

News

United States
Department
of Labor



Bureau of Labor Statistics Washington, D.C. 20212

Technical information: 202-691-6170 USDL 02-141
Media information: 202-691-5902 FOR RELEASE: 10 a.m. EDT
Internet address: <http://www.bls.gov/iif/home.htm> Wednesday, March 20, 2002

RESPIRATOR USE AND PRACTICES

Respirators had been used by employees in about 10 percent of the private industry workplaces surveyed in late 2001. In nearly half of these 619,400 establishments where respirators were used, they were used by employees on a voluntary basis only, and, in about 12 percent, they were used only when required because of emergencies (table 1). These data are from a special survey conducted by the Bureau of Labor Statistics, U.S. Department of Labor, for the National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention.

In 90 percent of the establishments that reported required respirator use, employees had used respirators in the 12-month period prior to completing the survey. (The 12-month period could fall from August 2000 to January 2002.) More detailed information was collected from these establishments with fairly recent respirator use. A total of 3.3 million employees, or about 3 percent of all private-sector employees, were included in this group (text table).

Number and percent of establishments and employees that required respirator use in the 12 months prior to the survey, by industry division

(In thousands)

Respirator Use	Number of establishments using respirators	Percent of establishments using respirators	Number of employees using respirators	Percent of employees using respirators
Private industry	281.8	4.5	3,303.4	3.1
Agriculture, forestry, and fishing	13.2	9.4	101.8	5.8
Mining	3.5	11.7	54.0	9.9
Construction	64.2	9.6	591.0	8.9
Manufacturing	48.6	12.8	882.5	4.8
Transportation and public utilities	10.4	3.7	189.9	2.8
Wholesale trade	31.2	5.2	182.9	2.6
Retail trade	16.9	1.3	118.2	0.5
Finance, insurance, and real estate	4.2	0.7	22.9	0.3
Services	89.6	4.0	1,160.3	3.2

Of the 281,800 establishments that used respirators during a prior 12-month period, nearly 98 percent reported required non-emergency use (table 2). Other findings from establishments that had required use of respirators in a 12-month period include:

- Ninety-five percent of these establishments reported using air-purifying respirators, while approximately 17 percent used air-supplied respirators (table 3).
- Almost 15 percent of these establishments reported using both air-purifying and air-supplied respirators.
- Non-powered air-purifying respirators were used in approximately 94 percent of these establishments. Less than 15 percent used powered air-purifying respirators.
- Dust masks were reported to be the most common type of air-purifying respirator used by these establishments, accounting for more than 71 percent of all use (table 4).
- Self-contained breathing apparatus (SCBA) were reported by these establishments to be the most commonly used air-supplied type of respirator, at nearly eight percent (table 5).
- Establishments reported paint vapors (110,700 establishments) and dust (106,700 establishments) to be the most common reasons for workers to wear air-purifying respirators, while paint vapors (21,600 establishments) and solvents (13,300 establishments) were the most common reasons for wearing air-supplied respirators (tables 6 and 7).
- Establishments reported that the following best described the training provided to their employees regarding respirator use: Fifty-nine percent of these establishments reported that employees are trained to understand the use and limitations of the respirators they wear; 32 percent reported that employees follow the respirator manufacturers' instructions; and approximately nine percent reported that training is not required because it is not needed (table 8).
- Establishments reported that the following best described how respirators are used at their company: Thirty-four percent of all establishments determine the use of respirators by a written program adopted by management; almost 23 percent reported that supervisors decide based on employee input and job characteristics; 22 percent reported that employees decide based on job characteristics; and 20 percent reported that respirator manufacturers' written instructions determine how respirators are used (table 9).
- Over 57 percent of these establishments reported using material safety data sheets to determine which type of respirator is appropriate for substance(s) encountered by their employees (table 10).

Background of the Survey

The Bureau of Labor Statistics (BLS) entered into an interagency agreement with the National Institute for Occupational Safety and Health (NIOSH) to conduct a survey of United States employers regarding the use of respiratory protective devices. The voluntary survey provides estimates of the number of establishments and employees who used respirators in a recent 12-month period by type of respirator and type of use. (Appendix A provides definitions of types of respirators and their uses.) The survey also collected data on the characteristics of the

respirator program at the establishment; assessment of medical fitness to wear respirators; characteristics of respirator training at the establishment; usefulness of NIOSH approval labels and respirator manufacturers' instructions; substances protected against by the use of respirators; and fit testing methods used for respirators.

The sample was stratified by 2-digit industry code and size class. The following industries were included in this survey: agriculture, forestry, and fishing; metal mining; coal mining; oil and gas extraction; sulfur mining, part of nonmetal mining; construction; manufacturing; railroad transportation; transportation and public utilities; wholesale and retail trade; finance, insurance, and real estate; and services. Establishments are classified in the above industry categories based on the 1987 Standard Industrial Classification (SIC) Manual, as defined by the Office of Management and Budget. The sample was selected from respondents to the 1999 Survey of Occupational Injuries and Illnesses. All 40,002 sample units were in private industry and located in the 50 states and the District of Columbia. The survey form was mailed to establishments in August 2001.

The survey estimates are based on a scientifically selected probability sample, rather than a census of the entire population. Because the data are based on a sample survey, the estimates probably differ from the figures that would be obtained from all units covered by the survey. To determine the precision of each estimate, a standard error is calculated. The standard error defines a range (confidence interval) around the estimate. The approximate 95-percent confidence interval is the estimate plus or minus twice the standard error. The standard error also can be expressed as a percent of the estimate, or the relative standard error. For example, the 95-percent confidence interval for an estimate of 50,000 establishments using respirators with a relative standard error of 1 percent would be 50,000 plus or minus 2 percent (2 times 1 percent) or 49,000 to 51,000. The user can be 95 percent confident that the "true" estimate falls within the confidence interval. The total estimate for respirator use in the 12 months prior to the survey of 281,800 establishments has an estimated relative standard error of less than 1 percent. A relative standard error was calculated for each estimate from this survey. A measure of sampling variability for each estimate is available upon request. (See standard errors for text table in appendix B.)

The data also are subject to nonsampling error. Mistakes in recording or coding the data, employer misunderstanding of questions, and definitional difficulties are general examples of nonsampling error in the survey. Although not measured, nonsampling errors will always occur when statistics are gathered. However, BLS has implemented quality assurance procedures to reduce nonsampling error in the survey, including detailed training of personnel involved in the nonresponse callbacks and callbacks resulting from editing of the data.

Appendix A. Definitions

Respirator use and types are defined for the survey as any of the following:

Respirator means any device designed to provide the wearer with respiratory protection against inhalation of a potentially hazardous atmosphere.

Voluntary use - employee decides to use a respirator (with the employer's approval) for personal reasons (e.g., allergy, desire to reduce exposure beyond that required by regulation).

Required non-emergency use - respirator use for exposure to known substances, which is required by regulation or by the employer.

Required emergency use - respirator use as a result of an unplanned situation, including escape from or entry into a potentially hazardous environment.

Air-purifying respirators filter out or capture harmful agents from the surrounding air (includes dust masks with two headstraps). NOTE: Air-purifying respirators are grouped into three general types: particulate removing, vapor and gas removing, and combination. Elements that remove particulates are called filters, while vapor and gas removing elements are called either chemical cartridges or canisters. Filters and cartridges/canisters are the functional portion of air-purifying respirators, and they can generally be removed and replaced once their effective life has expired. The exception would be disposable respirators, those that cannot be cleaned and disinfected or resupplied with an unused filter after use. Combination elements that protect for both particulates and vapors and gases also are available.

Non-powered air-purifying respirators (also called negative-pressure respirators) - The wearer draws air through particulate filters or gas/vapor filters (sometimes called chemical cartridges) by breathing. NOTE: Non-powered air-purifying respirators are grouped into the following types: *dust mask (disposable)*, *half-mask (other than disposable dust mask)*, *full-facepiece*, and *mouth-piece*.

Powered air-purifying respirators (also called PAPRs) - The wearer uses a blower to draw air through particulate filters or gas/vapor filters (sometimes called chemical cartridges). NOTE: Powered air-purifying respirators are grouped into the following types: *loose-fitting facepiece*, *hood/helmet without neck seal*, *hood/helmet with neck seal*, *tight-fitting half-facepiece*, and *tight-fitting full-facepiece*.

Air-supplying respirators provide a separate source of clean air for breathing. Sources include compressed air by an airline (i.e., airline respirators) and/or air or oxygen by a tank or cylinder (i.e., self-contained breathing apparatus, SCBA). NOTE: These respirators are classified by the method by which air is supplied and the way in which the air supply is regulated. These methods are: *self-contained breathing apparatus* (air or oxygen is carried in a tank on the worker's back); *air-supplied respirators* (compressed air from a stationary source is supplied through a high pressure hose connected to the respirator); and *combination self-contained and supplied air respirators*.

Tight-fitting respirators form a complete seal with the face.

Fit test means the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual.

Appendix B. Standard Errors

Standard errors for numbers of establishments and employees that required respirator use in the 12 months prior to the survey, by industry division

Respirator Use	Number of establishments using respirators	Number of employees using respirators
Private industry	196	2,677
Agriculture, forestry, and fishing	156	2,026
Mining	17	564
Construction	162	3,743
Manufacturing	34	613
Transportation and public utilities	144	2,026
Wholesale trade	167	2,914
Retail trade	153	1,186
Finance, insurance, and real estate	547	1,610
Services	457	5,749

TABLE 1. Number and percent of establishments that use respirators by selected type of use and industry division

(In thousands)

Respirator use	Private industry ¹	Goods producing				Service producing				
		Agriculture, forestry, and fishing ¹	Mining	Construction	Manufacturing	Transportation and public utilities	Wholesale trade	Retail trade	Finance, insurance, and real estate	Services
Number of establishments:										
Total use.....	619.4	27.3	8.4	153.9	100.9	29.0	66.3	43.7	12.9	177.1
Voluntary only ²	306.3	12.2	4.5	85.2	50.1	14.1	31.0	25.4	8.4	75.5
Voluntary and required ³	116.6	5.4	2.0	33.9	24.2	3.3	12.5	4.6	0.7	30.0
Required non-emergency ⁴	296.4	14.9	3.8	67.2	49.6	10.5	34.0	17.3	4.3	94.9
Required emergency ⁵	73.5	1.6	1.3	13.9	11.9	8.3	9.9	2.7	0.5	23.6
Percent of establishments:										
Total use.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Voluntary only ²	49.4	44.7	53.0	55.4	49.6	48.7	46.7	58.1	65.3	42.6
Voluntary and required ³	18.8	19.6	24.3	22.0	24.0	11.3	18.9	10.6	5.1	17.0
Required non-emergency ⁴	47.8	54.7	44.9	43.7	49.1	36.2	51.2	39.7	33.1	53.6
Required emergency ⁵	11.9	5.7	15.2	9.0	11.7	28.5	14.9	6.3	3.7	13.3

¹ Excludes farms with fewer than 11 employees.

² Employee decides to use a respirator (with the employer's approval) for personal reasons (e.g., allergy, desire to reduce exposure beyond that required by regulation).

³ Includes establishments that use respirators for voluntary and required non-emergency and/or emergency use.

⁴ Respirator use for exposure to known substances, which is required by regulation or by the employer.

⁵ Respirator use as a result of an unplanned situation, including escape from or entry into a potentially hazardous environment.

NOTE: Because of rounding, data exclusion of nonclassifiable responses, and establishments that used respirators for more than one type of use, data do not sum to the totals. Dashes indicate data that do not meet publication guidelines. A measure of sampling variability for each estimate is available upon request.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor

TABLE 2. Number and percent of establishments that used respirators in the 12 months¹ prior to the survey, by selected type and industry division

(In thousands)

Respirator use	Private industry ²	Goods producing				Service producing				
		Agriculture, forestry, and fishing ²	Mining	Construction	Manufacturing	Transportation and public utilities	Wholesale trade	Retail trade	Finance, insurance, and real estate	Services
Number of establishments:										
Total use.....	281.8	13.2	3.5	64.2	48.6	10.4	31.2	16.9	4.2	89.6
Required non-emergency ³	275.1	13.2	3.5	61.4	47.6	9.8	31.1	16.7	4.2	87.8
Required emergency ⁴	28.0	0.8	0.4	7.8	4.1	2.4	4.4	0.4	--	7.6
Required non-emergency and emergency ⁵	21.4	0.8	0.4	5.0	3.1	1.9	4.2	0.1	--	5.8
Percent of establishments:										
Total use.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Required non-emergency ³	97.6	99.8	99.3	95.6	98.0	94.4	99.4	98.3	100.0	98.0
Required emergency ⁴	10.0	6.4	12.0	12.1	8.4	23.5	14.0	2.5	--	8.5
Required non-emergency and emergency ⁵	7.6	6.2	11.4	7.8	6.4	17.9	13.4	0.7	--	6.5

¹ The 12-month period represents required use of respirators in the 12 months prior to the establishment's receipt of the survey. The survey was mailed to establishments in August 2001.

² Excludes farms with fewer than 11 employees.

³ Respirator use for exposure to known substances, which is required by regulation or by the employer.

⁴ Respirator use as a result of an unplanned situation, including escape from or entry into a potentially hazardous environment.

⁵ Includes establishments that use respirators for both required non-emergency and emergency use.

NOTE: Because of rounding, data exclusion of nonclassifiable responses, and establishments that used respirators for more than one type of use, data do not sum to the totals. Dashes indicate data that do not meet publication guidelines. A measure of sampling variability for each estimate is available upon request.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor

TABLE 3. Number and percent of establishments that used respirators in the 12 months¹ prior to the survey, by selected type and industry division

(In thousands)

Respirator type	Private industry ²	Goods producing				Service producing				
		Agriculture, forestry, and fishing ²	Mining	Construction	Manufacturing	Transportation and public utilities	Wholesale trade	Retail trade	Finance, insurance, and real estate	Services
Number of establishments:										
Total use.....	281.8	13.2	3.5	64.2	48.6	10.4	31.2	16.9	4.2	89.6
Total air-purifying.....	267.5	13.2	3.5	60.0	46.2	9.7	28.0	16.1	4.2	86.6
Non-powered air-purifying.....	264.4	12.7	3.5	58.7	45.5	9.6	27.9	15.9	4.2	86.2
Powered air-purifying.....	42.1	1.0	0.4	9.3	9.0	1.5	5.7	3.7	--	11.4
Total air-supplied.....	47.3	0.5	0.6	10.5	12.7	3.8	6.8	2.9	--	9.5
SCBA ³	21.9	0.3	0.4	3.7	4.9	2.8	4.4	1.1	--	4.5
Airline.....	37.1	0.4	0.3	9.7	10.5	2.1	3.1	2.6	--	8.3
Combination SCBA ³ /Airline.....	10.0	--	0.3	3.6	1.9	2.1	1.9	--	--	0.2
Air-purifying and air-supplied.....	41.3	0.5	0.6	9.9	11.0	3.2	6.7	2.4	--	7.2
Percent of establishments:										
Total use.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total air-purifying.....	94.9	99.9	98.8	93.5	95.2	93.9	89.5	95.0	100.0	96.6
Non-powered air-purifying.....	93.8	96.4	98.8	91.5	93.8	93.2	89.4	94.0	100.0	96.2
Powered air-purifying.....	14.9	7.5	12.1	14.6	18.5	14.7	18.1	22.1	--	12.8
Total air-supplied.....	16.8	3.6	16.9	16.4	26.2	36.6	21.8	17.0	--	10.6
SCBA ³	7.8	1.9	10.8	5.8	10.1	26.7	13.9	6.5	--	5.0
Airline.....	13.2	3.1	9.5	15.1	21.7	20.0	10.1	15.6	--	9.3
Combination SCBA ³ /Airline.....	3.5	--	8.2	5.6	3.9	20.3	6.1	--	--	0.2
Air-purifying and air-supplied.....	14.7	3.5	16.1	15.4	22.6	30.5	21.5	14.0	--	8.0

¹ The 12-month period represents required use of respirators in the 12 months prior to the establishment's receipt of the survey. The survey was mailed to establishments in August 2001.

² Excludes farms with fewer than 11 employees.

³ Self-contained breathing apparatus.

NOTE: Because of rounding, data exclusion of nonclassifiable responses, and establishments that used respirators for more than one type of use, data do not sum to the totals. Dashes indicate data that do not meet publication guidelines. A measure of sampling variability for each estimate is available upon request.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor

TABLE 4. Number and percent of establishments that used air-purifying respirators in the 12 months¹ prior to the survey, by industry division

(In thousands)

Air-purifying respirators	Private industry ²	Goods producing				Service producing				
		Agriculture, forestry, and fishing ²	Mining	Construction	Manufacturing	Transportation and public utilities	Wholesale trade	Retail trade	Finance, insurance, and real estate	Services
Number of establishments:										
Total use.....	281.8	13.2	3.5	64.2	48.6	10.4	31.2	16.9	4.2	89.6
Total air-purifying respirators.....	267.5	13.2	3.5	60.0	46.2	9.7	28.0	16.1	4.2	86.6
Non-powered air-purifying.....	264.4	12.7	3.5	58.7	45.5	9.6	27.9	15.9	4.2	86.2
Dust mask, disposable.....	201.0	10.6	2.4	49.9	30.8	5.4	17.6	11.8	3.7	68.6
Half-mask, non-disposable.....	136.8	3.3	2.1	26.0	28.3	4.8	15.1	10.6	1.1	45.5
Full-facepiece.....	61.5	1.4	0.7	12.8	15.1	2.6	8.6	4.3	0.2	15.8
Mouth-piece.....	8.4	1.8	--	2.1	1.5	0.1	--	0.9	--	1.2
Powered air-purifying.....	42.1	1.0	0.4	9.3	9.0	1.5	5.7	3.7	--	11.4
Loose-fitting facepiece.....	7.9	--	--	2.8	0.5	0.1	1.3	2.2	--	0.8
Hood/helmet without neck seal.....	7.9	--	0.1	2.5	2.8	0.5	--	0.4	--	1.2
Hood/helmet with neck seal.....	9.1	0.6	0.1	0.7	2.9	0.3	2.4	0.3	--	1.9
Tight-fitting half-facepiece.....	13.2	--	0.2	5.0	2.4	0.3	0.8	2.3	--	2.1
Tight-fitting full-facepiece.....	17.9	0.1	0.3	3.1	3.4	0.8	2.0	0.8	--	7.4
Percent of establishments:										
Total use.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total air-purifying respirators.....	94.9	99.9	98.8	93.5	95.2	93.9	89.5	95.0	100.0	96.6
Non-powered air-purifying.....	93.8	96.4	98.8	91.5	93.8	93.2	89.4	94.0	100.0	96.2
Dust mask, disposable.....	71.3	80.7	70.0	77.8	63.4	52.6	56.3	69.9	87.8	76.6
Half-mask, non-disposable.....	48.6	25.4	58.7	40.5	58.4	46.0	48.3	62.3	27.2	50.8
Full-facepiece.....	21.8	10.6	20.8	20.0	31.1	24.7	27.6	25.3	4.3	17.6
Mouth-piece.....	3.0	13.7	--	3.3	3.1	0.6	--	5.5	--	1.4
Powered air-purifying.....	14.9	7.5	12.1	14.6	18.5	14.7	18.1	22.1	--	12.8
Loose-fitting facepiece.....	2.8	--	--	4.4	1.1	1.2	4.0	12.9	--	0.9
Hood/helmet without neck seal.....	2.8	--	1.9	3.8	5.7	4.7	--	2.2	--	1.4
Hood/helmet with neck seal.....	3.2	4.5	2.4	1.1	5.9	3.0	7.6	1.5	--	2.1
Tight-fitting half-facepiece.....	4.7	--	6.9	7.8	4.9	3.3	2.6	13.4	--	2.4
Tight-fitting full-facepiece.....	6.3	0.7	7.6	4.9	7.0	7.8	6.3	4.7	--	8.2

¹ The 12-month period represents required use of respirators in the 12 months prior to the establishment's receipt of the survey. The survey was mailed to establishments in August 2001.

² Excludes farms with fewer than 11 employees.

NOTE: Because of rounding, data exclusion of nonclassifiable responses, and establishments that used respirators for more than one type of use, data do not sum to the totals. Dashes indicate data that do not meet publication guidelines. A measure of sampling variability for each estimate is available upon request.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor

TABLE 5. Number and percent of establishments that used air-supplied respirators in the 12 months¹ prior to the survey, by industry division

(In thousands)

Air-supplied respirators	Private industry ²	Goods producing				Service producing				
		Agriculture, forestry, and fishing ²	Mining	Construction	Manufacturing	Transportation and public utilities	Wholesale trade	Retail trade	Finance, insurance, and real estate	Services
Number of establishments:										
Total use.....	281.8	13.2	3.5	64.2	48.6	10.4	31.2	16.9	4.2	89.6
Total air-supplied respirators.....	47.3	0.5	0.6	10.5	12.7	3.8	6.8	2.9	--	9.5
SCBA ³	21.9	0.3	0.4	3.7	4.9	2.8	4.4	1.1	--	4.5
Airline, with half-mask.....	10.3	--	--	2.2	2.0	0.5	0.7	1.1	--	3.8
Airline, with full-facepiece.....	19.8	--	0.1	6.2	4.5	1.7	1.1	1.4	--	4.7
Airline, with integral hood/helmet..	18.7	0.3	0.2	4.9	7.5	0.7	2.1	0.7	--	2.3
Combination SCBA ³ /airline.....	10.0	--	0.3	3.6	1.9	2.1	1.9	--	--	0.2
Percent of establishments:										
Total use.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total air-supplied respirators.....	16.8	3.6	16.9	16.4	26.2	36.6	21.8	17.0	--	10.6
SCBA ³	7.8	1.9	10.8	5.8	10.1	26.7	13.9	6.5	--	5.0
Airline, with half-mask.....	3.7	--	--	3.4	4.1	5.0	2.3	6.2	--	4.2
Airline, with full-facepiece.....	7.0	--	3.7	9.7	9.3	16.4	3.4	8.1	--	5.3
Airline, with integral hood/helmet..	6.7	2.3	6.2	7.6	15.5	6.4	6.8	4.2	--	2.5
Combination SCBA ³ /airline.....	3.5	--	8.2	5.6	3.9	20.3	6.1	--	--	0.2

¹ The 12-month period represents required use of respirators in the 12 months prior to the establishment's receipt of the survey. The survey was mailed to establishments in August 2001.

² Excludes farms with fewer than 11 employees.

³ Self-contained breathing apparatus.

NOTE: Because of rounding, data exclusion of nonclassifiable responses, and establishments that used respirators for more than one type of use, data do not sum to the totals. Dashes indicate data that do not meet publication guidelines. A measure of sampling variability for each estimate is available upon request.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor

TABLE 6. Number of establishments that used air-purifying respirators in the 12 months¹ prior to the survey to protect workers against selected substances, by industry division

(In thousands)

Substance	Private industry ²	Goods producing				Service producing				
		Agriculture, forestry, and fishing ²	Mining	Construction	Manufacturing	Transportation and public utilities	Wholesale trade	Retail trade	Finance, insurance, and real estate	Services
Total air-purifying respirators.....	267.5	13.2	3.5	60.0	46.2	9.7	28.0	16.1	4.2	86.6
Substance:										
Acid gas (such as sulfur dioxide).....	27.7	1.1	0.5	4.1	7.6	1.1	5.4	0.6	--	7.2
Arsenic.....	10.2	1.2	0.2	2.9	2.5	0.9	0.8	0.1	--	1.6
Asbestos.....	27.9	1.2	0.4	6.0	4.0	2.2	2.6	0.3	--	8.7
Biologicals (i.e., TB & HIV).....	17.6	1.6	0.4	2.1	1.1	0.5	1.1	--	--	10.5
Cadmium.....	10.7	1.2	0.2	2.6	2.7	0.6	1.8	0.2	--	1.5
Carbon monoxide.....	24.4	1.1	0.4	5.7	5.3	0.7	2.9	0.8	--	7.3
Chlorine.....	15.0	1.2	0.2	5.3	2.6	0.4	2.2	--	0.5	2.5
Chromium.....	11.8	1.1	0.2	2.6	3.7	0.6	1.7	0.3	--	1.5
Coal mine dust.....	6.6	1.0	0.3	0.6	2.2	0.6	1.0	--	--	0.8
Coal tar pitch volatiles.....	6.9	1.0	0.1	0.9	2.2	0.2	1.2	0.1	--	1.1
Coke oven emissions.....	5.8	1.0	0.1	0.9	2.0	0.2	0.7	--	--	0.8
Copper.....	11.4	1.7	0.2	1.1	3.6	0.2	1.2	--	--	3.2
Cotton dust.....	7.2	2.5	0.1	0.8	1.4	0.2	1.1	0.1	--	1.0
Hydrogen sulfide.....	18.8	1.0	0.6	6.0	2.5	1.4	1.9	0.1	--	5.4
Iron oxide.....	11.3	1.4	0.2	1.0	3.3	0.4	1.2	0.1	--	3.7
Lead.....	31.3	1.1	0.3	7.9	5.5	1.4	3.7	0.6	--	10.8
Manganese.....	8.1	1.6	0.2	0.8	2.2	0.3	1.6	0.1	--	1.1
Paint vapors.....	110.7	3.6	1.2	27.3	21.7	2.5	11.0	9.4	0.9	33.2
Silica dust.....	43.7	1.8	2.3	14.3	8.9	1.2	4.2	1.3	--	9.5
Solvents.....	85.2	1.1	1.0	17.0	16.7	2.6	10.0	4.2	0.9	31.7
Styrene.....	11.5	1.7	0.1	2.9	3.7	0.2	0.9	0.2	--	1.7
Toluene.....	27.2	1.4	0.5	5.3	8.1	0.4	5.6	1.4	--	4.5
Welding fumes.....	46.1	1.9	0.9	5.3	12.3	2.0	5.0	2.8	0.2	15.7
Zinc oxide.....	15.3	1.4	0.2	1.8	3.5	0.2	2.6	0.9	--	4.8
Other dust.....	106.7	7.3	1.6	24.3	20.8	2.5	10.7	4.8	1.2	33.5
Other vapors.....	37.0	4.1	0.6	5.1	7.6	1.4	7.2	1.9	0.3	8.8
Other, n.e.c.	80.0	4.8	0.9	15.1	11.0	4.8	9.8	3.7	0.5	29.4

¹ The 12-month period represents required use of respirators in the 12 months prior to the establishment's receipt of the survey. The survey was mailed to establishments in August 2001.

² Excludes farms with fewer than 11 employees.

NOTE: Because of rounding, data exclusion of nonclassifiable responses, and establishments that used respirators for more than one type of use, data do not sum to the totals. Dashes indicate data that do not meet publication guidelines. A measure of sampling variability for each estimate is available upon request.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor

TABLE 7. Number of establishments that used air-supplied respirators in the 12 months¹ prior to the survey to protect workers against selected substances, by industry division

(In thousands)

Substance	Private industry ²	Goods producing				Service producing				
		Agriculture, forestry, and fishing ²	Mining	Construction	Manufacturing	Transportation and public utilities	Wholesale trade	Retail trade	Finance, insurance, and real estate	Services
Total air-supplied respirators.....	47.3	0.5	0.6	10.5	12.7	3.8	6.8	2.9	--	9.5
Substance:										
Acid gas (such as sulfur dioxide).....	6.5	--	0.3	2.8	1.8	0.5	1.0	--	--	--
Arsenic.....	2.3	--	--	1.7	0.4	0.1	--	--	--	--
Asbestos.....	3.1	--	--	1.0	0.6	1.0	--	--	--	--
Biologicals (i.e., TB & HIV).....	1.5	--	--	1.1	0.2	--	--	--	--	0.1
Cadmium.....	2.4	--	--	1.6	0.6	0.1	--	--	--	--
Carbon monoxide.....	7.9	--	0.1	3.8	2.0	0.4	0.7	0.4	--	0.4
Chlorine.....	5.1	--	--	2.8	0.7	0.8	0.6	--	--	--
Chromium.....	3.0	--	--	1.6	0.7	--	--	0.2	--	--
Coal mine dust.....	0.4	--	--	--	0.2	--	--	--	--	--
Coal tar pitch volatiles.....	0.5	--	--	0.2	0.2	0.1	--	--	--	--
Coke oven emissions.....	0.3	--	--	--	0.2	--	--	--	--	--
Copper.....	2.0	--	--	1.6	0.3	--	--	--	--	--
Hydrogen sulfide.....	7.3	--	0.3	4.6	0.8	1.0	--	--	--	0.2
Iron oxide.....	1.6	--	--	0.2	0.6	0.1	0.2	--	--	0.4
Lead.....	5.2	--	--	2.4	1.1	0.3	0.7	0.2	--	0.4
Manganese.....	1.6	--	--	--	0.4	--	--	--	--	--
Oxygen deficiency.....	7.2	--	0.3	2.3	1.4	1.0	1.2	--	--	--
Paint vapors.....	21.6	--	0.2	4.5	5.0	0.8	1.9	2.3	--	6.7
Silica dust.....	8.8	--	0.4	4.4	2.5	0.3	0.3	0.2	--	0.8
Solvents.....	13.3	--	0.4	2.1	3.6	0.8	1.9	1.3	--	3.3
Styrene.....	2.2	--	--	1.2	0.9	--	--	--	--	0.1
Toluene.....	6.3	--	0.2	1.4	2.1	0.1	1.0	0.4	--	1.2
Welding fumes.....	7.8	--	0.1	1.6	1.7	0.5	1.2	0.7	--	2.1
Zinc oxide.....	2.0	--	--	0.3	0.8	--	0.2	0.2	--	0.6
Other dust.....	9.6	0.3	0.1	1.8	3.4	0.3	1.7	0.5	--	1.5
Other vapors.....	5.4	--	--	0.2	2.1	0.5	1.8	0.5	--	0.3
Other, n.e.c.	12.7	--	0.1	3.2	3.9	1.3	3.7	0.2	--	0.3

¹ The 12-month period represents required use of respirators in the 12 months prior to the establishment's receipt of the survey. The survey was mailed to establishments in August 2001.

² Excludes farms with fewer than 11 employees.

NOTE: Because of rounding, data exclusion of nonclassifiable responses, and establishments that used respirators for more than one type of use, data do not sum to the totals. Dashes indicate data that do not meet publication guidelines. A measure of sampling variability for each estimate is available upon request.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor

TABLE 8. Number and percent of establishments by respirator use practices in the 12 months¹ prior to the survey, by industry division

(In thousands)

Respirator use practices	Private industry ²	Goods producing				Service producing				
		Agriculture, forestry, and fishing ²	Mining	Construction	Manufacturing	Transportation and public utilities	Wholesale trade	Retail trade	Finance, insurance, and real estate	Services
Number of establishments:										
Assessment of employees' medical fitness to wear respirators										
Yes.....	132.3	3.3	2.2	24.1	27.2	9.0	20.1	4.5	2.8	39.1
No.....	130.6	7.8	1.1	33.5	18.3	1.4	10.7	11.4	1.2	45.2
Don't know.....	13.6	2.1	0.2	4.3	1.5	--	0.5	0.6	--	4.3
Training regarding respirator use provided to employees³										
No training required.....	24.3	1.7	0.1	8.9	3.5	--	1.5	2.3	0.6	5.7
Wearers follow manufacturers' instructions.....	90.8	3.7	0.6	23.1	12.7	2.4	6.4	5.9	0.4	35.6
Wearers are trained to understand the use and limitations of respirators.....	166.7	7.8	2.9	32.1	32.4	7.9	23.3	8.8	3.2	48.3
Fit testing for employees who wear tight-fitting respirators										
Yes.....	154.4	5.5	2.7	31.8	33.8	7.1	18.5	8.2	3.2	43.6
No.....	52.8	3.2	0.3	13.4	6.1	0.7	5.3	5.5	--	18.4
Not needed.....	12.5	0.9	0.1	0.7	1.5	0.3	1.6	1.7	--	5.9
Don't know.....	5.7	0.8	--	1.3	1.3	0.2	0.6	0.3	--	0.9
Percent of establishments:										
Assessment of employees' medical fitness to wear respirators.....										
Yes.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No.....	47.8	25.1	64.8	38.9	57.9	86.8	64.3	27.3	66.1	44.1
Don't know.....	47.2	59.2	30.8	54.1	39.0	13.2	34.1	68.8	29.3	51.1
Don't know.....	4.9	15.7	4.3	7.0	3.1	--	1.5	3.8	--	4.8
Training regarding respirator use provided to employees³.....										
No training required.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Wearers follow manufacturers' instructions.....	8.6	13.0	1.5	13.9	7.1	--	4.9	13.3	14.0	6.4
Wearers are trained to understand the use and limitations of respirators.....	32.2	27.7	16.5	36.1	26.1	23.4	20.4	35.0	9.4	39.7
Wearers are trained to understand the use and limitations of respirators.....	59.2	59.3	82.1	50.1	66.8	76.1	74.6	51.7	76.6	53.9
Fit testing for employees who wear tight-fitting respirators.....										
Yes.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No.....	68.5	52.8	88.2	67.3	79.1	86.2	71.3	52.1	94.3	63.5
Not needed.....	23.4	30.8	8.9	28.3	14.3	8.6	20.4	34.9	--	26.7
Don't know.....	5.6	8.6	2.3	1.5	3.4	3.1	6.0	10.9	--	8.5
Don't know.....	2.5	7.7	--	2.8	3.1	2.0	2.3	2.1	--	1.3

¹ The 12-month period represents required use of respirators in the 12 months prior to the establishment's receipt of the survey. The survey was mailed to establishments in August 2001.

² Excludes farms with fewer than 11 employees.

³ Establishments were asked to give the best description of training provided to employees.

NOTE: Because of rounding and data exclusion of nonclassifiable responses, data may not sum to the totals. Dashes indicate data that do not meet publication guidelines. A measure of sampling variability for each estimate is available upon request.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor

TABLE 9. Number and percent of establishments by respirator use practices in the 12 months¹ prior to the survey, by industry division

(In thousands)

Respirator use practices	Private industry ²	Goods producing				Service producing				
		Agriculture, forestry, and fishing ²	Mining	Construction	Manufacturing	Transportation and public utilities	Wholesale trade	Retail trade	Finance, insurance, and real estate	Services
Number of establishments:										
Total use.....	281.8	13.2	3.5	64.2	48.6	10.4	31.2	16.9	4.2	89.6
How establishments determine respirator use³										
Supervisors decide based on employee input and job characteristics.....	64.1	6.8	1.0	14.7	13.3	1.5	6.7	4.1	3.3	12.8
Employees decide based on job characteristics.....	63.1	2.2	0.5	17.8	5.3	0.5	3.9	6.4	--	26.4
Written program adopted by management.....	96.2	1.8	1.7	19.3	22.9	5.1	17.6	2.9	0.8	23.9
Respirator manufacturers' written instructions.....	57.4	2.0	0.3	12.4	6.4	3.2	3.0	3.6	--	26.5
Percent of establishments:										
Total use.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
How establishments determine respirator use³										
Supervisors decide based on employee input and job characteristics.....	22.8	51.5	27.4	22.9	27.4	14.5	21.5	24.0	79.7	14.2
Employees decide based on job characteristics.....	22.4	16.8	14.3	27.7	11.0	5.2	12.6	37.6	--	29.5
Written program adopted by management.....	34.1	13.9	48.8	30.1	47.3	49.6	56.5	17.1	19.8	26.7
Respirator manufacturers' written instructions.....	20.4	15.4	9.6	19.3	13.1	30.7	9.4	21.4	--	29.6

¹ The 12-month period represents required use of respirators in the 12 months prior to the establishment's receipt of the survey. The survey was mailed to establishments in August 2001.

² Excludes farms with fewer than 11 employees.

³ Establishments were asked to give the best description of how respirators are used.

NOTE: Because of rounding and data exclusion of nonclassifiable responses, data may not sum to the totals. Dashes indicate data that do not meet publication guidelines. A measure of sampling variability for each estimate is available upon request.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor

TABLE 10. Number and percent of establishments by respirator use practices in the 12 months¹ prior to the survey, by industry division

(In thousands)

Respirator use practices	Private industry ²	Goods producing				Service producing				
		Agriculture, forestry, and fishing ²	Mining	Construction	Manufacturing	Transportation and public utilities	Wholesale trade	Retail trade	Finance, insurance, and real estate	Services
Number of establishments:										
Total use	281.8	13.2	3.5	64.2	48.6	10.4	31.2	16.9	4.2	89.6
How establishments determine which respirator is appropriate for substance(s) faced by employees										
Employee's suggestion.....	48.5	1.2	0.6	16.1	8.3	2.9	4.2	3.5	--	9.2
Local store products/salesperson.....	37.7	1.1	0.3	15.5	4.7	0.1	2.6	3.0	--	10.1
Air sampling at establishment.....	66.3	0.2	1.8	12.2	18.8	4.3	15.3	2.4	0.3	11.0
Air sampling at similar establishment.....	16.3	--	0.5	4.5	2.9	1.7	2.3	0.2	--	4.2
Respirator manufacturers' representative.....	58.4	3.1	0.8	8.7	12.7	1.1	7.8	4.7	--	19.5
Respirator manufacturers' literature.....	126.5	5.2	1.7	25.4	22.7	4.1	16.6	7.3	--	40.5
Assigned protection factor (APF).....	39.1	0.7	0.5	8.0	6.3	2.7	5.4	2.9	0.2	12.3
Hazard ratio.....	15.4	0.7	0.1	3.4	2.3	0.2	3.9	3.3	--	1.6
Material safety data sheets.....	161.1	7.1	2.2	31.8	31.2	5.8	20.6	9.3	3.9	49.2
Other, n.e.c.	32.3	3.6	0.3	5.1	3.9	1.5	2.5	0.8	0.1	14.3
Percent of establishments:										
Total use	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
How establishments determine which respirator is appropriate for substance(s) faced by employees										
Employee's suggestion.....	17.2	8.9	17.2	25.0	17.1	27.6	13.4	20.8	--	10.2
Local store products/salesperson.....	13.4	8.7	9.4	24.2	9.6	0.9	8.4	17.9	--	11.2
Air sampling at establishment.....	23.5	1.8	50.3	19.1	38.8	41.3	48.8	14.0	6.8	12.3
Air sampling at similar establishment.....	5.8	--	13.1	7.0	6.0	16.7	7.4	1.1	--	4.7
Respirator manufacturers' representative.....	20.7	23.8	22.3	13.5	26.1	10.4	24.8	27.8	--	21.8
Respirator manufacturers' literature.....	44.9	39.7	48.5	39.6	46.8	39.8	53.3	42.9	--	45.2
Assigned protection factor (APF).....	13.9	5.5	13.6	12.5	12.9	26.4	17.2	17.3	4.1	13.7
Hazard ratio.....	5.5	5.1	4.0	5.2	4.7	1.7	12.6	19.2	--	1.8
Material safety data sheets.....	57.2	53.8	62.4	49.6	64.3	55.7	66.0	55.0	92.6	54.9
Other, n.e.c.	11.5	27.3	7.3	8.0	8.1	15.0	8.1	5.0	1.6	16.0

¹ The 12-month period represents required use of respirators in the 12 months prior to the establishment's receipt of the survey. The survey was mailed to establishments in August 2001.

² Excludes farms with fewer than 11 employees.

NOTE: Because of rounding, data exclusion of nonclassifiable responses, and establishments that used respirators for more than one type of use, data do not sum to the totals. Dashes indicate data that do not meet publication guidelines. A measure of sampling variability for each estimate is available upon request.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor