

## THALLIUM

(Data in kilograms of thallium content, unless otherwise noted)

**Domestic Production and Use:** Thallium is a byproduct metal recovered in some countries from flue dusts and residues collected in the smelting of copper, zinc, and lead ores. Although thallium was contained in ores mined or processed in the United States, it was not recovered domestically in 1998. Research and development in the use of thallium-base superconductor materials accounted for a significant portion of domestic consumption in 1998. Thallium also was used in electronics, alloys, glass manufacturing, and pharmaceuticals.

<b>Salient Statistics—United States:</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998<sup>e</sup></b>
Imports for consumption <sup>1</sup>	630	1,180	166	168	NA
Exports	NA	NA	NA	NA	NA
Consumption <sup>e</sup>	630	700	300	300	NA
Price, metal, dollars per kilogram <sup>2</sup>	950	1,100	1,200	1,280	1,280
Net import reliance <sup>3</sup> as a percent of apparent consumption	100	100	100	100	100

**Recycling:** None.

**Import Sources (1994-97):** Mexico, 33%; Belgium, 31%; Canada, 29%; and Germany, 7%.

<b>Tariff: Item</b>	<b>Number</b>	<b>Normal Trade Relations (NTR)<sup>4</sup> 12/31/98</b>	<b>Non-NTR<sup>5</sup> 12/31/98</b>
Unwrought; waste and scrap; powders	8112.91.6000	4.3% ad val.	25% ad val.

**Depletion Allowance:** 14% (Domestic), 14% (Foreign).

**Government Stockpile:** None.

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**Events, Trends, and Issues:** Research and development activities of both a basic and applied nature were conducted during 1998 to improve and expand the use of thallium. In addition to a continued interest in thallium-containing materials for use as superconducting magnets in magnetic levitation transportation applications, there was a significant interest in the clinical application of thallium in cardiovascular imaging to detect coronary artery disease.

Thallium metal and its compounds are highly toxic materials and are strictly controlled to prevent a threat to humans and the environment. Thallium and its compounds can be absorbed into the human body by skin contact, ingestion, or inhalation of dust or fumes. With regard to these toxicity concerns, Federal agencies issued either proposed or final rules during the year that further addressed the control of thallium levels in the environment. In one rule, a final universal treatment standard for nonwastewater forms of thallium was established. In another, the allowable concentration limit for thallium in bottled water was determined to be the same as the limit established in the national standard for primary drinking water.

### **World Mine Production, Reserves, and Reserve Base:**<sup>6</sup>

	Mine production		Reserves <sup>7</sup>	Reserve base <sup>7</sup>
	1997	1998		
United States	(8)	(8)	32,000	120,000
Other countries	<u>15,000</u>	<u>15,000</u>	<u>350,000</u>	<u>530,000</u>
World total (may be rounded)	15,000	15,000	380,000	650,000

**World Resources:** World resources of thallium contained in zinc resources total about 17 million kilograms; most are located in Europe, Canada, and the United States. An additional 630 million kilograms is in the world's coal resources. The average thallium content of the Earth's crust has been estimated at 0.7 part per million.

**Substitutes:** While other light-sensitive materials can substitute for thallium and its compounds in specific electronic applications, ample supplies of thallium discourage development of substitute materials.

<sup>6</sup>Estimated. NA Not available.

<sup>1</sup>Unwrought; waste and scrap; powders, including thallium contained in compounds.

<sup>2</sup>Estimated price of 99.999%-pure granules in 100-gram lots.

<sup>3</sup>Defined as imports - exports + adjustments for Government and industry stock changes.

<sup>4</sup>By the North American Free Trade Agreement, there is no tariff for Canada or Mexico.

<sup>5</sup>See Appendix B.

<sup>6</sup>Estimates, based on thallium content of zinc ores.

<sup>7</sup>See Appendix D for definitions.

<sup>8</sup>Thallium contained in mined base-metal ores, estimated at 450 to 500 kilograms per year, is separated from the base metals but not extracted for commercial use.