

CORPORATE PROFILE





COMPANY



Factice was invented in Europe in the mid-19th century. And it is said that a technology or manufacturing factice was introduced to Japan in the early 20th century.

In the rubber industry, factice has been used more than 150 years as a very unique compounding ingredient, although the role of it is changing from substitute of natural rubber to processing aid of natural and synthetic rubbers.

Seiichi Yokoi, the founder of Tenma Factice MFG, CO., LTD., learned the production technology of factice and founded Tenma Factice Factory in Osaka in 1935.

Since then, he spent all of his life to spread factices in Japan.

Hajime Yokoi, the second president, developed various new products which the customer really needed. He also tried to suggest rubber engineers how to use factices. In addition, with a view to coming 21st century, he built a cutting-edge plant at Ono-city, Hyogo, in 1991. Furthermore, it was expanded in 1997 and it became the leading plant in Asia.

We will correspond the changes in the global framework and high functionalization of materials, and never forget our responsibility for environment. We will continue to make every effort to develop valuable products for customers. We look forward to your continuous support.

Akiko Houki
President

Profile

Name	TENMA FACTICE MFG.CO.,LTD.
Location of Office and Plant	Head office
	1-21-27, Furuichi, Joto-ku, Osaka 536-0001, Japan
	Phone +81-6-6932-1332 / Fax +81-6-6932-1333
	Hyogo plant
	586-146, Fukuzumi-cho, Ono, Hyogo 675-1309, Japan
	Phone +81-794-67-1370 / Fax +81-794-67-1375
Officers	President Akiko Houki Chairman Osamu Yokoi
Capital	50 million yen
Number of employees	18
Product Lines	Sulfur factices / Sulfur chloride factices / Sulfur-free factices
Bankers	Bank of Tokyo-Mitsubishi UFJ Sumitomo Mitsui Banking Corporation
Member Organization	The Society of Rubber Science and Technology, Japan The Osaka Chamber of Commerce and Industry

History

October, 1935	Seiichi Yokoi, the founder, established Tenma Factice Factory in Osaka, and started manufacturing of brown factices, white factices, and amber factices.
August, 1943	TENMA FACTICE MFG, CO., LTD. was established with the capital of 360,000 yen.
1972	Sulfur-free factice "U-8" and "U-10" were developed.
1982	The capital was increased to 50 million yen.
1987	Sulfur-free factice "Liquid F-3" was developed.
September, 1991	Hyogo plant was completed at Ono-city, Hyogo.
May, 1995	Hajime Yokoi, the second president, received an award for the contribution for many years from "The Society of Rubber Science and Technology, Japan".
December, 1997	The second term construction of the Hyogo plant was completed.
June, 2006	ISO 9001 was attested
December, 2006	KEMS, Kobe Environmental Management System, was attested.
May, 2008	The company received a letter of appreciation from "The Kansai Branch of The Society of Rubber Science and Technology, Japan".



WHAT'S FACTICE ?



Factice is used as a processing aid.
It prevents compounds from tackiness and shrinkage, and also modifies properties of products.



Utilities

As a processing aid

- Reduces tackiness of compounds during roll operations.
- Improves processability and shorten mixing time.
- Gives dimensional stability and smooth surface to compounds.
- Reduces die swell and calender shrinkage, and makes extrusion and injection time shorter.

As a softener and a dry plasticizer

- Is useful to make low-hardness rubber products by adding a large amount.
- Absorbs liquid plasticizers and oils and prevents blooming.
- Improves oil and solvent resistance.

Others

- Gives smooth surface and good appearance of the product.
- Improves ozone resistance and electric insulation, so prolongs the product lifetime.
- Gives good abrasability to the product and shortens grinding process time.

Uses

Industrial rubber products

belts, hoses, tubes, antivibration products, rolls, blankets, plates, seal products, rubber-coated electric wires, rubber sponges

Other rubber products

boots and shoes, rubber-coated fabrics, gloves, rubber threads, rubber bands, soft tennis balls, erasers

Others

lubricant oil additives, adhesive tapes, purge agents for resin, other kinds of cleaners, etc.



PRODUCT LIST



Table of Tenma factices

The factice grades can be classified into three types.

→ Sulfur factice, Sulfur chloride factice, Sulfur-free factice.

Chemical name	Group name	Commercial name	Quality standard				Appearance	Net wt. [kgs] (c)
			Acetone extract [%] (a)	Free sulfur [%]	Ash [%]	Specific gravity at 20°C (b)		
Sulfur factice	Golden factice	Golden	17~23	≤2.0	≤0.2	1.03	Yellow powder	15
		Golden T	25~31	≤2.0	≤0.2	1.03		
	Brown factice	Brown PR	14~20	≤1.5	≤0.2	1.05	Brown powder grain	20
		Brown PRS	33~39	≤1.5	≤0.2	1.02		
		Brown A	17~23	≤1.5	≤0.2	1.05		
		Brown AS	18~24	≤1.0	≤0.2	1.04		
		Brown B	19~25	≤1.5	≤0.2	1.05		
		Brown BS	20~26	≤1.0	≤0.2	1.04		
		Brown#21	19~27	≤1.5	≤0.2	1.05		
		Brown#30	39~45	≤1.5	≤0.2	1.04		
	Neo factice	Neo N	25~31	≤1.0	≤0.2	1.06	Brown powder grain	20
		Neo Q	9~15	≤1.5	≤0.2	1.06		
		Neo R	17~23	≤1.5	≤0.2	1.05		
Sulfur chloride factice	White factice	White#1	2~5	≤0.1	9~11	1.13	White powder	15
		White#2	2~5	≤0.1	18~20	1.20		
		White S	4~7	≤0.1	≤1.0	1.06		
	Amber factice	Amber	17~23	≤0.1	≤1.5	1.04	Amber block	25
		Amber L	27~33	≤0.1	≤1.5	1.01		
		Amber#50	40~48	≤0.1	≤1.5	0.99		
Sulfur-free factice		U-8	33~39	—	≤0.2	1.01	Amber block	15
		U-10	34~40	—	≤0.2	1.01		

(a) : "Normal hexane extract" is applied in case of Neo Q and Neo R.

(b) : The range is ±0.02.

(c) : Packed in paper bag, and packed in paper bag inserted PE bag in case of Amber factice and Sulfur-free factice.

Chemical name	Group name	Commercial name	Viscosity at 40°C	Refractive index at 20°C	Acid value	Specific gravity at 25°C	Appearance	Net wt. [kgs] (d)
Sulfur-free factice		Liquid F-3	Z3~Z5	1.4845~1.4865	≤30	1.00	Light Yellow Liquid	17

(d) : Packed in 18 liter can.



Sulfur factice



Made by reaction of vegetable oils and sulfur.

※Refer to the product list.

Golden factice

Notes

- Golden factice is yellow-colored sulfur factice made by using hydrogenated rapeseed oil, and has good aging property.
- "Golden" is high grade type and its color is lighter than that of "GoldenT".
- Golden factice does not contain chlorine and it is not necessary to care about vulcanizing disturbance.
- Addition of 5 to 10 phr to IIR improves processability and gives bad influence little to rate of cure, aging resistance, and other properties.
- It can be used to modify the flow of oily paints, to adjust the tackiness of tackifiers, and to retain the viscosity of lubricant oils and cutting oils at high temperature.



Product image



Package image

Applications

NR
SBR·NBR·CR·IIR·BR·CMS·EPDM etc.

Uses

light colored or transparent rubbers,
other industrial articles

Brown factice

Notes

- Brown factice is sulfur factice made by using rapeseed oil and vegetable oil (recycled rapeseed oil mixed with some soybean oil).
- "Brown PR" and "Brown PRS" are made by using rapeseed oil only, and "Brown PRS" contains naphthenic mineral oil.
- "Brown A", "Brown AS", "Brown B", "Brown BS" and "Brown#30" are made by using mixture of rapeseed oil and vegetable oil, and "Brown#30" contains aromatic mineral oil.
- "Brown#21" is economical type made by using vegetable oil only.



Product image



Package image

Applications

NR
SBR·NBR·CR etc.

Uses

printing rolls, OA rolls, autoparts,
rubber sheets, rubber sponges, hoses,
rubber-coated
fabrics and other industrial articles

Neo factice

Notes

- Neo factice is sulfur factice developed for special uses.
- "Neo N" is made by using soybean oil, and has some tackiness. It reduces the hardness of NBR or CR product by addition of large amount.
"Neo N" is very useful for the formulation of low hardness rolls.
- "Neo Q" and "Neo R" are made by using castor oil having high solubility with NBR. They are tolerable to petroleum solvent compared with the other Sulfur factices, but they are easily dissolved with hot acetone.
- For example, "Neo Q" is used in case of high temperature cure of light-colored CR compound.
- "Neo R" is the product modified for extruded or molded goods of NBR and CR.



Product image



Package image

Applications

NR
NBR, CR etc.



Sulfur chloride factice



Made by reaction of refined rapeseed oil and sulfur monochloride.

※Refer to the product list.

White factice

Notes

- "White#1" contains about 10 wt% of calcium carbonate and "White#2" contains about 20 wt% as stabilizer.
- "WhiteS" contains small quantity of magnesium oxide as stabilizer.
- In general, white factice is good in oil absorbability and prevents from bleeding of liquid type ingredient.
There is little influence to rubber physical properties compared with brown factices, especially to permanent compression set.
- Chlorine is generated at the temperature of rubber vulcanization, and vulcanization tends to be delayed. To the contrary, there are some cases to work as a kind of retarder by adequate addition.

Actions to prevent from vulcanizing delay

1. Add alkaline substances* 10 wt% of white factice.
2. Use vulcanization accelerator such as guanidine type, aldehyde-ammonia type, aldehyde-amine type.
3. Vulcanize at lower temperature.

* metal oxides, metal hydroxides, amines etc.



Product image



Package image

Applications

NR
SBR·NBR·EPDM etc.
TPE

Uses

autoparts(weather strip, glass run),
erasers, adhesion tapes,
soft tennis balls,rubberthreads
and other industrial articles

Amber factice

Notes

- Amber factice is a little softer than white factice, and is packed in plate form.
- It contains small quantity of magnesium oxide as stabilizer.
- "Amber L" and "Amber#50" contain naphthenic mineral oils.
- It causes the delay of vulcanizing same as white factice and the same actions are needed.



Product image



Package image

Applications

NR
SBR·NBR·EPDM etc.

Uses

white or light colored and transparent
products, rubber bands and other
industrial articles



Sulfur-free factice



Made by reaction of vegetable oils and special crosslinking agents not contained sulfur and chlorine.

☐Refer to the product list.

Powder type

Notes

- They can be used in case of crosslinking by organic peroxides.
- Addition of 5 to 10 phr improves permanent compression set in case of sulfur vulcanizing.
- They change color to pale yellow under UV exposure for a long time. "U-10" is high grade type, so color change is less than "U-8".
- As a special use, they are used for some cleaners and purge agents for resin.



Product image



Package image

Applications

NBR·CR·CSM·U·EPDM
TPE
PO·PVC etc.

Uses

autoparts, office automation equipments
and other industrial articles

Liquid type

Notes

- It is pale yellow viscous liquid like starch syrup.
- It gels irreversibly by sulfur, organic peroxides, isocyanates or other agents, and UV or heat. Acetone extract of gel is 20 to 30 wt%.
- In the compound, it works as liquid processing aid, but after the reaction it shows the same effects as solid factices.
- Increase of crosslinking agents quantity may need because of the consumption by "F-3".



Product image



Package image

Applications

Rubbers·polymers

Uses

autoparts, office automation equipments,
lubricating oils, tackifiers, adhesives,
paints etc.