FILE NAME: Reynolds Metals (RM)

DATE: 1975 Oct 1

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DOCUMENT DESCRIPTION: Internal Inspection Results with Cover Memo for Sampling Program Procedures

INTRACOMPANY CORRESPONDENCE
R-9e (Rev. 1-68)

PLAINTIFF'S EXHIBIT RMC-69

FROM:	R. E. Benton - GOB
TO:	G. L. Suffredini - Sherwin
COPY:	M. Collavo, R. D. Bird, Dr. R. D. Gamble - Sherwin; Dr. J. M. MacMillan - EXO
DATE & SUBJECT:	October 1, 1975 — SHERWIN INDUSTRIAL HYGIENE SAMPLING PROGRAM

Dear Lou:

Enclosed please find the protocol for an Industrial Hygiene sampling program to be instituted at Sherwin at your request. Sampling information and analytical procedures are set forth so that your staff can carry out the program on an in-house basis. Details of the analytical techniques have already been sent to your Laboratory Director, Bob Bird.

As soon as the plant has acquired the necessary sampling equipment as specified in the sampling data sheets, either Mac Cole or I will be glad to come to Sherwin and assist in a training program. At that time, the logistics of the sampling program and the regime to be followed can be worked out.

Please note that Mr. Featherston has not been copied on this report since I felt it more appropriate for you to discuss your plans for such a program with him.

Sincerely,

Ronald E. Benton

Ronald E. Benton

REB:dlm
Enclosures

Substance:

Alumina dust (total) - nuisance dust

Standard:

8-hr. time weighted average: 15 mg/m^3

Excursion limit: 22.5 mg/m^3

Analytical Procedure:

Gravimetric

Initial and final weights are obtained on pre-conditioned 0.8 micron PVC membrane filters. Filters should be conditioned in an area where the weight change due to humidity will be kept at a minimum.

Sampling Procedure:

Samples are to be collected by personal sampling pump using a polystyrene cassette holder containing a pre-weighed 0.8 micron PVC filter (cassette face cap on and small plug removed). The filter cassette holder is attached to the rubber tubing by an adaptor. A flow rate of 2 liters per minute is to be used; it should be checked and adjusted, as needed, throughout the sampling period of 2 hours duration. Additional samples should also be collected in order to fully evaluate the eight hour time weighted average exposure for each job category. The sampling device is attached to the worker's collar for the purpose of collecting a breathing zone sample.

With each batch of samples, one filter should be submitted for analysis which has been subjected to exactly the same handling as the samples except that air has not been drawn through it. Label this as a blank.

Substance:

Alumina dust (respirable) - nuisance dust

Standard:

8-hr. time weighted average: 5 mg/m^3

Excursion limit: 10 mg/m^3

Analytical Procedure:

Gravimetric

Initial and final weights are obtained on pre-conditioned 0.8 micron PVC membrane filters. Filters should be conditioned in an area where the weight change due to humidity will be kept at a minimum.

Sampling Procedure:

Samples are to be collected by personal sampling pump using a polystyrene cassette holder containing a preweighed 0.8 micron PVC filter. The polystyrene cassette holder is inserted into a standard 10 mm nylon cyclone with a sampling rate of 1.7 liters per minute. Sampling rate (1.7 lpm) should be checked and adjusted throughout the sampling period. Samples should be collected for two hour periods. Additional samples should also be collected in order to fully evaluate the eight hour time weighted average exposure for each job category. The sampling device is attached to the worker's collar for the purpose of collecting a breathing zone sample.

With each batch of samples, one filter should be submitted for analysis which has been subjected to exactly the same handling as the samples except that air has not been drawn through it. Label this as a blank.

Substance:

Asbestos

Standard:

8-hr. time weighted average: 5 fibers per cc of air greater than 5 microns in length

Excursion limit: 10 fibers per cc

Analytical Procedure:

Samples should be sent to the Industrial Hygiene Department in Richmond.

Sampling Procedure:

Samples are collected using a personal sampling pump plus Millipore type AA membrane filters. (These filters will come pre-packaged in filter cassette holders from the company.) The cassette face cap is removed for open face sampling. A flow rate of 2 lpm is used; it should be checked and adjusted as needed throughout the sampling period. A minimum of six 15-minute samples should be collected in order to document an exposure to asbestos fibers. The sampling device is attached to the worker's collar for the purpose of collecting a breathing zone sample.

With each batch of samples, one filter should be submitted for analysis which has been subjected to exactly the same handling as the samples except that air has not been drawn through it. Label this as a blank.

Substance:

Bauxite dust (total) - nuisance dust

Standard:

8-hr. time weighted average: 15 mg/m^3

Excursion limit: 22.5 mg/m^3

Analytical Procedure:

Gravimetric

Initial and final weights are obtained on pre-conditioned 0.8 micron PVC membrane filters. Filters should be conditioned in an area where the weight change due to humidity will be kept at a minimum.

Sampling Procedure:

Samples are to be collected by personal sampling pump using a polystyrene cassette holder containing a preweighed 0.8 micron PVC filter (cassette face cap on and small plug removed). The filter cassette holder is attached to the rubber tubing by an adaptor. A flow rate of 2 liters per minute is to be used; it should be checked and adjusted, as needed, throughout the sampling period of 2 hours duration. Additional samples should be collected in order to fully evaluate the eight hour time weighted average exposure for each job category. The sampling device is attached to the worker's collar for the purpose of collecting a breathing zone sample.

With each batch of samples, one filter should be submitted for analysis which has been subjected to exactly the same handling as the samples except that air has not been drawn through it. Label this as a blank.

Substance:

Bauxite dust (respirable) - nuisance dust

Standard:

8-hr. time weighted average: 5 mg/m^3

Excursion limit: 10 mg/m^3

Analytical Procedure:

Gravimetric.

Initial and final weights are obtained on pre-conditioned 0.8 micron PVC membrane filters. Filters should be conditioned in an area where the weight change due to humidity will be kept at a minimum.

Sampling Procedure:

Samples are to be collected by personal sampling pump using a polystyrene cassette holder containing a preweighed 0.8 micron PVC filter. The polystyrene cassette holder is inserted into a standard 10 mm nylon cyclone with a sampling rate of 1.7 liters per minute. Sampling rate (1.7 lpm) should be checked and adjusted throughout the sampling period. Samples should be collected for four hour periods. Additional samples should also be collected in order to fully evaluate the eight hour time weighted average exposure for each job category. The sampling device is attached to the worker's collar for the purpose of collecting a breathing zone sample.

With each batch of samples, one filter should be submitted for analysis which has been subjected to exactly the same handling as the samples except that air has not been drawn through it. Label this as a blank.

Substance:

Caustic (sodium hydroxide)

Standard:

8-hr. time weighted average: 2 mg/m^3

Excursion limit: 4 mg/m^3

Analytical Procedure:

Atomic Absorption Spectroscopy

Detection limit: 0.02 µg/ml Na

Sampling Procedure:

Samples are to be collected by personal sampling pump using a polystyrene cassette holder containing a preweighed 0.45 micron Millipore membrane filter type HA (cassette face cap on, and small plug removed). The cassette filter holder is attached to the rubber tubing by a cassette adaptor. A flow rate of approximately 2 lpm is used; it should be checked and adjusted as needed throughout the sampling period. The sampling period should be of an 8 hour duration. This will allow the collection of enough caustic to be detected by the analytical technique. Additional samples should also be collected in order to fully evaluate the 8 hour time weighted average exposure for each job category. The sampling device is attached to the worker's collar for the purpose of collecting a breathing zone sample.

With each batch of samples, one filter should be submitted for analysis which has been subjected to exactly the same handling as the samples except that air has not been drawn through it. Label this as a blank.

Substance:

Crystalline silica (free silica)

Standard:

$$\text{Respirable dust} = \frac{10\ \text{mg/m}^3}{\%\ \text{quartz} + 2}$$

Excursion limit: variable

Analytical Procedure:

X-ray diffraction

Initial and final weights are obtained on preconditioned 0.8 micron PVC membrane filters. Filters should be conditioned in an area where the weight change due to fluctuations in the humidity will be kept at a minimum.

Sampling Procedure:

Samples are to be collected by personal sampling pump using a polystyrene cassette holder containing a pre-weighed 0.8 micron PVC filter. The polystyrene cassette holder is inserted into a standard 10 mm nylon cyclone with a sampling rate of 1.7 liters per minute. Sampling rate (1.7 lpm) should be checked and adjusted throughout the sampling period. Samples should be collected for four hour periods. Additional samples should also be collected in order to fully evaluate the eight hour time weighted average exposure for each job category. The sampling device is attached to the worker's collar for the purpose of collecting a breathing zone sample.

With each batch of samples, one filter should be submitted for analysis which has been subjected to exactly the same handling as the samples except that air has not been drawn through it. Label this as a blank.

Substance:

Hydrogen sulfide

Standard:

8-hr. time weighted average: 15 mg/m^3

Excursion limit: 22.5 mg/m^3

Analytical Procedure:

Absorption spectroscopy

Sampling Procedure:

Samples are to be collected by personal sampling pump using a midget impinger containing 10 ml of the absorbing solution and 5 ml of 95% ethanol (controls foaming for approximately two hours). The flow rate should be 1.5 lpm through the impinger with a sampling period of two hours. If this time interval does not collect enough H_2S for the analytical procedure, the sampling time may be extended as necessary. If a four hour sample does not collect enough H_2S to be measured, it may be assumed that the 8 hour time weighted average MESA standard will not be exceeded. Additional samples should also be collected in order to fully evaluate the 8 hour time weighted average exposure for each job category. The sampling device is attached to the worker's belt. An absorption tube with a plug of glass wool is loosely inserted between the exit arm of the impinger and the pump in order to protect the pump from splash-over or water condensation.

With each batch of samples, one impinger should be submitted for analysis which has been subjected to exactly the same handling as the samples except that air has not been drawn through it. Label this as a blank.

Substance:

Lime (calcium oxide)

Standard:

8-hr. time weighted average: 5 mg/m^3

Excursion limit: 10 mg/m^3

Analytical Technique:

Atomic Absorption Spectroscopy

Detection limit: 0.07 µg/ml Ca

Sampling Procedure:

Samples are to be collected by personal sampling pump using a polystyrene cassette holder containing a pre-weighed 0.45 micron Millipore membrane filter type HA (cassette face cap on, and small plug removed). The cassette filter holder is attached to the rubber tubing by a cassette adaptor. A flow rate of approximately 2 lpm is used; it should be checked and adjusted as needed throughout the sampling period. The sampling period should be of a four hour duration. This will allow the collection of enough lime to be detected by the analytical technique. Additional samples should also be collected in order to fully evaluate the 8 hour time weighted average exposure for each job category. The sampling device is attached to the worker's collar for the purpose of collecting a breathing zone sample.

With each batch of samples, one filter should be submitted for analysis which has been subjected to exactly the same handling as the samples except that air has not been drawn through it. Label this as a blank.

Substance:

Noise

Standard:

8-hr. time weighted average: 90 dBA

Excursion limit: none

Sampling Procedure:

Noise exposure determinations are to be made using DuPont audiodosimeters (these have already been acquired by the plant). Dosimeter measurements integrate noise exposure over the entire work shift. Consequently, the sampling duration should be of an entire eight-hour work shift. The microphone is attached to the collar of the worker just below the ear, and the dosimeter is placed in the shirt pocket or clipped to the belt. Exposure levels are determined by inserting the memory cell into the audiodosimeter readout and reading the level as a percentage of the permissible exposure.

Substance:

Solvents (e.g. varsol, xylene, thinners, etc.)

Standard:

Variable depending upon solvent of concern

Analytical Procedure:

Samples should be sent to the Industrial Hygiene Department in Richmond.

Sampling Procedure:

Samples are to be collected by a personal sampling pump using an activated charcoal filled glass tube. Immediately before sampling, the ends of the tube should be broken so as to provide an opening approximately one half of the internal diameter of the tube. The smaller section of charcoal is used as a back-up and should be positioned nearest the sampling pump. A flow rate of approximately 1 lpm is used; it should be checked and adjusted as needed throughout the sampling period. The sampling period should be of a 2 to 4 hour duration. Additional samples should also be collected in order to fully evaluate the eight hour time weighted average exposure for each job category. The sampling device is attached to the worker's collar in a vertical position for the purpose of collecting a breathing zone sample.

With each batch of samples, one charcoal tube should be submitted for analysis which has been subjected to exactly the same handling as the samples except that air has not been drawn through it. Label this as a blank.

WELDING FUMES

At the present time there is no specific MESA standard regarding welding fumes. However, such a standard has been incorporated into the 1974 Threshold Limit Value Book and will eventually be included as a MESA standard. As a result, welding samples should be taken and compared with proposed guidelines for total welding fumes. When considering welding operations, we also have to be aware of the various alloys and components used in welding applications. For example, at Sherwin you do a great deal of welding on stainless steel. Stainless steel usually contains a significant percentage of chromium (up to 30%) and nickel (up to 35%). These two components, of course, are covered in the MESA standards as specific substances. Consequently, samples should be collected in order to evaluate an employee's exposure to the various metals released during the welding procedure.

Substance:

Individual components of welding fumes (e.g., Fe, Cr, Ni, Zn, etc.)

Standard:

Depends upon component of concern

Analytical Procedure:

Atomic Absorption Spectroscopy

Detection limit: varies with metal of concern

Sampling Procedure:

Samples are to be collected by personal sampling pump using a polystyrene cassette holder containing a pre-weighed 0.45 micron Millipore membrane filter type HA (cassette face cap on and small plug removed). The cassette filter holder is attached to the rubber tubing by a cassette adaptor. A flow rate of approximately 2 lpm is used; it should be checked and adjusted as needed throughout the sampling period. The sampling period should be of a 2 to 4 hour duration. This will allow the collection of enough welding fumes to be detected by the analytical technique. Additional samples should also be collected

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Welding Fumes
Sampling Procedure continued:

in order to fully evaluate the 8 hour time weighted average exposure for each job category. The sampling device is attached to the worker's collar for the purpose of collecting a breathing zone sample.

With each batch of samples, one filter should be submitted for analysis which has been subjected to exactly the same handling as the samples except that air has not been drawn through it. Label this as a blank.

PUMP CALIBRATION PROCEDURE

The calibration setup for a personal sampling pump with a filter cassette (or charcoal tube) is shown in Figure XI-1. Before starting the calibration procedure, make sure that the sampling pump has been adequately charged. Once this has been done, assemble the sampling train as shown in Figure XI-1. Turn pump on and moisten the inside of the one liter buret by immersing the buret in the soap solution and draw bubbles up the inside of the buret until they are able to travel the entire length of the buret without bursting.

Adjust the pump flow meter until the flow meter ball is at a particular numerical setting (read at the middle of the ball). Start a soap bubble up the buret and measure the time it takes the bubble to move up the graduated portion of the one liter buret. Repeat the procedure at least twice, average the results, and calculate the flow rate by dividing the volume (one liter) by the time required for the soap bubble to traverse the distance.

This entire procedure should be repeated at several other ball settings for each type of sample to be collected (i.e., membrane filters, PVC filters, charcoal tubes, etc.).

The data for the calibration should include the volume measured, the serial number of the pump and/or pump number, date of calibration and the name of the person doing the calibration. This data should be kept in a loose leaf notebook binder. Re-calibration checks should be performed at six month intervals, and this data should replace the old calibration information.

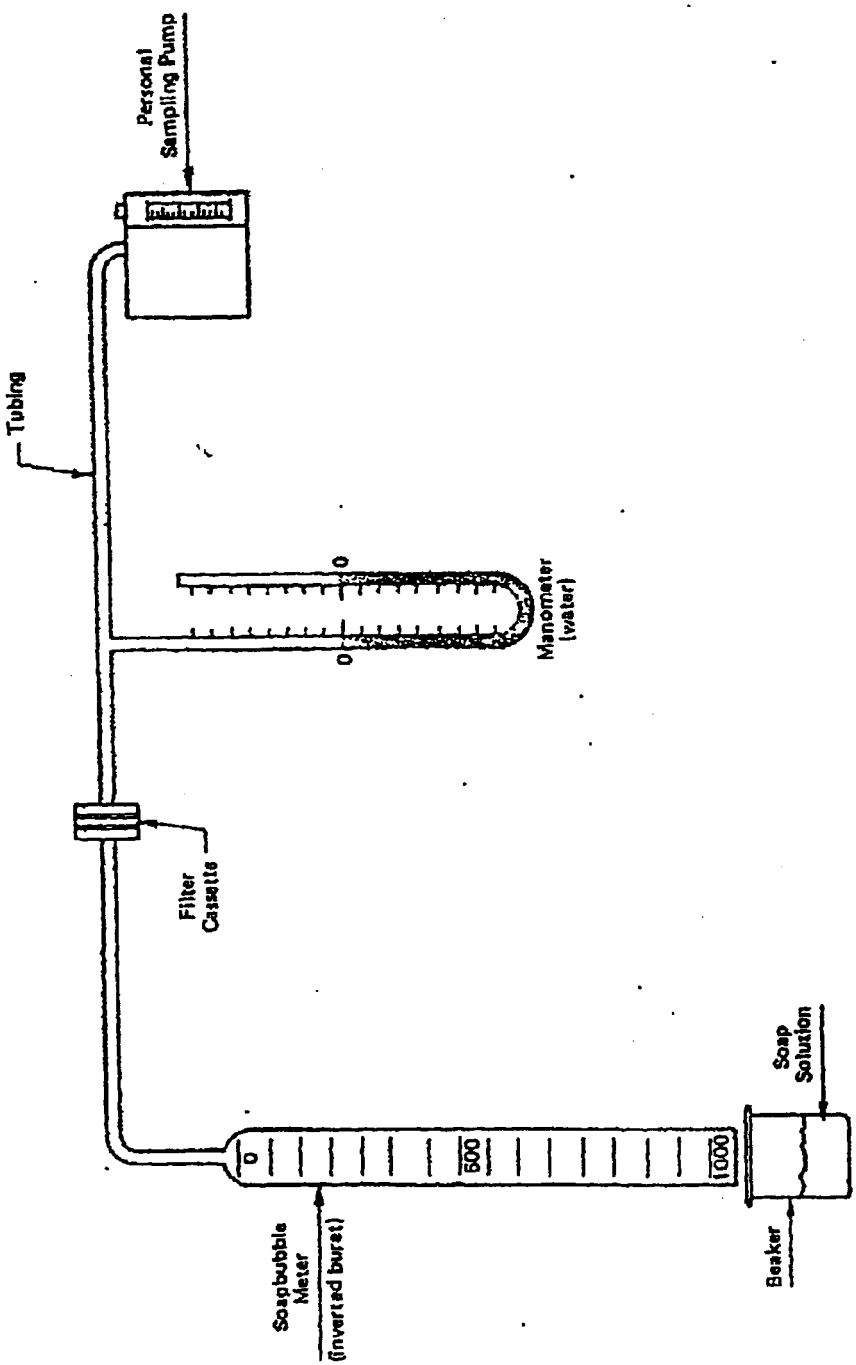


FIGURE XI - 1. CALIBRATION SETUP FOR PERSONAL SAMPLING PUMP WITH FILTER CASSETTE

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EQUIPMENT LIST

Recommend that you order the following equipment:

Millipore Corporation
Ashby Road
Bedford, Massachusetts 01730
Tel.: (617 275-9200

1 polystyrene cassettes, package of 100, catalog # M 0000 3700
5 filter cassette holder adaptor (aerosol adaptor), catalog # XX62 000 04
1 membrane filters, Type AA, 50/ctn., catalog # MAWP 037 AO
1 membrane filters, Type HA, 100/pkg., catalog # HAWP 037 00

National Environmental Instruments, Inc.
Occupational Health, Air Pollution & Safety Instrumentation
P. O. Box 590
Warwick, Rhode Island 02888
Tel.: (401) 738 3710

5 model 31 pump with counter, catalog # 2418875 0001
5 rechargeable Nicad battery pack - 4 cell, catalog # 2418592 0001
5 flow meter 1-4 liters, catalog # 2418811 0001
5 flow meter 25-200 cc, catalog # 2418756 0001
5 low flow valve assembly, catalog # 2418861 0001
5 hose, ten inches, catalog # 2417220 0001
5 rubber cap, catalog # 2418860 0117
2 comprehensive illustrated operation and service manual including exploded views and spare parts list, catalog # 1138183 1
5 BDX 99 respirable dust lapel sampler, catalog # 2418543 0001

Mine Safety Appliances Company
201 N. Braddock Avenue
Pittsburgh, Pennsylvania 15208

2 membrane filters, Type FWS-B (PVC), 50/pkg., part # 625413
4 cellulose bands, 60/jar, part # 625414

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