

FILE NAME: Johns-Manville (JMA)

DATE: 1969 - 1971

DOC#: JMA286

DOCUMENT DESCRIPTION: Mine Safety Appliance Company -
Inefficient Dustfoe 77 Masks - Memos, Manual Reprints, Reports
& Product Lit

GHQ
January 8, 1971

J.R.M. Hutcheson - AFD Asbestos
J. B. Kaczowski - AFD Asbestos

**EVALUATION OF RESPIRATORS
MCGILL UNIVERSITY**

I am forwarding, under separate cover, six American Optical Disposable Dust-Mist Respirators.

These are the American Optical Disposable Respirators specifically designed for use in the construction industry, especially by the Heat, Frost, Insulation and Asbestos Workers.

Also enclosed please find four models each of the newly designed Welsh Disposable Respirators, #7160 and #7161.

I am also enclosing copies of correspondence between Welsh, American Optical, and myself in conjunction with the sample respirators in order that you are aware of the proposed Bureau of Mines approval for each.

All three models being forwarded should be included in the McGill University Study for evaluation with asbestos dust.

To date I have not received a copy of the protocol from McGill University concerning these Respiratory Equipment Studies, as requested in my letter of November 11, 1970. Kindly forward this information as soon as possible.

To the best of my knowledge, we have now included all of the light weight and disposable type respirators available. Is there any additional respiratory equipment that you feel should be included which I have not provided?

Kindly keep us advised of any interim reports received in conjunction with this work.

C. L. Sheckler

CLS:rw
Encl.

cc: W. L. VanDerbeek - Research

bcc: J. Leineweber-S.Speil - Research (w/attach.)

FILE COPY

FU 11/1

General Headquarters
June 22, 1950

K. W. Smith, M. D. - Asbestos

Asbestos and Lung Carcinoma

When you were here, the fact was mentioned that Dr. Lanza's set-up at the Bellevue Medical Center does not now provide dust rooms for making tests that require such facilities.

After our conversation, Dr. Lanza told me that he expects to have dust rooms for running such tests some time this fall, probably by November 1, at the latest.

In case you didn't have this information in connection with your consideration of tests that might be run, I thought you would be interested in having it. I do not know how extensive the facilities will be.

J. P. Woodard

cc: A. R. Fisher

G. M. McGraw - Asbestos

K. V. Lindell - Asbestos

6009

Research & Engineering Center
December 8, 1971

DEC 10 1971

MEMO FOR FILE:
VISIT TO MCGILL UNIVERSITY
DUST RESPIRATOR PROGRAM

C. Sheckler, J. Eby, R. Gresham, J. Matheson of Welsch Manufacturing Company, W. Burgess of Harvard Public Health and I met with Prof. Bardswick and J. Lajzarovics on December 1 to review their most recent report on studies of respirators for filtration of asbestos. Cliff Sheckler has a complete copy of this report.

In general the technique is satisfactory as a means of comparison between respirators, although it differs from the standard Bureau of Mines certification procedure in flow rate, particulate concentration and other factors, including the use of asbestos rather than silica dust.

A secondary part of the procedure was the evaluation of leakage around the mask using a helium concentration technique. There is some question concerning the significance of these helium leakage tests, especially where the face seal is accomplished by a sponge rubber media. Filter penetration tests were run using a 6yrd Mark 9 respirator operating at a total air volume of 6 liters/minute and with fiber concentrations of approximately 20, 40, and 100 fibers/cc, respectively.

The data indicate that the new 3M disposable filter, the Welsch disposable filter and the Willson prototype filter were all satisfactory from a penetration standpoint. From a face leakage standpoint the 3M and Welsch units were satisfactory, but the Willson prototype showed excessive leakage. This will undoubtedly be less with the softer plastic to be used in the final material.

By combining the fiber penetration through leakage with the fiber penetration through the filter media, it was possible to calculate an anticipated fiber concentration within the mask for each of the three concentrations used in the test. While this calculation appears an approximation at best, it would again reveal the suitability of the Welsch and 3M masks for most applications. A significant problem was revealed in that at the lower fiber concentrations (20 fibers/cc) the mask efficiency was markedly reduced leading in some cases to a greater fiber concentration within the mask in an atmosphere of 20 fibers/cc than in a concentration of

December 8, 1971

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MEMO FOR FILE:
VISIT TO MCGILL UNIVERSITY

100 fibers/cc when the entire test period of 6 hr was considered. This problem must undoubtedly be examined in more detail when NIOSH and OSHA present their proposals in the near future for improved respirator control.

The report also attempted to arrive at an index of effectiveness by combining the three factors of filter media efficiency, face leakage and inhalation resistance. In this case again the Welsch units appeared to be the best, although the 3M disposables were satisfactory. From a cost standpoint the 3M units will undoubtedly be most acceptable since they will probably cost from 50 to 60 per cent as much as the Welsch Disposable unit. However, other factors will have to be considered, including the greater durability of the Welsch unit and the actual conditions of use. For example, the 3M unit would be most satisfactory in a cold, dry atmosphere while the Welsch unit with its inhalation and exhalation valves would be much more comfortable in any hot or humid atmosphere. It is suggested that any future tests on face leakage be conducted with sodium chloride aerosol rather than a gas.

A byproduct of this test program was the observation that Dust Foe 77 respirators consistently failed to attain even 90 per cent efficiency compared to the 99+ per cent efficiency of the other satisfactory masks. This is particularly disturbing since Dust Foe 77 is one of the masks most recommended for use in J-M locations. This information became known to Bob Schutz of the U. S. Bureau of Mines who contacted the writer several weeks ago to verify what he had heard apparently from a meeting held in Canada.

Subsequent to the meeting at McGill, Cliff Sheckler and I visited Mr. Schutz to give him, on a privileged and confidential basis, the information contained in the report. He was very much concerned about the results with MSA Dust Foe and asked if we had any unused filters from this lot that he could test in his standard procedure to determine whether a QC problem existed at Mine Safety Appliance. Sheckler will check with Bardswick and arrange for transfer of filters if they are available.

Schutz thanked us for the information. He was also particularly impressed with the data concerning relatively high penetrations at low fiber concentrations and presumably also for short exposure periods at any concentration. Obviously in normal usage, fibers will constitute only a part of the dust exposure so that one might expect a greater build-up of particulates on the mask than was obtained with exposures to pure fiber at 10 fibers/cc. Considerable data would have to be obtained to investigate this problem in more detail. We do not anticipate doing this in the McGill program.

December 8, 1971
Page 3

MEMO FOR FILE:
VISIT TO MCGILL UNIVERSITY

Bob Schutz informed us that the emergency 5 fiber/cc limit was being published in the FEDERAL REGISTER on December 7 and that he anticipated that an emergency 2 fiber/cc limit might be established in the not too distant future.

A significant program is now underway at the Los Alamos Laboratory under the direction of Ed Hyatt to evaluate techniques for quantitating the effectiveness of face fit by different masks using sodium chloride techniques. There is a good possibility that this would end up with the requirement for "sized" masks to meet requirements of different facial characteristics.

While no further program is contemplated at McGill, it appears highly desirable that we maintain good contact with Bob Schutz and establish contact with Ed Hyatt at Los Alamos. As a side issue, the most recent meeting of the subcommittee of ANSI on respirator protection was recessed with no action pending the recommendations which are anticipated from both NIOSH and OSHA on the entire question of protection against exposure to asbestos. Probably these recommendations will be made in the usual manner with little or no factual basis.

S. SPEIL

SS/rs

cc:
W. L. VanDerbeek, Denver
E. M. Fenner, Denver
C. Sheckler, OH
J. R. M. Hutcheson, Asbestos
R. B. Gresham, Jeffrey
F. L. Pundsack
J. P. Leineweber
W. C. Streib

6020
MAY 17 1971

GENERAL OFFICES • 3M CENTER • ST. PAUL, MINNESOTA 55101 • TEL. 733-1110

May 14, 1971

Mr. C. L. Sheckler
Manager, Accident Prevention
and Health Administration
Johns-Manville Corporation
22 East 40th Street
New York, New York 10016

Dear Mr. Sheckler:

Thank you for your letter of May 12, and today we are sending to you fifteen of our #8710 High Efficiency Masks complimentary.

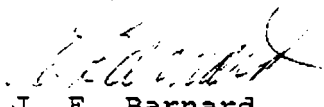
Presently this product is available only in the cities of Chicago and Cincinnati since these two areas are presently serving as a test market.

The mask is designed to meet the Bureau of Mines proposed schedule for single use respirators, which was published in the Federal Register on March 10, 1971. I am taking the liberty of enclosing a temporary data sheet which shows the Bureau of Mines test for the single use respirator and also a page showing the proper way to put the mask on.

We would be most interested in hearing from you at the conclusion of your testing; what your evaluation and results were.

Again, thank you very much.

Very truly yours, .


J. E. Barnard
Sales Manager
Respiratory Products

JEB:hc

Encl.

MINNESOTA MINING AND MANUFACTURING COMPANY

TO INSURE PROPER FIT OF YOUR **3M** BRAND RESPIRATOR, SIMPLY:



1. Cup mask under chin with metal nosepiece up.



2. Pull both headbands over head and position lower band around neck below ears. Position upper band at top — back of head.

3. Press soft metal nosepiece to conform snugly around bridge of nose.



NOTE: Place this poster in area where respirators are stored or used to assist in obtaining proper fit.

TEMPORARY TECHNICAL INFORMATION SHEET

"3M" BRAND RESPIRATOR #8710

The "3M" Brand Respirator #8710 meets requirements of proposed rule making of the U.S. Bureau of Mines, 30 CFR Part 11, as published in the Federal Register Volume 36, Number 47, Part II. It is a single use respirator designed as respiratory protection against pneumoconiosis - and fibrosis - producing dusts. (Subpart H, § 11.100 (i))

As outlined in the proposed rule making, the respirator must meet requirements of the Coal Dust Tightness Test, the Silica-Dust Test, and the Airflow Resistance Test. The #8710 meets all of these requirements.

Coal Dust Tightness Test

The respirator was fitted on a test subject who entered a test chamber containing an atmosphere of 75 ± 25 milligrams (0.0026 ± 0.008 oz.) per cubic meter of coal dust. The coal dust had an average particle size of 1.2 microns (0.000047 inches). Two dust samples were collected, one inside the respirator and one room sample, on preweighed membrane filters at a rate of 2 liters per minute for 30 minutes. During the thirty minute test period, the test subject performed the following routine twice:

- 3 minutes - walking and turning and nodding head
- 1.5 minutes - smiling
- 1.5 minutes - frowning
- 3 minutes - reciting the alphabet
- 3 minutes - talking
- 3 minutes - shallow and deep breathing.

The samples were reweighed on a Sortorius Model 2604 Semi-Micro balance. The percent efficiency of each respirator was calculated as:

$$\frac{\text{wt. room sample} - \text{wt. respirator sample}}{\text{wt. room sample}} \times 100$$

RESULTS:		wt. room sample
		% Efficiency
	Required -	90 (minimum)
	#8710 -	97 (average)

Silica-Dust Test and Airflow Resistance

The #8710 meets requirements of both tests. The following is provided to compare requirements for single-use respirators to those for dust, fume, and mist respirators.

<u>TEST</u>	<u>DUST MIST, AND FUME</u>	<u>SINGLE USE</u>
Test dust	Silica dust.	Silica dust.
Particle Size	0.4 to 0.6 microns. (0.0000157 to 0.0000236 Inches.)	0.4 to 0.6 microns. (0.0000157 to 0.0000236 Inches)
Test Time	90 minutes	90 minutes
Test Atmosphere Concentration	50-60 milligram/cubic meter (0.0017 - 0.0021 oz./cubic meter)	50-60 milligrams/ cubic meter. (0.0017- 0.0021 oz./cubic meter)
Test air (Flow Rate)	32 liters/minute (Inhalation Only)	40 liters/minute (Inhalation & Exhal.)
Breathing Machine Requirements	Not required	<u>24 cycles/minute</u> 95 ± 2% Exhalation air <u>Relative Humidity</u> 95 ± 3°F Exhalation Air Temperature
Allowable Penetration	4.5 Milligrams/ 3 Respirators Maximum 2 milligrams/ respirator	4.5 Milligrams/ 3 Respirators maximum 2 milligrams/ resp.
Total Dust Challenge to Respirator	144-172 milligrams	180-216 milligrams
Maximum Breathing Resistance at 85 liters/ minute	(See Following Page)	

	MM H ₂ O	IN. H ₂ O	MM H ₂ O	IN. H ₂ O
INITIAL INHALATION	30	(1.18)	12	(0.47)
FINAL INHALATION (AFTER 90 Minute test)	50	(1.97)	15	(0.59)
EXHALATION	20	(0.78)	15	(0.59)

GHQ
May 15, 1971

L. Tomsa - Manville

**RESPIRATORY PROTECTION FOR
PNEUMOCONIOSIS-PRODUCING DUSTS**

During my visit last Friday you requested information concerning an approved type of respiratory equipment for use in our mines and plants.

We have a number of filter type air purifying respirators approved by the Bureau of Mines for pneumoconiosis-producing dusts that are on our Johns-Manville approved respirator use for exposures to asbestos, silica, talc, graphite, and other less toxic or nuisance type dusts. We include only Bureau of Mines approved respirators on our Johns-Manville approved list of dust respirators.

The J-M approved dust respirators are as follows:

	<u>Bureau of Mines Approval Number</u>
Mine Safety Appliances Company - Dustfoe 77	BM-2115-97
- Dustfoe 66	BM-2116A
- Custom Comfo w/S Filter	BM-2113-69
American Optical Company - R2000 w/25 (BM-2145) 90 Filter	(BM-2172)
- R3000 w/30 Filter	BM-2115-78
- R5000 w/50 Filter	BM-2172
Willson Safety Products - Mono Mask 600A	BM-2170
- Single Cartridge #460	BM-2161
- Double Cartridge #860C	BM-2162

The above respirators are approved by the Bureau of Mines either under Schedule 21 or 21B. These Bureau of Mines tests are based on silica dust particulates and not asbestos. Although there are no official tests designated for asbestos fibre, filters capable of protecting against silica dust will also protect against asbestos.

When the threshold limit value for asbestos was 5 million particles per cubic foot of air, and prior to the marketing of the MSA Dustfoe 77, we recommended respirators approved under Schedule 21.

May 18, 1971

Upon NIOSH recommendations of the 12 F₁₀₀ or 2 MPPCF threshold limit value, we encouraged the use of Schedule 213 approved respirators. The Dustfree 77 is the lightest, most comfortable equipment available under this Schedule. Schedule 21 allows 3 mg. penetration, which is about twice that allowed by Schedule 213.

We are presently engaged in a research project with the McGill University in Montreal for testing various types of light weight respiratory equipment. These light weight respirators being tested include the Welsh 7050-7160-7161, 80 89100-89100T-1040, Millson Prototype 4 (Surgery Mask), IM 8500 Single Strap, - Test A Double Strap - 8710, and MSA Dustfree 77. These tests are specifically being conducted with asbestos rather than silica as used by the Bureau of Mines.

Upon completion of the McGill University research project we will be in a position to determine whether additional light weight respiratory equipment can be included on our Johns-Manville approved list.

There is other Bureau of Mines, Schedule 21 and 213, approved respiratory equipment available on the market that has not been included on our Johns-Manville approved list. We will give consideration to approving additional equipment if there is a need. We do, however, require that you contact me for this special approval.

C. L. Sheckler

cc: W. H. Gates - Research
W. L. Ruff - Manville
J. D. Anderson - Manville
L. Hamerda - Manville

6000

MANVILLE

4/22/69

C. L. SHECKLER. GHQ

RESPIRATOR APPROVAL DETERMINATION

As you know we have had problems with employees acceptance of the respirators we have been using, namely Dustfor 66.

We have had some employees request the A.O. Series 9100 or 9100 T. Both of these have a U. S. Bureau of mines approval. The 9100 respirator is lighter, less bulky and can be used in closer quarters. It is also less costly and has less parts.

We request that you investigate the efficiency of this 9100 series respirator and advise us as to whether or not you will approve it for our location.

L. R. THOMSON, SAFETY

Attached literature on respirator and also a copy of a Respirator Protection Guide. The guide recommends the 9100 for asbestos & silica.

Case 010-6543 arg.

BP 40%

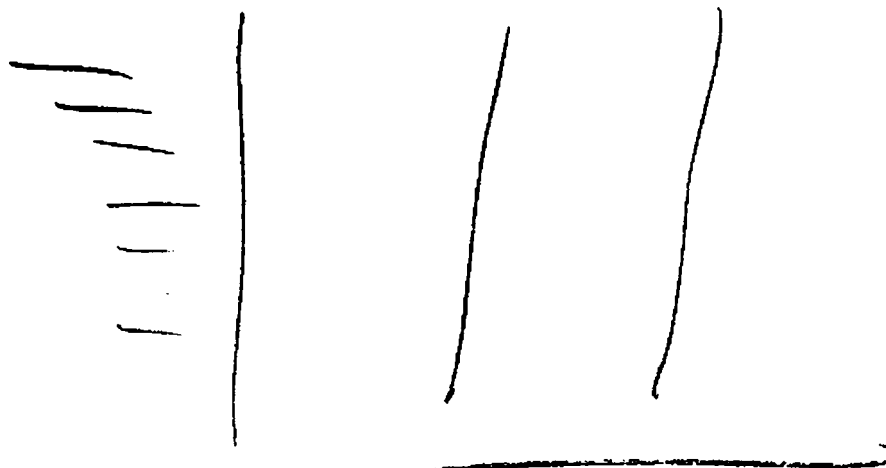
Argl 20%

See 30 arg.

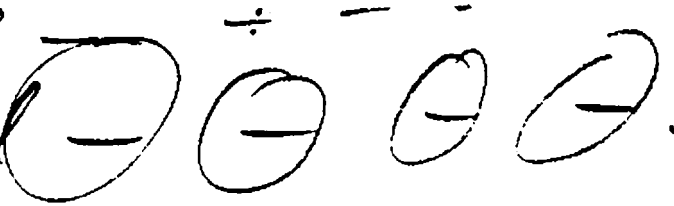
II 40%

See 60 arg.

u.c. not legal



Man Total
No. Pak Total



Warbonnet Commission Case Cost Summary

Preparing Report

Special permit original.

Quarterly DD report

Annual W.P. Case record report.

Define "other" expenses

W. B. Case

60 jobs - 144 people reqd. to wear
resp. - 20 covered - 124 newly reqd. to wear
resp.

Working in job descrip to effect that when
conditions were changed, ~~the~~ ^{the new plan} allow for
resp. would be eliminated.

Consultants E.C. — Walter Kelly Rev.

Total Resp? —

Refusals for wearing —

Other personal protective equip. —

Get Tucker opinion re: To of pulmonary
disfunction where physical exposure applies.

met w/ doctors re: pulmonary function

met w/ Div. re: respirator types, cleaning & maint.



**AMERICAN OPTICAL
CORPORATION**

SAFETY PRODUCTS DIVISION
Southbridge, Massachusetts, U.S.A. 01550

**WHATEVER THE HAZARD . . .
THERE'S AN AO RESPIRATOR TO CLEAR THE AIR**

If that sounds too much like a slogan, our apologies. The fact is that we do have a complete line of respirators that do an excellent job of clearing the air of hazards. And, frankly, we like to say so.

The AO respirator line is detailed in the enclosed new catalog . . . a concise guide that pictures and describes the proper respirators to use for protection against a variety of hazards common to manufacturing, mining and agriculture.

You'll want to give your attention to new respirators in the R8000, R2000, R6000 and R9000 Series, plus the new Paint-N-Dust Mask.

When you do see the respirator you think will meet the hazard at your plant, call your AO Safety Sales Representative for a personal demonstration. He's the man who will clear up all your questions.

AMERICAN OPTICAL CORPORATION
Safety Products Division

(Enc.)

8174

Whatever the Hazard



*A reference guide to the
complete AO respirator line*

- **Dust Type**
- **Vapor and Gas Type**
- **Single Filter**
- **Twin Filter**
- **Goggle Combinations**
- **Interchangeable Cartridges**
- **Hoods and Accessories**

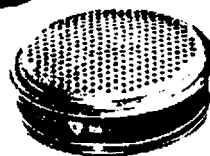


**AMERICAN OPTICAL
CORPORATION**

*... An Outstanding
Name in Respirators.*



*AO offers a
variety of filters
and cartridges, too*





What hazard do you want to overcome? Perhaps dusts, mists, fumes or organic vapors are part of your problem. Then look to AO's new R3000 and R8000 Respirator Series. One mask with twenty-three filters and seven U.S.B.M. approvals.

Pneumoconiosis-producing dust? Then check out AO's R9100. It's the lightest weight, least-expensive U.S.B.M. approved respirator you can buy.

Bothered by the hazards of acid, ammonia, or alkali gases? Better consider AO's R6000 Twin Filter Respirator Series . . . 21 respirators in one . . . with eight U.S. Bureau of Mines approvals.

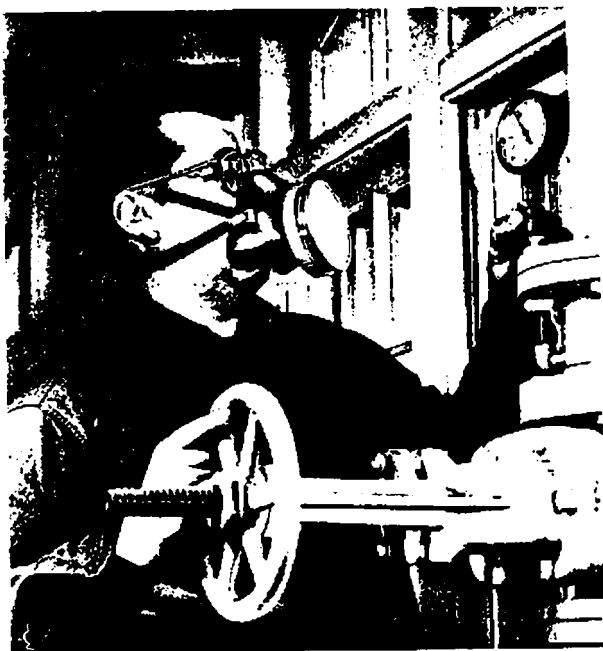
Want a simple, inexpensive respirator with a washable, reusable filter for protection against nuisance dusts and non-toxic paint sprays? Then try AO's latest addition to the line, the new Paint-N-Dust Mask.

Whatever your respirator needs, you'll find AO's selection of versatile respirators, filters and cartridges in this booklet will meet them. And do it with greater safety, comfort and economy.

*Now then,
make your choice
from the following pages.*



R3000 Series



R8000 Series

Could you ask for anything more?

Now AO gives you twenty-three choices for protection. The new R3000 and R8000 Respirator Series protect against a wide range of specific respiratory hazards and has several new Bureau of Mines approvals for dusts, mists, fumes, organic vapors, and paint spray.

New R3000 and R8000 respirators have filters and cartridges mounted off center so that vision remains unobstructed. The new design is the result of thousands of fitting tests to determine facepiece dimensions that provide the ultimate in comfortable, contoured facial fit. The result is a contoured facepiece which allows R3000 and R8000 to be worn over long periods of time without discomfort or fatigue. Both models are equipped with specially designed double-loop headbands (of either rubber or elastic) which, under the slightest tension, keep the respirator properly sealed to the face. Special headband design permits the user to "park" the respirator on his chest when not in use.

The R61 Knitted Cotton Face Cover is available for use on R3000 and R8000 Dust and Mist respirators for added comfort . . . especially during hot weather.

R3000 and R8000 respirators are equipped with a large variety of filtering units and are available for protection against a wide range of toxic air contaminants, as shown at right.

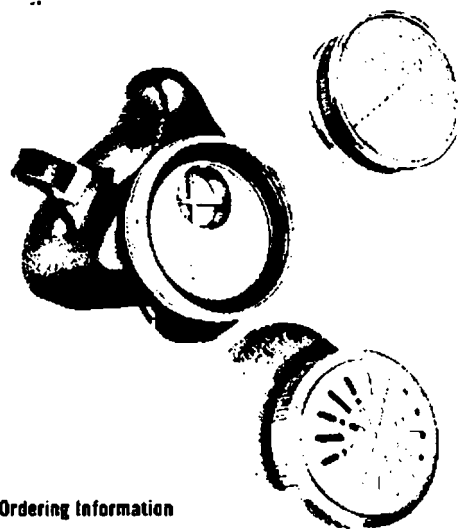
With one scientifically contoured facepiece and a total of twenty-three "specific hazard" filters and cartridges, you have a solid answer to the problem of economical respiratory protection. To prevent corrosion and thus provide longer service life, metal has been practically eliminated. And these compact, lightweight respirators disassemble fast, too, for easy cleaning and substitution of alternate parts.



Each R3000 and R8000 respirator is available with a 700A ventilated rubber goggle or a 701A non-ventilated rubber goggle, attached by snaps. To order, simply add the prefix 70 (for 700A goggle) or 71 (for 701A goggle). For example, the ordering number R703141 describes a combination which is an R3141 respirator with a 700A goggle.

Every R3000 and R8000 respirator features AO's new precision-molded Exhalation Valve System for superior performance. Exhalation resistance is well below the maximum allowed by the U.S. Bureau of Mines. During inhalation and before exhalation, the valve flap remains completely sealed. At the slightest exhalation, however, the valve flap opens to allow expelled air to freely leave the mask.

The valve seat consists of a single piece of molded plastic. This valve has a "dead air" space that provides an important extra margin of safety by making it impossible for contaminated air to enter the respirator through the exhalation valve system. This means that, in the split second while the valve flap is closing, only exhaled air surrounds the valve flap. Contaminated air cannot enter.



R-3000 Ordering Information

Catalog Number	Cartridge or Filter	Hazards
R3030	R30 "Red Devil"® Filter	Dusts and mists. Bureau of Mines approval No. BM-21A-85.
R3141 *	R141 Adsorbent Cartridge	Organic vapors.
R3142 *	R142 Adsorbent Cartridge	Acid gases.
R3143 *	R143 Adsorbent Cartridge	Organic vapors and acid gases.
R3144 *	R144 Adsorbent Cartridge	Ammonia gas.
R3145 *	R145 Filter-Adsorbent Cartridge	Organic vapors, dusts and mists.
R3173 *	R173 Adsorbent Cartridge	Vapors of amines and amine derivatives.
R3174 *	R174 Adsorbent Cartridge	Ammonia gas and organic vapors.

R-8000 Ordering Information

R8100	R100 "Red Devil"® Filter	Dusts and mists. Bureau of Mines approval No. BM-21B-88.
R8151	R151 Adsorbent Cartridge	Organic vapors. Bureau of Mines approval No. BM-23B-24.
R8151P	R151 Adsorbent Cartridge R150 Rubber Clip R149 Pre-Filter	Paint sprays and vapors, dusts, and mists. Bureau of Mines approval No. BM-23B-32.
R8152 *	R152 Adsorbent Cartridge	Acid gases.
R8153 *	R153 Adsorbent Cartridge	Organic vapors and acid gases.
R8154 *	R154 Adsorbent Cartridge	Ammonia gas.
R8155	R155 Filter-Adsorbent Cartridge	Organic vapors, dusts, mists. Bureau of Mines approval No. BM-23B-26.
R8156	R156 Filter Cartridge	Dusts, metal fumes, and mists. Bureau of Mines approval No. BM-21B-87.
R8158 *	R158 Filter-Adsorbent Cartridge	Toxic insecticides.
R8175P	R175 Adsorbent Cartridge R187 Rubber Clip R149 Pre-Filter	Special electrostatic paint spray respirator. Approved for paint sprays, dust and mists. Bureau of Mines approval No. BM-23B-34.
R8183 *	R183 Adsorbent Cartridge	Vapors of amines and amine derivatives.
R8184 *	R184 Adsorbent Cartridge	Ammonia gas, and organic vapors.
R8188 *	R188 Filter-Adsorbent Cartridge	Mercury vapor, dusts and mists.
R8191P	R191 Filter Adsorbent Cartridge	Paint sprays and vapors, dusts, and mists. Bureau of Mines approval No. BM-23B-33.
R8193 *	R193 Filter-Adsorbent Cartridge	Dusts, mists, mercury vapor and chlorine gas.

*The U.S. Bureau of Mines does not provide testing and approval schedules for respirators protecting against acid gases, combined organic and acid gases, ammonia gas, mercury vapor, chlorine gas, amine vapors, or insecticides; therefore, Bureau of Mines approvals are not available for these units.

®T.M. Registered by American Optical Corporation



Nine interchangeable filters and cartridges protect against dusts, mists, organic vapors, acid gases, combinations of organic vapors and acid gases, ammonia and other alkali gases. Face mask fits most faces, has smooth, contoured sealing edges. Positive-action inhalation valve admits air at slightest breath, seals tightly on exhalation. Exhalation valve assures complete expulsion of exhaled air. Can't stick, won't trap dust or moisture.

The R2000 respirator is light, durable, easily disassembled for cleaning and sterilizing. Clean, comfortable R-11 Washable Knitted Cotton Face Cover keeps worker's face from contact with rubber.

R2000 SERIES RESPIRATOR WITH 700A GOGGLE

Features R2000 respirator with rubber goggle frame and large shatter-resistant plastic lens. Protects against chemical splash, spray, flying particles and fine dusts. Screened ventilation ports prevent lens from fogging. Goggle may be removed from respirator if desired.

WITH 701A "GAS-TIGHT" GOGGLE

Same goggle as 700A, but without vents in frame or slots in lens for headband. Plastic lens provides gas-tight seal. For use where gases, fumes or smoke are present.



R2000 SERIES ORDERING INFORMATION

Catalog Number	Cartridge or Filter	Hazard
R2090	R90	All dusts and mists not significantly more toxic than lead. Bureau of Mines approval BM-2172.
R2017	R17	All dusts not significantly more toxic than lead. Bureau of Mines approval BM-2138.
R2000	R25	All dusts not significantly more toxic than lead. Bureau of Mines approval BM-2145.
R2031	R31	Organic vapors.
R2032	R32	Acid gases.
R2033	R33	Acid gases and organic vapors.
R2034	R34	Ammonia gas.
R2035	R35	Dusts and mists not significantly more toxic than lead and organic vapors.
R20211	R211	"Super" cartridge for organic vapors.

The R9000 Belt-Aire Respirator provides maximum protection against a wide range of respiratory hazards. Utilizing 20 different filter combinations, six of them with Bureau of Mines approval, the R9000 respirator unit permits the filters to be quickly replaced without removal of the respirator.

It can be easily worn under a welding helmet to protect the welder from dangerous metal fumes. The facepiece has no protruding filters and the welder is completely protected from flying sparks and glare. The R9000 can be worn in areas where head protection, as well as respiratory protection, is required. Respirator headbands will not interfere with proper seating of safety headgear on the wearer's head.

R9000 ORDERING INFORMATION

Catalog Number	Cartridge or Filter	Hazards
R9051	R51	Organic vapors (BM-23B-19)
R9051P	R51 with R59 filter and R64A clip	Paint sprays (Clip-on Filter). (BM-23B-20)
R9052*	R52	Acid gases.
R9053*	R53	Organic vapors and acid gases.
R9054*	R54	Ammonia gas.
R9055	R55	Dusts, mists, organic vapors. (BM-23B-21)
R9057	R57	Radioactive particulate.
R9058*	R58	Insecticides.
R9088*	R88	Mercury vapor, dusts, mists.
R9089*	R89	Mercury vapor, dusts, mists, metal fumes.
R9091P	R91	Paint Sprays. (BM-23B-22)
R9093*	R93	Dusts, mists, mercury vapor and chlorine gas.
R9113*	R113	Vapors of amines and amine derivatives.
R9114*	R114	Ammonia gas and organic vapors.
R9166	R166	Dusts, mists and metal fumes. (BM-21B-24).
R9180*	R180	Organic vapors and acid gases ("Super" cartridge).
R9561	R561	Dusts, mists, metal fumes and organic vapors. (BM-23B-23)
R9562*	R562	Dusts, mists, metal fumes and acid gases
R9563*	R563	Dusts, mists, metal fumes, organic vapors and acid gases.
R9564*	R564	Dusts, mists, metal fumes and ammonia gas.

Note: See page 15 for additional information on filter cartridges for R9000 Belt-Aire

*The U.S. Bureau of Mines does not provide testing and approval schedules for respirators protecting against acid gases, combined organic and acid gases, ammonia gas, mercury vapor, chlorine gas, amine vapors, or insecticides; therefore, Bureau of Mines approvals are not available for these units.



Something NEW...in Filter Clips

AO has designed four new auxiliary filter clips for securing a filter to a chemical cartridge. Molded from rubber, they will firmly hold anything from an unwoven textile filter to a Red Devil or paint spray filter. And these new clips snap-on quickly and easily, preventing any leakage.



R150 Clip for 8000 Series R151 style cartridge

R185 Clip for R3000, R4000, R5000, R6000, R9000 Series R141 or R51 cartridges



R186 Clip for R3000, R4000, R5000, R6000, R9000 Series R142 or R52 style plastic cartridges

R187 Clip for 8000 Series R152 style cartridge





Low Cost Bureau of Mines Approved Protection

The R9100 and R9100T respirators are the lightest weight, lowest priced Bureau of Mines approved respirators you can buy for protection against dusts. Large area filter offers low breathing resistance.

R9100 is approved by U.S.B.M. for protection against pneumoconiosis-producing and nuisance dusts. Protects workers in quarries, grain mills, cement plants, saw mills and textile plants.

R9100T is approved by U.S.B.M. for protection against toxic dusts not significantly more toxic than lead. Its dense fibrous filter offers protection to workers exposed to harmful metal dusts generated in operations such as grinding, deburring, and polishing metals.

ORDERING INFORMATION

Catalog Number

Hazards

R9100
Bureau of Mines
approval BM-2137

Pneumoconiosis-producing and nuisance dusts: such as borax, carbon, glass, grain, graphite, cement, limestone, gypsum, coke, charcoal, wood and flour.

R9100T
Bureau of Mines
approval BM-2144

All dusts not significantly more toxic than lead: such as lead, barium, iron, nickel and manganese.



Gives You Full Protection In 5 Seconds!

Here's the ideal device for emergency use against a variety of respiratory hazards. Whether you suspend it around the neck, or keep it in a belt pouch, the R9900 can be put on in just 5 seconds! Developed in conjunction with one of the country's largest chemical companies, the R9900 is compact, rugged and highly efficient. Contains a complete inhalation and exhalation valve system, offers low breathing resistance and long service life. Mouthpiece can be easily replaced.

The AO Pocket respirator is available with five replaceable filter cartridges listed below. It will also accommodate any of the 19 different cartridges designed for use with the R6000 series respirator.

R9000 SERIES ORDERING INFORMATION

Catalog Number	Cartridge or Filter	Hazards
R9921	R921	Dusts, mists and organic vapors.
R9922	R922	Dusts, mists and acid gases.
R9923	R923	Dusts, mists, organic vapors and acid gases including nuisance concentrations of chlorine and bromine.
R9924	R924	Dusts, mists and ammonia gas.
R9926	R926	Dusts, mists, acid gases and ammonia gas.

For Abnormal Temperatures

The R2039 Thermalair respirator is especially engineered to protect workers who operate in atmospheres of excessive heat (up to 300° F.). When worker inhales, heat is stored in R39 cartridge; as worker exhales, heat is removed from cartridge. Temperature of inhaled air is reduced to approximately body temperature (100° F.). The R2039 is lightweight, inexpensive, can be washed and sterilized. Will also warm extremely cold air (-60° F.) as efficiently as it cools warm air. Also available with additional R40 Filter to provide dust protection at same time. A complete line of aluminized clothing is available for use with the Thermalair respirator. Respirator can also be used to protect workers against low temperature air. In this application, heat from exhaled air is stored in cartridge and as worker inhales this heat is removed from cartridge to elevate temperature of inspired air.



Full Protection When Contaminants are Heavy

AO R2099 is a continuous flow air-supplied respirator designed for protection against exposures of dusts, mists, fumes, sprays, smokes, vapors and gases. Features an AO R2000 rubber face mask with smooth cantilevered-type edges for positive seal. Fits snugly, can be worn for long periods of time in comfort. Ideally suited for use with AO 75 Hood.

Air flow is regulated by adjustable valve clipped to belt or clothing. Valve locks in position, cannot be changed accidentally. Detachable hose coupling automatically shuts off air supply when disconnected. Operates at pressures of 9 to 25 psi, has 2 1/2 foot non-kinking flexible air tube, plus 12 1/2 foot rubber air hose. Air hose also available in lengths of 25 feet and 50 feet.



For Nuisance Dusts

For protection against low concentrations of non-toxic nuisance dusts. Smoothly rounded edges of rubber face mask fit snugly against face. Exhalation valve provides for expulsion of exhaled air and also drainage, with minimum breathing resistance. Positive-action inhalation valve.

Filter, composed of a web of synthetic fibers thermally bonded together, is lightweight, inexpensive and can be replaced in seconds. Elastic headband R2900A is same as R2900, but without inhalation valve.





One mask and one filter protects against nuisance dusts and non-toxic paint sprays for greater economy, comfort and worker acceptance.

This new lightweight mask is ideal for industry, schools, farms, gardens and homes. It protects against such hazards as dusts from grinding, sanding, planing, spinning, weaving, harvesting, soil, wood, grain, cement, limestone, coal and spray from non-toxic paint. It is also excellent for filtering pollens that cause hayfever.

The Paint-N-Dust Mask consists of only 3 simple parts — sculptured plastic facepiece, reusable foam filter and adjustable rubber headband. The filter can be easily washed and sterilized after use against dust and reused many times for greater economy. It is easy to install. The facepiece locks together at 3 points to assure a positive filter seal all the way around. The rubber headband is built in two sections to provide an easy, adjustable, snug fit for both men and women.

Every Paint-N-Dust Mask is individually boxed and each filter is wrapped in a glassine envelope, 25 to a package.

Note: The Paint-N-Dust Mask should not be used for protection against dangerous pneumococci-producing dusts (such as silica type dusts); toxic dusts (such as lead); toxic paints (such as lead base paints) or metal fumes or vapors. We recommend U.S. Bureau of Mines approved respirators for protection against these types of hazards.

Sanitary, comfortable, washable.

R-11 Face Cover

Fits face mask snugly. Keeps worker's face from contact with rubber. Absorbs perspiration and prolongs service life of respirator.



R-61 Face Cover

Can be washed and sanitized time and time again. Lets worker enjoy "personal" protection.

R-74 Face Cover

Elastic border provides tight grip over facemask edge. Slips on quickly and easily. Elastic loop secures unit to mask.

For use with:

**R2000
R2039
R2099
R2900
R9100
R9100T
Respirators**

For use with:

**R3000
R8000
R5000
Respirators**

For use with:

**R5000
R6000
Respirators**

With R2000 Series Respirators

Provides complete head, eye, neck, shoulder and respiratory protection for dust and spraying operations. Any R2000 Series respirator may be used in this hood. Available in white nylon, black or yellow neoprene rubber, flame-resistant duck, white or aluminized asbestos material. Lightweight, cool and comfortable. The drawstrings under arms assure snug fit. Elastic strap sewn into back of head adjusts to any head size. Reinforced in four places where headband fits through hood and where underarm straps are tied. Very broad plastic window, clear or aluminized. Unobstructed frontal vision. Window provides full facial protection for dust and spray particles.



With R6000 Series Respirators

Provides complete head, eye, neck, shoulder and respiratory protection for dusting and spraying operations. Any R6000 Series Respirator may be used in this hood.

Made of vinyl-coated blaze orange fabric for easy identification of workers. Lightweight, cool and comfortable. Two drawstrings under arms assure snug fit. The hood is stitched and reinforced where underarm straps are tied.

Broad plastic window provides unobstructed frontal vision and full facial protection.



With R3000 and R8000 Series Respirators

Announcing three new hoods ideal for use in hazardous atmospheres. They are very similar to the R75 hood listed above and designed to be used with any of the new R3000 and R8000 Series of respirators.

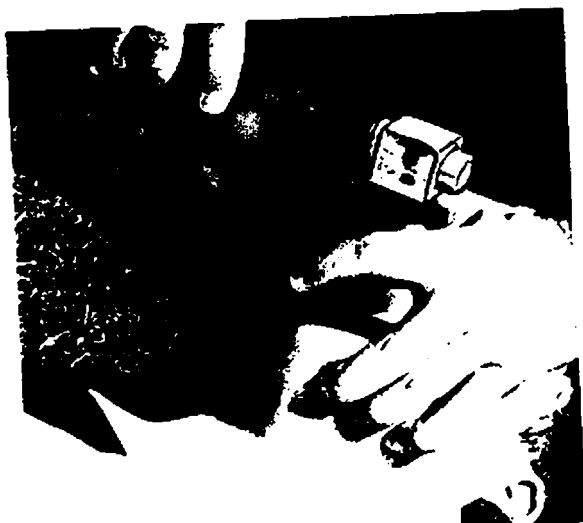
- R195 FP ... made of duck
- R195 M ... made of muslin
- R195 N ... made of nylon





Guard against skin disease and dermatitis by washing respirators, goggles, helmets and other safety equipment with AO 101 Germicidal Detergent.

AO 101 Detergent cleans and sanitizes in one operation, assures cleanliness whether you wash, swab, spray or immerse. Effective in hot or cold water. Though powerful and quick-acting, won't corrode, stain, or deteriorate rubber, plastic, glass or metal parts. No prewashing required. No after-rinse, either. Odorless and non-irritating when used as directed. Available in one gallon size (dilutes to 64 gallons) and 2-ounce bottle (which dilutes to one gallon).



When Every Second Counts, This

Could Save a Life

When spontaneous breathing stops, the AMBU resuscitator is ready to go to work instantly. Kit holds a foot-operated suction pump used to clear the air-way fast, and a resuscitator to give air and start breathing again. Entire kit weighs only 6^{3/4} lbs., can be taken anywhere, needs no electricity, can be operated by one person.

Simple foot-operated suction pump. Delivers enough suction to quickly clear mouth and throat of blood, mucous, vomitus or other liquid, without injuring tissue. Spare intake valve included. Entire unit corrosion-resistant, easily cleaned. Just immerse in soapy water, pump a few times, and rinse.

Sturdy, self-inflating bag, delivers adequate volume of air to the lungs when squeezed. Air flow starts at first squeeze. Unique, nonbreathing valve keeps fresh air flowing into lungs, exhausts expired air. Simple instruction permits use of oxygen when desired. Face mask assures universal fit to all facial contours.

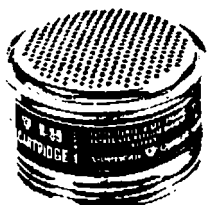
Complete unit - Catalog No. R-124
Resuscitator only - Catalog No. R-125



*The U.S. Bureau of Mines does not provide testing and approval schedules for respirators protecting against acid gases, combined organic and acid gases, ammonia gas, mercury vapor, chlorine gas, amine vapors, or insecticides; therefore, Bureau of Mines approvals are not available for these units.



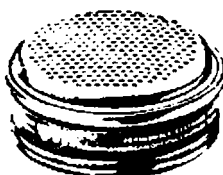
For low concentrations of dusts not significantly more toxic than lead, mists, and organic vapors simultaneously. Protects against organic dusts that emit organic vapors. Bureau of Mines approval 2305.



For elemental mercury vapors, plus dusts, mists, and fumes.



"Super Cartridge" for organic vapors and acid gases



For metal fumes, dusts not significantly more toxic than lead, pneumoconiosis-producing mists, and chromic acid mists. Bureau of Mines approval 218-63.
R166 For R9000 respirators. Bureau of Mines approval 218-84.



For sprays and vapors of enamels, lacquers, and lead-base paints. Also sprays of: (1) paints containing epoxy, acrylic, and silicone compounds, (2) rubber or latex-based paints that do not contain ammonia, (3) vitreous enamels and varnishes. Bureau of Mines approval 238-15.



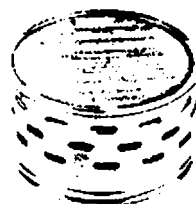
For all dusts and metal fumes not significantly more toxic than lead, pneumoconiosis-producing mists, chromic acid mist, low concentrations of organic vapors, useful for protection against finely divided airborne particulate, solid or liquid, that emit organic vapors. Bureau of Mines approval 238-11.



"Red Devil" Filter
Protects against all dusts not significantly more toxic than lead, pneumoconiosis-producing mists, and chromic acid mist. Bureau of Mines approval 21A-78.



For low concentrations of acid gases around plating and pickling tanks, storage battery production.



For non-volatile dusts, mists and fumes significantly more toxic than lead, including radioactive particulate. Bureau of Mines approval BM-218-98.



For dusts, mists, elemental mercury vapor, and chlorine gas. Especially useful for maintenance workers involved in cleaning chlorine-caustic electrolytic cells that employ mercury as the cathode.



For all combinations of dusts not significantly more toxic than lead, pneumoconiosis-producing mists, chromic acid mist, metal fumes, and acid gases. Especially useful for protection against small acid mist particles that emit acid gases.

When you have
respiratory problems,
let AO "clear the air."
American Optical...
an outstanding name
in respirators.

American Optical Safety Service Centers are located in:

EAST CAMDEN, N.J. 08105
P. O. Box 1353
Tel. 609-663-7230
Telex No. 845-351

ATLANTA, Ga. 30324
P. O. Box 13198
Station K
Tel. 404-873-1074
Telex No. 542-578

CLEVELAND, Ohio 44101
P. O. Box 6628
Tel. 216-241-3936
Telex No. 98-487

DETROIT, Mich. 48232
P. O. Box 781
Tel. 313-963-1150
Telex No. 23-5571

CHICAGO, Ill. 60666
P. O. Box 66357
Tel. 312-678-8880
Telex No. 25-207

ST. LOUIS, Mo. 63166
P. O. Box 74
Tel. 314-531-1155 Ext. 33

HOUSTON, Texas 77019
P. O. Box 13288
Tel. 713-526-1241
Telex No. 775-270

SAN FRANCISCO, Cal. 94119
P. O. Box 3349
Rincon Annex Sta.
Tel. 415-282-4985
Telex No. 34-462

GLENDALE, Calif. 91204
P. O. Box 6127
Tel. 213-246-2497

DENVER, Colo. 80207
5965 East 39th Ave.
Tel. 303-399-0302
Telex No. 45-652

PUTNAM, Conn. 06260
P. O. Box 392
Tel. 203-928-7721
Telex No. 927-780

**AMERICAN OPTICAL
CORPORATION**

SAFETY PRODUCTS DIVISION • SOUTHBRIDGE, MASS. 01550
ST.M. Registered by American Optical Corporation

Pertinent
Information
Concerning

Bureau
of
Mines
Approval
Schedule
21C

Schedule 21B, adopted January 19, 1965, is the latest approval schedule for filter type dust, mist and fume (particulate) respirators. It is an upgraded schedule, with broader scope and more stringent requirements than Schedule 21A.

BASIC DIFFERENCES ARE:

1. Schedule 21B includes approval classifications for highly toxic materials such as beryllium (Threshold Limit Value of 0.002 mg/m³) and radioactive materials (radionuclides).
2. Efficiency test concentrations specified under 21B are 25% to 300% higher, and the allowable leakage for silica dust has been cut in half.

Therefore, approval qualification under Schedule 21B generally requires filters with higher efficiency and dust loading characteristics.

A MORE DETAILED COMPARISON BETWEEN THE TWO SCHEDULES IS SET FORTH BELOW:

1. Respirators approved under Schedule 21A are limited to pneumoconiosis-producing and nuisance dusts and mists; chromic acid mist; and toxic dusts and metal fumes not significantly more toxic than lead. Schedule 21B has similar approval classifications, specifically related to the Threshold Limit Value (TLV) for materials having a TLV not less than 0.1 milligram per cubic meter (mg, m³) or 2.4 million particles per cubic foot (mppcf).

In addition, Schedule 21B has higher approval classifications for materials having a TLV less than 0.1 mg m⁻³, including beryllium and radionuclides, with separate approvals for exposure concentrations of 10, 100 and 1,000 times the TLV (Protection factors of 10, 100 and 1,000).

RESPIRATOR APPROVAL CLASSIFICATIONS UNDER EACH SCHEDULE ARE:

21B

1. Respirators for dusts having a TLV of not less than 0.1 mg m⁻³ or 2.4 mppcf.
2. Respirators for metal fumes having a TLV not less than 0.1 mg m⁻³.
3. Respirators for mists having a TLV not less than 0.1 mg m⁻³ or 2.4 mppcf.
4. Respirators for dusts, mists and fumes having a TLV less than 0.1 mg m⁻³ where the exposure concentration is no more than 10 times the TLV (Protection factor of 10)
5. Same as 4) except limited to exposure concentrations up to 100 times the TLV (Protection factor of 100)
6. Same as 4) except limited to exposure concentrations up to 1,000 times the TLV (Protection factor of 1,000)
7. Respirators for various combinations of above.
8. Respirators that are combinations of mechanical filter and other types.

21A

1. Respirators for mechanically generated dusts, including pneumoconiosis-producing dusts such as silica dust, and toxic dusts not significantly more toxic than lead.
 2. Respirators for fumes of various metals not significantly more toxic than lead.
 3. Respirators for mists of materials which do not produce harmful gases or vapors, such as silica mist and chromic acid mist.
 4. Respirators for various combinations of above.
2. The efficiency test concentration ranges specified under Schedule 21B are higher; and efficiency requirements for silica dust are greater, to coincide with the reduction in TLV for free silica from 5 mppcf to 2.4 mppcf:

21B**21A****Silica Dust (0.4-0.6 micron)**

Test Concentration	50-60 mg/m ³	40-60 mg/m ³
Max. Leakage — 3 respirators	4.5 mg	9.0 mg
Max. Leakage — 1 respirator	2.0 mg	4.0 mg

Lead Dust (0.4-0.6 micron)

Test Concentration	15-20 mg/m ³	10-20 mg/m ³
Max. Leakage per respirator	0.43 mg	0.43 mg

Lead Fume

Test Concentration	15-20 mg/m ³	10-20 mg/m ³
Max. Leakage per respirator	1.5 mg	1.5 mg

Silica Mist (325 Mesh SiO₂)

Test Concentration	20-25 mg/m ³	5-15 mg/m ³
Max. Leakage per respirator	2.5 mg	2.5 mg

Chromic Acid Mist

Test Concentration	15-20 mg/m ³	10-20 mg/m ³
Max. Leakage per respirator	1.0 mg	1.0 mg

In addition, Schedule 21B requires the use of 0.3 micron DOP (dioctyl phthalate) aerosols for evaluating respirators for materials having a TLV less than 0.1 mg. m⁻³.

MSA RESPIRATORS CURRENTLY APPROVED UNDER SCHEDULE 21B

Custom Comfo S Cat. No. Dusts, mists and fumes having a
(BM 21B-69) 10-86431 TLV not less than 0.1 mg. m⁻³ or
2.4 mppcf. (Class 1, 2, 3)

Custom Comfo H Cat. No. Dusts, mists and fumes having a
(BM 21B-90) 10-86432 TLV less than 0.1 mg. m⁻³ (Pro-
tection factor of 10). (Class 4)

Dustfoe 77 Cat. No. Dusts and mists having a TLV
(BM 21B-97) 10-96000 not less than 0.1 mg. m⁻³ or 2.4
mppcf. (Class 1, 3)



MINE SAFETY APPLIANCES COMPANY
201 NORTH BRADDOCK AVE., PITTSBURGH, PA 15208

Printed in U.S.A. 5710

MEETS A VARIETY OF INDUSTRIAL NEEDS.

Ideally suited for use in coal mines, metal and non-metal mining, construction and insulation industry, textile plants, foundries, detergent plants, grain mills, saw mills, cement plants, plus a wide range of other industrial applications.

DUST DEMON is approved for respiratory protection against dusts and mists having a Threshold Limit Value (TLV) not less than 0.1 milligram per cubic meter or 2.4 million particles per cubic foot.

DUST DEMON . . . use it all day, then throw it away!

ORDERING INFORMATION:

Dust Demon Catalog No. R1040

® T. M. Reg. by American Optical Corporation

*Use it
all day, then throw it away!*





INTRODUCING A NEW DIMENSION IN RESPIRATORY PROTECTION

Dust Demon

**The First Disposable
Dust-Mist Respirator
with U.S. Bureau of Mines
Approval (BM-21B-107)
Provides at least 8 hours of
protection for most jobs.**

**Now! New! From AMERICAN OPTICAL, a Bureau of
Mines Approved respirator that ends all maintenance.
Nothing to replace or repair.
DUST DEMON provides unmatched protection,
comfort and convenience.**

PROTECTION:

Approved by U.S. Bureau of Mines for both dusts and mists (BM-21B-107). Large filter area provides extremely low breathing resistance, minimizing wearer fatigue. Exhalation valve permits expulsion of warm, moist air. Special fibrous filter not affected by moisture.

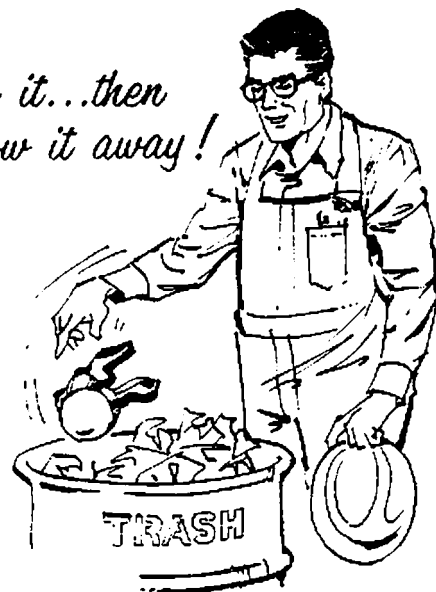
COMFORT:

Weighs less than 2 ounces. Malleable aluminum frame easily formed to contours of wearer's face. Double loop headband attached at 4 points maximizes fitting qualities. Soft foam gasket effectively seals respirator to face. Unique adjustable harness permits headband tension to be adjusted while respirator is being worn.

CONVENIENCE:

Use It All Day, Then Throw It Away!

*Use it...then
throw it away!*





AMERICAN OPTICAL CORPORATION

SAFETY PRODUCTS DIVISION • SOUTHERIDGE, MASS. 01550

RESPIRATORS

Cat. No.	Product Code	Description	1-5	6-11	12 or
			Ctn.	Ctn.	more
					Ctn.
R1040	50216	Disposable Dust-Mist Respirator (BM-218-107)			
		Carton of 24	\$39.60	\$36.00	\$32.40

Note: Sold in cartons of 24 only.

TERMS

Quotation F.O.B. Shipping Point

Cash Discount 2%, ten days—Net, thirty days

Prices subject to change without notice

Your Surest Protection . . . AO SURE-GUARD Products



AMERICAN OPTICAL CORPORATION

SAFETY PRODUCTS DIVISION
Southbridge, Massachusetts, U.S.A. 01550

NEW DIMENSION IN RESPIRATORY PROTECTION:

DISPOSABILITY!

Now there's a disposable dust-mist respirator with
Bureau of Mines approval!

It's called the DUST DEMON™ dust-mist respirator.
And only AMERICAN OPTICAL makes it.

The disposable DUST DEMON has wide application for
all types of industries. It's an exceptionally
comfortable respirator - lightweight and snug fitting.

Devilishly efficient, too! DUST DEMON lets workers
breathe effortlessly, even after many hours of steady
use on tough, dusty jobs.

And because it's disposable, DUST DEMON eliminates
the expense of cleaning and repair.

All the facts are on the accompanying sheet. Your
AO Safety Sales Representative will be pleased to
give you a DEMON-stration.

DUST DEMON. Use it all day, then throw it away.

AMERICAN OPTICAL COMPANY

SAFETY PRODUCTS DIVISION

Southbridge, Massachusetts, U.S.A. 01550

FOUNDED IN 1933

Date: 4-24-70

Inquiry No: phone

QUOTATION

TO: Johns Manville Corporation
Research Engineering Center
Attn: ~~Mr. Harry Carey~~
Manville, New Jersey 08805

We are pleased to quote price, delivery, F.O.B. point, terms and conditions on the following:

Item No.	Quantity	Description	Price
1	1500 each	R9100T Respirators Dust Type	\$ 2.20 ea.

PRICE BREAKDOWN IS AS FOLLOWS

<u>1-71</u>	<u>72-143</u>	<u>144 or more</u>
\$2.60	\$2.35	\$2.20

Delivery Schedule FROM STOCK

Terms: 2% ten net thirty

F.O.B.: Shipping Point

AMERICAN OPTICAL COMPANY

BY: A. C. Paines,

TITLE: Branch Manager

JB

M1500B

SAFETY PRODUCTS DIVISION



AMERICAN OPTICAL CORPORATION

SAFETY PRODUCTS DIVISION

Southbridge, Massachusetts, U.S.A. 01550

THE DEVIL YOU SAY . . .

An old phrase with an entirely new meaning for you! Because the devil we want to have our say about is the famous RED DEVIL™ filter featured in the attached 4-page brochure.

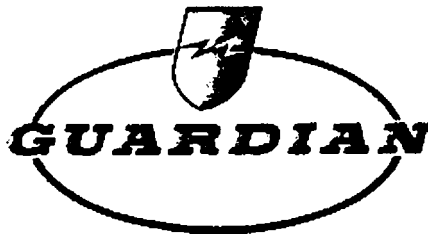
New RED DEVIL filters have the highest protection in the smallest area . . . have earned U.S. Bureau of Mines approval for dusts and mists, under schedule 21B with only 5.4 inches of filter material.

For example, in tests of critical areas of performance (dust penetration and inhalation resistance) conducted under conditions determined by U.S. Bureau of Mines Schedule 21B for silica dust testing, the R8100 Respirator with only 10 sq. inches of RED DEVIL filter area far outperformed our largest competitor's new unit with 14.5 sq. inches.

As a result, new RED DEVIL filters have been incorporated into 9 different respirators as well as in all eight units of the new R9700 series respirator. We have not changed our catalog numbers or prices on these new RED DEVIL filters.

The highest efficiency and the lowest breathing resistance ever can be yours in the new RED DEVIL filters. Your AO Safety Sales Representative will tell you all about them.

AMERICAN OPTICAL CORPORATION
Safety Products Division
(Enc.)



JUN 1 1971

GUARDIAN Safety Equipment Co.

DIVISION OF SAFETY, INC.

37 EAST 21ST STREET, LINDEN, N. J. 07037 • P.O. BOX 455 • PHONE N. J. (201) WA 5-0520 • N. Y. C. (212) BE 3-7695

May 27, 1971

Johns-Manville Corp.
22 East 40th St.
NYC, NY 10017
Attn: Mr. Clifford L. Scheckler

Dear Mr. Scheckler:

I direct please find the items you requested. We are looking forward
to the pleasure of being very possible to receive your complete satisfaction with the products
you have selected. We would appreciate hearing from you. The bottom of this form
contains a list of references. Thank you.

Edward G. Krusman, Sales

NOTE:

EDWARD G. KRUSMAN

503MFD



37 EAST 21ST STREET
LINDEN, N. J. 07036

N. J. (201) WA 5-0520
N. Y. (212) BE 3-7695



INTRODUCES THE

A NEW DIMENSION IN RESPIRATORY PROTECTION!

Use it all day, then throw it away! The utmost in convenience. Provides at least 8 hours of protection for most jobs. Ends all maintenance. Nothing to replace or repair. No cleaning required.

- Approved by U.S. Bureau of Mines for both dusts and mists having a Threshold Limit Value (TLV) not less than 0.1 milligram per cubic meter or 2.4 million particles per cubic foot.
- Special fibrous filter with large area provides both outstanding efficiency and low breathing resistance.
- Special design to minimize fatigue, maximize wearing comfort.
- Exhalation valve permits expulsion of warm, moist air.
- Lightweight — less than 2 ounces.
- Soft aluminum frame easily shaped to wearer's face.
- Double loop headband attached at 4 points maximizes fitting value.
- Soft foam gasket seals respirator to face.
- Headband tension adjustable while respirator is being worn.

Ideal for use in coal mines, metal and non-metal mining, foundries, textile plants, detergent plants, grain mills, saw mills, construction and insulation industry, and many other industrial applications.





THE SAFEST LINE TO FOLLOW IS SAFELINE

(NEW PRODUCT)

SAFELINE RESPIRATOR

Cat. No.	Description		1-3	4-11	12 or
			Ctn.	Ctn.	more
5340	Disposable Dust-Mist Respirator	Ctn. of 24 List	\$39.90	\$36.00	\$32.40

Note: Sold in cartons of 24 only.



37 EAST 21ST STREET
LINDEN, N. J. 07036

N. J. (201) WA 5-0520
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SAFELINE PRODUCTS, PUTNAM, CONNECTICUT