



DOCUMENT REFERENCE NUMBER
015/AMINO

Noise and Vibration Analysis

The company does not use large reciprocating or rotating machinery on site, but is more based on pipelines, pumps and reactor vessels. The materials flow is through pipelines and not conveyor belts or process lines. The largest piece of rotating machinery in the factory are the chillers used for process cooling. In view of this, vibration and noise levels are deemed to be quite low when compared to other industries.

Amino Chemicals still feels that a proper noise analysis of the factory should be carried out, which may then lead to a vibration analysis if the need arises. The company has commissioned an independent third party to carry out such an investigation and the report should be received within the next four months. A copy of the report will be forwarded to the authorities upon its receipt.

INSPECTION REPORT		Doc. No. NB/AM/01/03
Survey Carried Out: Factory Premises		
Sound Pressure Levels		
Plant Description: The Factory Floor and Elevated Areas		
Model:	Not Applicable	Client: Amino Chemicals Ltd The Managing Director
Type:	Not Applicable	
Installation Date:	Not Applicable	
Comments: Sound Pressure Levels were monitored throughout the factory and the results produced are included in this report. The factory grid was developed and the readings correspond to various positions in the factory.		
Recommendations The highest sound levels correspond to position 39-U, an area occupied by the chiller compressors. The readings were taken whilst two units were in operation. This area is not manned continuously since the machinery operates automatically and it is not a production area of the factory. The average sound pressure level is 69.9 dBA.		
Signed:  Ing. N. Bellizzi B. Mech. Eng., M.Sc., Eur. Ing.		Date: 23rd December, 2003
<div style="text-align: center;"> NBEng. Services Ltd. 27, Madonnina, Triq in- Nahla, Zabbar, Malta ZBR 08 Tel./ Fax : 0 (356) 21 692647 </div> <div style="text-align: right;">  </div>		

AMINO CHEMICALS

SOUND PRESSURE LEVEL SURVEY - DEC 2003

Survey Conducted by NBEngineering Services Ltd.
 Surveyor: Ing. Nicholas Bellizzi
 Date: 17th December, 2003

Grid Position	Sound Pressure Value (dBA)	Grid Position	Sound Pressure Value (dBA)
3-G	48	38-H	80.3
6-G	46.5	40-H	73
6-I	63	43-E	68.5
6-J	52	43-I	69
6-K	54	43-L	67.3
6-L	62	43-Q	66.5
6-M	60.5		
6-R	54	39-M	69.4
6-S	57	39-O	76.2
5-R	51	39-P	73.8
		39-R	73.2
8-C	58.4	37-M	75
11-C	59.7	37-O	69
14-C	62.8	37-P	68.3
18-C	61.5	37-R	67.2
25-C	60.8	39-S	92.7
35-C	62.7	39-U	93
38-C	61	37-S	81.4
40-C	65.9	37-U	87
8-H	60	41-M	96
11-H	64.3		
14-H	66.4		
18-H	78.3		
25-H	80.7		
35-H	81		
15-O	85		
19-O	85.8		
23-O	74.5		
15-T	78.7		
19-T	82.3		
23-T	66		
13-O	83		
13-T	68		

Elevated Production Level

23-V	73
21-V	72.6
19-V	78
17-V	71.2
15-V	73.9
13-V	75.6
11-V	66

External Area at Rear of Factory

41-M	69
41-O	67.5
41-Q	68.6
41-S	75.9
41-U	75.1

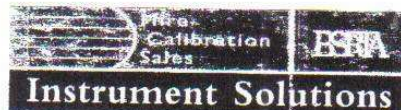


Certificate of Calibration

This is to certify that the instrument detailed below has been calibrated using standards which are periodically verified and are traceable to National Standards where these exist.

Customer : NB Engineering
Customer Identifier : N/A
Manufacturers Name : Testo
Type : 816 Sound Level Meter
Manufacturers Serial Number : 27800803
BSRIA Identifier : 30718
Previous BSRIA Identifier : N/A
Calibration Date : 17 November 2003
Recommended Next Calibration Date : 15 November 2004
Certificate Number : 30718
Laboratory Conditions : Temperature $23 \pm 4^{\circ}\text{C}$
: Humidity $40 \pm 15\% \text{ RH}$

Approved Signature



BSRIA Instrument Solutions
Old Bracknell Lane West, Bracknell, Berkshire RG12 7AH UK
Tel: +44 (0) 1344 459314 Fax: +44 (0) 1344 714868

BSRIA CALIBRATION SHEET

Manufacturers Name & Model

Serial No.

BSRIA Identifier

Previous New

TESTO 816 SOUND LEVEL METER

27800803

N/A

30718

1) Ref Standard Used

Accuracy

ZZ/CAL/01

±0.5dB.

Unless otherwise stated, all calibrations were performed at 1 kHz dB(Lin).

Customer Identifier

N/A

2) Ref Standard Used

Accuracy

N/A

N/A



CALIBRATION RESULTS

FUNCTION	TRUE dB	INDICATED dB	CORRECTION dB
Calibration, 70 - 105dB range, 1 kHz.	94.00	93.70	0.30
	104.00	103.70	0.30
Calibration, 90 - 130dB range, 1 kHz.	94.00	93.70	0.30
	104.00	103.80	0.20
	114.00	113.80	0.20

Comments :-

Results as found.

Date 17 Nov 2003

Engineer

D.M. Tovey

All Calibrations are Traceable to National Standards where these exist.

Calshell Doc 1. Issue 1. 13 August 1997.

DOCUMENT REFERENCE NUMBER
016 /AMINO

Emission Monitoring Strategy.

The gaseous emissions resulting from the industrial processes are neutralized at the scrubbing towers. The scrubbing system is completely automatic and the gaseous emissions are completely neutralized before discharge.

The company has portable testing equipment which it uses on the scrubbers to verify the efficiency of the units. It is envisaged that the gaseous testing procedure be carried out once every 2 months by in-house technicians. Appendix 016/Amino/1 gives the typical result format for scrubber sampling, whilst 016/Amino/2 gives the test procedure for such an analysis.

The liquid effluent used in the scrubbers results in high concentration material which is also sent to the same EU processing plant as the rest of the wastes. Hence there is no pure discharge to be considered.

Regarding the gaseous emissions from the boiler due to combustion of fossil fuels, these have been quantified and a third party inspection service is used once yearly to check each boiler/ burner setting. The inspection analyses and reports the following:

- CO, CO₂, NO_x, Sox, excess air, fuel gas temp., boiler efficiency (net and gross).

We envisage that this inspection and monitoring service for boiler flue gas emissions be carried out twice yearly. Appendices 016/Amino/3 and 016/Amino/4 give the typical format of the inspection.

RESULTS OF THF IN SAMPLES

These samples were taken from Scrubber Tower AB 203

LIMITS

200ppm = 590mg/m³ = 1180gr/hr

NIOSH / OSHA / ACGIH

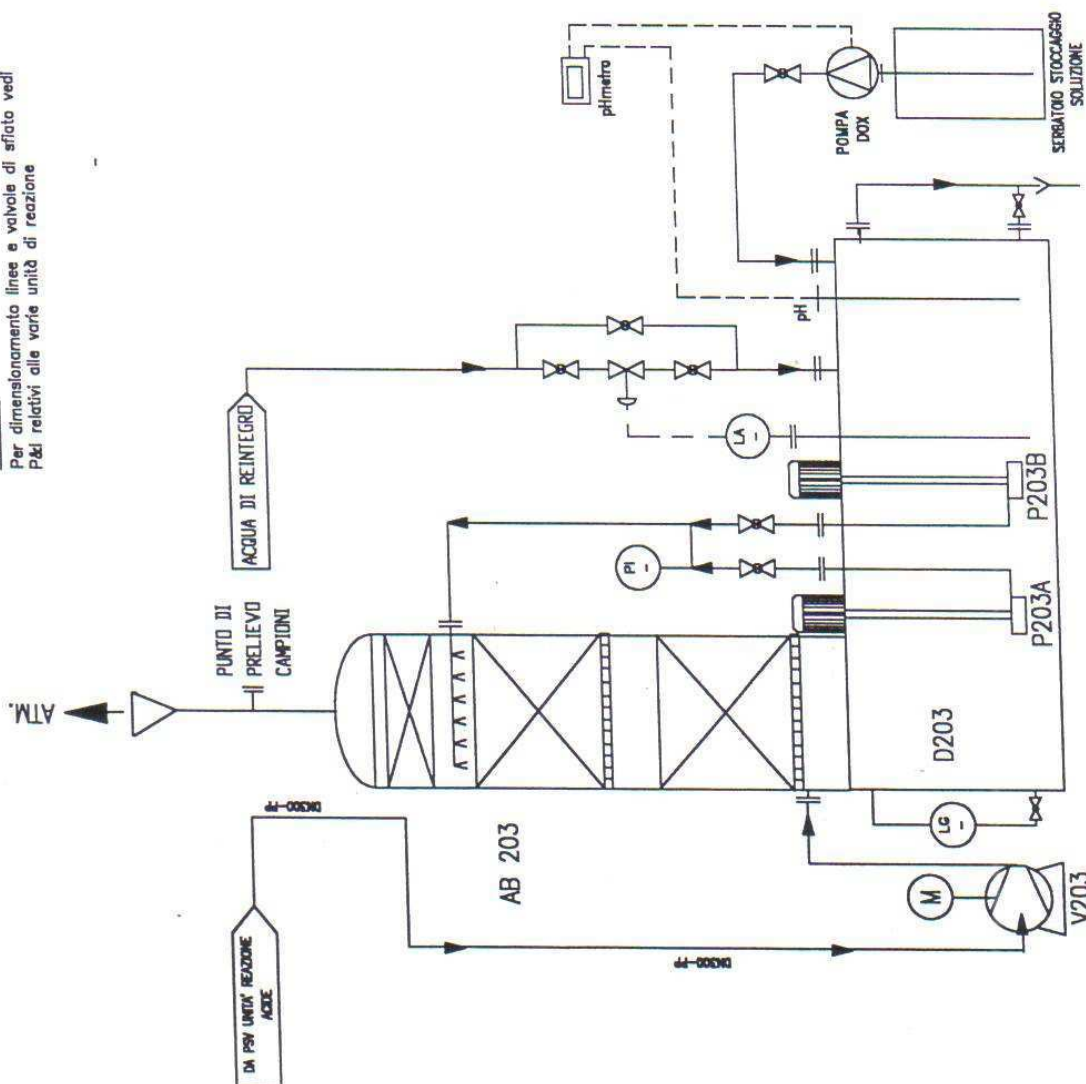
Flow of exhaust from chimney in Norm m³/hr = 2000m³/hr

	Norm. mg/5Lt	Norm. mg/m ³	ppm	Norm. ^{gr} m ³ /hr
Blank 1	0.48 mg/5Lt	96 mg/m ³	33 ppm	192 gr/hr
Blank 2	0.43 mg/5Lt	86 mg/m ³	29 ppm	172 gr/hr
Sample 1	1.17mg/5Lt	230 mg/m ³	78 ppm	460 gr/hr
Sample 2	1.23mg/5Lt	250 mg/m ³	85 ppm	500 gr/hr

No THF was detected in the back part of all the vials


Appendix 016/Amino/1

note.
per dimensionamento linee e valvole di sfiato vedi
p. 61 relativi alle varie unità di reazione



ELENCO APPARECCHIATURE

SIGLA	PP* INIZIATA	CONCENTRAZIONE MAG. COST.	OPACITA' (%)	SPESSE (mm.)	SPESSE INIZIATA	PERCENTUALE INIZIATA	PERCENTUALE FINE	PERCENTUALE FINE
AB 203	/	/	DIAMETRO mm. 300	ALTEZZA mm. 770	PP	/	/	/
CL203	/	/	/	/	PP	/	/	/
SP203	/	/	DIAMETRO mm. 400	/	PP	/	/	/
V203	/	/	PREVAL 2500cm/h	PREVAL 2500cm/h	PP	/	/	/
P203A-B	/	/	TIPO P203	PORTATA 250 l/min	PP	/	/	/
P203	/	/	/	/	/	/	/	/

2	03-07-03	SITUAZIONE AL 03-07-003	RA	B.S.	.
0	27-06-03	PRIMA EMISSIONE	V.D.		.
REV.	DATA	DESCRIZIONE	DISCON.	CONTR.	APPROV.
					
<p align="center">AMINO CHEMICALS L.t.d</p> <p align="center">A01, INDUSTRIAL ESTATE MARSA LON OR, MALTA</p>					
<p align="center">AB-203</p> <p align="center">SCHEMA DI IMPIANTO</p>					
<p align="center">IMPIANTO DI ASPIRAZIONE E ABBATTIMENTO EFFLUENTI GASSOSI DA VALVOLE SOVRAPPRESSIONE UNITA' REAZIONE ACIDE</p>					
Rev.	27-06-03				REV. 1
File	27-06-03				N. AMI-PD-AB203AU

NIOSH Manual of Analytical Methods

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U.S. Department of Health and Human Services. Provided by CCOHS.

TETRAHYDROFURAN

1609

C₄H₈O

MW: 72.11

CAS: 109-99-9

RTECS: LU5950000

METHOD: 1609, Issue 2

EVALUATION: PARTIAL

Issue 1: 15 May 1985

Issue 2: 15 August 1994

OSHA : 200 ppm

NIOSH: 200 ppm; STEL 250 ppm

ACGIH: 200 ppm; STEL 250 ppm (1 ppm = 2.95 mg/m³ @ NTP)

PROPERTIES: liquid; MP -108 °C; BP 66 °C; d 0.886 g/mL @ 20 °C; VP
19.3 kPa (145 mm Hg; 19% v/v) @ 20 °C; explosive range 2
to 11.8% v/v in air

SYNONYMS:

diethylene oxide; THF

SAMPLING

SAMPLER: SOLID SORBENT TUBE (coconut shell charcoal, 100 mg/50 mg)

FLOW RATE: 0.01 to 0.2 L/min

VOL-MIN: 1 L

-MAX: 9 L

SHIPMENT: routine

SAMPLE STABILITY: not determined

BLANKS: 2 to 10 field blanks per set

ACCURACY

RANGE STUDIED: 323 to 1240 mg/m³ [1] (9-L samples)

BIAS: - 3.9%

OVERALL PRECISION (S_{rT}): 0.055 [1]

ACCURACY: ± 12.6%

MEASUREMENT

TECHNIQUE: GAS CHROMATOGRAPHY, FID

ANALYTE: tetrahydrofuran

DESORPTION: 0.5 mL CS₂; stand 30 min

INJECTION VOLUME: 5 µL

TEMPERATURE-INJECTION: 190 °C

-DETECTOR: 250 °C

-COLUMN: 185 °C

CARRIER GAS: N₂, 30 mL/min

COLUMN: stainless steel, 1.2 m x 6-mm OD, packed with 50/80 mesh
Porapak Q

CALIBRATION: tetrahydrofuran in CS₂

RANGE: 0.5 to 13 mg per sample

ESTIMATED LOD: 0.05 mg per sample

PRECISION (S_r): 0.016 @ 3 to 11.8 mg per sample [1]

APPLICABILITY:

The working range is 100 to 2600 mg/m³ (34 to 880 ppm) for a 5-L air sample.

INTERFERENCES:

High humidity may reduce the breakthrough volume of the charcoal tube. The column specified may not be appropriate for large numbers of samples. CS₂ tends to dissolve some porous polymers. An alternate GC column is 30 m x 0.32-mm ID fused silica capillary coated with 0.5 µm DBWAX at 60 °C [2].

OTHER METHODS:

This revises Method S78 [3].

PROCEDURE

REAGENTS:

1. Carbon disulfide, chromatographic quality.*
2. Tetrahydrofuran (THF), reagent grade.*
3. Hydrogen, prepurified,
4. Nitrogen, purified.
5. Air, filtered, compressed.

* See SPECIAL PRECAUTIONS.

EQUIPMENT:

1. Sampler: glass tube, 7 cm long, 6-mm OD, 4-mm ID; flame-sealed ends with plastic caps, containing two sections of activated (600 °C) coconut shell charcoal (front = 100 mg; back = 50 mg) separated by a 2-mm urethane foam plug. A silylated glass wool plug precedes the front section, and a 3-mm urethane foam plug follows the back section. Pressure drop across the tube at 1 L/min airflow must be less than 3.4 kPa. Tubes are commercially available.
2. Personal sampling pump, 0.01 to 0.2 L/min, with flexible connecting tubing.
3. Gas chromatograph, FID, integrator and column (page 1609-1).
4. Vials, glass, 1-mL, PTFE-lined caps.
5. Syringe, 10- μ L, readable to 0.1 μ L.
6. Pipet, 0.5-mL, with pipet bulb.
7. Volumetric flasks, 10-mL.

SPECIAL PRECAUTIONS:

Tetrahydrofuran and carbon disulfide are toxic and extremely flammable (flash points -17 °C and -30 °C, respectively) [4]. All work should be performed in a well-ventilated hood.

SAMPLING:

1. Calibrate each personal sampling pump with a representative sampler in line.
2. Break the ends of the sampler immediately before sampling. Attach sampler to personal sampling pump with flexible tubing.
3. Sample at an accurately known flow rate between 0.01 and 0.2 L/min for a total sample size of 1 to 9 L.
4. Cap the samplers. Pack securely for shipment.

SAMPLE PREPARATION:

5. Place the front and back sorbent sections of the sampler tube in separate vials. Discard the glass wool and foam plugs.
6. Add 0.5 mL CS₂ to each vial. Attach cap to each vial.
7. Allow to stand 30 min with occasional agitation.

CALIBRATION AND QUALITY CONTROL:

8. Calibrate daily with at least six working standards over the range 0.05 to 13 mg THF per sample.
 - a. Add known amounts of THF to CS₂ in 10-mL volumetric flasks and dilute to the mark with CS₂ to produce concentrations in the range 0.1 to 26 mg THF/mL.
 - b. Analyze together with samples and blanks (steps 11 and 12).
 - c. Prepare calibration graph (peak area vs. mg THF).
9. Determine desorption efficiency (DE) at least once for each lot of charcoal used for sampling in the calibration range (step 8). Prepare three tubes at each of five levels plus three media blanks.
 - a. Remove and discard back sorbent section of a media blank sampler.
 - b. Inject a known amount (1 to 20 µL) of THF or a standard solution of THF in CS₂ directly onto front sorbent section with a microliter syringe.
 - c. Cap the tube. Allow to stand overnight.

- d. Desorb (steps 5 through 7) and analyze together with working standards (steps 11 and 12).
 - e. Prepare a graph of DE vs. mg THF recovered.
10. Analyze three quality control blind spikes and three analyst spikes to ensure that the calibration graph and DE graph are in control.

MEASUREMENT:

11. Set gas chromatograph according to manufacturer's recommendations and to conditions given on page 1609-1. Inject sample aliquot manually using solvent flush technique or with autosampler.

NOTE: If peak area is above the linear range of the working standards, dilute an aliquot of the desorbed liquid with CS₂, reanalyze, and apply the appropriate dilution factor in calculations.

12. Measure peak area.

CALCULATIONS:

13. Determine the mass, mg (corrected for DE) of THF found in the sample front (W_f) and back (W_b) sorbent sections, and in the average media blank front (B_f) and back (B_b) sorbent sections.

NOTE: If W_b > W_f/10, report breakthrough and possible sample loss.

14. Calculate concentration, C, of THF in the air volume sampled, V (L):

$$C = \frac{(W_f + W_b - B_f - B_b) \times 10^3}{V}, \text{ mg/m}^3$$

EVALUATION OF METHOD:

Method S78 was issued on February 14, 1975 [3]. The precision and bias were determined by analyzing generated atmospheres of tetrahydrofuran in dry air containing 323, 636 and 1240 mg/m³ at 22.5 °C and 763 mm Hg using 9-L samples [1]. The concentrations were determined by comparison with a "bag" standard using a hydrocarbon analyzer. Storage stability was not assessed. Breakthrough of the front section of the charcoal tube was observed after sampling 13.32 L of dry test atmosphere containing 1140 mg/m³ for 72 min at 0.185 L/min. Desorption efficiencies for samples spiked with tetrahydrofuran were 0.91 to 0.95 in the range 3 to 11.8 mg tetrahydrofuran per sample.

REFERENCES:

- [1] Documentation of the NIOSH Validation Tests, S78, U.S. Department of Health, Education, and Welfare, Publ. (NIOSH) 77-185 (1977), available as GPO Stock #017-033-00231-2, from Superintendent of Documents, Washington, DC 20402.
- [2] User check, UBTL, Inc., NIOSH Sequence #4585-S (NIOSH, unpublished, March 21, 1985).
- [3] NIOSH Manual of Analytical Methods, 2nd ed., Vol. 2, S78, U.S. Department of Health, Education, and Welfare, Publ. (NIOSH) 77-157-B (1977).
- [4] NIOSH/OSHA Occupational Health Guidelines for Chemical Hazards, U.S. Department of Health, Education, and Welfare, Publ. (NIOSH) 81-123 (1981), available as GPO Stock #017-033-0037-8 from Superintendent of Documents, Washington, DC 20402.

METHOD REVISED BY:

Julie R. Okenfuss, NIOSH/DPSE; S78 originally validated under NIOSH Contract CDC-99-74-45.

NBEngineering Services Ltd

27, Triq in-Nahla,
Zabbar, Malta
ZBR 08

Tel. / Fax : 00356 21692647 – Mob: 99804748
VAT: 1580 8323

FLUE GAS EMISSION ANALYSIS

A sample of flue gas was taken at

**Amino Chemicals, Marsa
Boiler No. 2**

On

9th July, 2003.

The instrument used was

Testo 300 XL-I

with cells calibrated in 2003.

Findings:

Boiler is performing well
as expected.

N. Bellizzi
Ing. N. Bellizzi
Managing Director

Date: 9/07/2003.

testo

testo 300 - I

- Testo -

"

09.07.03
AMINO-2

12:06h

Fuel: HEAVY-OIL

191.4 °C	FlueGas.Temp
5.6 %	O2 -content
11.6 %	CO2 -content
0 ppm	CO -content
75 ppm	NO -content
91.5 %	EffNet
86.5 %	EffGross
36.7 %	Excess air
35.8 °C	Amb.Air.Temp
0 kg/h	Mass flow CO
-0.02 hPa	DiffPressure
2.3 m/s	Gas velocity
169 m3/h	Volume flow

SmokeNo. : - - - - -

Average : ----
OilDerivative: ----

HeatCarrierTmp.: --- °C

Accordia 016/017-12

NBEngineering Services Ltd

27, Triq in-Nahla,
Zabbar, Malta
ZBR 08

Tel. / Fax : 00356 21692647 – Mob: 99804748
VAT: 1580 8323

FLUE GAS EMISSION ANALYSIS

A sample of flue gas was taken at

**Amino Chemicals, Marsa
Boiler No. 1**

On

9th July, 2003.

The instrument used was

Testo 300 XL-I

with cells calibrated in 2003.

Findings:

Boiler is operating at correct
air/fuel ratio but gas path tubes
are of large ϕ , hence gas escapes
fast. This explains the high
exhaust temp.

N. Bellizzi
Ing. N. Bellizzi
Managing Director



testo 300 - I

- Testo -

09.07.03 11:55h
AMINO-1

Fuel: HEAVY-OIL

432.8 °C	FlueGas.Temp
4.0 %	O2 -content
12.8 %	CO2 content
103 ppm	CO -content
81.3 ppm	NO -content
76.9 %	EffNet
23.9 %	EffGross
47.5 °C	Excess air
0 kg/h	Amb.Air.Temp
-0.01 hPa	Mass flow CO
2.0 m/s	DiffPressure
147 m3/h	Gas velocity
	Volume flow

SmokeNo. : - - - - -

Average : - - - - -
OilDerivative: - - - - -

HeatCarrierTemp.: - - - °C

Date: *9th July, 2003.*

Appendix 016/Amu7.014

NBEngineering Services Ltd

27, Triq in-Nahla,
Zabbar, Malta
ZBR 08

Tel. / Fax : 00356 21692647 – Mob: 99804748
VAT: 1580 8323

FLUE GAS EMISSION ANALYSIS

A sample of flue gas was taken at

Amino Chemicals

From Boiler No.2 Low Flame

The instrument used was

Testo 300 XL-I


with cells calibrated in 2003.

Findings:

Low flame settings
correctly set.

N. Bellizzi

Ing. N. Bellizzi
Managing Director

AMINO. 
Nº 2
testo 300 - I
- Testo -
21.11.04 08:16h

Fuel: LIGHT-OIL

181.3 °C	FlueGas.Temp
6.4 %	O2 -content
10.7 %	CO2 content
1 ppm	CO -content
34 ppm	NO -content
91.1 %	EffNet
85.8 %	EffGross
44.3 %	Excess air
22.3 °C	Amb.Air.Temp


NBEng. Services Ltd.
Ing. N. Bellizzi
B. Mech. Eng., M. Sc., Eur. Ing
Warrant No. 213
Tel/Fax: 692647
VAT No 1580-8323

Date: 11th November, 2004

FACTORIES (STEAM BOILERS) REGULATIONS, 1951.
Prescribed form for
REPORT OF EXAMINATION OF STEAM BOILER WHEN COLD

For report of examination under normal steam pressure see Form Dol. 218
For Economisers see Forms Dol. 102 and 218.
For Superheaters see Forms Dol. 103 and 218.

See Note on Legal Requirements and space for continuation of entries overleaf.

Name of Occupier	Mr. Philip Micallef
Address of (a) Factory (b) Head Office of Occupier	A 61 Industrial Estate, Marsa HMR 015
NOTE:- Address (b) is required only in the case of a boiler used in a temporary location, e.g. on a building operation, work of engineering construction	
Description and distinctive number of Boiler and type	Fire Tube Boiler No. 2, Shell Type Diesel Fired, Serial No. 7848
Date of Construction. The history should be briefly given, and the examiner should state whether he has seen the last previous report.	2002 Mingazzini, Italy
Date of last hydraulic test (if any) and the pressure applied.	12.0 bar on 17.10.2003
Quality and source of feed water	Chemically Treated Water
Is the boiler in the open or otherwise exposed to weather or to damp?	Boiler is housed inside.
1. Boiler- (a) What parts of seams, drums or headers are covered by brickwork? (b) Date of last exposure of such parts for the purpose of examination. (c) What parts (if any) other than parts covered by brickwork and mentioned above were inaccessible? (d) What examination and tests were made? (See Note A. on page hereunder. If there was any removal of brickwork, particulars should be given here.) (e) Condition of Boiler (State any defects materially affecting the maximum permissible working pressure.) - External - Internal	Not Applicable Not Applicable Not Applicable A visual inspection and a hydrotest was carried out. Test pressure was 14.0 bar and no leaks were evident. <div style="text-align: right;"></div> Good Good
2. Fittings and Attachments.	

Para. 11 No steam boiler which has been previously used shall be taken into use in any factory for the first time in that factory nor shall a steam boiler which has stood idle for a period of six consecutive months be re-taken into use in any factory until it has been re-examined and reported on in accordance with the last three foregoing regulations; and no new steam boiler shall be taken into use unless there has been obtained from the manufacturer of the boiler, or from a boiler inspecting company or association, a certificate specifying the maximum permissible working pressure thereof, and stating the nature of the tests to which the boiler and the fittings have been submitted, and the certificate is kept available for inspection, and the boiler is so marked as to enable it to be identified as the boiler to which the certificate relates:

Provided that in the case of a new steam boiler where a certificate as prescribed in this regulation is not available the Director of Labour may permit that it be taken into use after an examination by an examiner appointed under regulation 8 of these Regulations has been carried out and the examiner is satisfied that boiler may be used.

Para. 12 Where the report of any examination under these Regulations specifies conditions for securing the safe working of a steam boiler, the boiler shall not be used except in accordance with those conditions.

NOTES

- A. According to the type of boiler, facilities must be given by the occupier for such examination (internal and external) hammer testing, drilling, lifting, hydraulic testing, steam trial, or other means of testing as may be necessary for the thorough examination. The boiler should be opened out, cleaned and scaled; doors of man-holes, mud holes and hand holes taken off fire bars removed, and (in case of Lancashire and Cornish boilers) fire bridges if of brick; all connections opened out and safety valves taken adrift and cleaned.

Brickwork must be removed for the purpose of the examination to the extent required by the person making the examination. It should in any case be removed to the extent necessary to expose the seams of shell boiler and the drums and headers of water tube boilers, not less frequent than once in every six years in the case of a steam boiler situated in the open exposed to the weather or to damp, and not less frequently than once in every ten years in the case of every other steam boiler.

- B. Where the person making the examination considers this necessary, he may insert, in his report on any of the items, an entry "subject to further report after examination under normal steam pressure".

(a) Are there proper fittings and attachments?	Yes
(b) Are all fittings and attachments in satisfactory condition (so far as ascertainable when not under pressure?)	
3. Repairs (if any) required, and the period within which they should be executed, and any other conditions which the person making the examination thinks it necessary to specify for securing safe working.	None
4. Maximum permissible working pressure calculated from dimensions and from the thickness and other data ascertained by the present examination; due allowance being made for conditions of working if unusual or exceptional severe. Where repairs affecting the working pressure are required, state the maximum permissible working pressure:	NWP is 5.0 – 6.0 bar
(a) Before the expiration of the period specified in (3)	(a) 12.0 bar
(b) After the expiration of such period if the required repairs have not yet been completed.	(b) 12.0 bar
(c) After the completion of the required repairs.	(c) 12.0 bar
5. Other observations NONE	
<p>Subject to reservation (noted above) of certain points for examination under steam pressure, I certify that on 09.11.2004 the boiler above described was sufficiently scaled, prepared, and (so far as its construction permits) made accessible for thorough examination and for such tests as were necessary for thorough examination, and that on the said date I thoroughly examined the boiler, including its fittings and attachments, and that the above is a true report of the result.</p> <p>Signature <i>N. Bellizzi</i> Qualification B. Mech.(Hons)., M.Sc., Eur. Ing Warrant No. 213</p> <p>Address NBEng. Services Ltd., 27, Triq in-Nahla, Zabbar, ZBR 08. Tel./ Fax : 00 356 21692647</p> <p><i>The words in italics should be deleted if not required – see Note B hereunder</i></p> <p>THIS REPORT IS TO BE MADE OUT IN DUPLICATE</p> <p>FORM DOL. 217</p> <p>SPACE FOR CONTINUATION OF ENTRIES.</p>	



NOTE ON REQUIREMENTS OF THE FACTORIES (STEAM BOILERS) REGULATIONS, 1951, as regards "steam boilers" other than economisers or superheaters.

Para 3. Every steam boiler whether separate or one of a range –

(a) shall have attached to it-

FACTORIES (STEAM BOILERS) REGULATIONS, 1951
Prescribed Form for
REPORT OF EXAMINATION OF STEAM BOILER, UNDER NORMAL STEAM
PRESSURE

This Form may also be used (so far as applicable) for supplementary reports on
Economizers and Superheaters

Name of Occupier	Mr. Philip Micallef
Address of (a) Factory (b) Head Office of Occupier	A61 Industrial Estate, Marsa HMR 15
Note – Address (b) is required only in the case of a boiler or superheater used in a temporary location.	
Description and distance number of Boiler and Type.	Fire Tube, 3 Pass, Shell Tube Type Boiler No. 2 Mingazzini Type Serial No. 7848
1. Condition (External)	Excellent, brand new
2. Fittings and Attachments (a) (i) is the safety valve so adjusted as to prevent the boiler being worked at a pressure greater than the maximum permissible working pressure specified in the last report (Form DOL 217) on the examination when cold? (ii) If a lever safety valve, is the weight secured on the lever in the correct position? (b) Is the pressure gauge working correctly? Is the water gauge in proper working order?	Yes Safety Valve No.1 Opens: 12.0 bar Closes: 11.0 bar Safety Valve No. 2 Opens: 12.5 bar Closes: 11.0 bar Yes Yes
3. Repairs (if any) required, and period within which they should be executed and any other conditions which the person making the examination thinks it necessary to specify for securing safe working.	None
4. Other observations.	Accumulation Test Satisfactory, pressure stops rising at 13.2 Bar Electrical Cut-Out works at 8.0 bar and another one at 10.0 bar. Photocell functions correctly
I certify that on 11.11.2004 I examined the above-mentioned boiler under normal steam pressure and that the above is a true report of the result.	
Signature <i>N. Bellizzi</i>	Qualifications: B.Mech.Eng (Hons)., M.Sc., Eur.Ing Warrant No. 213
Address NBEng. Services Ltd., 27, Triq in – Nahla, Zabbar Tel. / Fax : 00 356 21692647	
THIS REPORT TO BE MADE OUT IN DUPLICATE Form DOL 218 R.C 17	



FACTORIES (STEAM BOILERS) REGULATIONS, 1951.

Prescribed form for REPORT OF EXAMINATION OF STEAM BOILER WHEN COLD

For report of examination under normal steam pressure see Form Dol. 218

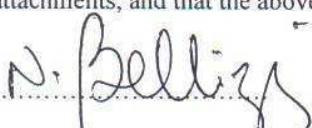
For Economisers see Forms Dol. 102 and 218.

For Superheaters see Forms Dol. 103 and 218.

**See Note on Legal Requirements and space for
continuation of entries overleaf.**

Name of Occupier	Mr. Philip Micallef
Address of (a) Factory (b) Head Office of Occupier	A 61 Industrial Estate, Marsa HMR 015
NOTE:- Address (b) is required only in the case of a boiler used in a temporary location, e.g. on a building operation, work of engineering construction	
Description and distinctive number of Boiler and type	Fire Tube Boiler, Shell Type Diesel Fired, Serial No. 4.2.F.153
Date of Construction. The history should be briefly given, and the examiner should state whether he has seen the last previous report.	1991 Seveso SpA
Date of last hydraulic test (if any) and the pressure applied.	03.06.2003 and at 12.5 barg
Quality and source of feed water	Chemically Treated Water
Is the boiler in the open or otherwise exposed to weather or to damp?	Boiler is housed inside.
1. Boiler-	
(a) What parts of seams, drums or headers are covered by brickwork?	Not Applicable
(b) Date of last exposure of such parts for the purpose of examination.	Not Applicable
(c) What parts (if any) other than parts covered by brickwork and mentioned above were inaccessible?	Not Applicable
(d) What examination and tests were made? (See Note A. on page hereunder. If there was any removal of brickwork, particulars should be given here.)	A visual inspection and a hydrotest was carried out. Test pressure was 11.5 bar and no leaks were evident.
(e) Condition of Boiler (State any defects materially affecting the maximum permissible working pressure.)	
- External	Good
- Internal	Good
2. Fittings and Attachments.	
(a) Are there proper fittings and attachments?	Yes



(b) Are all fittings and attachments in satisfactory condition (so far as ascertainable when not under pressure?)	
3. Repairs (if any) required, and the period within which they should be executed, and any other conditions which the person making the examination thinks it necessary to specify for securing safe working.	None
4. Maximum permissible working pressure calculated from dimensions and from the thickness and other data ascertained by the present examination; due allowance being made for conditions of working if unusual or exceptional severe. Where repairs affecting the working pressure are required, state the maximum permissible working pressure:	NWP is 5.0 – 6.0 bar
(a) Before the expiration of the period specified in (3)	(a)
(b) After the expiration of such period if the required repairs have not yet been completed.	(b)
(c) After the completion of the required repairs.	(c)
5. Other observations NONE	
<p>Subject to reservation (noted above) of certain points for examination under steam pressure, I certify that on 10.09.2004 the boiler above described was sufficiently scaled, prepared, and (so far as its construction permits) made accessible for thorough examination and for such tests as were necessary for thorough examination, and that on the said date I thoroughly examined the boiler, including its fittings and attachments, and that the above is a true report of the result.</p> <p>Signature  Qualification B. Mech.(Hons.), M.Sc., Eur. Ing Warrant No. 213</p> <p>Address NBEng. Services Ltd., 27, Triq in-Nahla, Zabbar, ZBR 08. Tel./ Fax : 00 356 21692647</p> <p><i>The words in italics should be deleted if not required – see Note B hereunder</i></p> <p>THIS REPORT IS TO BE MADE OUT IN DUPLICATE</p> <p>FORM DOL. 217</p> <p>SPACE FOR CONTINUATION OF ENTRIES.</p>	



NOTE ON REQUIREMENTS OF THE FACTORIES (STEAM BOILERS) REGULATIONS, 1951, as regards "steam boilers" other than economisers or superheaters.

Para 3. Every steam boiler whether separate or one of a range –

(a) shall have attached to it-

- (i) a suitable safety valve separate from any stop valve, which shall be so adjusted as to prevent the boiler being worked at a pressure greater than the maximum permissible working pressure and shall be fixed directly to, or as close as practicable to, the boiler;
 - (ii) a suitable stop-valve connecting the boiler to the steam pipe;
 - (iii) a correct steam pressure gauge, connected to the steam space and easily visible by the boiler attendant, which shall indicate the pressure of steam in the boiler in pounds per square inch, and have marked upon it in a distinctive colour the maximum permissible working pressure;
 - (iv) at least one water gauge of transparent material or other type approved by the Director of Labour to show the water level in the boiler, and, if the gauge is of the glass tubular type and the working pressure in the boiler normally exceeds forty pounds per square inch, the gauge shall be provided with an efficient guard but so as to obstruct the reading of the gauge;
 - (v) where it is one of two or more boilers, a plate bearing a distinctive number which shall be easily visible; and
- (b) shall be provided with means for attaching a test pressure gauge; and
 - (c) unless externally fired, shall be provided with a suitable fusible plug or an efficient low water alarm device.

Para. 4 For the purposes of the last foregoing regulation a lever-valve shall not be deemed a suitable safety valve unless the weight is secured on the lever in the correct position.

Para. 5 No person shall enter or be in any steam boiler which is one of a range of two or more steam boilers unless-

- (a) all inlets through which steam or hot water might otherwise enter the boiler from any other part of the range are disconnected from that part; or
- (b) all valves or taps controlling such entry are closed and securely locked, and, where the boiler has a blow-off pipe in common with one or more other boilers or delivering into a common blow-off vessel or sump, the blow-off valve or tap on each such boiler is so constructed that it can only be opened by a key which cannot be removed until the valve or tap is closed and is the only key in use for that set of blow-off valves or taps.

Para. 7.

- (1) Every steam boiler and all its fittings and attachments shall be properly maintained.
- (2) The furnace or furnaces shall be so used as not to cause any undue strain on the steam boiler.

Para. 8 Every steam boiler and all its fittings and attachments shall be thoroughly examined after any extensive repair and at least once in every period of twelve months, by a competent person appointed by the Minister to be an Examiner of Steam Boilers for the purposes of these Regulations.

Para. 9 Any examination in accordance with the requirements of the last foregoing regulation shall be carried out on two days' notice being given and shall consist, in the first place, of an examination of the boiler when it is cold and the interior and exterior have been prepared in the manner prescribed by the order of the Minister, and secondly of an examination when it is under normal steam pressure, and the two parts of the examination may be carried out by different persons.

Para. 10 The examination of a boiler when it is cold and its examination when it is under steam pressure shall be treated as separate examinations

Para. 11 No steam boiler which has been previously used shall be taken into use in any factory for the first time in that factory nor shall a steam boiler which has stood idle for a period of six consecutive months be re-taken into use in any factory until it has been re-examined and reported on in accordance with the last three foregoing regulations; and no new steam boiler shall be taken into use unless there has been obtained from the manufacturer of the boiler, or from a boiler inspecting company or association, a certificate specifying the maximum permissible working pressure thereof, and stating the nature of the tests to which the boiler and the fittings have been submitted, and the certificate is kept available for inspection, and the boiler is so marked as to enable it to be identified as the boiler to which the certificate relates:

Provided that in the case of a new steam boiler where a certificate as prescribed in this regulation is not available the Director of Labour may permit that it be taken into use after an examination by an examiner appointed under regulation 8 of these Regulations has been carried out and the examiner is satisfied that boiler may be used.

Para. 12 Where the report of any examination under these Regulations specifies conditions for securing the safe working of a steam boiler, the boiler shall not be used except in accordance with those conditions.

NOTES

- A. According to the type of boiler, facilities must be given by the occupier for such examination (internal and external) hammer testing, drilling, lifting, hydraulic testing, steam trial, or other means of testing as may be necessary for the thorough examination. The boiler should be opened out, cleaned and scaled; doors of man-holes, mud holes and hand holes taken off fire bars removed, and (in case of Lancashire and Cornish boilers) fire bridges if of brick; all connections opened out and safety valves taken adrift and cleaned.

Brickwork must be removed for the purpose of the examination to the extent required by the person making the examination. It should in any case be removed to the extent necessary to expose the seams of shell boiler and the drums and headers of water tube boilers, not less frequent than once in every six years in the case of a steam boiler situated in the open exposed to the weather or to damp, and not less frequently than once in every ten years in the case of every other steam boiler.

- B. Where the person making the examination considers this necessary, he may insert, in his report on any of the items, an entry "subject to further report after examination under normal steam pressure".

FACTORIES (STEAM BOILERS) REGULATIONS, 1951
Prescribed Form for
REPORT OF EXAMINATION OF STEAM BOILER, UNDER NORMAL STEAM
PRESSURE

This Form may also be used (so far as applicable) for supplementary reports on
Economizers and Superheaters

Name of Occupier	Mr. Philip Micallef
Address of (a) Factory (b) Head Office of Occupier	A61 Industrial Estate, Marsa HMR 15
Note – Address (b) is required only in the case of a boiler or superheater used in a temporary location.	
Description and distance number of Boiler and Type.	Fire Tube, 3 Pass, Shell Tube Type Boiler Diesel Oil Fired Seveso Type Serial No. 4.2.F.153
1. Condition (External)	Good
2. Fittings and Attachments (a) (i) is the safety valve so adjusted as to prevent the boiler being worked at a pressure greater than the maximum permissible working pressure specified in the last report (Form DOL 217) on the examination when cold? (ii) If a lever safety valve, is the weight secured on the lever in the correct position? (b) Is the pressure gauge working correctly? (c) Is the water gauge in proper working order?	Yes Safety Valve No.1 Opens: 11.0 bar Closes: 8.00 bar Safety Valve No. 2 Opens: 11.25 bar Closes: 8.50 bar Yes Yes
3. Repairs (if any) required, and period within which they should be executed and any other conditions which the person making the examination thinks it necessary to specify for securing safe working.	None
4. Other observations.	Accumulation Test Satisfactory Electrical Cut-Out works at 7.0 bar and photocell functions
I certify that on 23.09.2004 I examined the above-mentioned boiler under normal steam pressure and that the above is a true report of the result.	
Signature <i>N. Bellizzi</i>	Qualifications: B.Mech.Eng (Hons)., M.Sc., Eur.Ing Warrant No. 213
Address NBEng. Services Ltd., 27, Triq in – Nahla, Zabbar Tel. / Fax : 00 356 21692647	
THIS REPORT TO BE MADE OUT IN DUPLICATE Form DOL 218 R.C 17	



NBEngineering Services Ltd

27, Triq in-Nahla,
Zabbar, Malta
ZBR 08

Tel. / Fax : 00356 21692647 – Mob: 99804748
VAT: 1580 8323

FLUE GAS EMISSION ANALYSIS

A sample of flue gas was taken at

Amino Chemicals, Marsa

From Boiler No. 1 - 100% Low Flame

The instrument used was

Testo 300 XL-I

with cells calibrated in 2003.

Findings:

The air-fuel ratio is
acceptable.

Ing. N. Bellizzi
Managing Director

testo 300 - I

Amino
low flame.



testo 300 - I

- Testo -

22.09.04

12.01.76

01111h

1800 hr.

Fuel: LIGHT-OIL

152.8 °C	FlueGas.Temp
6.6 %	O2 -content
10.6 %	CO2 content
68 ppm	CO -content
58 ppm	NO -content
92.9 %	EffNet
87.5 %	EffGross
46.2 %	Excess air
28.8 °C	Amb.Air.Temp
0 kg/h	Mass flow CO
-0.55 hPa	DiffPressure
11.7 m/s	Gas velocity
8.4 m³/s	Gas flow

NBEng. Services Ltd.

Ing. N. Bellizzi
B. Mech. Eng., M. Sc., Eur. Ing
Warrant No. 213
Tel/Fax: 692647

VAT No 1580-8323

Date: 26th September, 2004

NBEngineering Services Ltd

27, Triq in-Nahla,
Zabbar, Malta
ZBR 08

Tel. / Fax : 00356 21692647 – Mob: 99804748
VAT: 1580 8323

FLUE GAS EMISSION ANALYSIS

A sample of flue gas was taken at

Amino Chemicals, Marsa

From Boiler No. 1 - 100% High Flame

The instrument used was

Testo 300 XL-I

with cells calibrated in 2003.


Findings:

The air-fuel ratio was
set accordingly.
Acceptable measurements.

N. Bellizzi

Ing. N. Bellizzi
Managing Director

testo 300 - I

Amino
high flame 

testo 300 - I

- Testo -

22.09.04

12.01.76

01.15h

1800h

Fuel: LIGHT-OIL

235.5 °C	FlueGas.Temp
6.0 %	O2 -content
11.0 %	CO2 content
54 ppm	CO -content
63 ppm	NO -content
88.8 %	EffNet
83.6 %	EffGross
40.5 %	Excess air
28.8 °C	Amb.Air.Temp
0 kg/h	Mass flow CO
-0.67 hPa	DiffPressure
14.1 m/s	Gas velocity
1023 m3/h	Volume flow

NBEng. Services Ltd.

Ing. N. Bellizzi
B. Mech. Eng., M. Sc., Eur. Ing
Warrant No. 213
Tel/Fax: 692647

Date: 20 September, 2004

DOCUMENT REFERENCE NUMBER
017/AMINO

Measures to Avoid Pollution in the Case Activities Cease

In the unlikely event that operations cease from the site, all our base chemical stockpiles will be retrieved by the mother company and sent back to our Italian plant.

All industrial assets within our site, including reactors and machinery, can be dismantled and would so be if our activities stopped in Malta. These assets would also be shipped back to our Mother Company in Italy.

Therefore all company assets would be dissolved and no detriment to the site would have resulted from our operations in Malta.

DOCUMENT REFERENCE NUMBER
018/AMINO

Environmental Impact Assessment of Emissions.

In order to assess the impact of emissions, one needs to quantify these emissions first.

Amino Chemicals has installed technologies to clean all process gases derived from production. These industrial process emissions are being scrubbed by industrial scrubbers at the rear of the factory. No airbourne emissions result from the direct production process.

Diesel fuel is burnt in shell type boilers to produce steam. The only emissions from the factory are those arising from this combustion process and are hence quantified:

Diesel oil consumption (see DRN 012/Amino) is
81.58 cu.mtrs / year, or 1.31 MT per week.

An emphirical formula for sulphur conversion is

$$\text{Sox (tons/week)} = 0.01753 \times \text{S\%} \times \text{Fuel Usage (tons/week)}$$

Where S is the sulphur content of the fuel, 0.18%

Therefore,

$$\text{Sox (tons / week)} = 0.01753 \times 0.18 \times 1.31 = 4.2 \text{ kg/week}$$

An emphirical formula for Nitrogen Conversion is

$$\text{NOx (tons/week)} = 0.01052 \times \text{Fuel usage (tons per week)}$$

Therefore,

$$\text{NOx} = 0.01052 \times 1.31 = 13.78 \text{ kg/week.}$$

These emissions are considered negligible when considering other industrial plants.

DOCUMENT REFERENCE NUMBER
019 /AMINO

Assessment of Alternative Sites.

The whole industrial process is regulated and monitored vigorously by the local competent authority. All emissions originating from the industrial process are neutralized before emitting to the atmosphere, whilst the combustion process emissions are almost negligible.

All by-products and end waste products not suitable for local discharge are being dispatched to a dedicated site in the EU for disposal.

In view of the above, and the fact that the company has shown great interest in setting up a waste water reprocessing plant to reduce nitride content of waste water (hence recycling), we feel that Amino Chemicals has no adverse effect on neighboring factories.

DOCUMENT REFERENCE NUMBER
020 /AMINO

Environmental Statement

The factory currently occupied by Amino Chemicals was constructed prior to the issue of the Legal Notice in question, hence we have no comments on this aspect.