

WASTE MINIMIZATION AND RECYCLING

The generation, management and disposal of solid wastes from our operations has the potential to impact the public health and environment in our local communities. We are therefore committed to minimizing the generation of solid wastes from our operations and to safely manage these solid wastes using a hierarchy of environmentally sound management practices, including ISO 14001 and Lean Manufacturing. We also believe that finding alternative uses for waste materials and byproducts presents the greatest opportunities to minimize the impact of these wastes and to further contribute to a circular economy.

Materion globally utilizes Lean Manufacturing principles to identify projects and actions that minimize waste through actions and initiatives that maximize process yields and efficiencies. Examples of waste management and reduction projects performed in 2023 included scrap reduction and recycling, edge loss minimization, equipment upgrades and process efficiency optimization. We also have programs in place to actively reuse shipping materials, including pallets, drums, and coil spools.

Many of our waste streams, including metal and alloy scrap or off-spec product, may contain high-value mineral or metal content and are recycled into our processes. Additionally, Materion also recycles chemical and waste streams generated in our manufacturing processes including used oils, antifreeze, refrigerants, lighting, batteries, electronic waste, and office waste.

The 2020 - 2023 company-wide Waste Generation and Recycling data is provided in the following table. Materion absolute and intensity generation amounts for 2023 have increased relative to prior years which is associated with increased production volumes and associated scrap generation as well as increased process waste recycling.

During 2023, 52% of Materion's combined total waste generated was diverted from disposal and reused or recycled back into the process. Of the portion sent for disposal approximately 77% was sent to landfill; with the balance managed via incineration or other methods.

WASTE GENERATION AND RECYCLING					
Hazardous Waste		2020	2021	2022	2023
Absolute (MT)	Generated	1,121	1,455	1,482	2,086
	Disposal	*	*	1,405	1,539
	Recycled	*	*	77	546
Intensity (MT/\$1000 Net Sales)	Generated	0.001	0.001	0.001	0.001
	Disposal	*	*	0.001	0.001
	Recycled	*	*	0.00004	0.0003
Non-Hazardous Waste		2020	2021	2022	2023
Absolute (MT)	Generated	5,457	2,793	7,705	8,840
	Disposal	*	*	3,507	3,713
	Recycled	*	*	4,199	5,126
Intensity (MT/\$1000 Net Sales)	Generated	0.005	0.002	0.004	0.005
	Disposal	*	*	0.002	0.002
	Recycled	*	*	0.002	0.003

*Not Tracked

MINERAL WASTE

Our operations also include the Materion bertrandite ore mine located near Delta, Utah, which has been producing beryllium feedstock since 1968. The mine process results in the generation of high volumes of waste rock to expose subsurface ore for extraction. Displaced waste rock is managed in a responsible manner and in accordance with a Utah-approved Mining and Reclamation Plan. Mine reclamation work includes surface contouring to restore surfaces to match natural topography, replacement of topsoil, and restoration of natural habitat by reseeding and monitored revegetation.

For 2023, Materion produced significantly more mineral waste rock than the prior year. Significant fluctuations in mineral waste production is typical given multi-year mining cycles.

Mineral Waste					
Mineral Waste		2020	2021	2022	2023
Absolute (MT)	Waste Rock	*	*	1,814	1,469,369

*Not Tracked

MATERION RECYCLING

At Materion, we pride ourselves on our product stewardship. With more than 100 years of experience in precious metal refining and recycling, Materion offers rare earth and precious metal recycling and reclamation services that help our customers compete in today's competitive business environment, where advanced materials recycling is increasingly more important in the supply chain. In fact, we offer two of the largest and most efficient state-of-the-art chemical and electrolytic refineries designed to handle our customers' precious metal and other valuable scrap from production waste streams. As an example, at our Buffalo facility in 2022 at least 55% of our gold input originated from post-consumer scrap. Our material recycling and reclamation services capabilities include:

- [Aluminum Twin Wire Arc Spray Coating](#)
- [Assaying](#)
- [Beryllium Metal & Beryllium Aluminum Recycling and Reclamation](#)
- [Large Area Glass Shield Kit Cleaning](#)
- [Plating Solutions for Precious Metals](#)
- [Precious Metal Refining and Recycling](#)
- [Precision Parts Cleaning/Shield Cleaning](#)
- [Process Material & Precious Metal Recovery](#)
- [Sputtering Target Recycling](#)

WATER USE

Water is a natural resource which is essential to life and a healthy environment. Water is also an essential raw material in our manufacturing processes, and we are committed to the responsible management and consumption of this important resource. Therefore, we seek to conserve water across our operations and manage water and wastewater responsibly; and consistent with our [Environmental Policy](#) which requires proactive stewardship of the environment and responsible management of any emissions to water.

Materion is continuing to identify water use efficiency reduction opportunities and to deploy water efficiency best management practices. Where feasible our facilities emphasize closed-loop water recycling systems including in process equipment such as cooling towers, chillers, boilers, scrubbers, parts washing, equipment cooling/heating, and sluice water.

Waste Reduction, Recycling, and Water Use



Materion is continuously working to improve water usage accountancy systems at our facilities; inclusive of water usage mapping, submetering, and monitoring. For example, the Delta facility recently established an improved water usage flowsheet model for its Mill which will be used as the basis for establishing improved submetering, monitoring, and tracking of water use reduction initiatives. These, and similar improvements at other facilities have enabled Materion to capture improved water recycling information which is being reported for the first time (see table below).

Materion has nine locations that are classifiable as meeting "high" or "extremely-high" baseline water stress criteria as defined by the World Resource Institute. As of 2023, these sites comprise approximately 49% of all water withdrawals; with the majority of this consumption occurring at the Delta ore milling facility, where we continue to prioritize water usage reduction efforts and initiatives.

The 2019 - 2023 companywide Water Use data is provided in the following table. Absolute water withdrawal and withdrawal intensity increased in 2023 versus 2022. The increase is primarily attributed to cyclical mining and milling activities at our Delta facility.

Starting in 2023, Materion began reporting water discharge (treated water returned to environment under permit) and consumption (water not returned to environment due to evaporation, impoundment, or other). For 2023 Materion withdrew 1.99 MMm³ of water; of which 1.02 MMm³ was discharged and 0.97 MMm³ was consumed. The majority (94%) of consumption was associated with mining and milling, and related processes at Delta, UT. Additionally, Materion recycled 0.08 MMm³ of water.

Water Usage					
Water Usage; Absolute (MMm³)					
Topic	2019	2020	2021	2022	2023
Withdrawal	1.61	1.78	1.83	1.78	1.99
Discharge	*	*	*	*	1.02
Consumption	*	*	*	*	0.97
Water Usage; Intensity (m³/ \$1000 of Net Sales)					
Topic	2019	2020	2021	2022	2023
Withdrawal	1.36	1.51	1.21	1.01	1.20
Discharge	*	*	*	*	0.61
Consumption	*	*	*	*	0.58

*Not Tracked