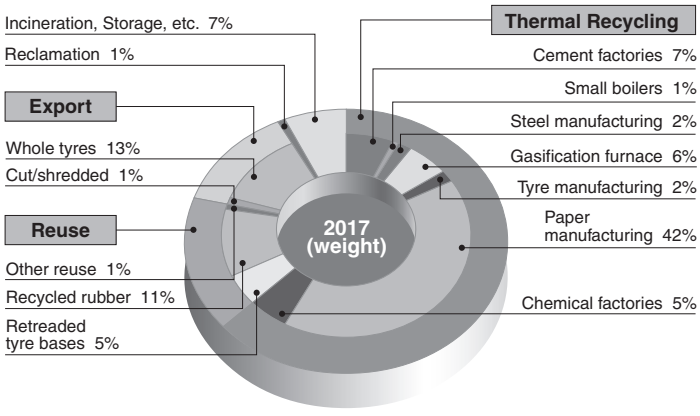


Table 12: Newly scrapped tyres

(Tyres: millions; Tons: thousands)

		2013	2014	2015	2016	2017		
						units and tons	distribution (%)	2017/2016 (%)
At "tyre replacement"	Tyres	82	84	81	81	83	86	102
	Tons	894	924	877	879	897	87	102
At "vehicle scrapping"	Tyres	14	15	14	13	14	14	108
	Tons	128	127	122	118	137	13	116
Total	Tyres	97	99	95	94	97	100	103
	Tons	1,021	1,052	1,000	997	1,034	100	104

Source: JATMA

Table 13: Scrap tyre (Used tyre) Recycling

(Tons: thousands)

				2013	2014	2015	2016	2017		
				tons	tons	tons	tons	tons	distribution(%)	2017/2016(%)
Kind of recycling	Domestic	Reuse	Retreaded tyre bases	59	59	56	53	54	5	102
			Recycled rubber	100	106	105	104	118	11	113
			Other reuse	2	3	3	5	6	1	120
			Subtotal (A)	161	168	164	162	178	17	110
		Thermal Recycling	Paper manufacturing	372	415	439	407	436	42	107
			Chemical factories	40	46	51	58	47	5	81
			Cement factories	62	53	59	63	70	7	111
			Steel manufacturing	27	27	20	19	17	2	89
			Gasification furnace	44	50	49	51	58	6	114
			Tyre manufacturing	27	22	23	23	21	2	91
			Small boilers	6	2	2	5	3	1	60
			Subtotal (B)	578	615	643	626	652	63	104
	Abroad	Export	Whole tyres	153	130	108	108	131	13	121
			Cut/Shredded	7	8	7	7	4	1	57
			Subtotal (C)	160	138	115	115	135	13	117
Total recycling (A+B+C)				899	921	922	903	965	93	107
Reclamation				2	1	1	1	1	1	100
Incineration, Storage, etc.				120	130	77	93	68	7	73
Subtotal (D)				122	131	78	94	69	7	73
Total (A+B+C+D)				1,021	1,052	1,000	997	1,034	100	104

N.B.: There can be some cases that distribution's subtotals and the sums of their constituent items don't match due to the handling of decimals.

Source: JATMA

5. Situation in Illegal Piling & Dumping of Scrap Tyres

As of February 2018 the number of cases of illegal piling & dumping of scrap tyres was 89, and the total weight of scrap tyres was 35,771 tons. Comparing to the statistical research of February last year, the number of cases decreased by 2 and the total weight increased by 30 tons.

"Newly found cases" are cases exists in the past, additionally reported from municipalities and so on, not newly occurred cases.

The demand for scrap tyre as an alternative fuel is still high.

The total of 3 removal operations have been carried out last year.

6. Support Program for Dumping Site Restoration by JATMA

The tyre industry established the support program for dumping site restoration in 2005 and has been operating it in order to reduce illegal piling and dumping of scrap tyres.

In the total of thirteen years, from 2005 to 2017, for 22 cases, JATMA supported 362.13 million yen and removed 2,966,306 units/29,867 tons of scrap tyres.

In 2018, this support is continued.

Note: Please refer to the following Uniform Resource Locator for details.

http://www.jatma.or.jp/english/tyrerecycling/report03.html

V References

1. Automobiles and Tyres

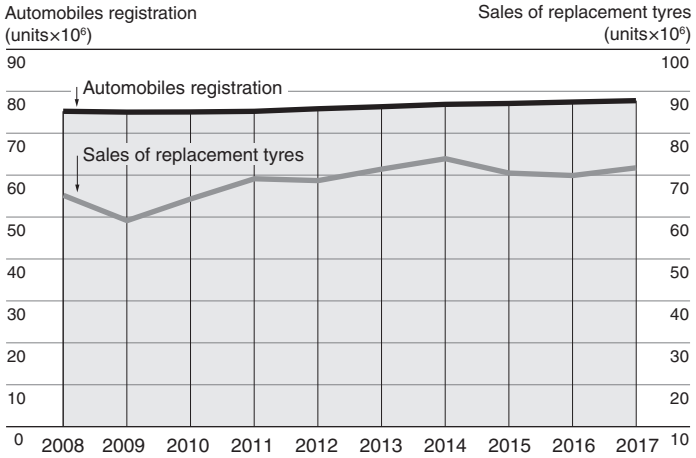
①The number of registered automobiles as of the end of December 2017 increased by 0.4% from the previous year to 77.73 million. The sales volume of replacement tyres (for four-wheeled vehicles) is 71.72 million, which increased by 2.6% from the previous year.

Table 14: Automobile registrations and sales of replacement tyres in 2017

Automobile	Registrations($\times 10^3$)	2017/2016(%)
Passenger cars	61,803	100.6
Trucks and buses	15,930	99.5
Total	77,733	100.4
Replacement tyres	**Sales($\times 10^3$)**	**2017/2016(%)**
Passenger car tyres	52,558	103.0
Commercial vehicle tyres	19,165	101.6
Total	71,723	102.6

Source: Ministry of Land, Infrastructure, Transport and Tourism, JATMA

Figure 17: Trends in automobile registrations and sales of replacement tyres



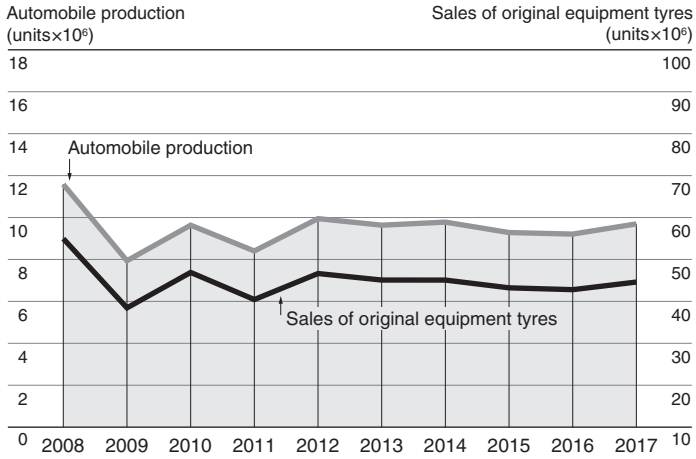
②The volume of domestic production of automobile increased by 5.3% from the previous year to 9.69 million.
Under the influence of this, the sales volume of original equipment tyres (for four-wheeled vehicles) is samely increased by 4.3% from the previous year to 44.59 million tyres in 2017.

Table 15: Automobile production and sales of original equipment tyres in 2017

Automobile	Productions($\times 10^3$)	2017/2016(%)
Passenger cars	8,348	106.0
Trucks and buses	1,343	100.9
Total	9,691	105.3
Original equipment tyres	**Sales($\times 10^3$)**	**2017/2016(%)**
Passenger car tyres	37,907	104.9
Commercial vehicle tyres	6,678	100.6
Total	44,585	104.3

Source: Japan Automobile Manufacturers Association, JATMA

Figure 18: Trends in automobile production and sales of original equipment tyres



2. Distribution Channels

The distribution of automobile tyres is divided into three channels: original equipment, replacement and exports. The channel for replacement is particularly wide-ranging with distributors as key stations as shown in Figure 19. The routes for the channels are roughly divided into two types: direct sales and indirect sales. Direct sales are those under which distributors sell tyres directly to some large users, such as transport, bus and taxi companies, and government and municipal users. Indirect sales are those under which tyre dealers supply tyres to end users. About 90 distributors and approximately about 110,000 tyre dealers supply replacement tyres. In addition, the component ratio (quantity) of sales for each channel in 2017 is 28.3% for original equipment, 45.4% for replacements and 26.3% for exports.

Figure 19: Distribution channels

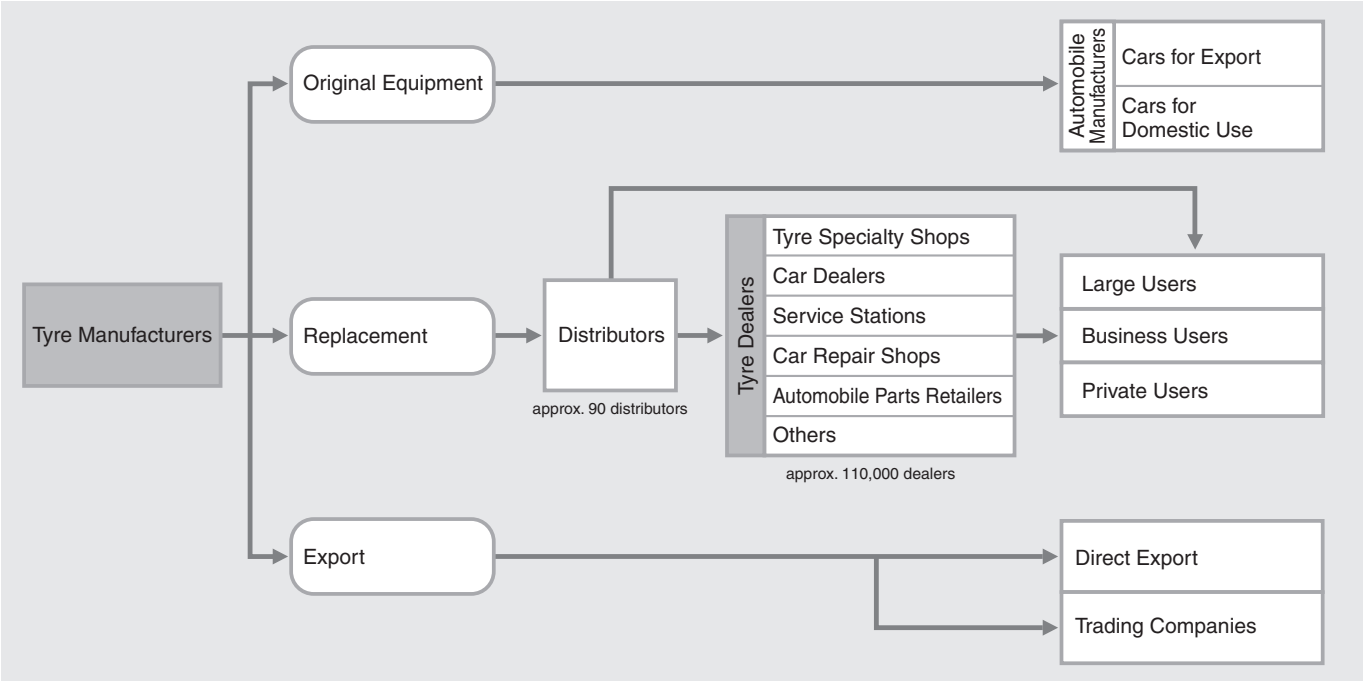
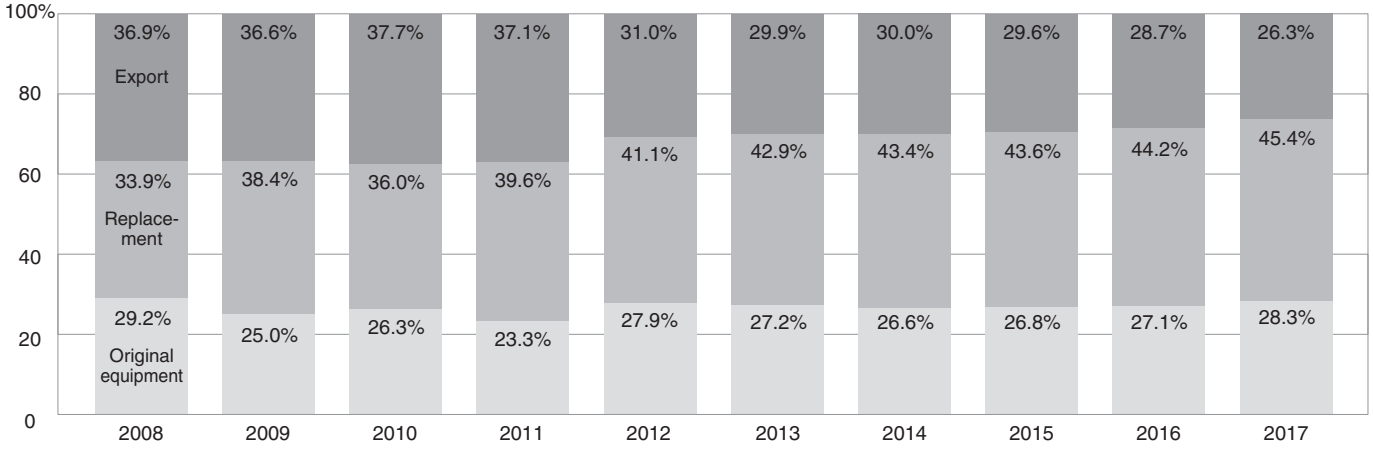


Figure 20: Trends in sales share of automobile tyres

(based on unit)



3. Raw Materials

More than 100 raw materials are used in the production of automobile tyres, including rubber, reinforcing agent, tyre cord, compounding ingredients and bead wire.

The percent distribution in weight of raw materials varied depending on the tyre category, it used in tyres was approximately the same as the previous year, rubber constituting about half of a tyre (natural rubber 30% and synthetic rubber 21%), next comes reinforcing agent (carbon black) 25%, and then tyre cord 14%.

Table 16: Basic composition

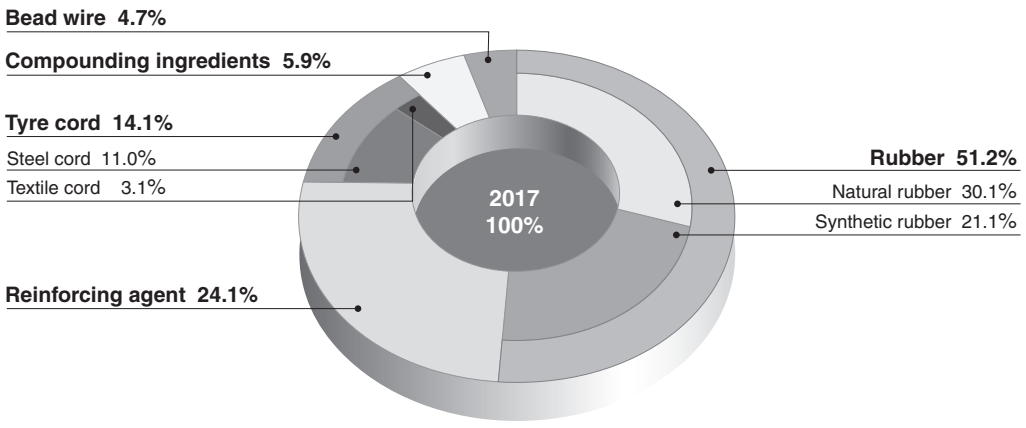
Composition	Examples
Rubber	Natural rubber, Synthetic rubber
Reinforcing agent	Carbon black, Silica
Tyre cord	Steel cord, Textile cord (Nylon, Polyester, Rayon, etc.)
Compounding ingredients	Vulcanizing agent, Vulcanizing accelerator, Vulcanizing accelerator aid, Antioxidant, Filler, Softener etc.
Bead wire	

Table 17: Consumption of main raw materials used in automobile tyres in 2017

Raw Materials			Consumption (tons)	2017/2016(%)
Rubber	Natural rubber		595,027	99.5
	Synthetic rubber		417,281	100.4
	Total		1,012,308	99.9
Reinforcing agent (Carbon black)			476,946	99.0
Tyre cord	Steel		217,683	102.4
	Textile	Nylon	15,541	88.8
		Polyester	41,295	102.8
		Rayon	3,734	95.0
		Others	476	140.4
	Total		278,729	101.5

Source: JATMA

Figure 21: Tyre raw material weight composition



4. Tyre Production Worldwide

According to IRSG (International Rubber Study Group) research, it is estimated that the total production of tyres of the world of 2017 was 16.55 million tons, increased by 2% from the previous year.

By region it is estimated that the Asia and Oceania region takes up 67% of the world production, of which China accounts for 40% and Japan accounts for 6%.

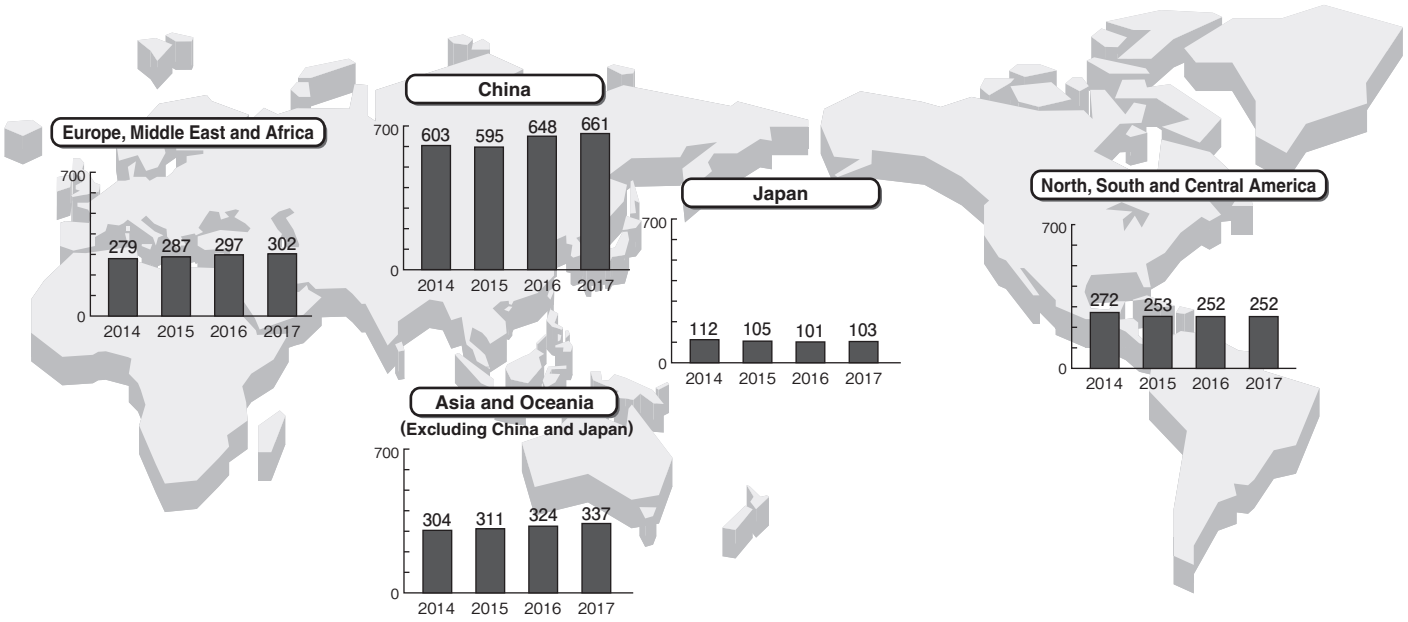
Table 18: Share of world tyre production by geographic region (units×10^3 tons (produced rubber))

	2014	2014/2013(%)	2015	2015/2014(%)	2016	2016/2015(%)	2017	2017/2016(%)	composition ratio(%)
Asia and Oceania	10,184	105	10,112	99	10,727	106	11,010	103	67
(China)	(6,027)	(106)	(5,952)	(99)	(6,484)	(109)	(6,607)	(102)	(40)
(Japan)	(1,119)	(101)	(1,049)	(94)	(1,007)	(96)	(1,031)	(102)	(6)
Europe, Middle East and Africa	2,789	102	2,873	103	2,969	103	3,019	102	18
North, South and Central America	2,721	102	2,528	93	2,523	100	2,522	100	15
Total	15,694	104	15,513	99	16,218	105	16,551	102	100

N.B.: Each value is rounded, so the total doesn't match.

Source: IRSG (International Rubber Study Group)

Figure 22: Tyre Production Worldwide

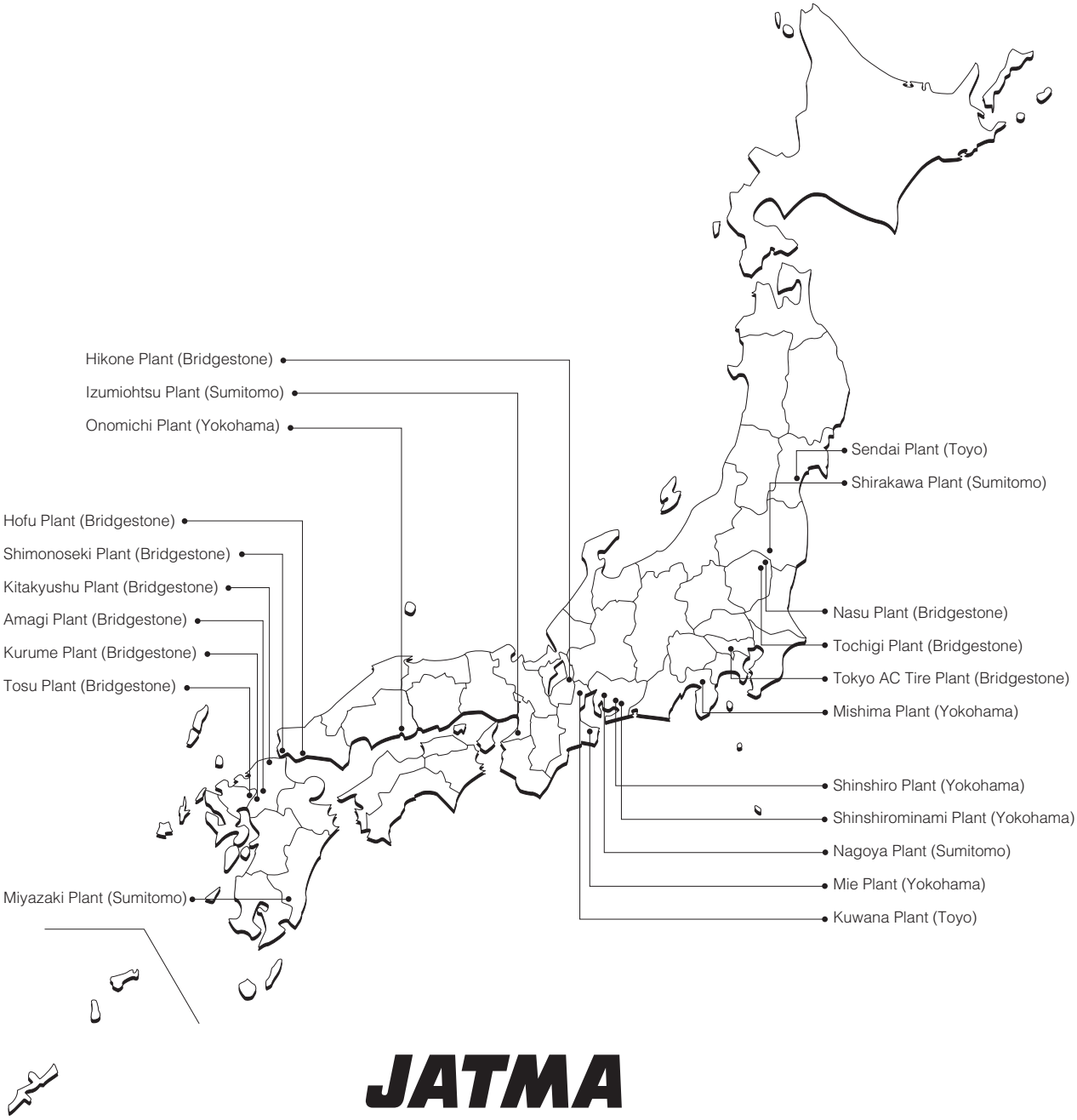


N.B.: 1. Unit: x10,000 tons (produced rubber)
2. Including tyres other than vehicle tyres.

Source: IRSG (International Rubber Study Group)

Distribution of Member Firms' (Full Member) Automobile Tyre Plants

(July 2018)



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Technical Department		Phone. 03-3435-9094	Fax. 03-3435-9097
International Affairs Department		Phone. 03-3435-9094	Fax. 03-3435-9097
Environmental Department		Phone. 03-5408-5051	Fax. 03-3435-9097
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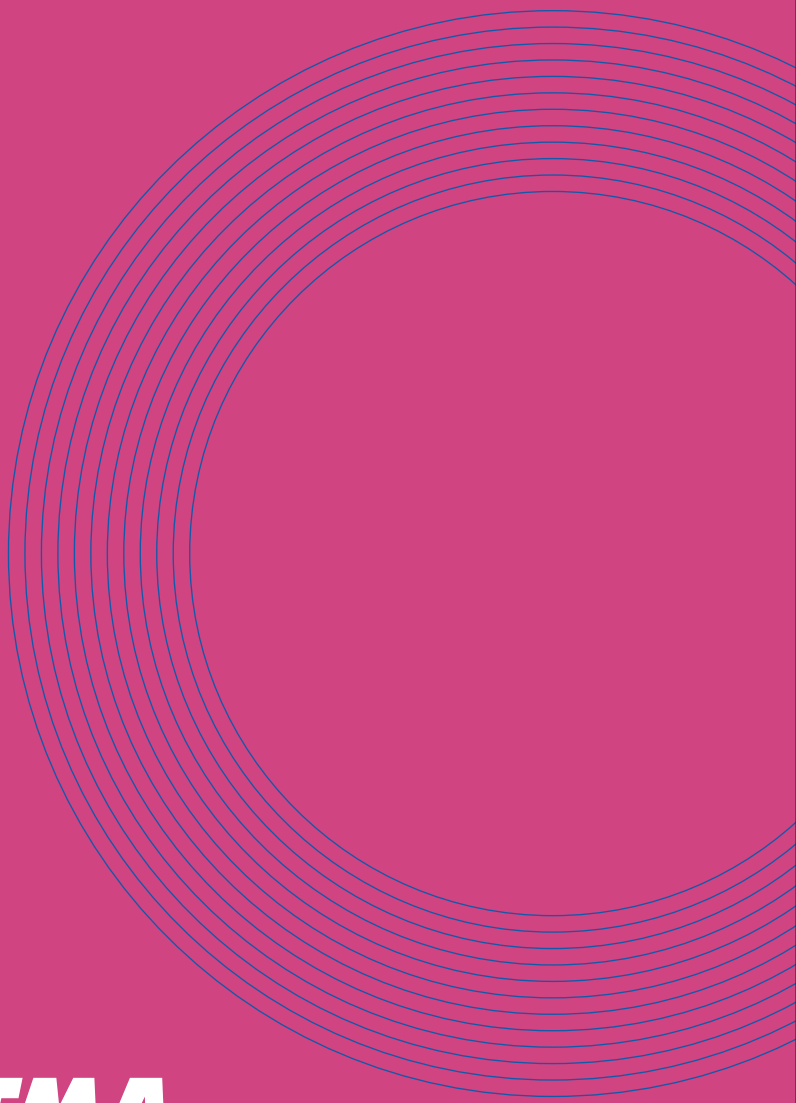
Aug. 2018



JATMA

THE JAPAN AUTOMOBILE TYRE MANUFACTURERS ASSOCIATION,INC.

Time-series Statistical Tables

【Contents 】

Production of automobile tyres and tubes

tyres : $\times 10^3$, rubber : tons, ( ) : year to year comparison %

		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Truck and bus tyres	Tyres	14,140	9,450	11,208	11,387	10,843	10,808	11,001	10,266	9,888	10,499
		(98.2)	(66.8)	(118.6)	(101.6)	(95.2)	(99.7)	(101.8)	(93.3)	(96.3)	(106.2)
	Rubber	363,618	240,743	281,604	282,053	263,370	259,638	263,082	239,596	229,072	241,319
		(98.2)	(66.2)	(117.0)	(100.2)	(93.4)	(98.6)	(101.3)	(91.1)	(95.6)	(105.3)
Light truck tyres	Tyres	23,986	18,915	22,176	22,604	23,194	24,682	24,649	23,141	21,783	21,527
		(95.6)	(78.9)	(117.2)	(101.9)	(102.6)	(106.4)	(99.9)	(93.9)	(94.1)	(98.8)
	Rubber	159,078	122,208	141,588	144,734	142,125	146,561	148,518	139,477	130,183	127,179
		(96.7)	(76.8)	(115.9)	(102.2)	(98.2)	(103.1)	(101.3)	(93.9)	(93.3)	(97.7)
Passenger car tyres	Tyres	135,815	107,409	130,530	126,998	120,609	119,485	120,005	113,821	110,002	108,258
		(99.3)	(79.1)	(121.5)	(97.3)	(95.0)	(99.1)	(100.4)	(94.8)	(96.6)	(98.4)
	Rubber	633,863	485,515	599,075	583,792	535,354	523,064	526,341	505,586	486,732	471,774
		(98.6)	(76.6)	(123.4)	(97.4)	(91.7)	(97.7)	(100.6)	(96.1)	(96.3)	(96.9)
Off-the-road tyres	Tyres	588	293	438	525	504	453	479	446	440	459
		(100.0)	(49.8)	(149.5)	(119.9)	(96.0)	(89.9)	(105.7)	(93.1)	(98.7)	(104.3)
	Rubber	157,097	117,670	152,870	181,585	188,224	181,232	164,831	155,453	156,083	168,892
		(110.3)	(74.9)	(129.9)	(118.8)	(103.7)	(96.3)	(91.0)	(94.3)	(100.4)	(108.2)
Industrial tyres	Tyres	763	429	449	476	442	399	453	415	429	397
		(102.0)	(56.2)	(104.7)	(106.0)	(92.9)	(90.3)	(113.5)	(91.6)	(103.4)	(92.5)
	Rubber	9,108	4,696	5,451	5,899	5,744	4,864	5,761	5,380	5,766	5,464
		(99.6)	(51.6)	(116.1)	(108.2)	(97.4)	(84.7)	(118.4)	(93.4)	(107.2)	(94.8)
Others	Tyres	7,371	4,642	4,906	4,452	3,607	3,804	3,838	3,726	3,833	3,783
		(89.0)	(63.0)	(105.7)	(90.7)	(81.0)	(105.5)	(100.9)	(97.1)	(102.9)	(98.7)
	Rubber	25,618	15,272	15,123	13,900	12,088	12,591	12,529	12,078	11,965	11,822
		(88.8)	(59.6)	(99.0)	(91.9)	(87.0)	(104.2)	(99.5)	(96.4)	(99.1)	(98.8)
Total	Tyres	182,663	141,138	169,707	166,442	159,199	159,631	160,425	151,815	146,375	144,923
		(98.3)	(77.3)	(120.2)	(98.1)	(95.6)	(100.3)	(100.5)	(94.6)	(96.4)	(99.0)
	Rubber	1,348,382	986,104	1,195,711	1,211,963	1,146,905	1,127,950	1,121,062	1,057,570	1,019,801	1,026,450
		(99.3)	(73.1)	(121.3)	(101.4)	(94.6)	(98.3)	(99.4)	(94.3)	(96.4)	(100.7)

N.B.: 1. Source : JATMA

N.B.: 2. "Others" are "agricultural tyres", "motorcycle tyres", "cart tyres", and "flaps and rim-bands"*. (*"Rubber" only)

N.B.: 3. 2001 and following years had a category shift between truck and bus tyres and light truck tyres.

Domestics shipment of automobile tyres and tubes

tyres : $\times 10^3$, rubber : tons, ( ) : year to year comparison %

		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Truck and bus tyres	Tyres	6,300	4,319	5,166	5,647	5,611	6,051	6,294	6,102	6,041	6,313
		(94.3)	(68.6)	(119.6)	(109.3)	(99.4)	(107.8)	(104.0)	(96.9)	(99.0)	(104.5)
	Rubber	138,982	94,056	111,821	121,806	118,001	128,194	132,039	125,959	124,704	130,028
		(94.4)	(67.7)	(118.9)	(108.9)	(96.9)	(108.6)	(103.0)	(95.4)	(99.0)	(104.3)
Light truck tyres	Tyres	15,227	11,863	14,130	14,576	16,313	18,034	17,766	16,913	15,574	15,805
		(91.9)	(77.9)	(119.1)	(103.2)	(111.9)	(110.5)	(98.5)	(95.2)	(92.1)	(101.5)
	Rubber	86,314	64,126	74,287	76,891	84,184	89,746	90,023	84,935	77,304	77,367
		(93.4)	(74.3)	(115.8)	(103.5)	(109.5)	(106.6)	(100.3)	(94.3)	(91.0)	(100.1)
Passenger car tyres	Tyres	81,240	64,410	77,274	76,304	81,640	81,411	81,736	77,441	75,960	78,407
		(97.9)	(79.3)	(120.0)	(98.7)	(107.0)	(99.7)	(100.4)	(94.7)	(98.1)	(103.2)
	Rubber	348,690	260,861	315,780	304,580	319,184	318,344	319,414	304,460	298,886	305,837
		(96.0)	(74.8)	(121.1)	(96.5)	(104.8)	(99.7)	(100.3)	(95.3)	(98.2)	(102.3)
Off-the-road tyres	Tyres	192	102	140	172	169	188	199	194	163	170
		(88.5)	(53.1)	(137.3)	(122.9)	(98.3)	(111.2)	(105.9)	(97.5)	(84.0)	(104.3)
	Rubber	18,487	7,514	12,757	16,152	14,985	12,823	14,406	12,889	11,841	13,962
		(99.4)	(40.6)	(169.8)	(126.6)	(92.8)	(85.6)	(112.3)	(89.5)	(91.9)	(117.9)
Industrial tyres	Tyres	762	470	556	608	545	539	568	541	528	538
		(104.0)	(61.7)	(118.3)	(109.4)	(89.6)	(98.9)	(105.4)	(95.2)	(97.6)	(101.9)
	Rubber	8,686	5,184	6,230	6,825	6,157	6,124	6,414	6,111	6,008	6,125
		(103.2)	(59.7)	(120.2)	(109.6)	(90.2)	(99.5)	(104.7)	(95.3)	(98.3)	(101.9)
Others	Tyres	4,003	2,676	2,641	2,528	2,261	2,097	2,091	1,988	1,857	1,875
		(94.8)	(66.9)	(98.7)	(95.7)	(89.4)	(92.8)	(99.7)	(95.1)	(93.4)	(101.0)
	Rubber	15,609	9,914	9,971	9,464	8,961	8,786	8,797	8,490	7,502	7,472
		(101.4)	(63.5)	(100.6)	(94.9)	(94.7)	(98.1)	(100.1)	(96.5)	(88.4)	(99.6)
Total	Tyres	107,724	83,840	99,907	99,835	106,539	108,320	108,654	103,179	100,123	103,108
		(96.7)	(77.8)	(119.2)	(99.9)	(106.7)	(101.7)	(100.3)	(95.0)	(97.0)	(103.0)
	Rubber	616,768	441,655	530,846	535,718	551,472	564,017	571,093	542,844	526,245	540,791
		(95.6)	(71.6)	(120.2)	(100.9)	(102.9)	(102.3)	(101.3)	(95.1)	(96.9)	(102.8)

N.B.: 1. Source : JATMA

N.B.: 2. "Others" are "agricultural tyres", "motorcycle tyres", "cart tyres", and "flaps and rim-bands"*. (*"Rubber" only)

N.B.: 3. 2001 and following years had a category shift between truck and bus tyres and light truck tyres.

Export shipment of automobile tyres and tubes

tyres : $\times 10^3$, rubber : tons, ( ) : year to year comparison %

		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Truck and bus tyres	Tyres	7,743	5,288	6,011	5,803	5,208	4,630	4,739	4,146	3,837	4,192
		(99.8)	(68.3)	(113.7)	(96.5)	(89.7)	(88.9)	(102.4)	(87.5)	(92.5)	(109.3)
	Rubber	224,628	152,284	171,056	163,608	146,529	129,486	133,266	114,516	104,618	112,045
		(100.2)	(67.8)	(112.3)	(95.6)	(89.6)	(88.4)	(102.9)	(85.9)	(91.4)	(107.1)
Light truck tyres	Tyres	8,800	7,347	8,122	8,184	6,867	6,616	6,840	6,437	6,101	5,891
		(98.4)	(83.5)	(110.5)	(100.8)	(83.9)	(96.3)	(103.4)	(94.1)	(94.8)	(96.6)
	Rubber	73,511	61,294	68,985	69,691	59,288	57,844	59,719	56,596	52,947	51,659
		(97.4)	(83.4)	(112.5)	(101.0)	(85.1)	(97.6)	(103.2)	(94.8)	(93.6)	(97.6)
Passenger car tyres	Tyres	54,351	44,139	53,420	51,097	39,953	38,182	39,070	36,717	34,608	30,661
		(100.0)	(81.2)	(121.0)	(95.7)	(78.2)	(95.6)	(102.3)	(94.0)	(94.3)	(88.6)
	Rubber	281,589	229,881	280,881	274,091	216,362	204,849	209,103	201,221	189,369	167,617
		(99.7)	(81.6)	(122.2)	(97.6)	(78.9)	(94.7)	(102.1)	(96.2)	(94.1)	(88.5)
Off-the-road tyres	Tyres	401	241	350	408	388	335	346	326	324	337
		(103.4)	(60.1)	(145.2)	(116.6)	(95.1)	(86.3)	(103.3)	(94.2)	(99.4)	(104.0)
	Rubber	137,891	112,522	140,328	166,756	174,104	170,369	151,308	143,992	144,645	155,024
		(112.2)	(81.6)	(124.7)	(118.8)	(104.4)	(97.9)	(88.8)	(95.2)	(100.5)	(107.2)
Industrial tyres	Tyres	118	108	109	78	59	56	70	65	85	50
		(80.8)	(91.5)	(100.9)	(71.6)	(75.6)	(94.9)	(125.0)	(92.9)	(130.8)	(58.8)
	Rubber	2,064	1,692	2,044	1,866	1,840	1,355	1,841	1,832	2,112	1,757
		(89.6)	(82.0)	(120.8)	(91.3)	(98.6)	(73.6)	(135.9)	(99.5)	(115.3)	(83.2)
Others	Tyres	3,531	2,353	2,704	2,304	1,682	2,000	2,035	2,066	2,328	2,171
		(100.9)	(66.6)	(114.9)	(85.2)	(73.0)	(118.9)	(101.8)	(101.5)	(112.7)	(93.3)
	Rubber	13,310	9,879	10,514	8,985	7,163	7,678	7,763	7,468	7,734	7,314
		(101.9)	(74.2)	(106.4)	(85.5)	(79.7)	(107.2)	(101.1)	(96.2)	(103.6)	(94.6)
Total	Tyres	74,944	59,476	70,716	67,874	54,157	51,819	53,100	49,757	47,283	43,302
		(99.8)	(79.4)	(118.9)	(96.0)	(79.8)	(95.7)	(102.5)	(93.7)	(95.0)	(91.6)
	Rubber	732,993	567,552	673,808	684,997	605,286	571,581	563,000	525,625	501,425	495,416
		(101.7)	(77.4)	(118.7)	(101.7)	(88.4)	(94.4)	(98.5)	(93.4)	(95.4)	(98.8)

N.B.: 1. Source : JATMA

N.B.: "Others" are "agricultural tyres", "motorcycle tyres", "cart tyres", and "flaps and rim-bands"*. (*"Rubber" only)

N.B.: 3. 2001 and following years had a category shift between truck and bus tyres and light truck tyres.

Sales of original equipment tyres

tyres : $\times 10^3$, ( ) : year to year comparison %

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Truck and bus tyres	1,217	582	900	989	1,131	1,180	1,402	1,372	1,373	1,393
	(97.9)	(47.8)	(154.6)	(109.9)	(114.4)	(104.3)	(118.8)	(97.9)	(100.1)	(101.5)
Light truck tyres	6,277	4,290	4,990	4,591	5,109	5,588	5,900	5,821	5,265	5,285
	(97.0)	(68.3)	(116.3)	(92.0)	(111.3)	(109.4)	(105.6)	(98.7)	(90.4)	(100.4)
Passenger car tyres	47,443	33,551	40,989	34,827	40,376	38,295	37,752	36,012	36,129	37,907
	(99.3)	(70.7)	(122.2)	(85.0)	(115.9)	(94.8)	(98.6)	(95.4)	(100.3)	(104.9)
Total for four-wheeled vehicle tyres	54,937	38,423	46,879	40,407	46,616	45,063	45,054	43,205	42,767	44,585
	(99.0)	(69.9)	(122.0)	(86.2)	(115.4)	(96.7)	(100.0)	(95.9)	(99.0)	(104.3)
Off-the-road tyres	88	37	65	83	90	101	108	106	82	92
	(91.7)	(42.0)	(175.7)	(127.7)	(108.4)	(112.2)	(106.9)	(98.1)	(77.4)	(112.2)
Industrial tyres	412	149	223	245	248	230	244	238	207	221
	(90.4)	(36.2)	(149.7)	(109.9)	(101.2)	(92.7)	(106.1)	(97.5)	(87.0)	(106.8)
Agricultural tyres	690	522	519	566	556	524	537	533	483	493
	(110.0)	(75.7)	(99.4)	(109.1)	(98.2)	(94.2)	(102.5)	(99.3)	(90.6)	(100.8)
Motorcycle tyres	1,933	970	996	951	960	986	1,039	928	889	986
	(81.3)	(50.2)	(102.7)	(95.5)	(100.9)	(102.7)	(105.4)	(89.3)	(95.8)	(110.9)
Cart tyres	802	221	279	137	56	24	31	6	6	-
	(75.3)	(27.6)	(126.2)	(49.1)	(40.9)	(42.9)	(129.2)	(19.4)	(100.0)	-
Total	58,862	40,322	48,961	42,389	48,526	46,928	47,013	45,016	44,434	46,377
	(97.9)	(68.5)	(121.4)	(86.6)	(114.5)	(96.7)	(100.2)	(95.8)	(98.7)	(104.4)

N.B.: 1. Source : JATMA (Total of members only)

N.B.: 2. 2001 and following years had a category shift between truck and bus tyres and light truck tyres.

N.B.: 3. The figures include imported tyres.

N.B.: 4 2017 and following years, cart tyres are included for agricultural tyres.

Sales of replacement tyres

tyres : $\times 10^3$, ( ) : year to year comparison %

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Truck and bus tyres	5,091	4,042	4,620	4,931	4,727	5,026	5,319	5,143	5,233	5,458
	(91.1)	(79.4)	(114.3)	(106.7)	(95.9)	(106.3)	(105.8)	(96.7)	(101.7)	(104.3)
Light truck tyres	13,103	11,959	12,769	13,731	13,820	14,272	14,615	13,615	13,628	13,707
	(93.2)	(91.3)	(106.8)	(107.5)	(100.6)	(103.3)	(102.4)	(93.2)	(100.1)	(100.6)
Passenger car tyres	46,952	43,124	46,908	50,448	50,119	52,109	53,956	51,699	51,023	52,558
	(94.8)	(91.8)	(108.8)	(107.5)	(99.3)	(104.0)	(103.5)	(95.8)	(98.7)	(103.0)
Total for four-wheeled vehicle tyres	65,146	59,125	64,297	69,110	68,666	71,407	73,890	70,457	69,884	71,723
	(94.2)	(90.8)	(108.7)	(107.5)	(99.4)	(104.0)	(103.5)	(95.4)	(99.2)	(102.6)
Off-the-road tyres	117	76	87	102	94	101	105	103	93	93
	(88.6)	(65.0)	(114.5)	(117.2)	(92.2)	(107.4)	(104.0)	(98.1)	(90.3)	(100.0)
Industrial tyres	711	530	593	635	565	583	597	581	580	589
	(96.0)	(74.5)	(111.9)	(107.1)	(89.0)	(103.2)	(102.4)	(97.3)	(99.8)	(101.6)
Agricultural tyres	120	110	114	109	103	100	93	86	88	91
	(92.3)	(91.7)	(103.6)	(95.6)	(94.5)	(97.1)	(93.0)	(92.5)	(102.3)	(103.4)
Motorcycle tyres	2,092	1,877	1,908	1,702	1,637	1,604	1,551	1,510	1,503	1,456
	(99.8)	(89.7)	(101.7)	(89.2)	(96.2)	(98.0)	(96.7)	(97.4)	(99.5)	(96.9)
Cart tyres	35	33	29	28	27	30	28	29	27	27
	(92.1)	(94.3)	(87.9)	(96.6)	(96.4)	(111.1)	(93.3)	(103.6)	(93.1)	(100.0)
Total	68,221	61,751	67,028	71,686	71,092	73,825	76,264	72,766	72,175	73,979
	(94.4)	(90.5)	(108.5)	(106.9)	(99.2)	(103.8)	(103.3)	(95.4)	(99.2)	(102.5)

N.B.: 1. Source : JATMA (Total of members only)

N.B.: 2. 2001 and following years had a category shift between truck and bus tyres and light truck tyres.

N.B.: 3. The figures include imported tyres.

Sales of summer tyres and winter tyres for replacement(for four-wheeled vehicles)

tyres : $\times 10^3$, ( ) : year to year comparison %

		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Truck and bus tyres	Total	5,091	4,042	4,620	4,931	4,727	5,026	5,319	5,143	5,233	5,458
		(91.1)	(79.4)	(114.3)	(106.7)	(95.9)	(106.3)	(105.8)	(96.7)	(101.7)	(104.3)
	Summer	3,331	2,587	2,923	2,969	2,710	2,961	3,090	2,896	2,943	3,002
		(94.9)	(77.7)	(113.0)	(101.6)	(91.3)	(109.3)	(104.4)	(93.7)	(101.6)	(102.0)
	Winter	1,760	1,455	1,697	1,962	2,017	2,065	2,229	2,247	2,290	2,456
		(84.7)	(82.7)	(116.6)	(115.6)	(102.8)	(102.4)	(107.9)	(100.8)	(101.9)	(107.2)
Light truck tyres	Total	13,103	11,959	12,769	13,731	13,820	14,272	14,615	13,615	13,628	13,707
		(93.2)	(91.3)	(106.8)	(107.5)	(100.6)	(103.3)	(102.4)	(93.2)	(100.1)	(100.6)
	Summer	9,561	8,901	9,344	9,654	9,547	9,750	9,863	9,426	9,434	9,346
		(96.5)	(93.1)	(105.0)	(103.3)	(98.9)	(102.1)	(101.2)	(95.6)	(100.1)	(99.1)
	Winter	3,542	3,058	3,425	4,077	4,273	4,522	4,752	4,189	4,194	4,361
		(85.4)	(86.3)	(112.0)	(119.0)	(104.8)	(105.8)	(105.1)	(88.2)	(100.1)	(104.0)
Passenger car tyres	Total	46,952	43,124	46,908	50,448	50,119	52,109	53,956	51,699	51,023	52,558
		(94.8)	(91.8)	(108.8)	(107.5)	(99.3)	(104.0)	(103.5)	(95.8)	(98.7)	(103.0)
	Summer	33,564	31,183	33,620	34,394	33,366	33,738	34,979	34,851	34,907	35,072
		(96.3)	(92.9)	(107.8)	(102.3)	(97.0)	(101.1)	(103.7)	(99.6)	(100.2)	(100.5)
	Winter	13,388	11,941	13,288	16,054	16,753	18,371	18,977	16,848	16,116	17,486
		(91.4)	(89.2)	(111.3)	(120.8)	(104.4)	(109.7)	(103.3)	(88.8)	(95.7)	(108.5)
Total	Total	65,146	59,125	64,297	69,110	68,666	71,407	73,890	70,457	69,884	71,723
		(94.2)	(90.8)	(108.7)	(107.5)	(99.4)	(104.0)	(103.5)	(95.4)	(99.2)	(102.6)
	Summer	46,456	42,671	45,887	47,017	45,623	46,449	47,932	47,173	47,284	47,420
		(96.2)	(91.9)	(107.5)	(102.5)	(97.0)	(101.8)	(103.2)	(98.4)	(100.2)	(100.3)
	Winter	18,690	16,454	18,410	22,093	23,043	24,958	25,958	23,284	22,600	24,303
		(89.6)	(88.0)	(111.9)	(120.0)	(104.3)	(108.3)	(104.0)	(89.7)	(97.1)	(107.5)

N.B.: 1. Source : JATMA (Total of members only)

N.B.: 2. 2001 and following years had a category shift between truck and bus tyres and light truck tyres.

N.B.: 3. 1998 and following years had all season tyres in the summer tyre category.

Exports of tyres and tubes based on Ministry of Finance customs statistics

tyres : $\times 10^3$, value : FOB dollar $\times 10^3$, ( ) : year to year comparison %

		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Asia	Tyres	9,129	6,999	7,560	7,827	6,477	5,985	6,356	5,180	5,579	5,556
		(100.7)	(76.7)	(108.0)	(103.5)	(82.8)	(92.4)	(106.2)	(81.5)	(107.7)	(99.6)
	Value	799,530	674,912	808,485	1,031,338	1,054,305	962,418	836,093	631,309	597,200	677,938
		(117.6)	(84.4)	(119.8)	(127.6)	(102.2)	(91.3)	(86.9)	(75.5)	(94.6)	(113.5)
Middle East	Tyres	14,702	13,412	13,627	12,031	10,606	10,333	10,370	9,180	9,040	7,787
		(105.6)	(91.2)	(101.6)	(88.3)	(88.2)	(97.4)	(100.4)	(88.5)	(98.5)	(86.1)
	Value	1,184,574	1,107,936	1,173,872	1,263,993	1,234,746	1,087,672	977,794	763,439	672,015	589,771
		(123.9)	(93.5)	(106.0)	(107.7)	(97.7)	(88.1)	(89.9)	(78.1)	(88.0)	(87.8)
Europe	Tyres	22,200	15,070	18,908	21,108	17,057	15,392	15,324	13,570	13,507	11,741
		(100.1)	(67.9)	(125.5)	(111.6)	(80.8)	(90.2)	(99.6)	(88.6)	(99.5)	(86.9)
	Value	1,849,351	1,162,604	1,486,981	1,928,789	1,725,179	1,509,561	1,377,041	988,576	967,527	938,779
		(110.9)	(62.9)	(127.9)	(129.7)	(89.4)	(87.5)	(91.2)	(71.8)	(97.9)	(97.0)
North America	Tyres	20,729	17,352	23,016	19,353	14,152	13,599	13,996	14,972	13,122	12,514
		(93.8)	(83.7)	(132.6)	(84.1)	(73.1)	(96.1)	(102.9)	(107.0)	(87.6)	(95.4)
	Value	1,613,517	1,359,334	1,870,321	2,064,587	1,907,040	1,674,369	1,608,169	1,543,873	1,244,632	1,204,854
		(105.5)	(84.2)	(137.6)	(110.4)	(92.4)	(87.8)	(96.0)	(96.0)	(80.6)	(96.8)
South and Central America	Tyres	4,512	3,086	4,365	3,993	3,160	3,407	3,556	3,113	2,630	3,008
		(118.3)	(68.4)	(141.4)	(91.5)	(79.1)	(107.8)	(104.4)	(87.5)	(84.5)	(114.4)
	Value	437,762	410,729	573,743	727,322	817,381	806,013	675,734	595,299	461,168	517,028
		(124.7)	(93.8)	(139.7)	(126.8)	(112.4)	(98.6)	(83.8)	(88.1)	(77.5)	(112.1)
Africa	Tyres	2,140	1,771	2,274	2,085	2,146	1,868	2,284	2,303	2,296	2,193
		(91.9)	(82.8)	(128.4)	(91.7)	(102.9)	(87.0)	(122.3)	(100.8)	(99.7)	(95.5)
	Value	289,539	273,759	338,985	369,284	433,173	408,086	357,368	303,212	259,719	252,438
		(105.5)	(94.5)	(123.8)	(108.9)	(117.3)	(94.2)	(87.6)	(84.8)	(85.7)	(97.2)
Oceania	Tyres	3,959	3,332	3,697	3,243	3,093	3,029	2,747	2,686	2,704	2,160
		(94.0)	(84.2)	(111.0)	(87.7)	(95.4)	(97.9)	(90.7)	(97.8)	(100.7)	(79.9)
	Value	490,931	442,356	589,773	763,649	802,393	697,401	537,353	416,188	430,784	517,591
		(106.2)	(90.1)	(133.3)	(129.5)	(105.1)	(86.9)	(77.1)	(77.5)	(103.5)	(120.2)
Total	Tyres	77,371	61,022	73,447	69,640	56,691	53,613	54,633	51,004	48,878	44,959
		(99.7)	(78.9)	(120.4)	(94.8)	(81.4)	(94.6)	(101.9)	(93.4)	(95.8)	(92.0)
	Value	6,665,204	5,431,630	6,842,160	8,148,962	7,974,217	7,145,520	6,369,552	5,241,896	4,633,045	4,698,399
		(112.6)	(81.5)	(126.0)	(119.1)	(97.9)	(89.6)	(89.1)	(82.3)	(88.4)	(101.4)

Source: Ministry of Finance customs export records

Imports of tyres and tubes based on Ministry of Finance customs statistics

tyres : $\times 10^3$, value : CIF yen$\times 10^4$, ( ) : year to year comparison %

		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Passenger car tyres	Tyres	23,572	19,302	19,346	19,401	20,920	20,267	21,304	21,924	21,918	23,857
		(97.9)	(81.9)	(100.2)	(100.3)	(107.8)	(96.9)	(105.1)	(102.9)	(100.0)	(108.8)
	Value	7,386,186	5,292,031	5,527,743	6,247,210	7,293,639	8,034,798	9,126,658	9,101,192	7,901,000	9,114,454
		(101.7)	(71.6)	(104.5)	(113.0)	(116.8)	(110.2)	(113.6)	(99.7)	(86.8)	(115.4)
Commercial vehicle tyres	Tyres	3,145	2,880	2,617	2,577	2,170	2,245	2,639	2,322	2,300	1,994
		(98.1)	(91.6)	(90.9)	(98.5)	(84.2)	(103.5)	(117.6)	(88.0)	(99.1)	(86.7)
	Value	1,124,280	911,466	947,069	1,081,932	1,149,559	1,151,719	1,713,412	1,757,492	1,483,087	1,633,063
		(97.0)	(81.1)	(103.9)	(114.2)	(106.3)	(100.2)	(148.8)	(102.6)	(84.4)	(110.1)
Motorcycle tyres	Tyres	2,895	2,362	2,595	2,743	2,931	2,841	3,009	2,768	2,889	2,934
		(93.6)	(81.6)	(109.9)	(105.7)	(106.9)	(96.9)	(105.9)	(92.0)	(104.4)	(101.6)
	Value	382,082	330,296	385,462	416,944	469,834	514,251	558,067	540,554	521,073	539,436
		(82.4)	(86.4)	(116.7)	(108.2)	(112.7)	(109.5)	(108.5)	(96.9)	(96.4)	(103.5)
Others	Tyres	510	401	556	593	557	532	592	584	498	520
		(120.5)	(78.6)	(138.7)	(106.7)	(93.9)	(95.5)	(111.3)	(98.6)	(85.3)	(104.4)
	Value	712,295	395,608	701,082	777,141	821,736	833,951	728,744	725,961	667,630	674,037
		(134.7)	(55.5)	(177.2)	(110.8)	(105.7)	(101.5)	(87.4)	(99.6)	(92.0)	(101.0)
Tubes	Value	421,909	312,576	351,526	272,805	300,251	302,412	328,625	323,553	249,739	239,755
		(329.4)	(74.1)	(112.5)	(77.6)	(110.1)	(100.7)	(108.7)	(98.5)	(77.2)	(96.0)
Total	Tyres	30,122	24,945	25,114	25,314	26,578	25,885	27,544	27,598	27,605	29,305
		(97.8)	(82.8)	(100.7)	(100.8)	(105.0)	(97.4)	(106.4)	(100.2)	(100.0)	(106.2)
	Value	10,026,752	7,241,977	7,912,882	8,796,032	10,035,019	10,837,131	12,455,506	12,448,752	10,822,529	12,200,745
		(105.1)	(72.2)	(109.3)	(111.2)	(114.1)	(108.0)	(114.9)	(99.9)	(86.9)	(112.7)

Source: Ministry of Finance customs import records