

TYRE INDUSTRY OF JAPAN

2024



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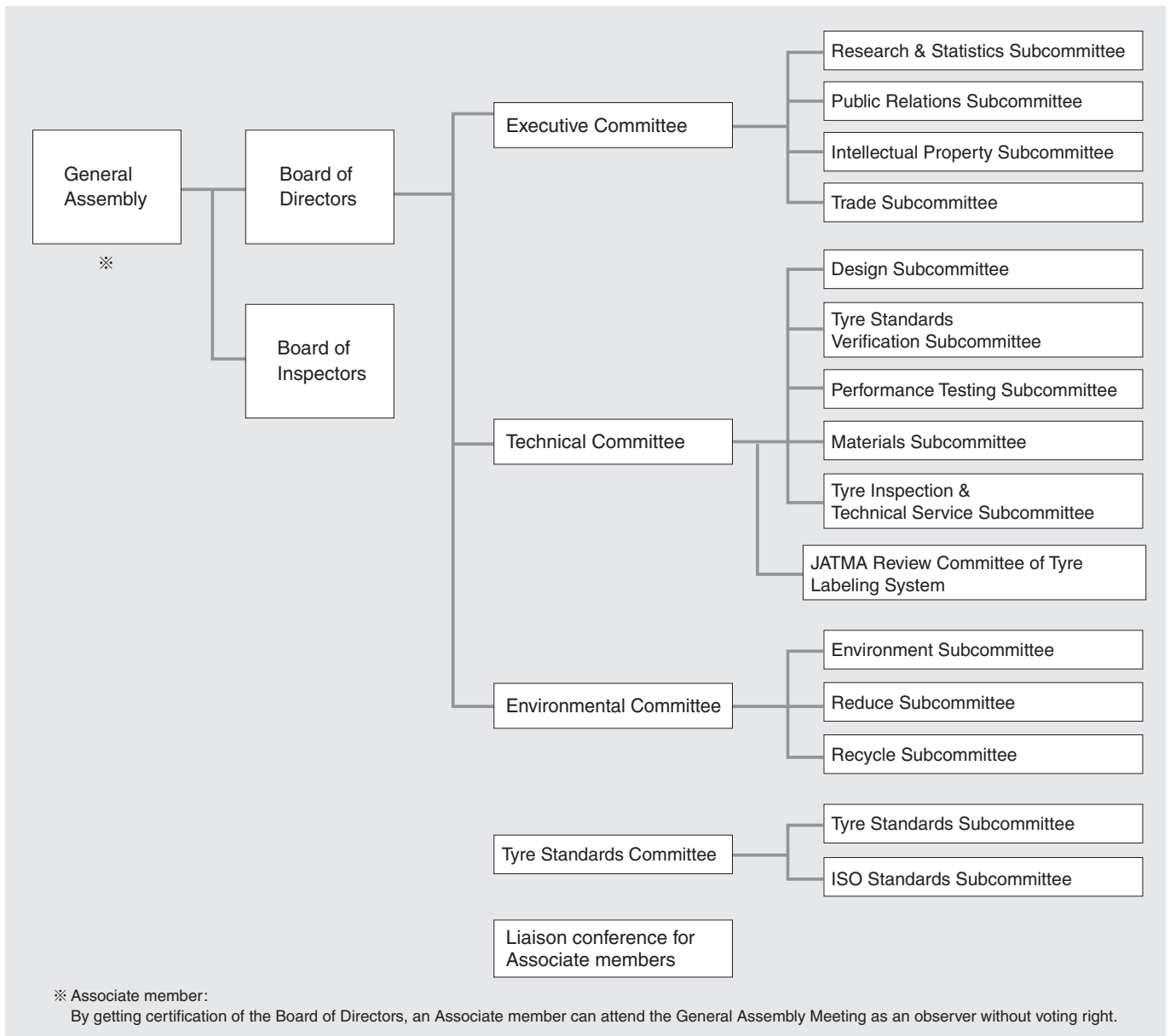
The Japan Automobile Tyre Manufacturers Association, Inc.

Chairman: Satoru Yamamoto, President and CEO, Representative Director, Sumitomo Rubber Industries, Ltd.
Vice-Chairman: Takashi Shimizu, Representative Director, President & CEO, Toyo Tire Corporation
Executive Director: Kenji Kurata
Established: September 1947 (incorporated in December 1968)
Head Office: Toranomom No. 33 Mori Bldg., 8F, 8-21, Toranomom 3-chome, Minato-ku, Tokyo 105-0001, Japan
 Tel.: 03 (3435) 9091 Fax: 03 (3435) 9097

Members:
 [Full members]
 Bridgestone Corporation
 Sumitomo Rubber Industries, Ltd.
 The Yokohama Rubber Co., Ltd.
 Toyo Tire Corporation
 [Associate members]
 Nihon Michelin Tire Co., Ltd.
 Goodyear Japan, Ltd.
 PIRELLI JAPAN K.K.

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.



JATMA Member Companies

[Full members]

Bridgestone Corporation

Representative Masahiro Higashi
Established: March 1, 1931
Capital: ¥126,354 million
(as of the end of December 2023)
Annual sales: revenue*1 ¥4,313,800 million
(fiscal year ending December 2023)
(consolidated)
Employees: 125,199
(consolidated) (as of the end of December 2023)
Head office: 1-1, Kyobashi 3-chome,
Chuo-ku, Tokyo 104-8340
Tel.: 03 (6836) 3001
<https://www.bridgestone.com/>

*1 International Financial Reporting Standards (IFRS) has been applied from 2020

Sumitomo Rubber Industries, Ltd.

Representative Satoru Yamamoto
Established: March 6, 1917
Capital: ¥42,658 million
(as of the end of December 2023)
Annual sales: revenue*2 ¥1,177,399 million
(fiscal year ending December 2023)
(consolidated)
Employees: 39,975
(consolidated) (as of the end of December 2023)
Head office: 6-9, Wakinohama-cho 3-chome, Chuo-ku,
Kobe, Hyogo Prefecture 651-0072
Tel.: 078 (265) 3000
<https://www.srigroup.co.jp/english/>

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

The Yokohama Rubber Co., Ltd.

Representative Masataka Yamaishi
Established: October 13, 1917
Capital: ¥38,909 million
(as of the end of December 2023)
Annual sales: revenue ¥985,333 million
(fiscal year ending December 2023)
(consolidated)
Employees: 33,617
(consolidated) (as of the end of December 2023)
Head office: 2-1 Oiwake, Hiratsuka City,
Kanagawa Prefecture, 254-8601
Tel.: 0463 (63) 0400
<https://www.y-yokohama.com/global/profile/company/>

Toyo Tire Corporation

Representative Takashi Shimizu
Established: August 1, 1945
Capital: ¥55,935 million
(as of the end of December 2023)
Annual sales: ¥552,825 million
(consolidated) (fiscal year ending December 2023)
Employees: 11,656
(consolidated) (as of the end of December 2023)
Head office: 2-13, Fujinoki 2-chome, Itami,
Hyogo Prefecture 664-0847
Tel.: 072 (789) 9100
<https://www.toyotires-global.com/>

[Associate members]

Nihon Michelin Tire Co., Ltd.

Representative Gen Sudo
Established: June 10, 1975
Capital: ¥100 million
(as of the end of December 2023)
Employees: 500
(as of the end of December 2023)
Head office: 880 Uekinocho, Ota City,
Gunma Prefecture 373-8668
Tel.: 0276-25-4321
<https://www.michelin.co.jp/>

Goodyear Japan, Ltd.

Representative Ramy Elsabee
Established: January 10, 1952
Capital: ¥2,336 million
(as of the end of December 2023)
Employees: 181
(as of the end of December 2023)
Head office: Ark Hills South Tower 7F,
1-4-5 Roppongi, Minato-ku,
Tokyo 106-0032
<https://www.goodyear.co.jp/>

Pirelli Japan K.K.

Representative Filippo Cibrario
Established: December 28, 2004
Capital: ¥2.2 billion
(as of the end of December 2023)
Employees: 60
(as of the end of December 2023)
Head office: 20F Sumitomo Realty Shiba Koen First Building,
3-8-2 Shiba, Minato-ku, Tokyo 105-0014
Tel.: 03-5418-6500
www.pirelli.co.jp



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 almost steady demand in the domestic market and active export. It declined severely in 2009 due to the world economic crisis. Though it recovered to a certain extent in 2010, it gradually decreased thereafter, and one of the causes is globalization of the production system. It was considerably lower than the previous year due to the spread of COVID-19 around the world in 2020. The number of tyre production in 2023 was 129.84 million units, and the amount of rubber consumption was 0.97 million tons. Both figures were lower than the previous year, and did not reach the level of 2019, before the spread of COVID-19.

The tyre industry of Japan accounts for about 80% of the domestic rubber industry in terms of rubber consumption, and its trend by decade is as follows.

(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) 2010s

The economy of Japan recovered, supported by the government's economic policies etc, but stagnated in 2011 due to the Great East Japan Earthquake and the record appreciation of the yen. After 2013, it continued its gradual increase by the effect of high stock prices and the depreciation of the yen, but since 2018, due to the effect of the global economic slowdown, it experienced a negative growth in 2019. The world economy also gradually recovered from the financial crisis, and 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, however, growth slowed in many countries and regions since the middle of the 2018. The losing momentum of growth led to the decrease of the tyre volume for export from Japan, and the tyre production amount on a rubber consumption basis in Japan has decreased from 1.20 million tons in 2010 to 1.07 million tons in 2019.

(8) 2020-2023

The Japanese economy was sluggish throughout the year in 2020 due to the impact of COVID-19. Since 2021, effect to the relaxation of behavioral restrictions, it turned to positive but lacked strength due to the turmoil in the global supply network and high prices of commodities. The world economy was also affected by COVID-19, and had negative growth in many countries and regions in 2020. Although the economic activities were normalized and economic recovery trend continued in 2021, but since 2022, the world economy was an inflationary trend in many countries due to high prices of raw materials and soaring energy costs. Under such circumstances, the rubber amount used for tyre production in Japan for both domestic and export decreased from the previous year in 2023, did not reach 1.00 million tons for the first time in three years since 2020, when it was greatly affected by COVID-19.

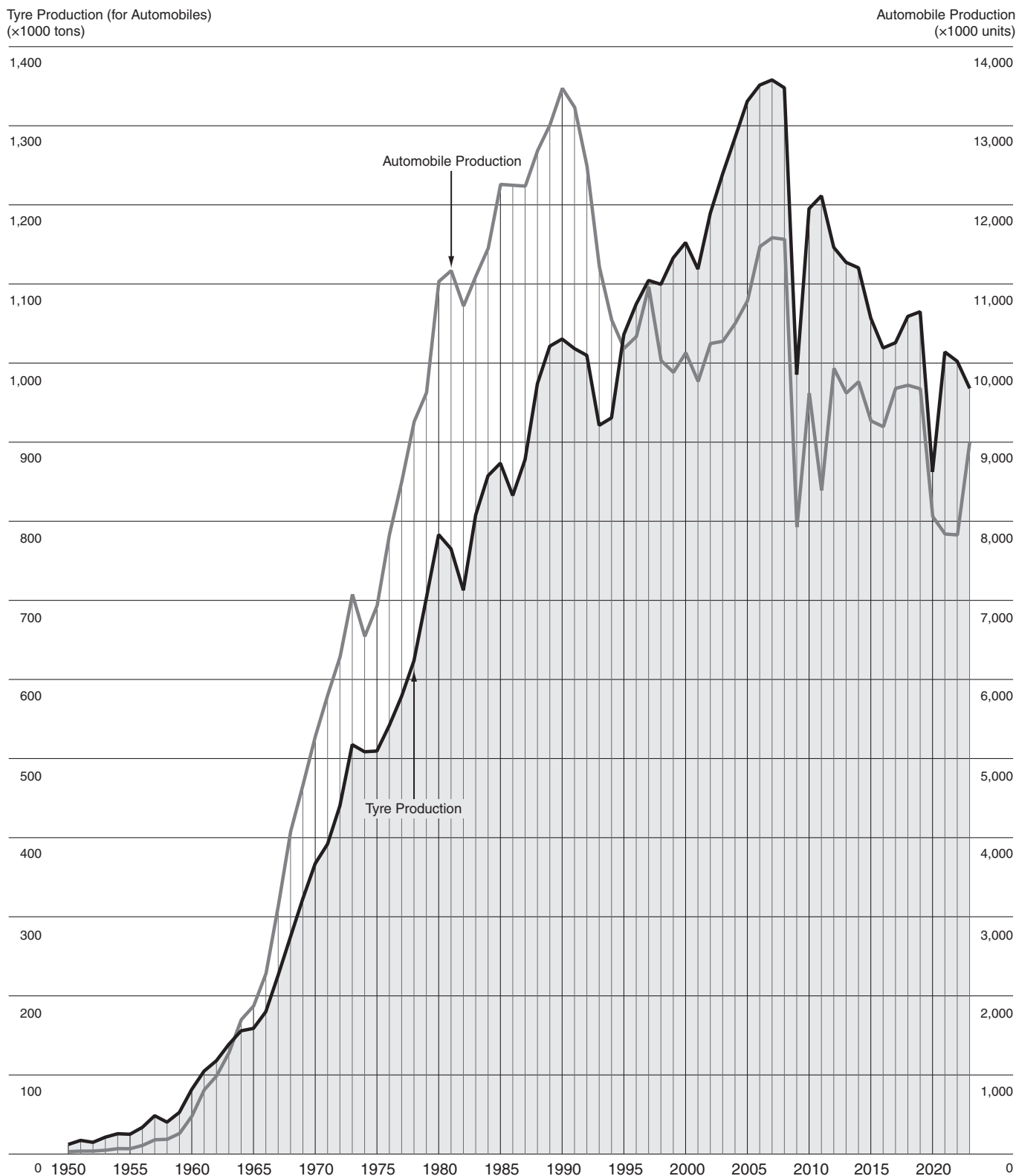
2. Changes in Production Volume of Tyres and Automobiles

Table 1: Changes in Production Volume of Tyres and Automobiles

	1950	1960	1970	1980	1990	2000	2010	2015	2016	2017	2018	2019	2020	2021	2022	2023
Tyre Production (for Automobiles) (×1000 tons)(quantity of rubber)	14	83	369	784	1,031	1,153	1,196	1,058	1,020	1,026	1,060	1,066	863	1,015	1,003	968
Automobile Production (×1000 units)	32	482	5,289	11,043	13,487	10,141	9,629	9,278	9,205	9,691	9,730	9,684	8,068	7,847	7,835	8,999

Source: JATMA

Figure 1: Changes in Production Volume of Tyres and Automobiles



1. Overview

The proportion of the tyre industry (fig. 2 and 3) in the rubber industry in terms of consumption of raw materials (natural rubber and synthetic rubber) decreased by 1.0 percentage points from the previous year to 80.2%. The amount of sales value increased by 2.1 percentage points from the previous year to 55.6%.

The proportion of the tyre industry in the rubber industry in 2023 (excluding cart tyres, tubes and flaps)

Figure 2: Raw material consumption (the amount of natural rubber and synthetic rubber)

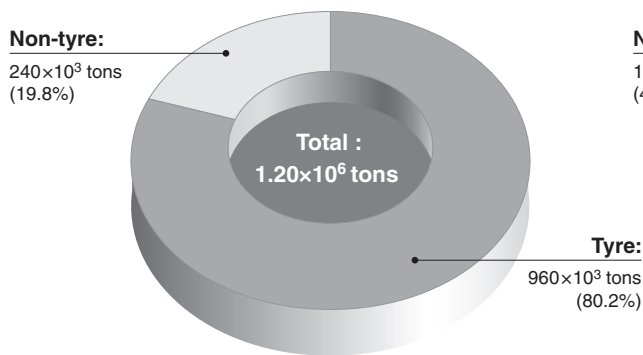
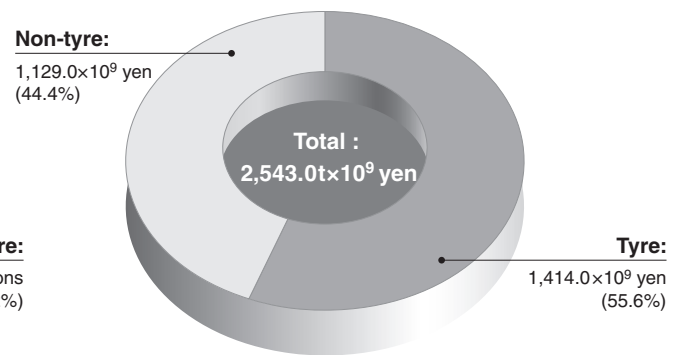
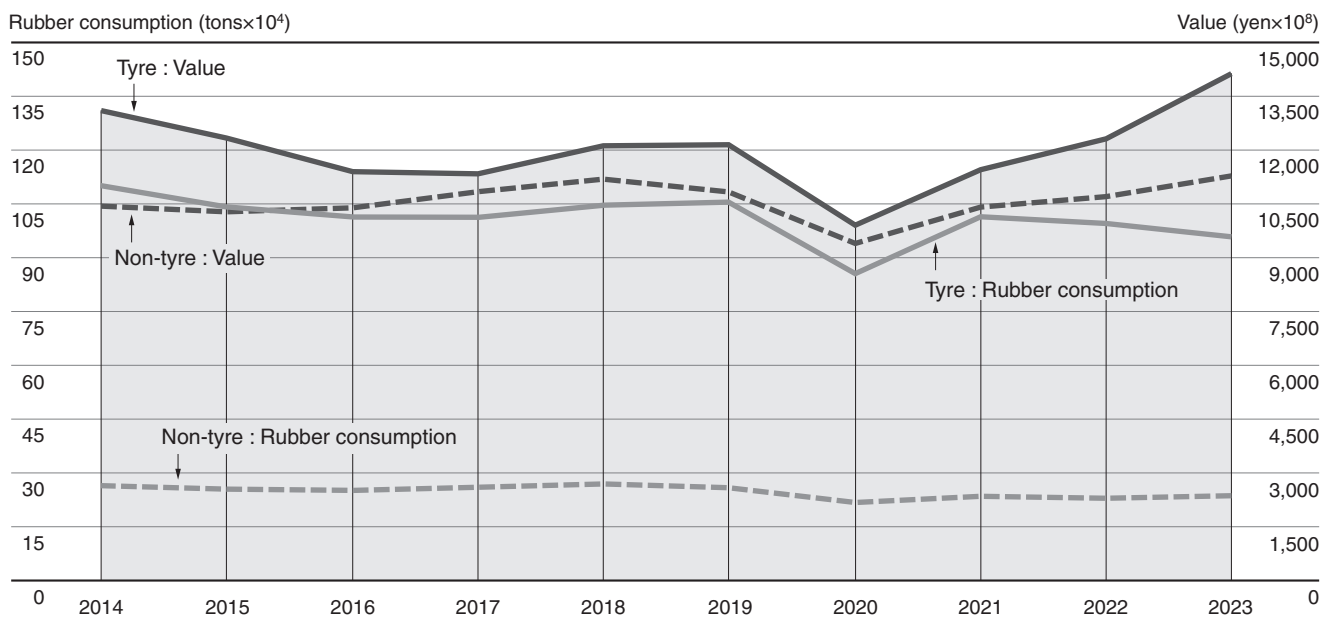


Figure 3: The sales amount



Source: Current Production Statistics by the Ministry of Economy, Trade and Industry

Figure 4: Trends in the raw material consumption (the amount of natural rubber and synthetic rubber) and the sales amount of the tyre industry of Japan



Source: Current Production Statistics by the Ministry of Economy, Trade and Industry

2. Trends in Production by Tyre Category

The production volume of automobile tyres decreased by 2.0% from the previous year to 129.84 million tyres in 2023, which was a decrease for two consecutive years. Passenger car tyres slightly increased by 0.5% from the previous year, but light truck tyres decreased by 6.3%. Truck & bus tyres decreased considerably by 10.9% from the previous year because export volume decreased considerably.

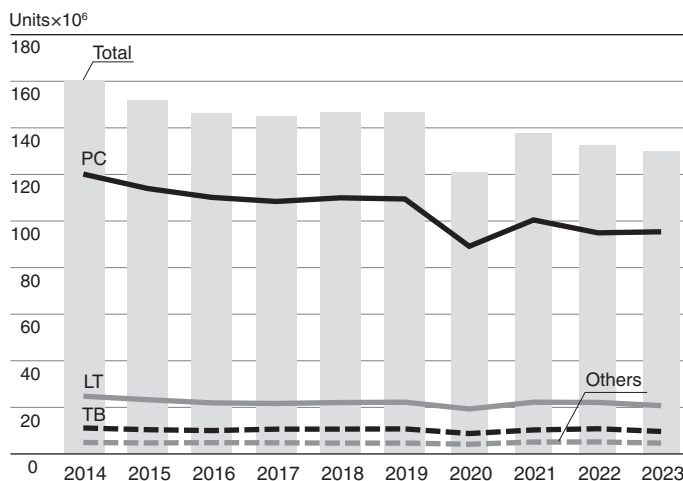
Table 2: Automobile tyre production in 2023

	Production	
	Units($\times 10^3$)	2023/2022(%)
Passenger car tyres	95,234	100.5
Light truck tyres	20,586	93.7
Truck and bus tyres	9,511	89.1
Others	4,511	90.0
Total	129,842	98.0

Note: "Others" are off-the-road tyres, industrial tyres, agricultural tyres, cart tyres, and motorcycle tyres.

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 considerably by 13.6% to 41.59 million tyres in 2023. Although it increased from the previous year for the first time in six years, did not reach the level of 2019, before the spread of COVID-19.

Because of increasing production volume of passenger cars, which reduced the shortage of parts such as semiconductors, the sales volume of their tyres increased considerably by 17.2% from the previous year.

Truck & bus tyres increased considerably by 12.8% as well. However, the sales volume of Light truck tyres almost stayed at the same level as the previous year.

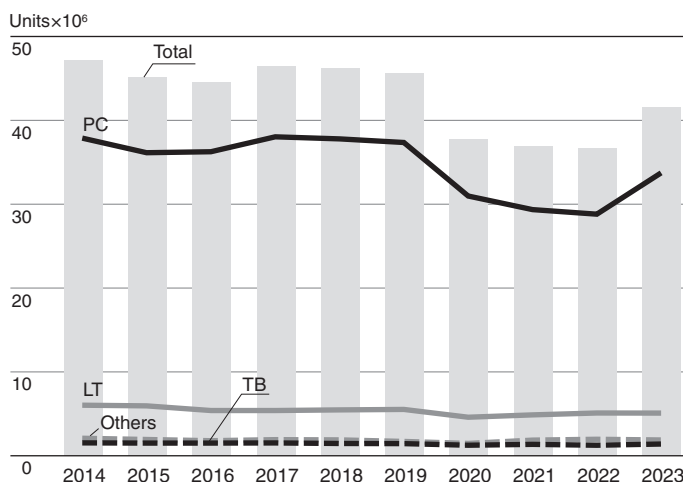
Table 3: Sales of original equipment tyres in 2023

	Sales	
	Units($\times 10^3$)	2023/2022(%)
Passenger car tyres	33,608	117.2
Light truck tyres	4,958	99.8
Truck and bus tyres	1,268	112.8
Others	1,753	95.4
Total	41,587	113.6

Note: 1. "Others" are off-the-road tyres, industrial tyres, agricultural tyres, cart tyres, and motorcycle tyres.
2. Imported tyres 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 decreased by 6.9% from the previous year to 67.09 million tyres in 2023, which was a decrease from the previous year for the first time in three years.

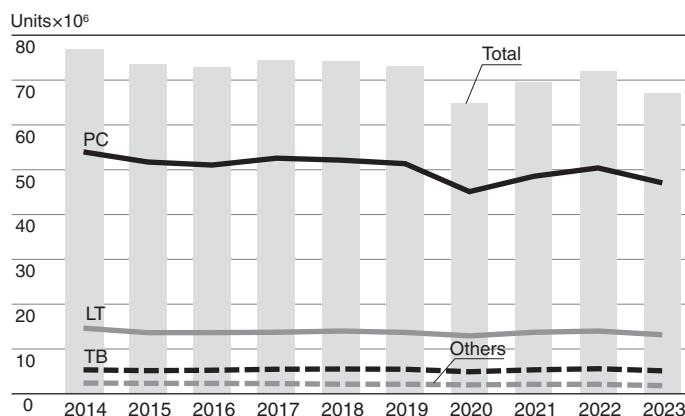
Table 4: Sales of replacement tyres in 2023

	Sales	
	Units($\times 10^3$)	2023/2022(%)
Passenger car tyres	47,049	93.4
Light truck tyres	13,145	94.0
Truck and bus tyres	5,106	91.7
Others	1,787	85.7
Total	67,087	93.1

Note: 1. "Others" are off-the-road tyres, industrial tyres, agricultural tyres, cart tyres, and motorcycle tyres.
2. Imported tyres 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 replacement summer tyres (normal tyres except snow tyres) decreased by 7.5% from the previous year to 42.56 million tyres in 2023, which was a decrease from the previous year for the first time in three years. The sales volume of all categories decreased from the previous year, corporate and consumer confidence were worsening due to high prices of commodities and continuing high prices of gasoline, as passenger car tyres, light truck tyres, and truck & bus tyres decreased by 7.3%, 6.8%, and 11.1%, respectively.

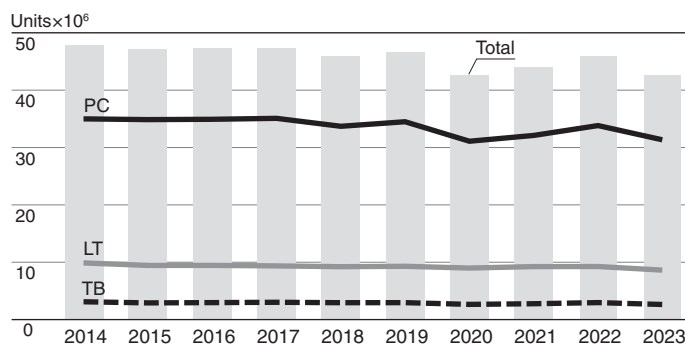
Table 5-1: Sales of summer tyres for replacement (for four-wheeled vehicles) in 2023

	Summer tyres		
	Units($\times 10^3$)	2023/2022(%)	Summer tyre rate(%)
Passenger car tyres	31,332	92.7	66.6
Light truck tyres	8,611	93.2	65.5
Truck and bus tyres	2,619	88.9	51.3
Total	42,562	92.5	65.2

Note: 1. "Summer tyre rate" indicates a percentage of summer tyres in total number of replacement tyre sales.
2. Imported tyres 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 replacement winter tyres decreased by 5.0% from the previous year to 22.74 million tyres in 2023, which was a decrease from the previous year for the first time in three years. The sales volume of all categories decreased from the previous year, corporate and consumer confidence were worsening due to high prices of commodities and continuing high prices of gasoline, and a warm winter, as passenger car tyres, light truck tyres, and truck & bus tyres decreased by 5.2%, 4.5%, and 5.2%, respectively.

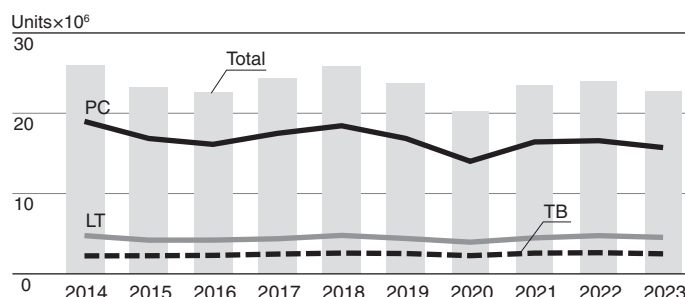
Table 5-2:
Sales of winter tyres for replacement (for four-wheeled vehicles) in 2023

	Winter tyres		
	Units($\times 10^3$)	2023/2022(%)	Winter tyre rate(%)
Passenger car tyres	15,717	94.8	33.4
Light truck tyres	4,534	95.5	34.5
Truck and bus tyres	2,487	94.8	48.7
Total	22,738	95.0	34.8

Note: 1. "Winter tyre rate" indicates the percentage of winter tyres in total number of replacement tyre sales.
2. Imported tyres 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 7.5% from the previous year to 38.01 million tyres in 2023, which was an decrease for two consecutive years. The export volume of all categories decreased from the previous year, as passenger car tyres, light truck tyres, and truck & bus tyres decreased by 3.6%, 11.5%, and 22.1%, respectively.

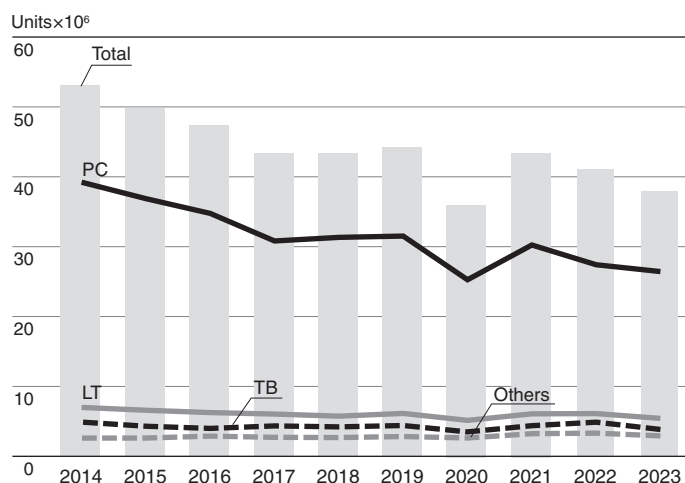
Table 6: Sales of export tyres in 2023

	Sales	
	Units($\times 10^3$)	2023/2022(%)
Passenger car tyres	26,283	96.4
Light truck tyres	5,271	88.5
Truck and bus tyres	3,685	77.9
Others	2,766	87.6
Total	38,005	92.5

Note: "Others" are off-the-road tyres, industrial tyres, agricultural tyres, cart tyres, and motorcycle tyres.

Source: JATMA

Figure 9: Trends in sales of export tyres



6. Exports by Region of Destination

The export volume of automobile tyres in 2023 decreased by 8.8% from the previous year to 38.79 million tyres, however, it increased on a value basis by 8.6% from the previous year to 757.1 billion yen. The total of product weight for export decreased by 8.2% from the previous year to 1.04 million tons.

By region (on a quantity basis) apart from North America, the export volume for the other regions decreased, and for world wide resulted in a decrease from the previous year as well.

Table 7: Exports by region of destination in 2023

	Tyre Units($\times 10^3$)				2023/ 2022 (%)	Value (FOB) (yen $\times 10^9$)	2023/ 2022 (%)
	PC	TB<	Others	Total			
North America	12,667	2,560	490	15,717	102.0	267,850	116.2
South & Central America	1,578	502	279	2,359	88.2	83,575	98.1
Europe	5,847	474	1,515	7,836	79.9	94,017	90.6
Middle East	3,536	1,537	38	5,111	87.6	68,661	107.4
Africa	489	587	35	1,111	82.7	38,313	122.8
Asia	4,102	658	365	5,125	91.4	115,405	112.4
Oceania	993	413	128	1,534	81.5	89,230	112.1
Total	29,212	6,731	2,850	38,793	91.2	757,051	108.6
Weight(tons)	388,842	271,050	381,665	1,041,557	91.8		

Source: Trade Statistics of Japan

Note: 1. Exchange rates are averages of Tokyo InterBank offered spot exchange rate.

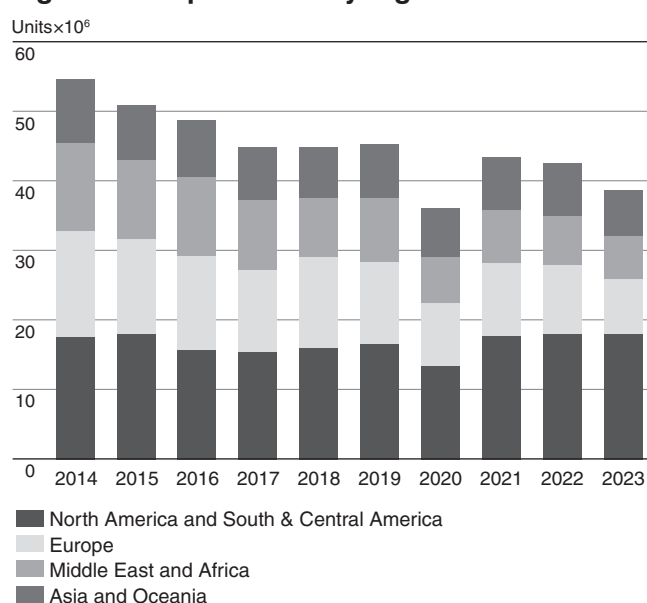
2022: 1USD = 131yen

2023: 1USD = 140yen

2. "Others" doesn't include Aircraft tyres and Bicycle tyres.

3. Weight and Value include tubes.

Figure 10: Export trend by region



7. Imports by Region of Origin

The import volume of automobile tyres in 2023 increased by 6.7% from the previous year to 30.56 million tyres on a quantity basis, and increased on a value basis by 10.3% from the previous year to 177.6 billion yen. Product weight total of import increased by 3.7% from the previous year to 0.29 million tons.

By region (on a quantity basis), import volume from Asia increased which account for more than 90% of the total and the total volume also increased from the previous year as well.

Table 8: Imports by region of origin in 2023

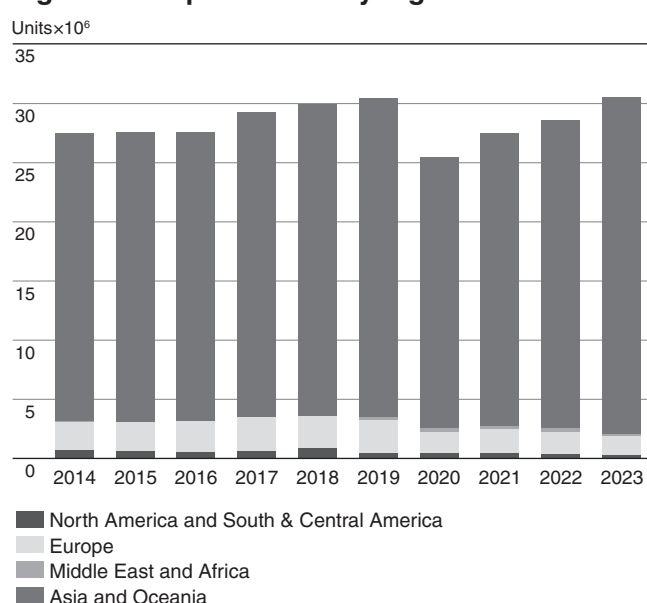
	Tyre Units($\times 10^3$)				2023/ 2022 (%)	Value (CIF) (yen $\times 10^9$)	2023/ 2022 (%)
	PC	TB<	Others	Total			
North America	152	33	27	212	68.8	3,883	90.1
South & Central America	46	2	9	57	85.1	2,158	151.4
Europe	1,471	33	181	1,685	88.2	23,256	99.7
Middle East	10	3	2	15	107.1	452	119.6
Africa	122	0	0	122	46.9	841	50.0
Asia	22,370	3,059	3,043	28,472	109.1	147,005	113.2
Oceania	0	0	0	0	—	0	0.0
Total	24,171	3,130	3,262	30,563	106.7	177,595	110.3
Weight(tons)	200,428	62,935	27,711	291,074	103.7		

Source: Trade Statistics of Japan

Note: 1. "Others" doesn't include Aircraft tyres and Bicycle tyres.

2. Weight and Value include tubes.

Figure 11: Import trends by region





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.

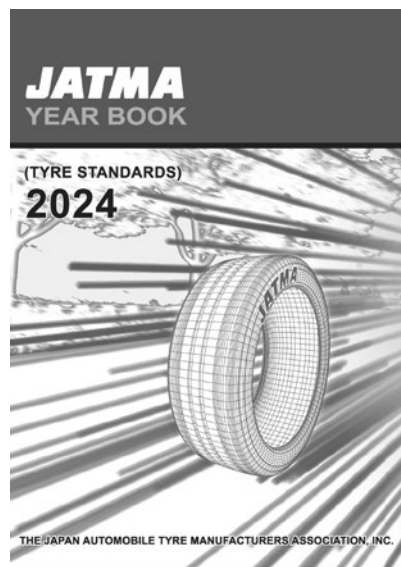
2. Tyre Standards

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 tread depth (minimum tread depth) in its Safety Regulations for Road Vehicles, and proscribed the use of tyres of insufficient tread 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 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 five 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	Tread 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	Tread depth limit
Passenger car tyres	1.6 mm
Light truck tyres	2.4 mm
Truck and bus tyres	3.2 mm

Figure 12: Causes of damages

(Parentheses show defect rates)

Insufficient tyre tread depth		2 (0.8)
Uneven wear		8 (3.4)
External cuts (reaching the cord)		0 (0.0)
Stepped on a nails or alien matter		0 (0.0)
Insufficient inflation pressure		80 (33.6)
Others		13 (5.5)

Notes:

- Multiple tyre defects per vehicle are possible, thus the number of tyre defects does not correspond to the number of vehicles with tyre defects.
- The defect rate is the number of defects divided by the number of vehicles inspected.
- Tyre inspections were carried out a total of 13 times (5 times on expressways and 8 times on ordinary roads) in 2023.

1. Tyre Labeling System for Low Car Exterior Sound Tyres

The purpose of this system is to contribute to the reduction of vehicle traffic noise from the tyre sector. The operation started from January 2023.

This is an industry voluntary system established to clarify “Low Car Exterior Sound Tyres”, which are tyres that meet a certain standard level on rolling sound emissions of tyres from a travelling vehicle, and how to display the labels.

• Scope

Replacement summer and winter tyres for passenger cars, light trucks, and trucks & buses.

• Performance Requirements

The limits of rolling sound emissions stipulated in UN R117-02.

• How to Display the Labels

Display the name and/or the label (shown on the right) representing “Low Car Exterior Sound Tyres”.



2. Tyre Labeling System for Fuel-Efficient Tyres

For the purpose of providing consumers with easy-to-understand and more appropriate information, it has been in operation since January 2010.

A system established as an industry voluntary standard to classify rolling resistance performance and wet grip performance based on a grading system and label them.

• Scope

Replacement tyres for passenger cars
Note : excluding tyres sold as “studless tyres”.

• 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

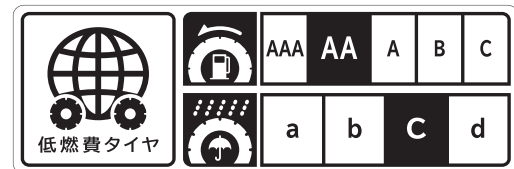
• Performance requirements for fuel efficient tyres

Rolling Resistance Coefficient
.....9.0 and below (Grade AAA to A)

Wet Grip Performance
..... 110 and above (Grade a to d)

• How to Display the Labels

(example)



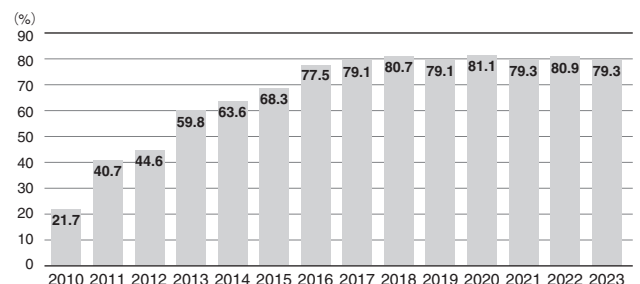
: Mark of fuel efficient tyres
低燃費タイヤ

: Rolling Resistance Performance

: Wet Grip Performance

• The spread of fuel efficient tyres :

The labeling system started in 2010, and in recent years, it is widely used and more than 80% is “Fuel Efficient Tyres”.



3. Preventing Global Warming

The tyre industry has been working to reduce GHG emissions throughout the entire life cycle of tyres.

To encourage consumer's cooperation to reduce CO₂ emissions during the "use stage", which accounts for over 80% of emissions during the lifecycle, JATMA started a tyre labeling system which includes information on RRC.

In 2012, JATMA developed "Tyre LCCO₂ Calculation Guidelines Ver.2.0" which explains how to calculate greenhouse gases throughout the entire lifecycle showing some examples. In 2021, JATMA developed "Tyre LCCO₂ Calculation Guidelines Ver.3.0", which complies with international standards and includes the latest data.

We also use this guideline to publicize the effects on resource usage saving and CO₂ emissions reduction. Together with our stakeholders, we are working to contribute to the prevention of global warming.

- Reduction Effect of CO₂ Emissions by Reducing Rolling Resistance of Passenger Car Tyres
- Effects on resource usage saving and CO₂ emissions reduction through the spread of retread tyres for trucks and buses (https://www.jatma.or.jp/english/environment_recycle/globalwarming.html)

4. Efforts to Reduce TRWP

The Japanese tyre industry is working to reduce the amount of tyre wear particles by improving abrasion performance. In cooperation with the WBCSD (World Business Council for Sustainable Development)/TIP (Tire Industry Project), which is composed of the world's leading tyre manufacturers, we are working to understand the essence of tyre and road wear particles (TRWP) through scientific research and to study their impact on the environment and human health and mitigation measures. The four full members of JATMA are all members of WBCSD/TIP.

TRWP is an acronym for Tyre and Road Wear Particles. Tyres are the only parts of a car that come into contact with the road surface, and friction between the road surface and the tyres is physically essential for the tyres to support the vehicle's load while driving, turning, and stopping. The particles generated by friction between the tyres and the road surface are called TRWP, which are a mixture of tyre tread and road pavement material. Most TRWP have a size of 100 µm or less (1 µm = 0.001 mm). Tyre tread rubber consists mainly of natural rubber and synthetic rubber (SBR, BR, etc.), but it also contains reinforcing materials such as carbon black and silica, as well as compounding ingredients such as vulcanizing agents, vulcanizing accelerators, vulcanizing accelerator aids, and antioxidants.

5. Effort to Reduce

In order to promote longer lasting and lighter tyres, we publish the "Reduction Achievement Rate" calculated from the life index and weight index of the new product compared to the old product every year.

A reduction achievement rate above 100 indicates improvement, and below 100 indicates deterioration.

- Reduction Achievement Rate = Reduction Coefficient x 100
- Reduction Coefficient = Life Index / Weight Index
- Life index = (Wear life of new product based on design specification (km) / Wear life of old product based on design specification (km)) x 100
- Weight index = (weight of new product (kg) / weight of old product (kg)) x 100

In recent years, the performance required of tyres has become more diverse, such as reducing exterior noise, wet grip, rolling resistance, etc., and it is important to consider the balance between these, but by promoting longer life and lighter weight, we aim to reduce the amount of ELT generated and the amount of raw materials used.

Table 11: Reduction achievement rate

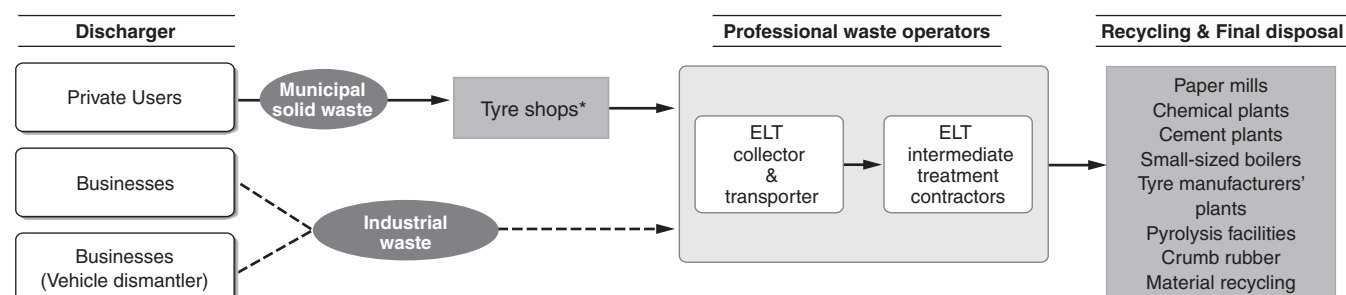
Category	Tyre size	Classification	Reduction achievement rate				
			2019	2020	2021	2022	2023
Passenger car tyres	155/65R13	Summer tyres	144	–	96	106	–
		Studless tyres	–	85	98	–	–
Passenger car tyres	175/65R14	Summer tyres	124	–	98	108	–
		Studless tyres	–	85	99	100	–
Passenger car tyres	195/65R15	Summer tyres	114	–	108	110	106
		Studless tyres	–	95	100	–	–
Passenger car tyres	215/45R17	Summer tyres	120	–	118	115	108
		Studless tyres	–	72	102	–	–
Light truck tyres	145R12 (145/80R12)	Summer tyres	110	–	–	100	–
		Studless tyres	–	–	97	121	–
Light truck tyres	185R14 (185/80R14)	Summer tyres	124	–	–	98	–
		Studless tyres	–	–	97	–	–
Light truck tyres	205/70R16	Summer tyres	101	115	133	–	–
		Studless tyres	–	96	–	122	116
Truck and bus tyres	225/80R17.5	Summer tyres	109	100	–	113	–
		Studless tyres	–	–	111	100	120
Truck and bus tyres	245/70R19.5	Summer tyres	107	–	–	113	–
		Studless tyres	–	–	107	107	107
Truck and bus tyres	11R22.5	Summer tyres	106	100	–	141	–
		Studless tyres	–	100	110	114	120

Note: 7.50R16 has been replaced by 245/70R19.5 since 2007.

Source: JATMA

6. Amount of ELT Generated and Effectively Utilized

Figure 13: Processing flow of ELTs



*Tyre shops such as tyre dealers, tyre shops, car accessory stores, gas stations, car dealers, car maintenance shops, etc.

(1) Amount of ELT generated

The amount of ELT generated in Japan in 2023 was 90 million tyres, including tyres replaced and those from scrapped vehicles. This is a decrease of 1 million units from the previous year.

① Amount of ELT generated by replacing tyres

The amount of ELT generated by replacing tyres was 78 million tyres. Due to the decline in consumer and business sentiment caused by high prices, sales of commercial tyres decreased from the previous year, and the amount of ELT generated also decreased by 1 million tyres compared to the previous year.

② Amount of ELT generated from scrapped vehicles

The amount of ELT generated from scrapped vehicles was 12 million units. The number of scrapped vehicles remained below 3 million units for the second consecutive year, and the amount of ELT generated was the same as the previous year.

Table 12: Trends in ELT generation

	Tyres: millions			
	2020	2021	2022	2023
The amount generated by replacing tyres *1	72	76	79	78
The amount generated from scrapped vehicles *2	13	14	12	12
Total	85	90	91	90

*1 Estimated based on the sales of commercial tyres and trade statistics of Japan by the Ministry of Finance.

*2 Estimated based on the amount of scrapped vehicles by Japan Automobile Recycling Promotion Center.

Source: JATMA

Retreaded tyres are excluded because they do not become ELTs while in use and do not affect the amount of ELT generated nor effectively used. The figures in the table above do not include retreaded tyres. Other countries use a similar approach to organize their data.

(2) Effective utilization of ELTs

The amount of effectively utilized ELT in 2023 was 776,000 tons, with an effective utilization rate of 99.2%. The use of ELTs as fuel in paper mills has expanded, increasing by about 10% year-on-year and accounting for about 60% of the total effectively utilized amount. Although new entrants continue to enter the ELT pyrolysis business, its usage is still limited in terms of the total amount of ELT effectively utilized.

Table 13: Trends in ELTs utilized effectively

Weight: kt

	2020	2021	2022	2023
Paper mills	415	425	433	476
Chemical plants	96	112	136	113
Cement plants	69	73	81	67
Small-sized boilers	2	3	5	5
Tyre manufacturers' plants	2	2	3	2
Pyrolysis facilities	10	1	2	1
Crumb rubber	115	84	85	88
Material recycling	1	1	15	24
Steel plants	16	17	0	0
Effective utilization amount	723	718	760	776
Amount of ineffective final disposal	5	11	14	6
Effective utilization rate	99.3%	98.5%	98.2%	99.2%

Source: JATMA

(3) Others

- Previously, the recycling rate was calculated based on estimates of the amount of ELT generated and the amount recycled, collected from separate data sources. However, this time, in order to present figures that are more in line with reality, we decided to calculate the effective utilization rate as the proportion of the amount of effectively utilized ELT in the total amount of processed ELT.

The effective utilization rate is calculated as “effectively utilized amount” / “effectively utilized amount + ineffectively utilized final disposal amount” x 100.

- For the purpose of calculating the domestic effective utilization rate, this calculation does not include exports of ELTs, and exports of cut/shredded ELTs, and imports cut/shredded ELTs.
- Plants that use ELTs as fuel continue to purchase cut/shredded ELTs from overseas, and the annual import amount for 2023 was approximately 139,200 tons. An increase of approximately 60,000 tons from the previous year, and the highest level since data collection began.

7. Status of Illegal Dumping of ELTs

At the time of investigation in February 2024, there were 75 cases and 23,765 tons of illegal dumping of ELTs in Japan. Although the entire amount was not removed, there were several cases where the amount of accumulated ELTs had decreased, resulting in a decrease in the total amount.

8. JATMA Support Program

To reduce illegal dumping of ELTs, JATMA has been operating a restoration support system since 2005.

In the total of 19 years, from 2005 to 2023, JATMA supported 379.26 million yen for 23 cases, and removed 2,993,013 tyres /30,117 tons of ELTs.

1. Automobiles and Tyres

①The number of registered automobiles as of the end of December 2023 increased by 0.3% from the previous year to 78.39 million units. The sales volume of replacement tyres (for four-wheeled vehicles) were 65.30 million tyres, which decreased by 6.6% from the previous year.

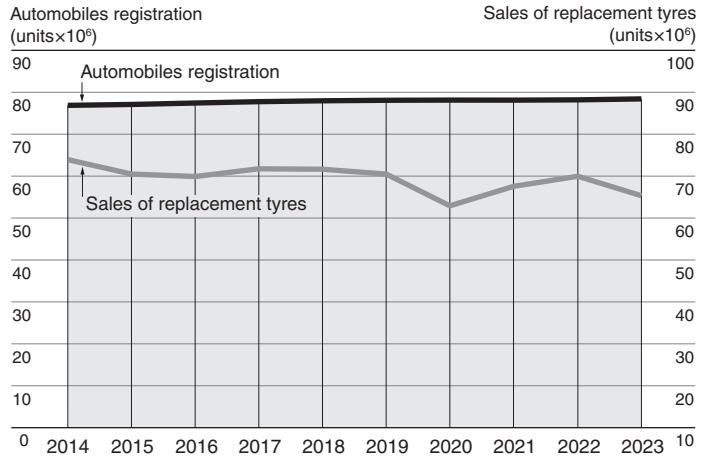
Table 14: Automobile registrations and sales of replacement tyres in 2023

Automobile	Registrations($\times 10^3$)	2023/2022(%)
Passenger cars	62,320	100.3
Trucks and buses	16,074	100.4
Total	78,394	100.3
Replacement tyres	Sales($\times 10^3$)	2023/2022(%)
Passenger car tyres	47,049	93.4
Commercial vehicle tyres	18,251	93.3
Total	65,300	93.4

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

Note: The number of automobile registrations does not include tricycles, towed vehicles, and large special vehicles.

Figure 14: Trends in automobile registrations and sales of replacement tyres



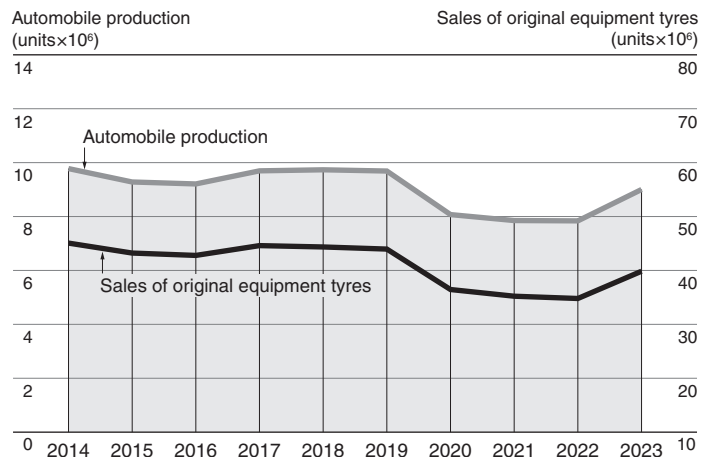
②The volume of domestic production of automobile in 2023 increased by 14.9% from the previous year to 9.00 million units. The sales volume of original equipment tyres (for four-wheeled vehicles) increased by 14.5% from the previous year to 39.83 million tyres.

Table 15: Automobile production and sales of original equipment tyres in 2023

Automobile	Productions($\times 10^3$)	2023/2022(%)
Passenger cars	7,767	118.3
Trucks and buses	1,232	97.1
Total	8,999	114.9
Original equipment tyres	Sales($\times 10^3$)	2023/2022(%)
Passenger car tyres	33,608	117.2
Commercial vehicle tyres	6,226	102.2
Total	39,834	114.5

Source: Japan Automobile Manufacturers Association, JATMA

Figure 15: 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 16. The routes for the channels are roughly divided into two types: the first type is distributors sell tyres directly to logistics, bus and taxi companies, and government and municipal users. The other next is tyre dealers supplying tyres to logistics, bus and taxi companies, government and municipal users, and general customers. In addition, the component ratio (quantity) of sales for each channel in 2023 is 28.4% for original equipment, 45.7% for replacements and 25.9% for exports.

Figure 16: Distribution channels

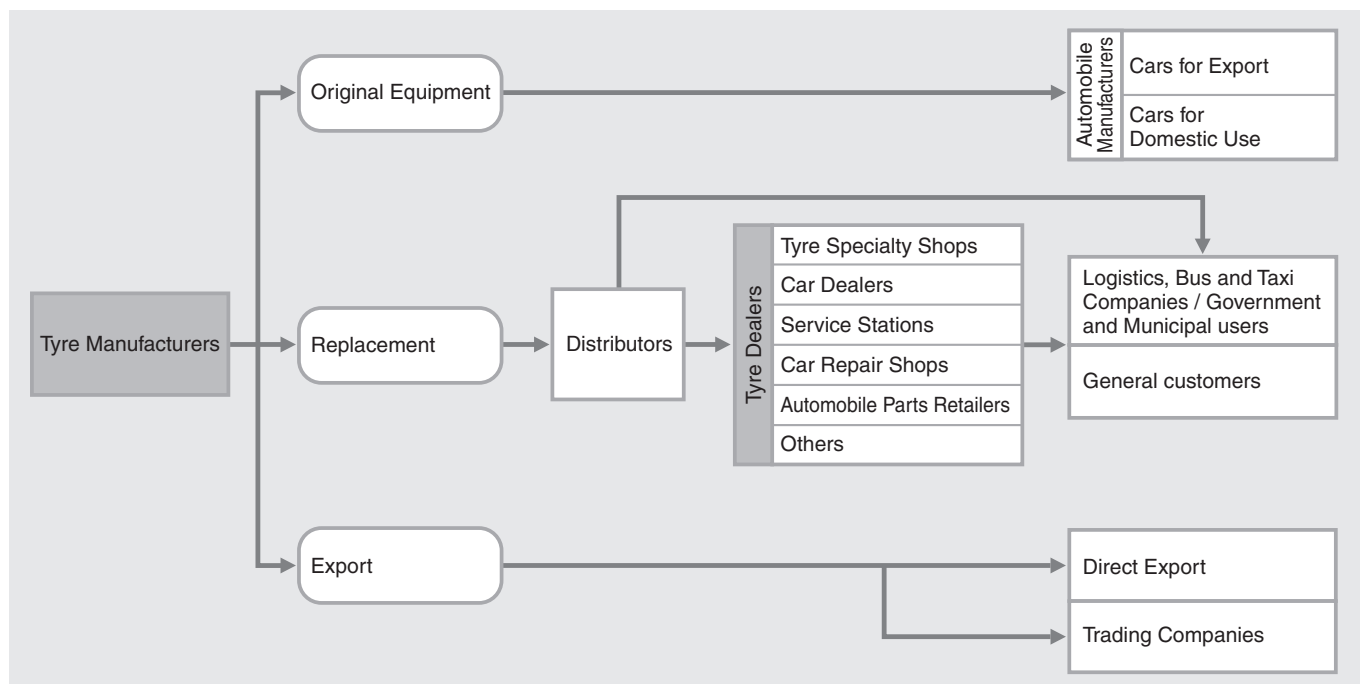
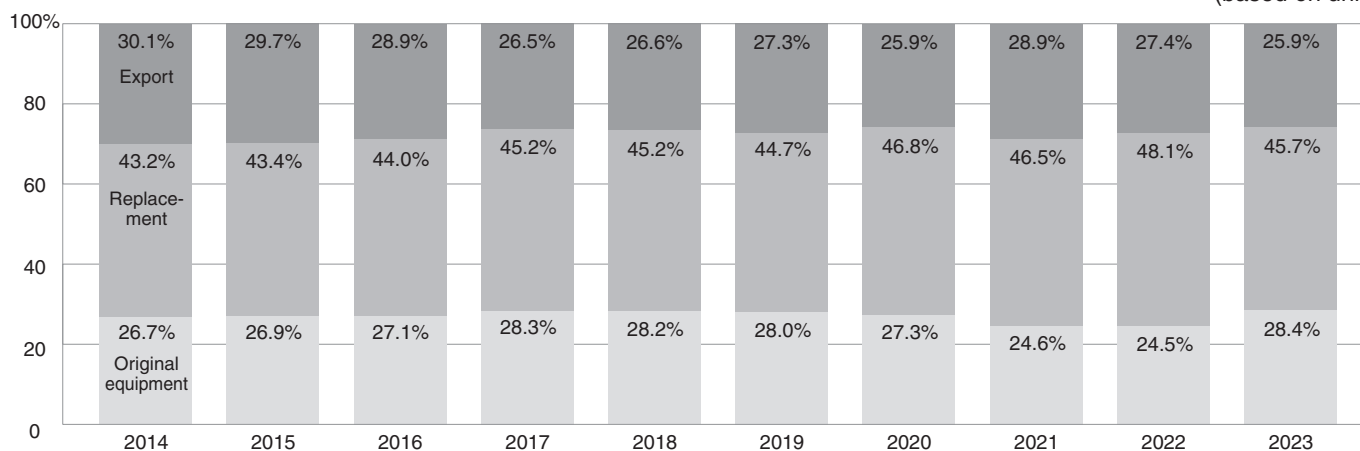


Figure 17: Trends in sales share of automobile tyres

(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 tyre composition in weight varies depending on the tyre category, but approximately half consists of rubber (natural rubber 29% and synthetic rubber 19%), and the others are reinforcing agent at 22%, tyre cord at 14% and so on.

Figure 18: Tyre raw material weight composition

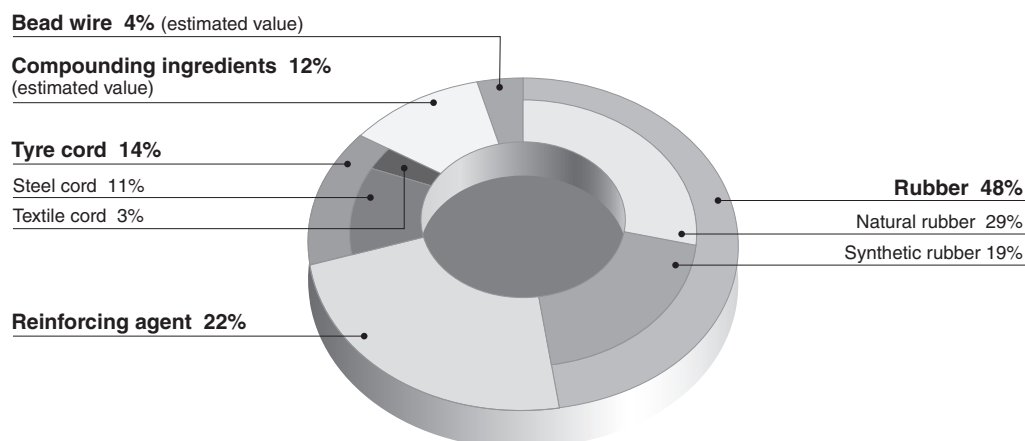


Table 16: Basic composition

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	

4. Consumption of Rubber by Tyre and Tyre Products

According to IRSG (International Rubber Study Group) research, it was estimated that the total rubber consumption by tyre and tyre products of the world in 2023 was 17.06 million tons, increased by 1% from the previous year.

By region, it was estimated that the Asia and Oceania regions account for more than 70% of the world's rubber consumption, among others, China and Japan account for 41% and 6%, respectively.

Table 17: Consumption of Rubber by Tyre and Tyre Products

2021–2022: Unit: ×1,000 tons

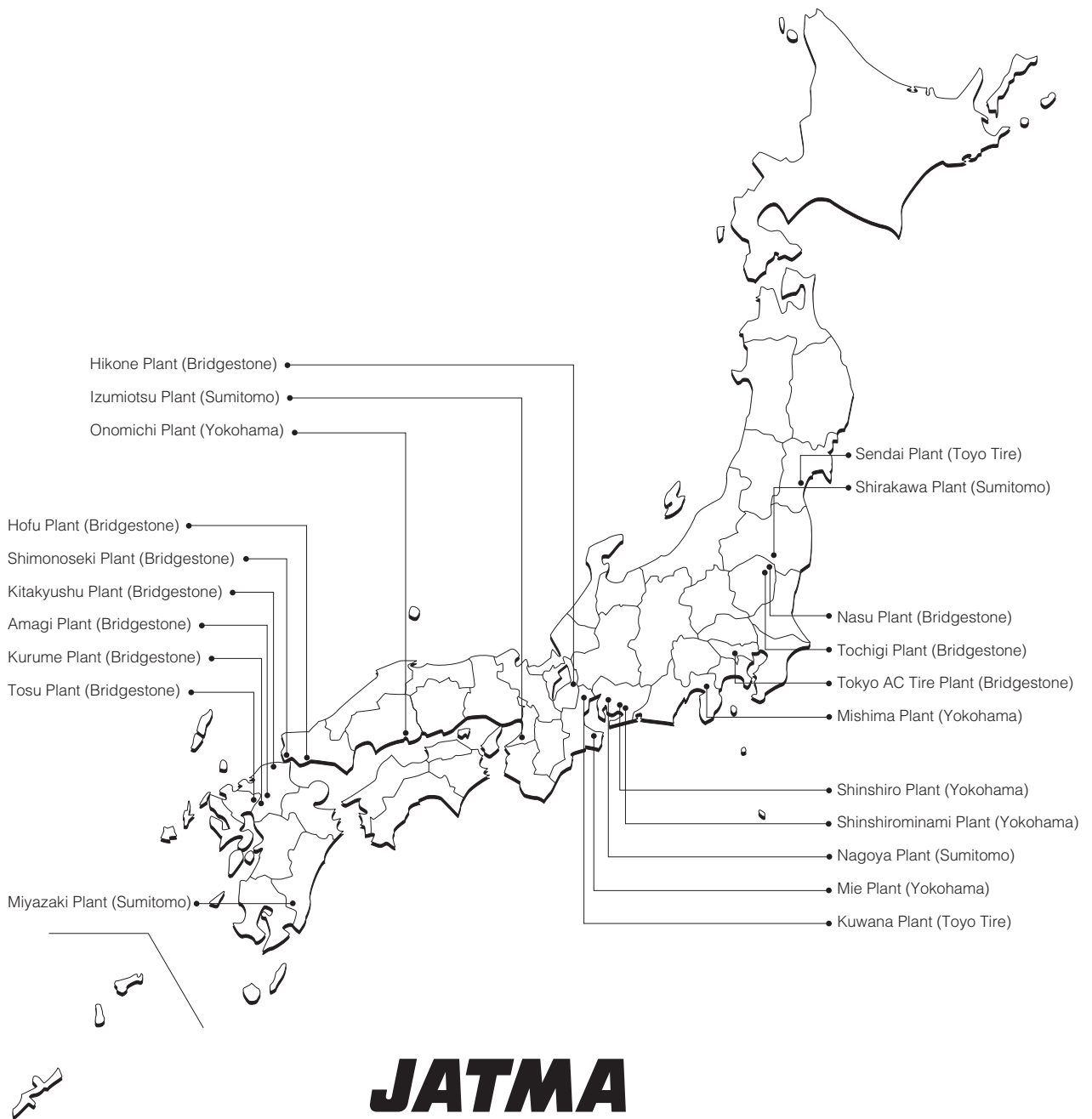
	2021	2022	2023	2023/2022(%)	composition ratio(%)
Asia and Oceania	12,041	11,922	12,124	102	71
(China)	(7,131)	(6,756)	(7,005)	(104)	(41)
(Japan)	(990)	(976)	(948)	(97)	(6)
Europe, Middle East and Africa	2,820	2,684	2,676	100	16
North, South and Central America	2,332	2,264	2,262	100	13
Total	17,194	16,870	17,063	101	100

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

Source: IRSG "The World Rubber Industry Outlook" (August 2023)

Distribution of Member Companies' (Full Members) Automobile Tyre Plants

(July 2024)

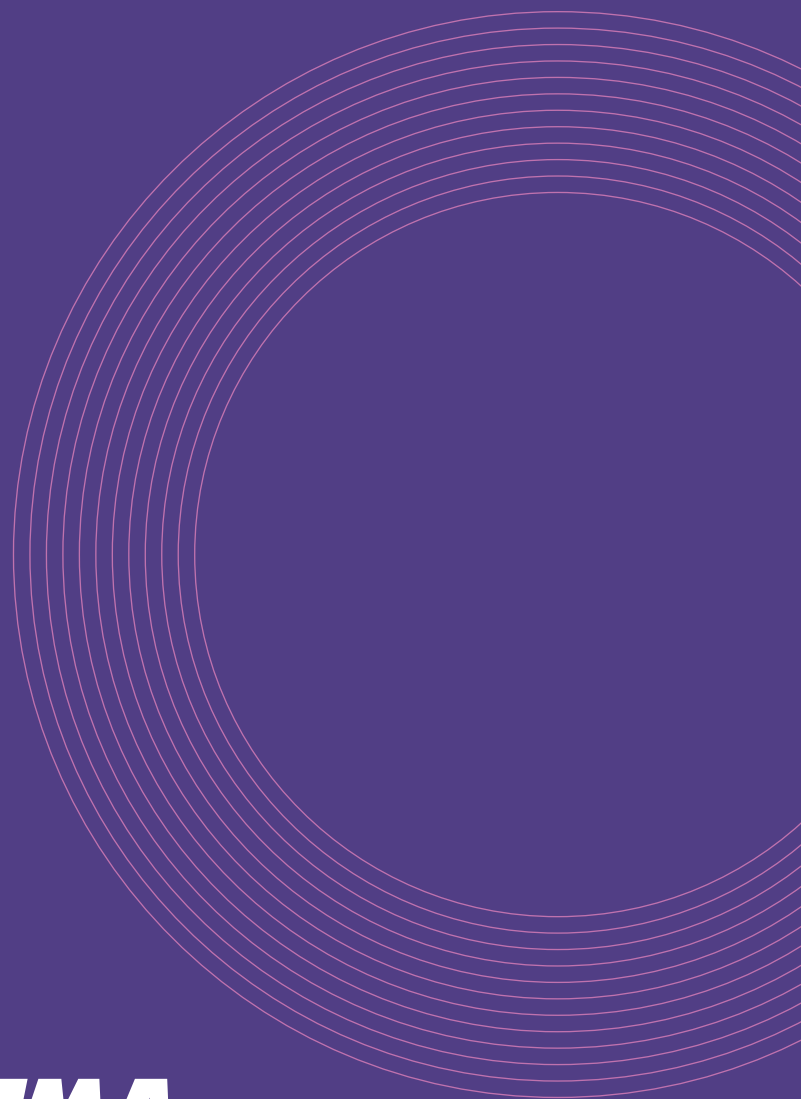


JATMA

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