AMD

2003 AMD Toxic Chemical Release Inventory Report

About this Report

Since 2000 Advanced Micro Devices, Inc. (AMD) has published an annual report summarizing Toxic Chemical Release Inventory (TRI) information submitted to the U.S. Environmental Protection Agency (EPA). With this report, AMD is providing to the public TRI data for the 2003 reporting year well in advance of EPA's public release, which is expected in spring 2005. For questions concerning this report or AMD's EHS worldwide programs, please contact Lee Reznicek at Lee.Reznicek@amd.com or call (512) 602-4607.

Corporate Overview

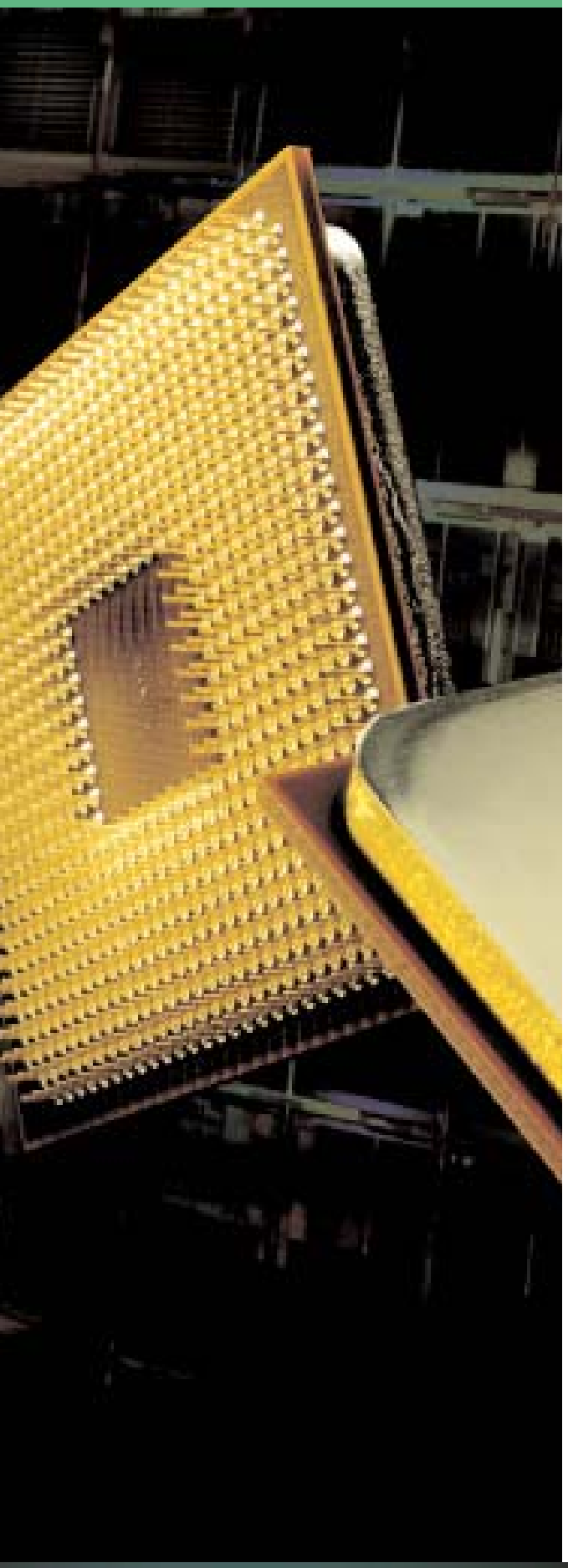
Founded in 1969 and headquartered in Sunnyvale, California, AMD (NYSE: AMD) provides microprocessors, Flash memory devices, and silicon-based solutions for our customers in the communications and computer industries worldwide.

Regulatory Background

The Emergency Planning and Community Right-to-Know Act (EPCRA) was enacted in 1986 and required EPA to establish a publicly available, national inventory of certain chemical releases based on annual reports submitted by numerous industry sectors. EPCRA was enacted through Title III of the Federal Superfund Amendments and Reauthorization Act (SARA) and is sometimes referred to as "SARA Title III". In 1990, the Pollution Prevention Act (PPA) extended the reporting and inventory requirements to include information on source reduction, recycling, treatment, and energy recovery activities. As a result, the TRI reports now include not only the amounts of TRI chemicals released into the air or discharged in water to a Publicly Owned Treatment Works (POTW), but also the amounts of those chemicals transferred off-site for recycling, energy recovery, treatment, or disposal. The data, which are published annually by EPA, provide a perspective on a company's management of chemicals from their use in the manufacturing process through their ultimate disposition after use.

AMD makes two separate TRI filings with the EPA: one for the Submicron Development Center (SDC) in Sunnyvale, CA and one for the Austin, TX facility (that includes Fab 25). Our California facility had various reporting sites in the early nineties, but the SDC is the only remaining reporting site. The Austin site previously submitted two reports – one for Fab 25 and one for Fab 14/15. This year only one report was submitted due to the closure of Fab 14/15.

This document presents a combined summary of TRI chemical information for AMD's U.S. sites. EPA provides extensive TRI information at the following website: www.epa.gov/enviro/html/toxic_releases.html.



Use of TRI Data

While TRI data provides a valuable tool for evaluating chemical management, it can be misleading if taken out of context. For example, although reported TRI "releases" and "transfers" are not comparable, the data are often misused by combining and presenting the total as a single number. However, unlike releases, – i.e., emissions to air, land, or receiving waters – transfers are made to permitted waste management facilities with strict regulatory controls intended to prevent releases to the environment. In AMD's case, releases to air are within prescribed regulatory limits and permits. Similarly, transfers to municipal wastewater treatment facilities result in the removal of ammonia and nitrates before discharge; and transfers to off-site treatment facilities result in the destruction of solvent wastes (*e.g.,* n-methyl pyrrolidone).

Similarly, making year-to-year comparisons of total TRI emissions can be misleading, since the TRI Toxic Chemical List can change. For example, in 1995 EPA expanded the list to include approximately 300 new chemicals. The inclusion of nitrates and n-methyl pyrrolidone as reportable chemicals caused AMD's total TRI releases and transfers to appear to increase significantly even though these chemicals may have been used in a similar quantity and were managed under all applicable environmental regulations in the prior year. Decreases can also be artificial, such as when chemicals are removed from the list. For example, removal of phosphoric acid from the list, and changes to the reporting requirements for ammonia, sulfuric acid, and hydrochloric acid reduced AMD's total TRI releases and transfers.

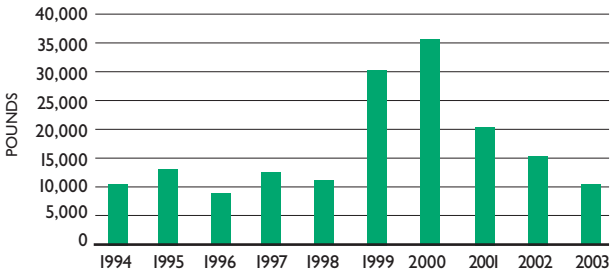
As previously stated, TRI reporting is limited to a specific list of chemicals or chemical categories (for example, lead compounds). A TRI chemical is reportable when it is manufactured, processed, or otherwise used in quantities above thresholds specified by the EPA.

At AMD, a majority of chemicals are "otherwise used" in the wafer fabrication process or associated support operations. These chemicals are used during manufacturing and are not incorporated into the product.

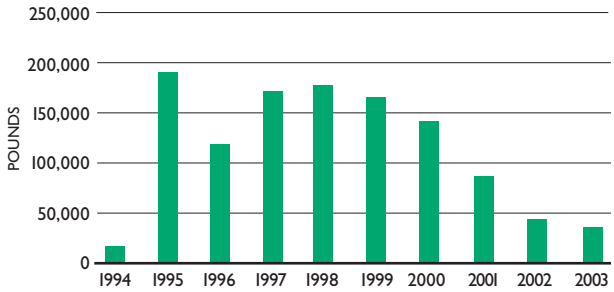
EPA requires submittal of a separate Form R for each TRI chemical that exceeds the reporting threshold. The Form R report contains information on the reporting facility, activity/use of the chemical, releases, transfers to off-site treatment facilities, waste treatment methods, as well as waste minimization activities. The report also includes a production ratio or activity index. AMD uses the number of annual wafer starts combined with complexity of the fabrication process or wafer activities to relate TRI releases and transfers to variations in annual production.

The following charts and explanations detail the total combined U.S. TRI releases and transfers reported to the EPA.

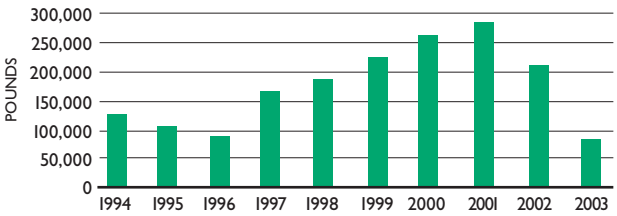
AMD U.S. TRI Chemical Air Releases



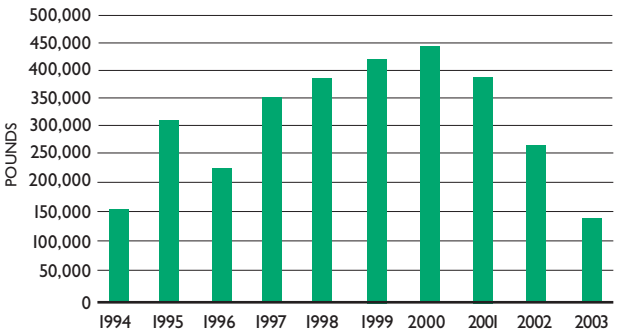
AMD U.S. TRI Chemical Transfers to POTW



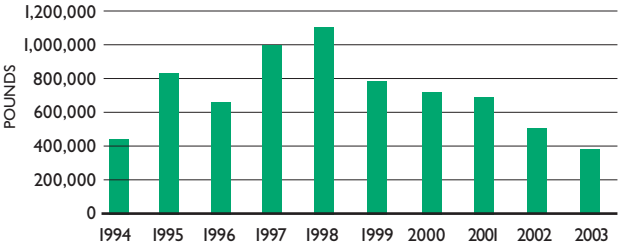
AMD U.S. TRI Chemical Off-Site Transfers



AMD U.S. TRI Chemical Total Releases and Transfers



AMD U.S. Total Production-Related Waste



TRI Chemical Use Update for 2003

AMD's total TRI chemical releases and transfers decreased 49 percent from 2002 to 2003 primarily due to the phase out of the "C4/Bump" processing at the Austin site in mid-2003 as well as the significant decrease in the amount of n-methyl pyrrolidone in our photolithography chemicals. Phase out of the C4/Bump process reduced lead usage by 87,000 pounds in 2003 and will reduce it by another 54,000 pounds in 2004. AMD reformulated several photolithography chemicals to decrease the amount of n-methyl pyrrolidone, reducing usage in 2003 by 37,000 pounds. These reductions were realized at the same time that production in Fab 25 in Austin increased by a factor of 1.37 (when compared to 2002.)

Similar to previous years, the Austin site accounted for over 99 percent of AMD's total chemical releases and transfers. In 2003, AMD completed Form R reports for nine chemicals that exceeded threshold limits.

AMD reported a 34 percent decrease in air releases of TRI chemicals in 2003 over 2002. The decrease was primarily due to improvements in the ammonia exhaust system at Fab 25 combined with reductions in ammonia usage.

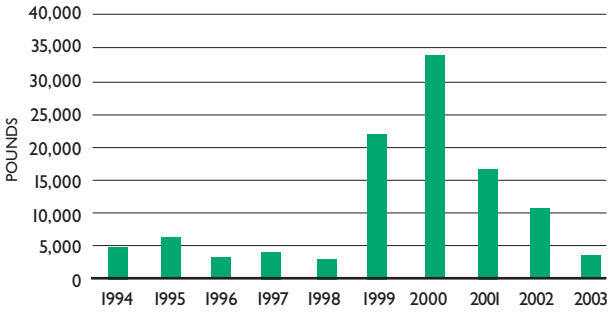
Transfers to Publicly Owned Treatment Works (POTWs) decreased 13 percent, while off-site transfers to contract recycling and treatment facilities decreased 58 percent. AMD conducts audits of contract waste treatment and recycling facilities to ensure that processes at these facilities are compliant with applicable requirements and meet AMD's expectations. Overall, the reduction of transfers to POTW can be attributed to a decrease in the usage of ammonia; and the decrease in transfers to contract waste treatment and recycling facilities can be attributed to a decrease in usage of lead resulting from the phase out of the C4/Bump process in Austin.

In addition to reporting releases and transfers, AMD is also required to report how much of each chemical is treated on-site (e.g., neutralization of acids and bases in wastewater streams, and the thermal oxidation of organic vapors). Public reports often combine the three numbers (releases, transfers and treated on-site) into an indicator called Total Production-Related Waste. AMD's Total Production-Related Waste decreased 22 percent from 495,137 pounds in 2002 to 387,853 pounds in 2003, primarily due to the reduction of lead, ammonia and n-methyl pyrrolidone usage.

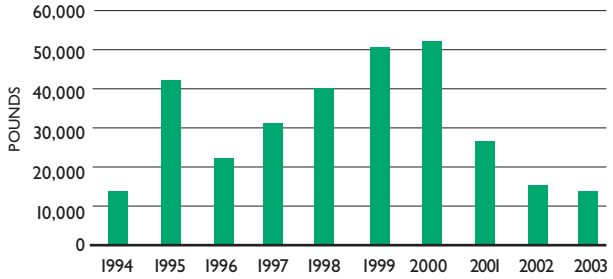
NOTE: The following summary graphs reflect the Total Releases and Transfers reported to EPA for all chemicals reported for each respective year. The TRI chemical specific information included after these graphs is provided only for those chemicals reported to the EPA for 2003.

Ammonia CAS Number: 7664-41-7

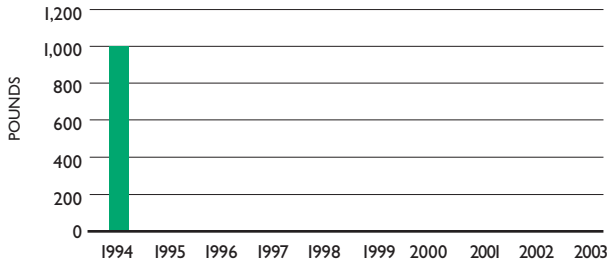
AMD U.S. TRI Ammonia Air Releases



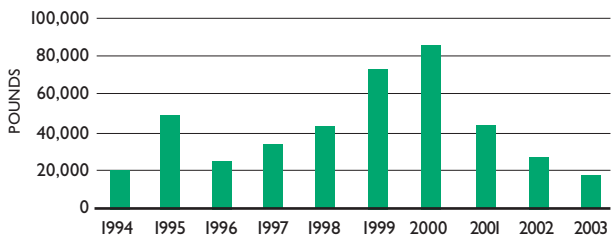
AMD U.S. TRI Ammonia Transfers to POTW



AMD U.S. TRI Ammonia Off-Site Transfers



AMD U.S. TRI Ammonia Total Releases and Transfers



Chemical Overview

- **Synonyms:** none
- **Specific Gravity:** 0.63 @ 68°F
- **NFPA Rating:** Health: 1; Flammability: 1; Reactivity: 0; Special Hazard: none
- **Use in Commerce:** Fertilizers, refrigerants, synthetic fibers, yeast nutrient, and fuel cells.

Use at AMD

In thin film deposition, layers of single crystal silicon, polysilicon, silicon nitride, silicon dioxide, or other materials are deposited on the wafer to provide desirable electrical properties. Each of these films serves a specific purpose in device operation. Ammonia is typically used along with either silane or dichlorosilane to produce silicon nitride layers.

Ammonia is also used in planarization and polishing of wafers. This technique combines chemical etching and mechanical buffing to create a flat top surface to allow for accurate photolithographic imaging.

Mass balance methodologies are used to determine the amounts of ammonia neutralized on-site and discharged to the POTW. Analytical testing data is used to calculate air releases.

TRI Reporting History

Ammonia was included on the original list of TRI chemicals provided to the EPA by Congress in EPCRA in 1986. The original list of chemicals was derived from data provided by the states of New Jersey and Maryland. No specific toxicity reason for listing ammonia was provided in the original statutory list.

In 1995, EPA amended the criteria for ammonia by adding the qualifier that reporting include only anhydrous ammonia and aqueous ammonia from water dissociable ammonium salts and other sources. Only 10 percent of total aqueous ammonia is reportable. The change was effective for the 1994 reporting year.

Reporting Threshold for AMD

Used in quantities greater than 10,000 pounds.

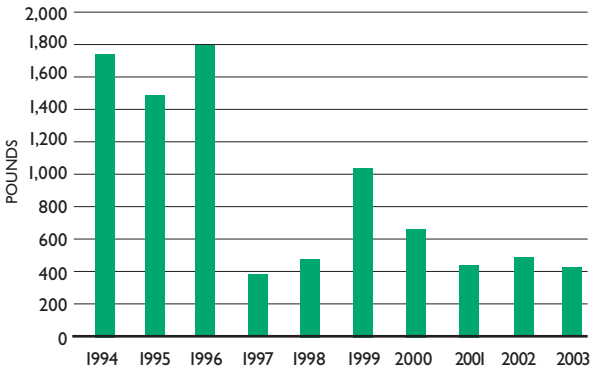
General Discussion

The rising trend and subsequent decline of ammonia air releases beginning in 1999 are the result of improvements in air monitoring procedures and improved ammonia abatement equipment, respectively. The rising and subsequent declining trend of POTW transfers from 1996 to 2002 reflects changes in production rates as well as the closure of Fab 14/15 in 2002. Subsequent declines are due to decreased usage of ammonium hydroxide.

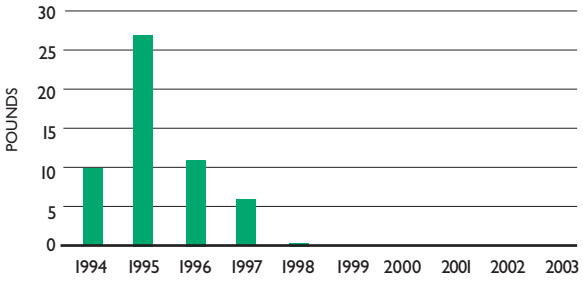
In 2003, ammonia exceeded the reporting threshold at the Austin, Texas facility only.

Hydrogen Fluoride CAS Number: 7664-39-3

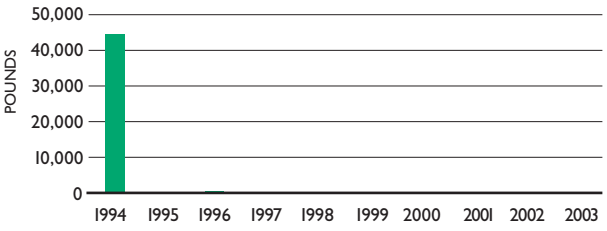
AMD U.S. TRI Hydrogen Fluoride Air Releases



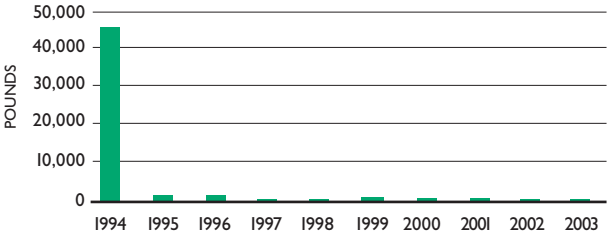
AMD U.S. TRI Hydrogen Fluoride Transfers to POTW



AMD U.S. TRI Hydrogen Fluoride Off-Site Transfers



AMD U.S. TRI Hydrogen Fluoride Total Releases and Transfers



Chemical Overview

- **Synonyms:** HF; hydrofluoric acid
- **Specific Gravity:** 1.176 @ 68°F
- **NFPA Rating:** Health: 4; Flammability: 0; Reactivity: 2; Special Hazard: none
- **Use in Commerce:** Used as a catalyst, especially in the petroleum industry; also used as a fluorinating agent in organic and inorganic reactions and an additive to rocket propellants.

Use at AMD

Silicon dioxide is oxidized silicon. In many steps in the wafer production process, this oxide needs to be stripped or etched away. HF is a unique acid that will dissolve this silicon dioxide without attacking the silicon. AMD uses HF to etch specific areas of deposited films to expose the underlying silicon substrate material. The etch process usually occurs after a photoresist pattern has been created on the silicon wafer.

HF is also used to clean quartz tubes used in diffusion furnaces. The HF etches a thin layer of quartz, exposing a new clean wall on the tubes.

Air emission analytical methods are used to calculate air releases of HF.

TRI Reporting History

Hydrogen fluoride was included on the original list of TRI chemicals provided to the EPA by Congress in EPCRA in 1986. The original list of chemicals was derived from data provided by the states of New Jersey and Maryland. No specific toxicity reason for listing hydrogen fluoride was provided in the original statutory list.

Reporting Threshold for AMD

Used in quantities greater than 10,000 pounds.

General Discussion

In 1994, the Austin site began neutralizing HF on-site, resulting in the elimination of HF transferred off-site. Changes in air releases are the result of variations within the manufacturing process and improvements in air emission analytical methods that were instituted in 1999.

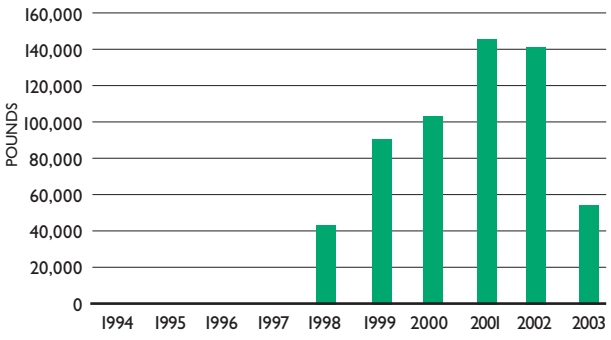
In 2003, HF exceeded the reporting threshold at the Austin, Texas facility only.

Lead CAS Number: 7439-92-1

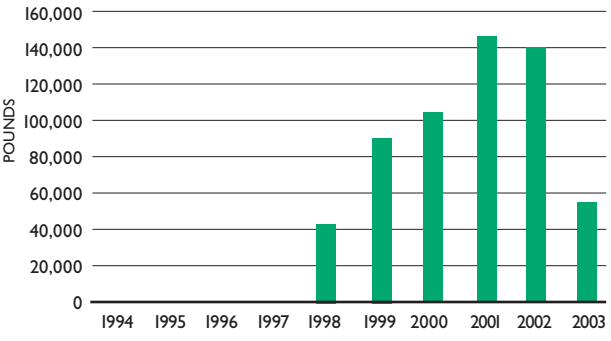
No Air Releases

No Transfers to POTW

AMD U.S. TRI Lead Off-Site Transfers



AMD U.S. TRI Lead Total Releases and Transfers



Chemical Overview

- **Synonyms:** None
- **Specific Gravity:** 11.4 @ 68°F
- **NFPA Rating:** Health: 3; Flammability: 1; Reactivity: 0; Special Hazard: none
- **Use in Commerce:** Storage batteries, radiation shielding, cable covering, solder, and fusible alloys.

Use at AMD

Reportable lead is used to form bumps on the wafer for flip-chip connections. Flip-chip connections bond the manufactured silicon chip directly to the final product package. The chip is flipped over and soldered directly onto the package, creating a lower profile product with lower electrical resistance.

The amount of lead reported as off-site recycling transfers is based on the amount of materials shipped to reclamation facilities and associated analytical data defining material constituents.

TRI Reporting History

Lead was included on the original list of TRI chemicals provided to the EPA by Congress in EPCRA in 1986. The original list of chemicals was derived from data provided by the states of New Jersey and Maryland. Lead has been identified as a bioaccumulative, persistent and toxic chemical.

Reporting Threshold for AMD

Used in quantities greater than 100 pounds. (In 2001 the reporting threshold changed from 10,000 pounds to 100 pounds).

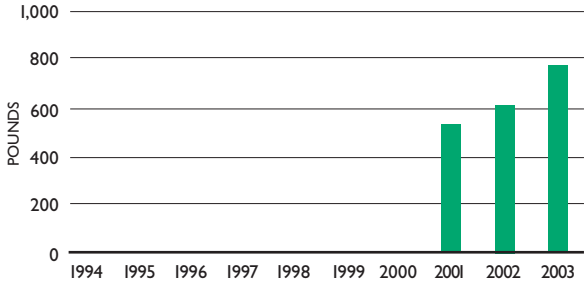
General Discussion

In 1997, Fab 25 in Austin began the flip-chip (C4/Bump) connection process utilizing lead. The reporting threshold was first exceeded in 1998. Increasing off-site transfers reflect increasing activity in this manufacturing process. The decrease in off-site transfers corresponds with decreasing production. The process was phased out at the Austin site in mid-2003.

In 2003, lead exceeded the reporting threshold at the Austin, Texas facility only.

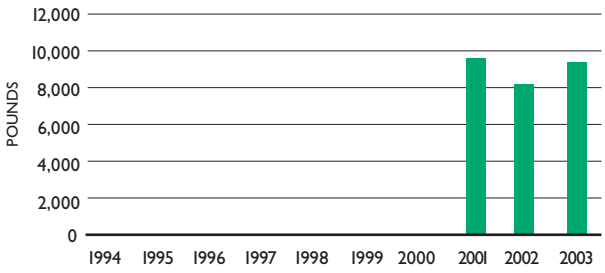
Methyl Isobutyl Ketone CAS Number: 108-10-1

AMD U.S. TRI MIBK Air Releases

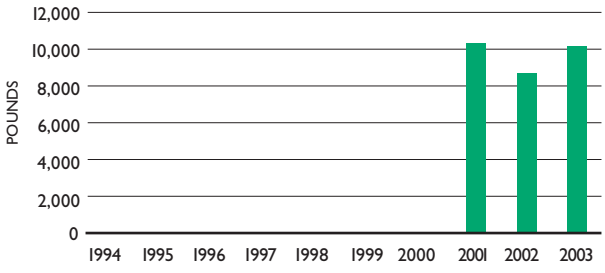


No Transfers to POTW

AMD U.S. TRI MIBK Off-Site Transfers



AMD U.S. TRI MIBK Total Releases and Transfers



Chemical Overview

- **Synonyms:** MIBK, hexone, 4-methyl-2-pentanone
- **Specific Gravity:** 0.8017 @ 68°F
- **NFPA Rating:** Health: 2; Flammability: 3; Reactivity: 1; Special Hazards: none
- **Use in Commerce:** a solvent for vinyl, epoxy, acrylic and natural resins, nitrocellulose, paints, varnishes, lacquers, protective coatings, rare metal extraction, and dyes.

Use at AMD

Photolithography processes are used in semiconductor manufacturing to form patterns on the surface of the wafers. Photoresist materials are used in these processes. Methyl isobutyl ketone (MIBK) is a component in organic solvents used for cleaning the back and side of the wafer after the resist coating. MIBK is also used to coat the silicon wafer prior to the application of a photoresist material.

Air emission analytical methods are used to calculate air releases of MIBK. Constituent analyses and quantities of waste streams shipped are used to calculate the amounts transferred off-site for treatment.

TRI Reporting History

MIBK was included on the original list of TRI chemicals provided to the EPA by Congress in EPCRA in 1986. The original list of chemicals was derived from data provided by the states of New Jersey and Maryland. No specific toxicity reason for listing MIBK was provided in the original statutory list.

Reporting Threshold for AMD

Used in quantities greater than 10,000 pounds.

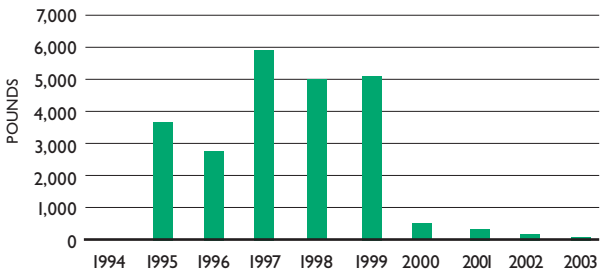
General Discussion

AMD first exceeded the threshold quantity for MIBK in 2001. The slight increase in air emissions is due to improvements in the monitoring methodology of air abatement equipment. Closure of Fab 14/15 contributed to the overall reduction in total releases and transfers from 2001 to 2002. Production increases accounted for the increase in total releases and transfers from 2002 to 2003.

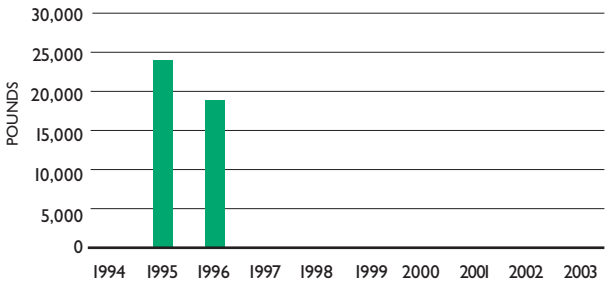
In 2003, MIBK exceeded the reporting threshold at the Austin, Texas facility only.

N-Methyl Pyrrolidone CAS Number: 872-50-4

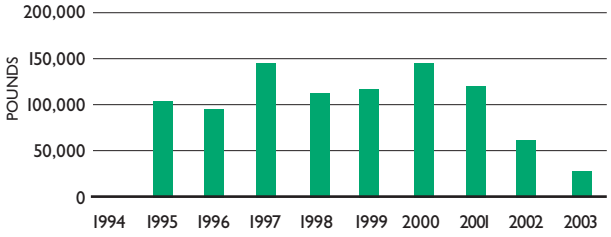
AMD U.S. TRI NMP Air Releases



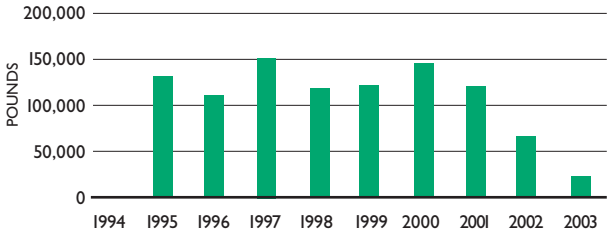
AMD U.S. TRI NMP Transfers to POTW



AMD U.S. TRI NMP Off-Site Transfers



AMD U.S. TRI NMP Total Releases and Transfers



Chemical Overview

- **Synonyms:** NMP, n-methyl 2 pyrrolidinone, M-Pyrol™
- **Specific Gravity:** 1.028 @ 77°F
- **NFPA Rating:** Health: 2; Flammability: 1; Reactivity: 0; Special Hazard: none
- **Use in Commerce:** Solvent for resins, pigment dispersions, petroleum processing, and microelectronics industry plastic solvent applications.

Use at AMD

Photolithography processes are used in semiconductor manufacturing to form patterns on the surface of the wafers. Photoresist materials are used in these processes. The photoresist is typically a viscous, organic solvent-based material that reacts to the presence of light. The "patterned" wafer allows for further processing (etching, ion implant, etc.) to ultimately create a printed circuit. After the subsequent processing steps, residual photoresist is removed by wet stripping. NMP is used to strip photoresist from the wafer. NMP is also found in polyimide, a buffer layer between the lead bumps applied for the flip-chip process and the silicon die.

Air emission analytical methods are used to calculate air releases of NMP. Constituent analyses and quantities of waste streams shipped are used to calculate the amounts transferred off-site for treatment.

TRI Reporting History

NMP was added to the TRI list in 1995 as a result of chronic developmental, reproductive and miscellaneous toxicity concerns.

Reporting Threshold for AMD

Used in quantities greater than 10,000 pounds.

General Discussion

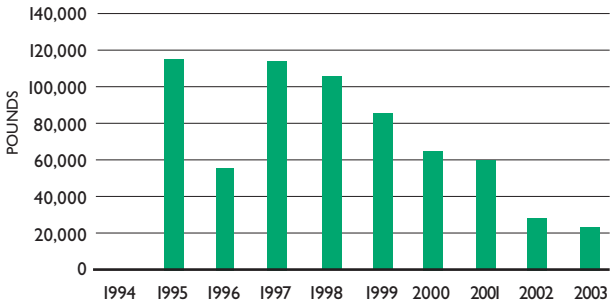
Subsequent to 1996, NMP usage at AMD's Sunnyvale, California facility dropped below the reporting threshold, eliminating reported off-site transfers to the POTW. Improved analytical methods implemented in 2000 revealed that considerably less NMP was being released to air than previously estimated. In 2002, total releases and transfers of NMP declined due to closure of Fab 14/15. In 2003, significant decreases in NMP total releases and transfers are attributable to new photolithography chemical formulations and processing techniques.

In 2003, NMP exceeded the reporting threshold at the Austin, Texas facility only.

Nitrates CAS Number: Not Applicable

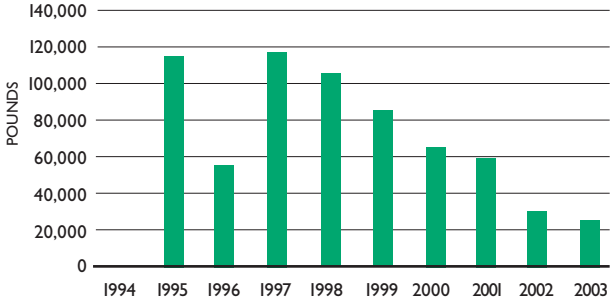
No Air Releases

AMD U.S. TRI Nitrates Transfers to POTW



No Off-Site Transfers

AMD U.S. TRI Nitrates Total Releases and Transfers



Chemical Overview

Nitrate compounds are generated during the neutralization of nitric acid. See the summary for nitric acid for more information regarding this chemical and its use at AMD.

Use at AMD

Nitrate compounds are a direct product of the neutralization of nitric acid. For more information on the use of nitric acid at AMD, see the summary for nitric acid.

Mass balance calculations were used to determine the amount of nitrates released to the POTW.

TRI Reporting History

Nitrate compounds were added to the TRI Reportable Chemicals list in 1995 due to their hematological toxicity.

Reporting Threshold for AMD

Generated at a volume greater than 25,000 lbs.

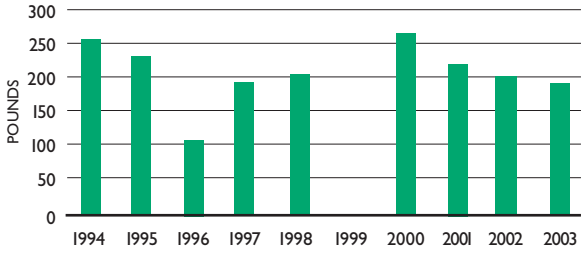
General Discussion

All nitrates reported by AMD result from neutralization of the nitric acid used in the manufacturing process. Nitrates do not contribute to air releases or off-site transfers. Reported nitrate releases typically reflect variations in amount of nitric acid used for wafer manufacturing. Closure of Fab 14/15 in mid-2002 significantly reduced the amount of total releases and discharges to POTW's.

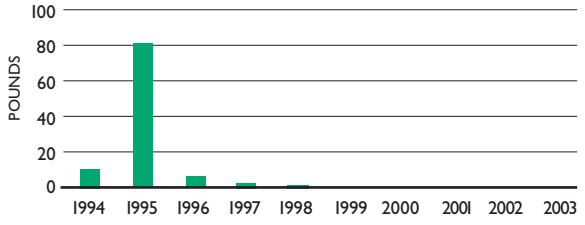
In 2003, nitrates exceeded the reporting threshold at the Austin, Texas facility only.

Nitric Acid CAS Number: 7697-37-2

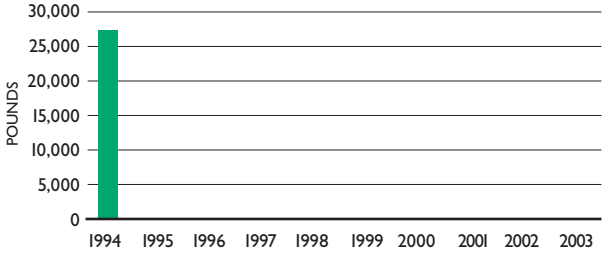
AMD U.S. TRI Nitric Acid Air Releases



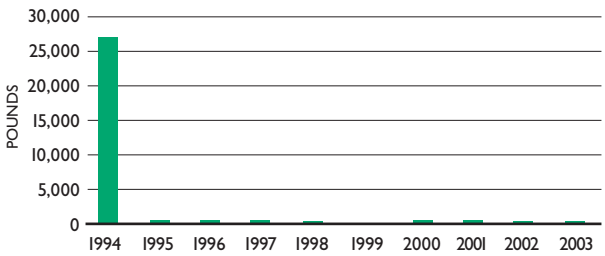
AMD U.S. TRI Nitric Acid Transfers to POTW



AMD U.S. TRI Nitric Acid Off-Site Transfers



AMD U.S. TRI Nitric Acid Total Releases and Transfers



Chemical Overview

- **Synonyms:** engraver's acid; azotic acid
- **Specific Gravity:** 1.504 @ 25°C
- **NFPA Rating:** Health: 3; Flammability: 0; Reactivity: 0; Special Hazard: none
- **Use in Commerce:** Nitric acid is commonly used to manufacture inorganic and organic nitrates and nitro compounds for fertilizers, dye intermediates, metallurgy, photoengraving, and etching steel.

Use at AMD

AMD uses nitric acid to etch specific areas of deposited films to expose the underlying silicon substrate material. The etch process usually occurs after a photoresist pattern has been created on the silicon wafer.

Air emission analytical results are used to calculate air releases, and mass balance methodologies are used to determine the amount neutralized on-site and discharged to the POTW.

TRI Reporting History

Nitric acid was included on the original list of TRI chemicals provided to the EPA by Congress in EPCRA in 1986. The original list of chemicals was derived from data provided by the states of New Jersey and Maryland. No specific toxicity reason for listing nitric acid was provided in the statutory list.

Reporting Threshold for AMD

Used in quantities greater than 10,000 pounds.

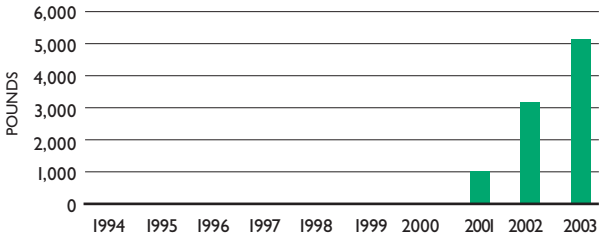
General Discussion

Prior to 1995, nitric acid waste was sent off-site for disposal. Since then, AMD has neutralized nitric acid on-site and discharged it to the POTW. The total releases and transfers of nitric acid declined due to the closure of Fab 14/15 in mid-2002.

In 2003, nitric acid exceeded the reporting threshold at the Austin, Texas facility only.

Ozone CAS Number: 10028-15-6

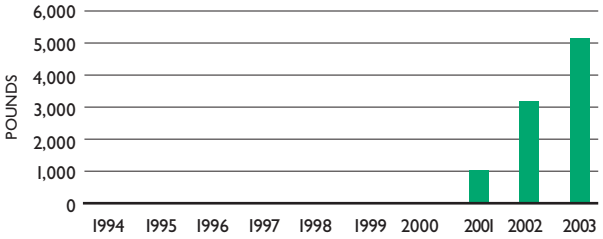
AMD U.S. TRI Ozone Air Releases



No Transfers to POTW

No Off-Site Transfers

AMD U.S. TRI Ozone Total Releases and Transfers



Chemical Overview

- **Synonyms:** triatomic oxygen, O_3
- **Specific Gravity:** 1.66 (Air = 1)
- **NFPA Rating:** Health: 4; Flammability: 0; Reactivity: 0; Special Hazard: OX
- **Use in Commerce:** purification of drinking water; industrial waste treatment; deodorization of air; production of peroxides; oxidizing agent.

Use at AMD

AMD primarily uses ozone as an oxidizing agent, in combination with sulfuric acid, to clean wafers.

Mass balance methodologies are used to determine the amount released.

TRI Reporting History

Ozone was not included on the original list of TRI chemicals provided to the EPA by Congress in EPCRA in 1986. It was added to the list in 1995 due to its potential chronic (non-cancer) effects.

Reporting Threshold for AMD

Otherwise used in quantities greater than 10,000 pounds.

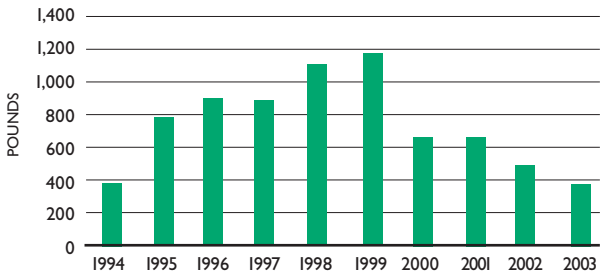
General Discussion

During the preparation of this report, AMD determined that the "otherwise used" threshold is appropriate for ozone generated in our production processes. The Austin facility exceeded the otherwise used threshold for Ozone for all years dating back to 1995. We have submitted appropriate correction requests to the EPA and the Texas Commission on Environmental Quality (TCEQ). The data presented in this report reflects these revisions.

In 2003, ozone exceeded the reporting threshold at the Austin, Texas facility only.

Sulfuric Acid Aerosol CAS Number: 7664-93-9

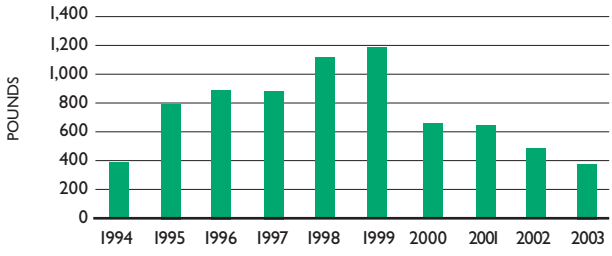
AMD U.S. TRI Sulfuric Acid Aerosols Air Releases



No Release to POTW

No Off-Site Transfers

AMD U.S. TRI Sulfuric Acid Aerosols
Total Releases and Transfers



Chemical Overview

- **Synonyms for Sulfuric Acid:** Hydrogen sulfate, battery acid, electrolyte acid
- **Specific Gravity:** 1.841 @ 60°F
- **NFPA Rating:** Health: 3; Flammability: 0; Reactivity: 2; Special Hazard: none
- **Use in Commerce:** Sulfuric acid is used in fertilizers, chemicals, dyes and pigments, etchants, alkylation catalyst, electroplating baths, iron and steel, rayon and film, industrial explosives, lab reagent, and nonferrous metallurgy. Sulfuric acid aerosols include mists, vapors, gas, fog, and other airborne forms of any particle size.

Use at AMD

Sulfuric acid is the most common chemical cleaning solution used in the semiconductor manufacturing process. Sulfuric acid mixed with hydrogen peroxide, ammonium persulfate, nitric acid, or ozone is used to remove inorganic residues, oxidants, strippers, or particulates from the surface of a wafer. Sulfuric acid is also used for neutralizing caustic industrial wastewater prior to discharge to the POTW.

Mass balance calculations based on analytical results are used to determine sulfuric acid emissions.

TRI Reporting History

Sulfuric acid was included on the original list of TRI chemicals provided to the EPA by Congress in EPCRA in 1986. The original list of chemicals was derived from data provided by the states of New Jersey and Maryland. No specific toxicity reason for listing sulfuric acid was provided in the statutory list.

In 1995, EPA amended the reporting requirements for sulfuric acid to include only aerosol forms (such as mists, vapors, gas or fog) of the chemical. Non-aerosol forms of the chemical were deleted from the reporting requirements. The change was effective for the 1994 reporting year.

Reporting Threshold for AMD

Otherwise used in quantities greater than 10,000 pounds.

General Discussion

Only the Austin site exceeded the reporting threshold for Sulfuric Acid Aerosol in 1994 through 1997. For reporting years 1998 – 2003, both the Sunnyvale and Austin sites exceeded the reporting threshold.

During the preparation of this report, AMD determined that the Austin facility exceeded the otherwise used threshold for sulfuric acid aerosol for all years dating back to 1994. We have submitted appropriate correction requests to the EPA and the Texas Commission on Environmental Quality (TCEQ). The data presented in this report reflects these revisions.

Sulfuric acid aerosol is generated in wafer etching/cleaning equipment at both the Austin and Sunnyvale sites. From early 1995 through 1999, the Austin site generated sulfuric acid aerosols during the on-site purification and recycling of sulfuric acid (otherwise known as sulfuric acid reprocessing).

In 2003, sulfuric acid aerosol exceeded the reporting threshold at the Austin and Sunnyvale sites.