

Waste Disposal and Recycling

TSRC optimizes the process conditions within the plants to precisely control material input and reduce waste production. TSRC also actively promotes the recycling of by-products within the factories and exploring the utilization of waste outside the factories by collaborating with upstream and downstream value chain partners and other industries. All measures aim to transform waste into valuable resources, expand the secondary raw materials market, and implement the concept of circular economy. TSRC has set waste management targets aiming for a group-wide waste recycling rate of 54% by 2025 and 56% by 2030. In 2024, the total waste generation target was set based on production volume, and the established goal was successfully achieved.

	Achievements in 2024	2024 Goals	2025 Goals	2030 Goals
 Goals and Achievement	 VOCs: 364.59 metric tons  Total waste: 5,941.26 metric tons	<ul style="list-style-type: none"> VOCs: 427.53 metric tons^{Note} Total waste: 6,154.93 metric tons <p><small>Note: Adjusted values for 2024 goals based on the production volume of the most recent year.</small></p>	<ul style="list-style-type: none"> Achieve waste recycling rate of 54% Number of ECR (Error Cause Removal) improvement proposals addressing waste management issues ≥ 10 	<ul style="list-style-type: none"> Achieve waste recycling rate of 56% Number of ECR improvement proposals addressing waste management issues ≥ 60

1. Waste Management Policy

TSRC refers to the basic principles and structure of the ISO 14001: 2015 environmental management system when formulating waste management plans and management goals, and periodically supervises and analyzes waste management results. In addition to the disclosure and reporting of waste data in each plant in accordance with local regulations, the Group holds at least one ESG production and waste management meeting per quarter, where the head of TSRC Global HSE, on behalf of each plant, reports to the head of the Group's Operational Division on the status of implementation and plans for future improvement. The Kaohsiung and Gangshan factories conduct quarterly reviews of the effectiveness of waste reduction, while Nantong Industries, Shen Hua Chemical, and TSRC-UBE track the amount of waste produced and the reduction targets on a monthly basis. Starting in 2024, TSRC Global HSE will collect waste data from each plant every month to review and track management performance on a monthly basis.

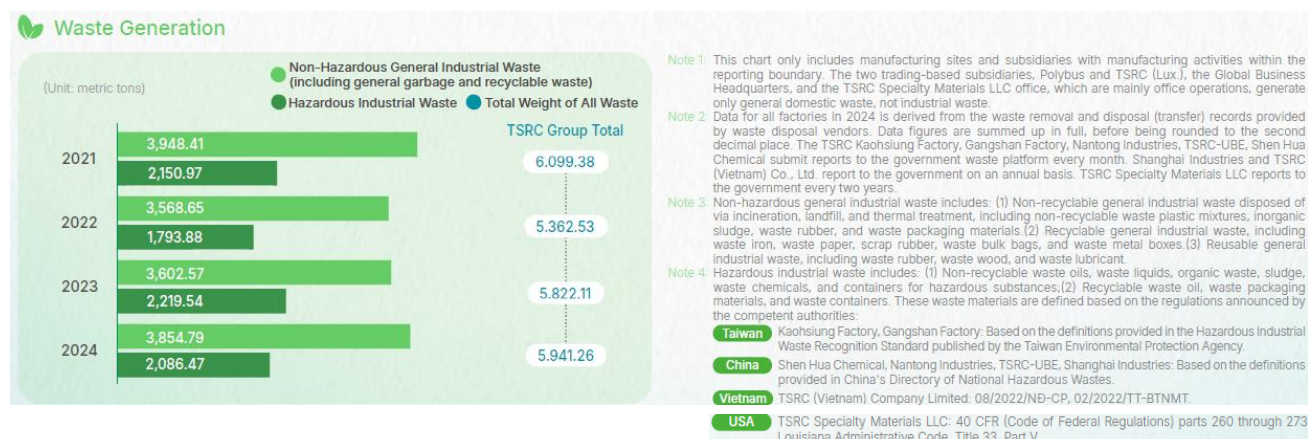
If TSRC Group's waste can be reused in the plants, it will be used as input materials in the manufacturing process. If in-site reuse is not possible, the waste will be commissioned to qualified waste disposal companies for final disposal or out-of-plant reuse. For wastes that cannot be avoided due to technical bottlenecks, the final disposal is mainly by incineration, during which the emission of air pollutants may cause air pollution and environmental impact. TSRC carefully manages each factory's waste based on our responsibility to the environment. We clear, dispose, or reuse waste with high standards in comply with environmental protection regulations of the country or region where each factory is located, and carries out audits, vehicle tracking, and other supervisory measures for waste removal and disposal companies.

2. Waste Generation and Recycling

In 2024, TSRC generated total general industrial waste (including non-recyclable, reusable, and recyclable) weighing 3,854.79 metric tons, a 7.00% increase compared to 2023. Total hazardous industrial waste (including non-recyclable, reusable, and recyclable) weighing 2,086.47 metric tons was generated, a 5.99% decrease compared to 2023. The total weight of all generated waste was 5,941.26 metric tons, an increase of 2.05% compared to 2023. Overall, TSRC's waste per unit product in 2024 was 10.76 metric tons/thousand metric tons of product, a decrease of 1.88% compared to 2023.

The total waste generated by the TSRC Group in 2024 increased slightly compared to 2023, due to TSRC (Vietnam) Company Limited increasing its production volume, non-process waste resulting from the Kaohsiung Factory and TSRC-UBE replacing old equipment, and TSRC Specialty Materials LLC cleaning up its ponds. TSRC continues to strengthen waste management by optimizing the packaging of raw materials, adjusting process control parameters, and implementing other measures to reduce waste generation at the source. We have also adopted resources and recycling measures, and recycled 69.54% of general industrial waste generated in 2024 along with 17.45% of hazardous industrial waste. In the future, we shall continue to improve our recycling rate, reducing our impact on the environment.

The total weight of waste only includes manufacturing sites and subsidiaries with manufacturing activities within the reporting boundary and has obtained ISO 14001 Environmental Policy Certification and Accountant's Limited Assurance of SASB Indicators (ISAE 3000).





2021-2024 Generation, Recycling and Percentage of General Industrial Waste and Hazardous Industrial Waste (by Subsidiary)

(Unit: metric tons)

		TSRC Corporation		Shen Hua Chemical	Nantong Industries	TSRC-UBE	Shanghai Industries	TSRC (Vietnam) Company Limited	TSRC Specialty Materials LLC	TSRC Group Total
		Kaohsiung Factory	Gangshan Factory							
2021	Total weight of general industrial waste	1,306.04		344.78	1,612.06	316.57	21.50	8.99	338.47	3,948.41
	General industrial waste recycled	491.73		311.27	1,572.18	299.59	6.00	0.00	0.00	2,680.76
	Percentage of general industrial waste recycled	90.00%		90.28%	97.53%	94.64%	27.91%	0.00%	0.00%	67.89%
	Total weight of hazardous industrial waste	75.23		1,323.12	350.59	346.30	48.80	0.50	371.57	2,150.97
	Hazardous industrial waste recycled	0.00		143.22	23.29	1.54	0.00	0.00	0.00	168.04
	Percentage of hazardous industrial waste recycled	0.00%		10.82%	6.64%	0.44%	0.00%	0.00%	0.00%	7.81%
2022	Total weight of general industrial waste	1,230.62	86.01	283.49	1,296.55	203.86	3.80	29.79	434.52	3,568.65
	General industrial waste recycled	770.64	21.68	225.34	1,222.97	170.32	3.80	28.33	0.00	2,473.09
	Percentage of general industrial waste recycled	62.62%	25.21%	90.07%	94.33%	83.55%	100.00%	95.10%	0.00%	69.30%
	Total weight of hazardous industrial waste	136.46	0.00	845.36	475.26	287.08	23.00	1.32	591.76	1,793.88
	Hazardous industrial waste recycled	0.00	0.00	94.29	23.96	6.50	22.93	0.00	0.00	147.67
	Percentage of hazardous industrial waste recycled	0.00%	0.00%	11.15%	5.04%	2.26%	99.70%	0.00%	0.00%	8.23%
2023	Total weight of general industrial waste	1,134.51	73.62	299.36	1,480.98	134.02	89.11	25.13	365.84	3,602.57
	Non-recyclable general industrial waste	411.30	50.95	7.48	74.00	31.72	52.83	1.10	365.84	995.21
	General industrial waste recycled	492.83	22.67	291.88	1,406.98	102.30	36.28	24.03	0.00	2,376.97
	General industrial waste reused	230.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	230.38
	Percentage of general industrial waste recycled and reused	63.75%	30.79%	97.50%	95.00%	76.33%	40.71%	95.62%	0.00%	72.37%
	Total weight of hazardous industrial waste	125.67	0.00	1,343.25	432.38	244.30	37.35	2.63	617.21	2,219.54
	Non-recyclable hazardous industrial waste	125.67	0.00	1,173.05	406.24	234.38	0.14	2.63	33.96	1,976.08
	Hazardous industrial waste recycled	0.00	0.00	170.20	26.14	9.92	37.21	0.00	0.00	243.46
	Percentage of hazardous industrial waste recycled	0.00%	0.00%	12.67%	6.05%	4.06%	99.63%	0.00%	0.00%	10.97%

(Continued)

(Unit: metric tons)

		TSRC Corporation		Shen Hua Chemical	Nantong Industries	TSRC-UBE	Shanghai Industries	TSRC (Vietnam) Company Limited	TSRC Specialty Materials LLC	TSRC Group Total
		Kaohsiung Factory	Gangshan Factory							
2024	Total weight of general industrial waste	1,262.53	63.14	291.42	1,353.95	161.84	62.01	55.26	604.64	3,854.79
	Non-recyclable general industrial waste	401.34	27.97	23.72	74.54	31.94	8.16	2.60	603.74	1,174.01
	General industrial waste recycled	861.19	0.00	267.70	1,279.41	129.90	53.86	16.39	0.90	2,609.34
	General industrial waste reused	0.00	35.17	0.00	0.00	0.00	0.00	36.27	0.00	71.44
	Percentage of general industrial waste recycled and reused	68.21%	55.70%	91.86%	94.49%	80.26%	86.85%	95.30%	0.15%	69.54%
	Total weight of hazardous industrial waste	135.76	0.00	1,080.44	420.52	298.39	37.41	4.47	109.49	2,086.47
	Non-recyclable hazardous industrial waste	135.76	0.00	797.82	391.37	283.33	0.24	4.47	109.49	1,722.48
	Hazardous industrial waste recycled	0.00	0.00	112.90	11.28	10.22	37.17	0.00	0.00	171.57
	Hazardous industrial waste reused	0.00	0.00	169.72	17.86	4.84	0.00	0.00	0.00	192.42
	Percentage of hazardous industrial waste recycled and reused	0.00%	0.00%	26.16%	6.93%	5.05%	99.36%	0.00%	0.00%	17.45%

Note 1: This table only includes manufacturing factories and subsidiaries that engage in manufacturing activities within the reporting boundary. The two trading-based subsidiaries, Polybus and TSRC (Lux.), the Global Business Headquarters, and the TSRC Specialty Materials LLC office, which are mainly office operations, generate only general domestic waste, not industrial waste.

Note 2: Data for all factories in 2024 is derived from the waste removal and disposal (transfer) records provided by waste disposal vendors. Data figures are summed up in full, before being rounded to the second decimal place. The TSRC Kaohsiung Factory, Gangshan Factory, Nantong Industries, TSRC-UBE, Shen Hua Chemical submit reports to the government waste platform every month. Shanghai Industries and TSRC (Vietnam) Co., Ltd. report to the government on an annual basis. TSRC Specialty Materials LLC reports to the government every two years.

Note 3: Non-hazardous general industrial waste includes: (1) Non-recyclable general industrial waste disposed of via incineration, landfill, and thermal treatment, including non-recyclable waste plastic mixtures, inorganic sludge, waste rubber, and waste packaging materials. (2) Recyclable general industrial waste, including waste iron, waste paper, scrap rubber, waste bulk bags, and waste metal boxes. (3) Reusable general industrial waste, including waste rubber, waste wood, and waste lubricant.

Note 4: Hazardous industrial waste includes: (1) Non-recyclable waste oils, waste liquids, organic waste, sludge, waste chemicals, and containers for hazardous substances; (2) Recyclable waste oil, waste packaging materials, and waste containers. These waste materials are defined based on the regulations announced by the competent authorities:

Taiwan Kaohsiung Factory, Gangshan Factory: Based on the definitions provided in the Hazardous Industrial Waste Recognition Standard published by the Taiwan Environmental Protection Agency.

China Shen Hua Chemical, Nantong Industries, TSRC-UBE, Shanghai Industries: Based on the definitions provided in China's Directory of National Hazardous Wastes.

Vietnam TSRC (Vietnam) Company Limited: 08/2022/NĐ-CP, 02/2022/TT-BTNMT.

USA TSRC Specialty Materials LLC: 40 CFR (Code of Federal Regulations) parts 260 through 273. Louisiana Administrative Code, Title 33, Part V.

Note 5: Restatements of information:

• Due to TSRC Specialty Materials LLC revising the scope for what materials are included in calculations of hazardous industrial waste (excluding low purity waste solvents for sale), total hazardous industrial waste for 2021 was revised from 2,516.11 metric tons to 2,150.97 metric tons, with the change being 1.45×10^1 of the original amount generated. Hazardous industrial waste for 2022 was revised from 2,360.24 metric tons to 1,793.88 metric tons, with the change being 2.40×10^1 of the original amount generated, and hazardous industrial waste for 2023 was revised from 2,802.79 metric tons to 2,219.54 metric tons, with the change being 2.08×10^1 of the original amount generated.

• The amount of waste recycled has also been recalculated due to the above changes described above, with the amount for 2021 revised from 533.18 metric tons to 168.04 metric tons, with the change being 6.85×10^1 of the original amount, amount of waste recycled for 2022 revised from 714.03 metric tons to 147.67 metric tons, with the change being 7.93×10^1 of the original amount, and the amount of waste recycled for 2023 revised from 826.71 metric tons to 243.46 metric tons, with the change being 7.06×10^1 of the original amount.

• The proportion of hazardous industrial waste recycled was recalculated due to the changes described above, with the proportion recycled changing from 21.19% to 7.81% for 2021, from 30.25% to 8.23% for 2022, and from 29.50% to 10.97% for 2023.

3. Waste Reduction and Reuse

TSRC actively reduces waste at the source by developing renewable materials to reduce the use of fossil fuels and waste. In addition, TSRC optimizes process control to stabilize reaction temperature and increase conversion rates, while increasing sampling analysis to make process conditions more precise and reduce waste and by-product production. TSRC's global factory sites and subsidiaries promote the reuse of by-products and resources within the plant to reduce waste production.

	Measures	Results
Waste Reduction at Source	<p>TSRC optimizes process controls to stabilize reaction temperature and increase conversion rates, while increasing sample analysis to make process conditions more precise and reduce the waste and by-products generated.</p>	<p>Kaohsiung Factory</p> <ul style="list-style-type: none"> SEBS production was suspended, reducing the possibility of being repackaged, and reducing the amount of waste paper and pallets generated by 71.15 metric tons in 2024. <p>Shen Hua Chemical</p> <ul style="list-style-type: none"> Reduced the amount of added iron sulfate and hydrogen peroxide encountered during the wastewater treatment process through suspending single production lines for maintenance and regularly pumping out waste sludge, reducing the amount of sludge generated by 37 tons. By controlling the amount of liquid in waste tanks to reduce foaming, we effectively reduced the amount of waste rubber generated from the use of anti-foaming agents, reducing the amount of waste rubber generated by approximately 70 metric tons. We strictly classify the different types of polluted waste generated by the manufacturing process, and also wash and reuse the filter cloths used in wastewater pressure filter machines in order to extend the life cycles of filter cloths, reducing the amount of polluted waste generated by 14 metric tons. <p>Nantong Industries</p> <ul style="list-style-type: none"> Optimized how dust collectors used in production zones collect rubber powder, reducing the amount of scrap rubber generated by approximately 50 metric tons. <p>Shanghai Industries</p> <ul style="list-style-type: none"> Optimized the packaging of raw materials, and reduced the amount of waste packaging bags made from non-recyclable raw materials by approximately 36 metric tons.
Waste Recycling (Off Site)	<p>TSRC actively works together with waste disposal vendors to convert waste into resources.</p>	<p>Kaohsiung Factory Gangshan Factory</p> <ul style="list-style-type: none"> Developed relationships with rubber reuse vendors, allowing 67.087 metric tons of rubber to be reused.