FILE NAME: Reynolds Metals (RM)

DATE: 1974 July 26

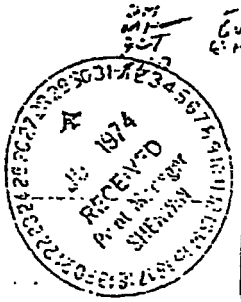
DOC#: RM012

DOCUMENT DESCRIPTION: Confidential Memo - Industrial Hygiene Survey Results

CONFIDENTIAL

H. M. Cole - GOB

G. L. Suffredini - Sherwin



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PLAINTIFF'S EXHIBIT RMC-28

July 26, 1974

INDUSTRIAL HYGIENE SURVEY
SHERWIN ALUMINA PLANT - MARCH 24-29, 1974

Attached is the belated Industrial Hygiene Survey of your plant. I apologize for this being late but I felt it appropriate that the plant institute certain changes prior to its issuance. Also, the questionable free silica problem which arose with regard to ambient air samples collected in bauxite transfer operations took longer to resolve than expected. I hope that you find this report useful and hope that I can be of further assistance to you at Sherwin. Also, I will send the information on purchasing the appropriate sampling equipment after you have an opportunity to review this report and can see the direction that I feel we should take.

Again, thank you very much for your cooperation and the consideration shown to me by the Sherwin Plant. Give my regards to all.

Yours truly,

H. M. Cole

HMC/mfj

ENCLOSURE

CONFIDENTIAL

TRACOMPANY CORRESPONDENCE

FROM:	H. M. Cole - GOB CONFIDENTIAL
TO:	G. L. Suffredini - Sherwin
COPY:	C. C. Craig, H. R. Bratt, M.D., Christine Cline, R.N. - Sherwin; R. H. Featherson, J. S. Kinzey, R. B. Newman, Drs. MacMillan & Irby, Ruth Carson, R.N., R. M. Kibby, J. A. Williams - EXO; B.J.Sasser, GOB
DATE & SUBJECT:	July 26, 1974 — INDUSTRIAL HYGIENE SURVEY SHERWIN ALUMINA PLANT - MARCH 24 - 29, 1974

At the request of plant management, an Industrial Hygiene Survey was made of the Sherwin Alumina Plant March 24 - 29, 1974. Following are the results of that survey:

ITEM 1 - Asbestos - Asbestos samples collected during the demolition of insulating material from several reactor vessels indicate non-compliance with present OSHA guidelines. See discussion.

ITEM 2 - Total Airborne Dust - Results of total airborne dust samples collected in the bauxite transfer tunnels and at alumina loading and unloading operations indicate non compliance with OSHA regulations. Although a good respiratory protection program is in effect in most areas much needs to be done with regard to the engineering aspects of the problem.

ITEM 3 - Solvent Vapors - Samples to determine solvent exposure collected in the electrical shop at the motor dip tank operation and while cleaning oil bulbs throughout the plant indicate compliance with OSHA guidelines in all areas tested.

ITEM 4 - Sodium Hydroxide - Samples to determine caustic exposure were collected in the hydrate filtration area (Fac. 46), at the SOP filters (Fac. 35), on top of the percipitators (Fac. 45) and in the recovery area (Fac. 230). Results indicate compliance in all areas tested.

ITEM 5 - Noise - Noise measurements were made in the power department (areas 110 and 111), on the Kiln Floor (calcining area) and while scaling reactor vessels. Results indicate that hearing protection is necessary and should be required in all scaling operations.

ITEM 6 - Materials Screening Program - In order that the Medical Department might better evaluate the hazard potential of many chemicals used in our plant locations, it has become necessary for us to implement a materials screening and evaluation program for new chemicals as they are introduced. In order that we might achieve this purpose, I will be in contact with the Purchasing Agent at your plant in hopes of setting up a procedure to obtain this information.

005193

DISCUSSION

ITEM 1

Samples were collected for airborne asbestos while removing asbestos insulation from several reactor vessels. Results appear in Table 1.

Samples collected while removing asbestos insulation from reactor vessels indicate non-compliance with the present OSHA guidelines. OSHA regulations require that you notify Mr. Enriquez in writing within five days after receiving this report that he was exposed to asbestos fibers in excess of permissible concentrations (10 fibers per cubic centimeter of air). It is also required that Mr. Enriquez be notified of the corrective action being taken to avoid future exposure Mr. Enriquez as well as other employees involved in the demolition of asbestos containing materials should also be provided with a comprehensive medical examination as stated by Section 19.93 a (j) of the Occupational Safety and Health Act. It should be noted that all corrective measures were instituted immediately by the plant and all workers involved have been provided with thorough medical examinations Also, employees involved in the removal of asbestos during this sampling were wearing MSA Dustfoe 66 Respirators which have Bureau of Mines approval (#21B-113) for protection against asbestos.

Thus, this respirator afforded the workers involved with adequate respiratory protection during the sampling and demolition period. However, OSHA regulations, having to do with the demolition of asbestos containing materials, constitute a work practice standard requiring that a continuous flow or pressure demand type "C" supplied air respirators and special clothing be provided for employee engaged in such operations. In general, it is felt that such operations are quite dusty and result in the liberation of asbestos dust in concentrations several times the permissible exposure limits. The plant has complied with these work practices and has instituted a comprehensive asbestos handling program. I might also add that all spraying of asbestos insulations has been discontinued and substitutes materials are presently being used and evaluated for performance.

In the future we need to improve on our handling procedures and be sure that they are put into practice. This requires an education program on the part of everyone, "supervisors as well as hourly workers". Further monitoring is also needed to determine the exposure parameters for individuals involved in other job classifications. The following job categories need to be sampled:

(1) Carpenters removing scaffolding after asbestos demolition.

Ref. 1
Pg. 3

Notification
?
5+ mos.
post
over-exp
measurement

Education
of
Supervisors
& hourly
workers

(2) Iron workers welding studs onto digestor vessels in preparation for new insulation.

(3) Employees or areas down wind from where asbestos insulation is being removed.

(4) Employees involved in the installation of preformed asbestos pipe covering.

(5) Monitoring should also be accomplished on any other job category where an exposure exists which I might have overlooked.

We need to monitor each of these operations at least yearly to better determine our position and to comply with OSHA guidelines. Also, yearly physicals would be in order for any other individual suspected of having asbestos exposures.

ITEM 2

Total airborne dust samples were collected throughout the plant. Results appear in Table 2.

Samples for total airborne dust were collected for each job category which involved either bauxite or alumina loading, unloading or transfer. Samples were collected by the personal sampling technique as set forth by NIOSH and OSHA in an attempt to better categorize employee exposure for each job classification. Personal monitors were worn by employees during their actual work. Samplers were worn for up to 4 hours in an attempt to gain a representative sample. Results are reported in Table 2 as actual exposures obtained during the sampling cycle and as time weighted average exposures extrapolated to eight hours.

Facilities 5 and 24 - Results of samples collected in the bauxite unloading and transfer operations indicate non-compliance with OSHA nuisance dust standards. I realize that you have an effective respiratory protection program and employees were wearing approved Bureau of Mines respirators during my visit, however, this method of control of a hazard is considered a temporary means of control.

In light of this fact, we need to develop documentation that we are looking into the feasibility of controlling this potential problem. If process changes or work schedules were altered at anytime in the past which relate to a lowering of dust exposures, this information should be extracted from past records and brought up to date. In addition, any proposed engineering changes that might bring about a similar reduction should also be documented. In general, exposures of this nature up to 12 times the Threshold Limit Value, would result in a serious category citation. The fact that

respirators are being worn would of course help, but the outcome would depend on the judgement of the Industrial Hygienist involved. Also, I spoke with your Assistant Laboratory Director and he indicated that the mean particle size of the airborne bauxite dust was something in the order of 1-2 micons. If this is in fact the case, the severity of the problem becomes much greater.

Also, I had two air samples of airborne bauxite dust run for free silica (crystalline) determinations. These samples were processed by two outside independent laboratories and results indicate a range of <0.4% - 5% free silica in total dust. I have discussed this possibility with several people within the company and the feeling is that anything above 1% free silica in Jamacian Bauxite would be considered quite high. As a result of these discussions I would tend to question the reliability of results of greater than 1-2% free silica. However, it should be pointed out that similar analysis from other independent labs might turn up comparable results. The analytical method for determining free silica is quite tedious and results are often scattered. To better determine our position in this matter, I suggest that the plant periodically collect air samples (by personal sampling method) and process them for free silica. After we establish that we do not in fact have a problem, we then have available the information to protect ourselves when such time comes.

Also, I think that the information collected here on our bauxite handling operation is typical of information that we might expect to collect at a later date. Therefore, we should concern ourselves with collecting only respirable dust samples in the future. This procedure will allow us to separate the respirable dust from the total dust exposure and hopefully, provide us with additional information that will allow us to better determine the extent of the problem (if at all).

Facility 90 - Results of samples collected in facility 90, involving the unloading of alumina from railroad cars and the subsequent transfer and loading of this material into barges and other vessels indicate non-compliance with OSHA guidelines. There is no standard at this point for Aluminum Oxide and it is therefore treated as a nuisance dust. However, more recent information implicates Al_2O_3 as having fibrogenic properties. A recent updating of Aluminum In The Environment and Human Health, University of Cincinnati, incorporates several references on this subject. In light of this material it would be appropriate for us to get our house in order prior to new standards being developed. In the future, we should sample this facility routinely using respirable sampling equipment to better determine the extent of the respiratory hazard associated with this operation.

Also, if there have been any process or administrative changes in this operation in the past or if engineering changes are planned that would reduce the above mentioned employee exposure, then such information should be made available and appropriate records kept.

Facility 51 - Alumina Loading. Statements regarding the health related aspects of the Alumina exposure problem also apply to this facility, however, additional comments should be made regarding this operation.

It is my feeling that exposure to aluminum oxide at this operation is overly excessive and should not be allowed from a health or safety point of view. I found it difficult to see, much less to walk on top of open hopper cars during my visit. I might add that such an exposure would probably represent a serious category citation (exposure 4-6 times OSHA standards can represent serious violations).

ITEM 3

Solvent Vapors - Results of solvent vapor samples collected in the electrical shop and while cleaning oil bulbs in the field appear in Table 3. All measurements indicate compliance with OSHA regulations and should not pose any health related problem.

ITEM 4

Sodium Hydroxide - Samples to determine caustic exposure were collected throughout the plant. Results appear in Tabel 4.

Personal samples were collected throughout the plant to determine sodium hydroxide exposure. Samples were collected on fiber glass filters wetted with deionized water and analyzed for both sodium hydroxide and sodium carbonate. Results of both analysis were combined and all results appear as sodium hydroxide. Results are somewhat lower than expected but in light of a lack of clinical manifestations of sodium hydroxide exposure the data appears in order.

ITEM 5

Noise - Noise measurements were taken in all areas of the plant suspected of a noise exposure problem. Results appear in Table 5.

Noise exposure determinations were made throughout the plant using DuPont Audio Dosimeters which integrate the workers exposure over the entire work shift. Results indicate compliance in all areas

tested except the scaling operations. It should be pointed out that scaler operators were wearing hearing protection during the sampling. However, it is difficult to determine the extent of exposure for this job category in that different tanks will require varying times to complete a job. Hearing protection should always be worn during this operation and employees should be followed very closely by our Medical Department to insure that employees hearing is being monitored. Your plant has done an excellent job taking care of noise related exposures in the past and I'm sure that that performance will continue.

ITEM 6

Materials Screening Program - The Medical Department is in the process of up-dating its records concerning the raw materials used at each of our plant locations. OSHA has been quite active in the past few years developing and setting standards for many of these materials. There have been occasions in the past where chemical substances have created considerable problem without prior opportunity by the Medical Department to evaluate the hazard potential. As a result, it has become necessary for us to re-evaluate many of the materials in use and implement a materials screening program for new chemicals as they are introduced. In order that we might accomplish this purpose, as well as eventually complying with OSHA, I would like your support in collecting this information.

For example, information that would be most helpful at your plant would have to do with the different kinds of protective coatings and their make up.

In order that we might accomplish this purpose, it is requested that each of your purchasing agents send out a copy of the enclosed letter with attached Material Safety Data Sheet in order that we might begin developing this list. Whenever possible the amount of material that is purchased for a given location should be noted.

In summary, I would like to thank you for your help and the consideration given to me during my trip to Corpus. If I can be of any further help or answer any questions, please don't hesitate to call on me. Thank you.

Homer M. Cole

Homer M. Cole

HMC/mfj
Enclosures

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TABLE 1

SHERWIN ALUMINA PLANT

ASBESTOS SAMPLING STUDY

FEBRUARY 19, 1974

	Sample No. and Description	Fibers/Milliliter of Air*
SH-1	W. Enriquez, Service Repairman (Knocking of asbestos from digester tank) (1:30 pm - 1:42 pm)	0.92
SH-2	L. Cadriel, Service Repairman (Service Repair), (1:30 pm - 1:42 pm)	3.18
SH-3	W. Enriquez, Service Repairman (Clean up of asbestos), (1:45 pm - 1:59 pm)	10.25
SH-4	L. Cadriel, Service Repairman (Clean up of asbestos), (1:45 pm - 1:59 pm)	2.73
SH-5	W. Enriquez, Service Repairman (Clean up) (2:00 pm - 2:20 pm)	16.73
SH-6	L. Cadriel, (Clean up) (2:00 pm - 2:20 pm)	5.65
SH-7	W. Enriquez, Service Repairman (Clean up) (2:40 pm - 2:50 pm)	3.31
SH-8	L. Cadriel, (Clean up) (2:40 pm - 2:50 pm)	1.50
SH-9	BLANK	

* OSHA standard for asbestos fiber - 5 fibers/milliliter of air sampled eight-hour time-weighted average or 10 fibers/milliliter ceiling value.

TABLE 2

SHERWIN ALUMINA PLANT

TOTAL AIRBORNE DUST SAMPLING STUDY

MARCH 25-29, 1974

Sample Number and Description	Total Dust Concentration (mg/m^3)*
Facility 24 - Bauxite Transfer	
4 - C. Gonzalez, laborer, shovelling bauxite, (9:00 am - 12:00 am) 3-26-74	62.58
20 - C. Gonzalez, trainee, bauxite transfer tunnels, (8:30 am - 10:10 am) 3-27-74	21.80
14 - C. Gonzalez, trainee, bauxite transfer tunnels, (12:30 am - 3:55 pm) 3-26-74	71.02
5 - Y. Ramirez, trainee, shovelling bauxite (Jam.), (8:55 am - 12:00 am) 3-26-74	16.27
15 - Y. Ramirez, trainee, bauxite transfer tunnel & tripper, (12:30 am - 3:45 pm), 3-26-74	13.02
8 - R. Vasquez, bauxite transfer man, (9:05 am - 11:05 am), 3-26-74	15.75
13 - R. Vasquez, bauxite transfer man, (11:45 am - 3:45 pm), 3-26-74	18.91
21 - C. Rodriquez, (RMW) bauxite transfer tunnels, (8:30 am - 12:00 am) 3-27-74	4.56
28 - C. Rodriquez, (RMW), bauxite transfer tunnels, (12:30 am - 3:30 pm) 3-26-74	23.28
26 - A. Benauides, (BTM), bauxite transfer tunnels, (12:30 am - 3:45 pm), 3-26-74	113.29

Sample Number and Description	Total Dust Concentration (mg/m^3*)
Facility 24 - Bauxite Transfer (continued)	
22 - A. V. Benauides, slurry control helper, (8:45 am - 11:55 am) 3-27-74	158.10
7 - J. Adams, slurry control man, (9:08 am - 12:00 am), 3-26-74	6.16
23 - N. Shaw, slurry control man, (9:00 am - 12:00 am), 3-27-74	5.74
27 - N. Shaw, slurry control man, (12:30 am - 3:45 pm), 3-27-74	4.56
Facility 5 - Bauxite Unloading	
33 - R. Martinez (RMM), Raw materials man (8:00 am - 12:30 am), 4-10-74	18.18
34 - A. B. Swanner, (UEM), Unloading equipment man, (8:00 am - 12:00 am), 4-10-74	3.04
35 - A. B. Swanner (UEM), Unloading equipment man, (12:02 a.m. - 3:45 pm) 4-10-74	10.56
Facility 90 - Alumina Loading and Unloading	
1 - F. Atkinson (scaler), cleaning tunnels, (8:00 am - 12:00 am), 3-26-74	contaminated
2 - C. Knox, (UEM), cleaning tunnels (8:00 am - 12:30 am), 3-26-74	395.42
3 - W. Reathy, (UEM), cleaning tunnels, (8:00 am - 12:00 am), 3-26-74	683.20
6 - W. Shelley (UEM), Unloading cars, (8:20 am - 12:20 am), 3-26-74	218.50

Sample Number and Description	Total Dust Concentration (mg/m^3*)
Facility 90 - Alumina Loading and Unloading	
17 - W. Reathy, (UEM), cleaning tunnels, (12:30 am - 3:15 pm), 3-26-74	59.51
9 - F. Atkinson, (Scaler), cleaning tunnels, (12:30 am - 3:15 pm) 3-26-74	26.06
12 - W. Shelley, (UEM), unloading cars, (1:30 pm - 3:15 pm), 3-26-74	9.17
11 - C. Knox.(UEM), cleaning tunnels, (1:30 pm - 3:15 pm), 3-26-74	662.9
Facility 51 - Alumina Loading	
18 - P. Primm, weight master and car loader (8:00 am - 12:00 am), 3-27-74	107.57
19 - P. Trevino, car loader, (8:00 am - 12:00 am), 3-27-74	58.33
24 - P. Primm, weight master and car loader (12:30 am - 3:30 pm), 3-27-74	373.94
29 - P. Trevino, car loader, (12:30 am - 3:30 pm), 3-27-74	308.38

* OSHA standard for nuisance dust is 15 mg/m^3 - eight-hour time weighted average.

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TABLE 3

SHERWIN ALUMINA PLANT

SOLVENT VAPOR SAMPLING STUDY

MARCH 26 - 29, 1974

Sample Number and Description	Xylene (PPM)*	Varsol (PPM)**	Exposure Index***
76 - G. Colmenro, Electrician dipping electric motor in varnish dip tank, (8:50 am - 8:55 am)	11.05		0.11
79 - A. Groins, Oiler (area 33), cleaning oil bulbs in 5 gallon can of varsol, (8:15 am - 8:28 am)		9.38	0.031
61 - A. Groins, Oiler (area 33), cleaning oil bulbs on bearing pumps, (8:28 am - 9:30 am)		4.39	0.015

* OSHA standard for xylene is 100 ppm - eight-hour time weighted average.

** Safety factor for varsol is 300 ppm.

*** When exposure index equals 1 or more standards have been exceeded.

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TABLE 4

SHERWIN ALUMINA PLANT

SODIUM HYDROXIDE SAMPLING STUDY

MARCH 26-29, 1974

	Sample Number and Description	Sodium Hydroxide Concentration mg/m^3*
	Facility 46 - Hydrate Filtration	
C1	Area sample, Hydrate Filtration Area, #2 and #4 filters, 3-27-74 (10:02 am - 10:28 am)	N.D.**
C2	W. Allison, Hydrate Filtration Operator (10:00 am - 10:27 am), 3-27-74	N.D.
	Facility 35	
C3	E. Jones, Filtration Man Helper (FMH), (10:50 am - 11:15 am), 3-27-74	N.D.
C4	H. Sneed, Filtration Operator (SOP filters), (10:50 am - 11:24 am), 3-27-74	N.D.
C5	H. Sneed, Filtration Operator (11:24 am - 12:00 am), 3-27-74	N.D.
C6	E. Jones, (FMH), (11:18 am - 11:45 am), 3-27-74	N.D.
	Facility 45 - Percipitators	
C9	R. Gutierrez, TPMH, (3:00 pm - 3:33 pm), 3-28-74	N.D.
C10	D. C. Powell, TPMH, (3:03 pm - 3:36 pm), 3-28-74	N.D.
C11	H. Bundock, TPMH, (3:05 pm - 3:34 pm), 3-28-74	N.D.
C12	W. Minchu, TPMH, (3:05 pm - 3:35 pm), 3-28-74	N.D.
C13	W. Neville, TPM , (3:08 pm - 3:34 pm), 3-28-74	N.D.

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Sample Number and Description	Sodium Hydroxide Concentration mg/m^3*
Facility 230 - Recovery	
C7 R. Trevino, Recovery Operator Helper, (9:04 am - 10:00 am), 3-28-74	N.D.
C8 W. B. Gerald, Recovery Operator (9:04 am - 9:50 am), 3-28-74	N.D.

* OSHA standard for sodium hydroxide is 2 mg/m^3 eight-hour time weighted average.

** Non-Detectable.

TABLE 5

SHERWIN ALUMINA PLANT

NOISE SURVEY USING AUDIO DOSIMETERS

MARCH 25 - 29, 1974

DATE	CELL NO.	DEPT.	NAME	JOB DESCRIPTION	BADGE NO.	SHIFT	EXPOSURE PERIOD START	STOP	HRS.	OVER 115 DBA YES	NO	READ-OUT % EXPOSU
·25-74	32	Power	B. E. Parker	111 Area	1329		1600	2400	8		X	86
·25-74	02	Power	K. Wells	110 Area	1136		1600	2400	8		X	58
·26-74	72	Power	Al Francis	111 Area	1287		2400	0800	8		X	60
·26-74	27	Power	J. P. Foster	110 Area	1030		2400	0800	8		X	49
·26-74	70	Power	L. E. Yates	110 Area	1990		0800	1600	8		X	60
·26-74	8	Power	K. M. Phagan	111 Area	1233		0800	1600	8		X	88
·26-74	12	Power	B. E. Parker	110 Area	1329		1600	2400	8		X	55
·26-74	83	Power	R. L. Wilson	111 Area	1436		1600	2400	8		X	74
·27-74	9	Power	Al Francis	110 Area	1287		2400	0800	8		X	50
·27-74	9	Power	R. L. Wilson	110 Area	1436	D	1600	2330	7½	X		63
·27-74	02	Power	B. E. Parker	111 Area	1329	D	1600	2330	7½		X	79
·28-74	32	Power	O. D. Terrell	110 Area	1295	B	2400	0730	7½	X		37
·28-74	72	Power	Al Francis	111 Area	1287	B	2400	0730	7½		X	67
·28-74	12	Power	L. E. Yates	110 Area	1990	C	0800	1530	7½		X	60
·28-74	83	Power	K. M. Phagan	111 Area	1233	C	0800	1530	7½	X		77

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005206

TABLE 5

SHERWIN ALUMINA PLANT

NOISE SURVEY USING AUDIO DOSIMETERS

MARCH 25 - 29, 1974

DATE	CELL NO.	DEPT.	NAME	JOB DESCRIPTION	BADGE NO.	SHIFT	EXPOSURE BERIOD START	STOP	HRS.	OVER 115 DBA YES	NO	READ-OUT % EXPOSUR
28-74	70	Power	Ray Richards	110 Area	1578	A	1600	2400	7½		X	74
28-74	8	Power	J. A. Dolan	111 Area	1330	A	1600	2400	7½	X		70
29-74	27	Power	Al Francis	110 Area	1287	B	000	0730	7½		X	67
26-74	85	Scaler	D. Gonzalez	Scaler	2019		0800	1600	8	X		44
26-74	86	Scaler	A. Galindo	Scaler	2208		0800	1600	8		X	48
26-74	5	Scaler	C. Hille	Scaler	2379		1600	2400	8		X	13
26-74	24	Scaler	A. Rocha	Scaler	1808		1600	2400	8		X	13
27-74	92	Scaler	D. Gonzalez	Scaler	2019		0800	1600	8	X		225
27-74	04	Scaler	R. Lopez	Scaler	2219		0800	1600	8	X		144
27-74	03	Scaler	R. Narnaez	Scaler	2210		1600	2400	8	X		492
27-74	77	Oper.	C. Williams	Calc. Helper Burner (Kiln Floor)	1777		0800	1600	8	X		54
27-74	78	Oper.	H. Milligan	Calc. Helper Burner (Kiln Floor)			1600	2400	8	X		43

Values greater than 100 percent indicate non-compliant with OSHA noise standards.

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Gentlemen:

In view of the recent enactment of the Occupational Safety and Health Act, we find it necessary to catalog in detail all materials which could possibly be construed as having any constituents harmful to personnel. It is not enough to merely certify that such materials are safe, or affix a label to the container warning of toxicity or other ill effect; we must now be in a position of knowing exactly what the constituents are and in what proportions.

We are now purchasing, or will possibly purchase the following materials classified as being subject to inquiry:

Your cooperation with us in preparing this information will be appreciated.

Very truly yours,

REYNOLDS METALS COMPANY

Purchasing Agent

005208

U.S. DEPARTMENT OF LABOR — OMB No. 44-R1367

Occupational Safety and Health Administration

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
ADDRESS (Number, Street, City, State, and ZIP Code)	
CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS
CHEMICAL FAMILY	FORMULA

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)		SPECIFIC GRAVITY (H_2O=1)	
VAPOR PRESSURE (mm Hg.)		PERCENT, VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR=1)		EVAPORATION RATE (_____ =1)	
SOLUBILITY IN WATER			
APPEARANCE AND ODOR			

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
EXTINGUISHING MEDIA			
SPECIAL FIRE FIGHTING PROCEDURES			
UNUSUAL FIRE AND EXPLOSION HAZARDS			

(Continued on reverse side)

Form OSHA-20
Rev. May 72

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005209

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
ADDRESS (Number, Street, City, State, and ZIP Code)	
CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS
CHEMICAL FAMILY	FORMULA

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)		SPECIFIC GRAVITY (H_2O=1)	
VAPOR PRESSURE (mm Hg.)		PERCENT, VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR=1)		EVAPORATION RATE (_____ =1)	
SOLUBILITY IN WATER			
APPEARANCE AND ODOR			

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
EXTINGUISHING MEDIA			
SPECIAL FIRE FIGHTING PROCEDURES			
UNUSUAL FIRE AND EXPLOSION HAZARDS			

(Continued on reverse side)

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SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

EFFECTS OF OVEREXPOSURE

EMERGENCY AND FIRST AID PROCEDURES

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE		

INCOMPATABILITY *(Materials to avoid)*

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR		

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*

VENTILATION	LOCAL EXHAUST	SPECIAL
	MECHANICAL *(General)*	OTHER

PROTECTIVE GLOVES	EYE PROTECTION

OTHER PROTECTIVE EQUIPMENT

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

OTHER PRECAUTIONS

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