

Medicare institute in Olomouc

Laboratory centre Olomouc

Wolkerova 74/6, 779 11, tel. 58 5719 111, fax. 58 5719 218, e-mail: podatelna@zuol.cz

Accredited testing laboratory č. 1392, no. of certificate 318/2004, released ČIA by ČSN EN ISO IEC 17 025.

Test title: SOP 6001 Noise measurement

Test protocol: noise measurement

6682H/04

Date of measurement:	21.9. 2004	Customer:	AMF REECE CR, s.r.o.
Performed by:	Dr. Dvorský, Mrs. Schwietzerová		OR Brno. Odd.C. vložka 45140
Measurement requested by:	AMF Reece		Tovární 582
Accompanied :	Mr. Šťastný, Mr. Hubáček	796 25	Prostějov
Date of issue:	22.9. 2004	Customer facility	Location of measurement: Production area
Measurement taken in accordance with:	ČSN ISO 9612 Acoustics – Directions for measurement and review of exposure in the working environment. Methodical instructions for noise measurement and vibration, in the work environment, sign- HEM-300-26.4.01.16344.		

Location of Measurement : S 211 assembly, AMF Reece Production Facility, Czech Republic

Acoustical area: Factory location, with the following characteristics:

floor - concrete
walls - reface brickwork , windows
ceiling - framework

Noise source : Imitation sleeves buttonhole machine with the chain stitch type S 4000 ISBH,
Serial number. H 240834, table number 03107

Microclimate conditions at the working place at the time of measurement:

Temperature 24,9°C, relative humidity 43,5%, atmospheric pressure 87hPa

Situation description:

Measurement, of the above listed machine, was performed for manufacturer, for technical reasons, at the customer request. Operating conditions specified as follows: running the machine in three modes of operation, without needle and without machine operator. This machine is operated from a sitting position.

The measurement took place, in the afternoon, when values of acoustic levels and acoustic pressure A, from the running machine, were not influenced by external factors in the working area, see enclosed foto.

Medicare institute in Olomouc

Laboratory centre Olomouc

Wolkerova 74/6, 779 11, tel. 58 5719 111, fax. 58 5719 218, e-mail: podatelna@zuol.cz

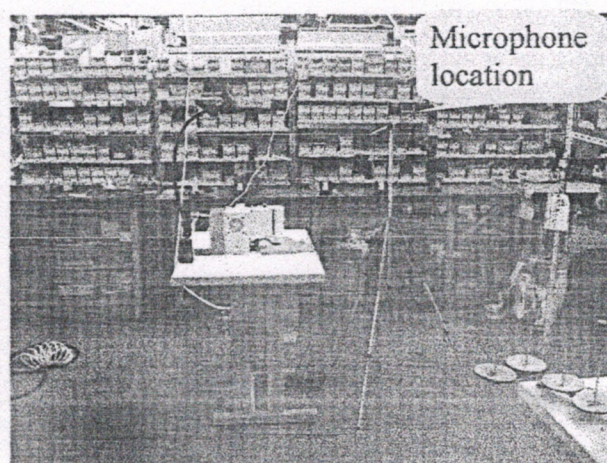
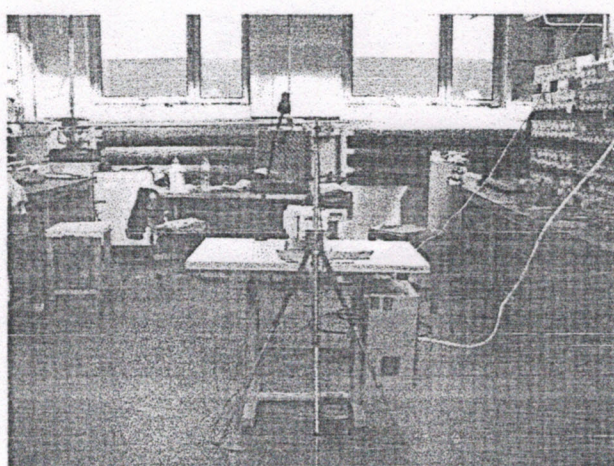
Accredited testing laboratory č. 1392, no. of certificate 318/2004, released ČIA by ČSN EN ISO IEC 17 025.

Test title: SOP 6001 Noise measurement

Test protocol: noise measurement

6682H/04

Photo documentation of the measurement environment:



Measuring devices:

Noise analyser: NORSONIC NOR 121, Manufacturer: Norsonic Norway, serial. no.č26329, "noise meter type class 1", in accordance with regulation ČSN IEC 651 and ČSN EN 60 804. The noise meter certification document is valid until 20.01.2006 released by ČMI Brno no. 6035-OL-Z005/04.

Measuring microphone Norsonic 1225, serial no. 14 422, sensitivity 52,3mV/Pa at the frequency 250Hz and barometric pressure 101 325Pa. The certification document of microphone is valid until 20.01.2006, released ČMI Brno no. 6035-OL-M006/04. The windscreen, type Norsonic, was not used, microphone cable B&K AO0416 10m

Calibration unit: 4231 producer Brüel & Kjaer, seriál no. 1 761 391, $L(\text{dB}) = 94,1$, $f = 999,9$ Hz and barometer pressure 101 325 Pa. The calibration unit certification documentation: no.035-KL-K002/04 for the acoustics pressure levels released by ČMI Brno, ŘM Laboratory Center at the Medical Institute in Olomouc is valid until 31.12.2006

Digital thermometer –humidity device - barometer with the recorded data type THPZ seriál no. 9915013, producer COMET SYSTEM s.r.o., Rožnov p.R., Czech Republic. The calibration documentation for device no. 636-KL-V074/01 for the temperature and relative humidity, is released by ČMI in Brno and calibration document no.613 - KL C098/01 for relative air pressure, released by ČMI in Brno, certified by ŘM laboratory center, Medical Institute located in Olomouc, CZ, is valid until 20.4.2006.

Medicare institute in Olomouc

Laboratory centre Olomouc

Wolkerova 74/6, 779 11, tel. 58 5719 111, fax. 58 5719 218, e-mail: podatelna@zuol.cz

Accredited testing laboratory č. 1392, no. of certificate 318/2004, released ČIA by ČSN EN ISO IEC 17 025.

Test title: SOP 6001 Noise measurement

Test protocol: noise measurement

6682H/04

Quantities and definition:

Quantity	Mark	Defined in
The noise level of acoustics pressure	L_p	ISO 1999
The noise level A	L_{pA}	ISO 1999
Peak acoustics pressure	L_{peak}	ISO 651
Peak level of acoustics pressure C	L_{Cpeak}	ISO 651
The level of acoustics pressure A equivalent, time T	$L_{Aeq, T}$	ISO 1999
The level of acoustics pressure C equivalent, time T	$L_{Ceq, T}$	ISO 9921-1
The level of acoustics pressure A equivalent, time T, timing parameter I	$L_{Aeq, T}$	IEC 804
The level of acoustics pressure at the 1/3 octave band, time T	$L_{teq, T}$	
Distribution level (percentage)	$L_{AN, T}$	ISO 1996-1
The level of sound exhibit A: SEL	L_{AE}	IEC 804
The level of acoustical pressure, octave zone, o – mid-frequency octave zone	L_{po}	ISO 532
The level of acoustical pressure, 1/3 octave zone, t – middle frequency 1/3 octave zone	L_{pt}	ISO 532
Time interval 8 hours: ordinary period of the work day	T_o	ISO 9612
Standard time interval: time interval, which is related to equivalent acoustical pressure A: the time of exhibit	T_N	ISO 9612
Time interval for which workers are exposed to sound daily	T_e	ISO 1999
The sound exposure for time T	$E_{A, T}$	ISO 1999
The level of noise exposure	$L_{EX, T}$	ISO 1999
Standard level of noise exposure during the Standard time of the work day (8 hours) = equivalent level of acoustical pressure A for the standard time of working day 8 hours	$L_{EX, 8h}$ $L_{Aeq, 8h}$	ISO 1999 ISO 9612
Standard equivalent level of acoustical pressure A for ordinary duration of working week 40 hr	$L_{EX, w}$	ISO 9612

Medicare institute in Olomouc

Laboratory centre Olomouc

Wolkerova 74/6, 779 11, tel. 58 5719 111, fax. 58 5719 218, e-mail: podatelna@zuol.cz

Accredited testing laboratory č. 1392, no. of certificate 318/2004, released ČIA by ČSN EN ISO IEC 17 025.

Test title: SOP 6001 Noise measurement

Test protocol: noise measurement

6682H/04

Measuring the noise of the buttonholes sewing machine with the chain stitch type S 4000 ISBH:

Measuring Site: x - S 4000 ISBH

Measuring was performed in the section of the production, with obstacles (assembly tables) more than one meter from machine table during usual machine operation in these modes:

1. maximal machine performance, 3800 stitches per /min.,
2. average machine performance, 3500 stitches per /min.,
3. low machine performance, 3000 stitches per/min,

and without the machine operation – see background .

The measuring microphone was located at the microphone holder B&K UA0588 tripod B&K UA0587 on the tripod „aluminium alloy “ stand 1,4m above the floor level, 40cm from the machine stand, which is at the level of a “seated“ operator’s head and was directed towards the measured machine, see photo documentation.

The time of exposition: counted for 8 hours / working shift

Measured levels of acoustics pressure A and C:

Variation:	Time interval:	Measured duration:	Number of record:	Measured levels of acoustics pressure A and C: [dB]				
				L_{Aeq}	L_{Aeq}	L_{Cpeak}	L_{Amax}	L_{Amin}
3800 stitches	14.47.44- 15.05.46	00.30.00	0002	81,3	83,5	102,4	85,0	56,9
3500 stitches		00.04.05		78,4	80,5	98,5	81,8	57,2
3000 stitches		00.15.11		77,2	79,1	97,7	80,3	56,9
Background		00.03.58		58,8	59,8	91,3	79,2	55,7

Medicare institute in Olomouc

Laboratory centre Olomouc

Wolkerova 74/6, 779 11, tel. 58 5719 111, fax. 58 5719 218, e-mail: podatelna@zuol.cz

Accredited testing laboratory č. 1392, no. of certificate 318/2004, released ČIA by ČSN EN ISO IEC 17 025.

Test title: SOP 6001 Noise measurement

Test protocol: noise measurement

6682H/04

Measured levels of acoustical pressure: 1/3 octave frequency analysis

1/3 oct. band	$L_{teq} - 3800 \text{ spm}$	$L_{teq} - 3500 \text{ spm}$	$L_{teq} - 3000 \text{ spm}$	$L_{teq} - \text{background}$
20	50,6	47,9	51,1	49,5
25	49,4	49,1	52,7	47,4
31,5	56,5	53,5	49,0	47,2
40	51,4	51,6	52,2	51,0
50	55,0	61,6	59,3	52,2
63	70,1	68,8	48,3	46,8
80	53,8	52,6	52,6	51,2
100	56,0	59,6	60,5	50,0
125	73,4	67,6	53,9	49,5
160	58,5	61,7	57,4	50,2
200	66,1	61,2	55,9	50,1
250	66,9	65,4	67,4	51,5
315	67,0	66,1	62,3	51,1
400	70,9	63,7	60,1	51,5
500	68,1	65,9	62,6	51,1
630	72,8	68,2	68,7	50,1
800	76,8	70,5	70,5	50,6
1k	68,8	66,4	65,7	49,2
1,25k	68,3	64,9	63,0	48,6
1,6k	69,7	66,6	66,4	48,7
2k	70,6	69,5	67,6	46,8
2,5k	68,1	66,9	65,8	44,3
3,15k	67,6	67,8	65,4	43,8
4k	67,5	66,3	64,8	41,7
5k	65,4	64,1	62,3	40,9
6,3k	63,1	61,4	59,7	36,9
8k	60,7	59,1	56,9	34,3
10k	60,2	58,8	56,2	33,4
12,5k	59,7	58,1	56,6	31,1
16k	61,3	59,0	57,5	30,3
20k	59,0	56,7	55,1	30,2

Medicare institute in Olomouc

Laboratory centre Olomouc

Wolkerova 74/6, 779 11, tel. 58 5719 111, fax. 58 5719 218, e-mail: podatelna@zuol.cz

Accredited testing laboratory č. 1392, no. of certificate 318/2004, released ČIA by ČSN EN ISO IEC 17 025.

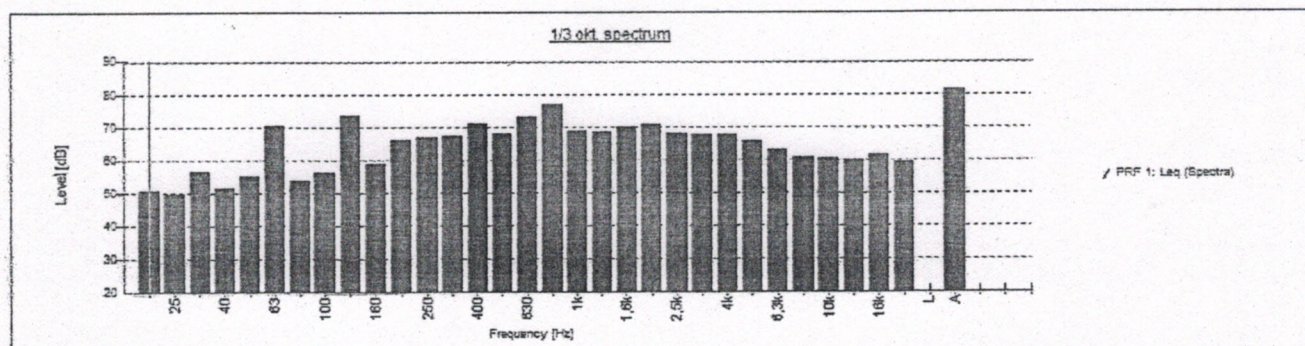
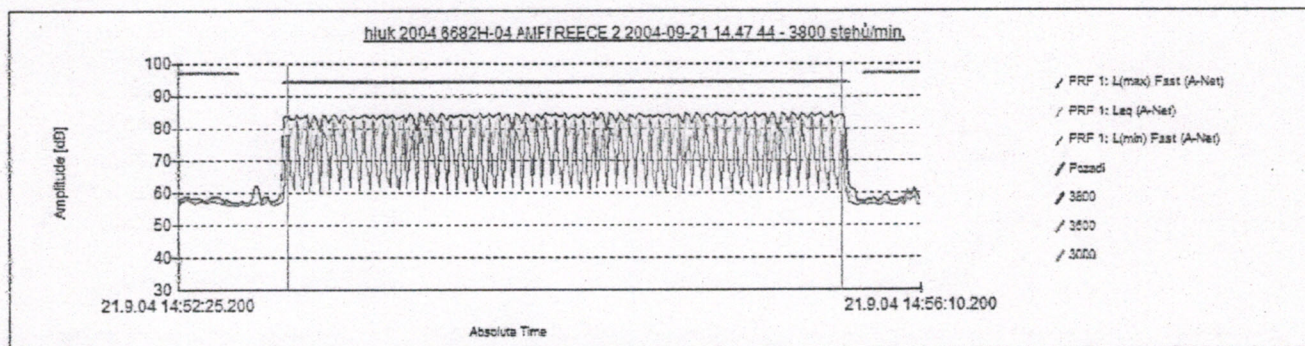
Test title: SOP 6001 Noise measurement

Test protocol: noise measurement

6682H/04

Time reference chart of the acoustical pressure levels A of measured machine including 1/3 octave analyse:

- 3800 stitches per/ min



- 3500 stitches per/min.

Medicare institute in Olomouc

Laboratory centre Olomouc

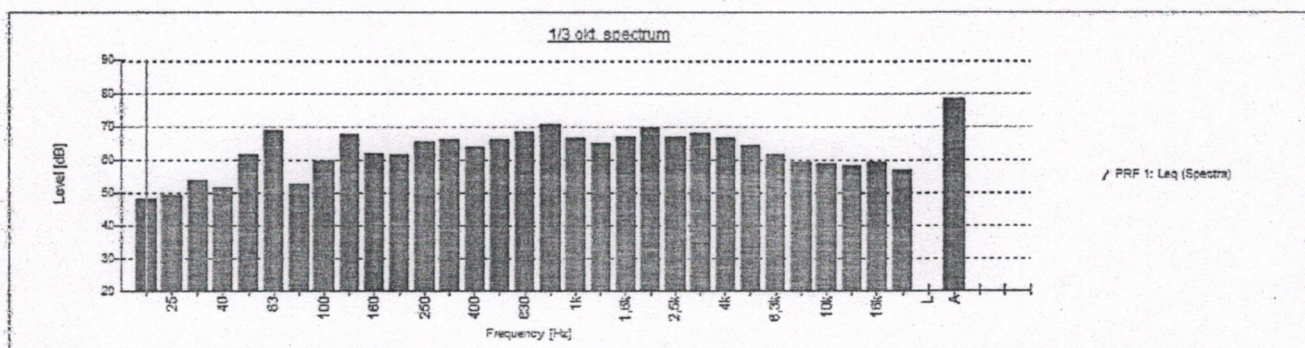
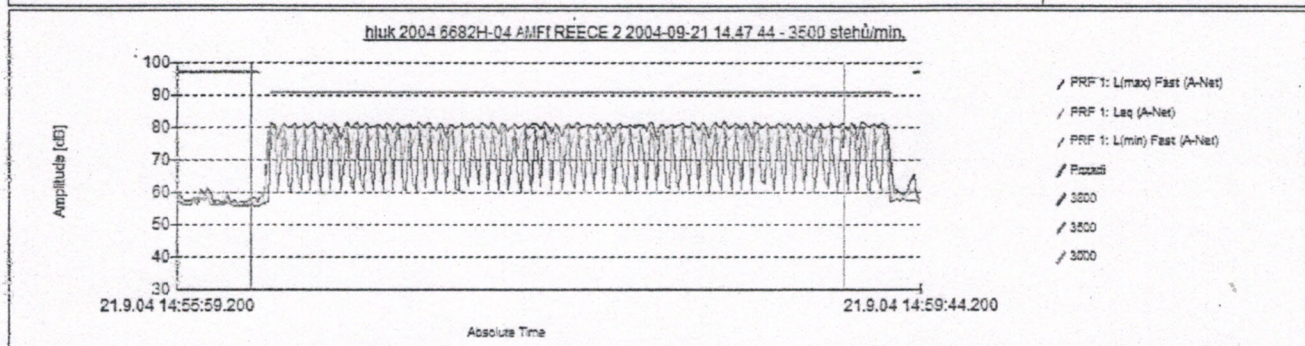
Wolkerova 74/6, 779 11, tel. 58 5719 111, fax. 58 5719 218, e-mail: podatelna@zuol.cz

Accredited testing laboratory č. 1392, no. of certificate 318/2004, released ČIA by ČSN EN ISO IEC 17 025.

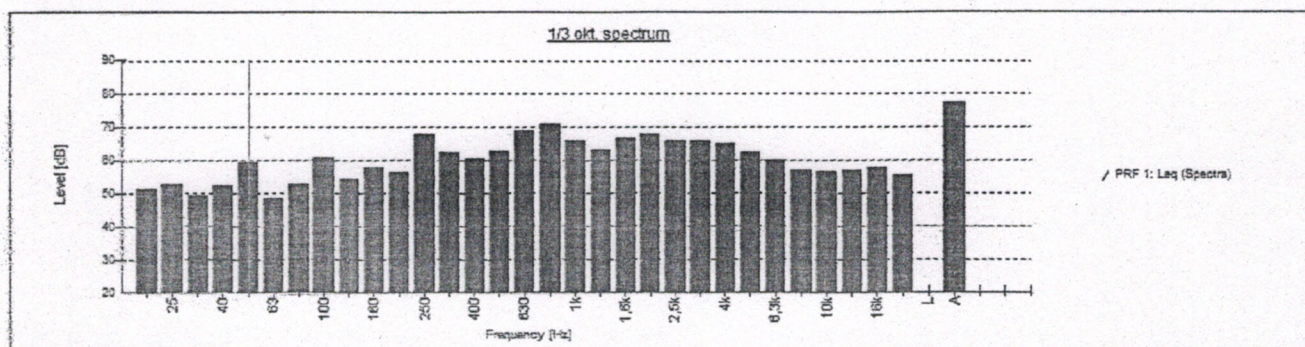
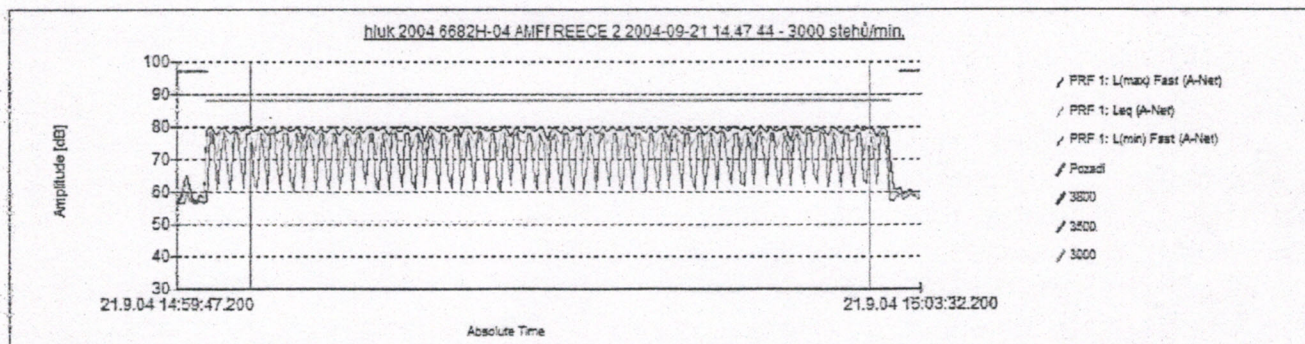
Test title: SOP 6001 Noise measurement

Test protocol: noise measurement

6682H/04



- 3000 stitches per/min.



- background

Medicare institute in Olomouc

Laboratory centre Olomouc

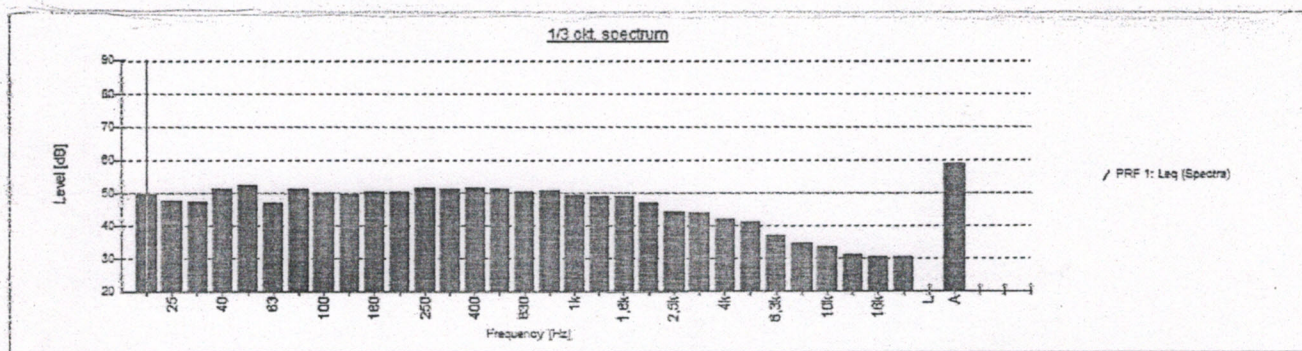
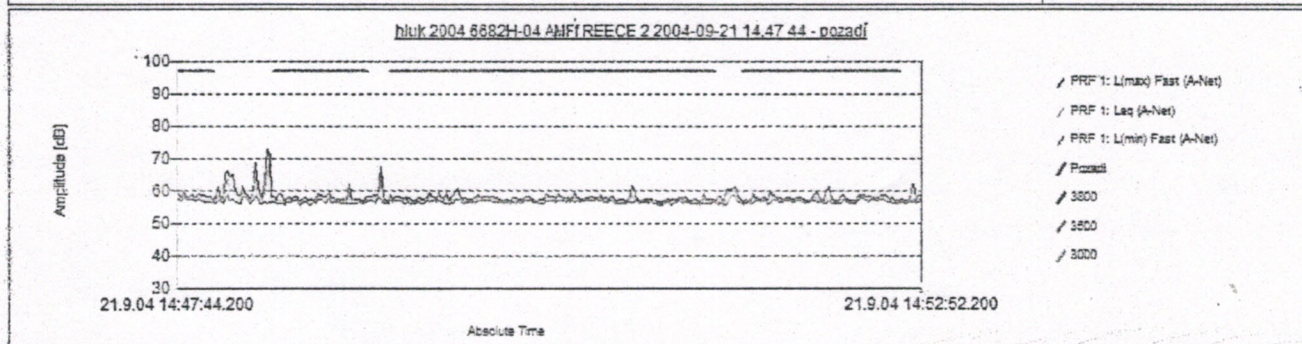
Wolkerova 74/6, 779 11, tel. 58 5719 111, fax. 58 5719 218, e-mail: podatelna@zuol.cz

Accredited testing laboratory č. 1392, no. of certificate 318/2004, released ČIA by ČSN EN ISO IEC 17 025.

Test title: SOP 6001 Noise measurement

Test protocol: noise measurement

6682H/04



The highest admissible noise level determined by Government Regulation no. 502/2000 Health & Safety regulation, against detrimental noise and vibrations influences, as outlined in the latest version of the regulation.

The highest admissible equivalent level of acoustical pressure A for 8 hours working shift $L_{Aeq,8h}$, which is the highest admissible standard level of noise exposure, for standard time, per 8 hr working day $L_{EX,8h}$, pertinently, the highest admissible level of noise exposure standard in an ordinary 8 hour working day for one week exposure, $L_{EX,W}$, will be determined by summation of fundamental level acoustic pressure A, 85dB and by correction related to the type of performed activity according to supplement no. 2 of this regulation. The highest admissible values in shifts of noise exposure for other than 8 hr work day of noise exposure T, measured in minutes, will be determined such, that to the highest prescribed admissible levels of the 8 hr work day, at the level of noise $L_{Aeq,8h}$ add the correction factor K_T , which will be determined by the relationship, $K_T = 10\log(480/T)$, /dB/.

The primary level of acoustical pressure A.

$L_{Ax} = 85,0dB$

Correction factor for activity type - class VI., physical work without the demand for mental concentration, monitoring and hearing control and speech communication (The most important is the hearing protection).

0dB

The highest admissible normed level of the noise exposition for the ordinary time duration of the working day 8hours, $L_{EX,8h}$, which is the highest admissible equivalent level of acoustical pressure A, for 8 an hour shift

$L_{Aeq,8h} = 85,0dB$

($L_{EX,8h}$)

$L_{Aeq,8h}$.

Correction K_T , $T = 480min.$, $K_T = 10\log(480/T)$, /dB/

0,0dB

Medicare institute in Olomouc

Laboratory centre Olomouc

Wolkerova 74/6, 779 11, tel. 58 5719 111, fax. 58 5719 218, e-mail: podatelna@zuol.cz

Accredited testing laboratory č. 1392, no. of certificate 318/2004, released ČIA by ČSN EN ISO IEC 17 025.

Test title: SOP 6001 Noise measurement

Test protocol: noise measurement

6682H/04

The highest admissible equipollet level acoustic pressure A for the other $L_{Aeq, 8h} = 85,0dB$ daily working time T.

Statement: This protocol can be reproduced without the expressed written permission of the testing laboratory, only in its entirety, the results are valid, only for this particular test. Any comparison of the above listed measured values, with requested values is beyond the scope of accreditation by ČSN EN ISO/IEC 17025. This protocol is not meant to replace any decision of the public health & safety institute. Potential uncertainty of measurement is outlined by expert estimate according to supplement D ČSN ISO 9612 in accordance with ČSN EN ISO/IEC 17025 and methodical instructions for noise and vibration measurement in the workplace, recorded under file HEM-300-26.4.01-16344, published by the Government Department of Health & Safety.

Distribution: 2x AMF REECE CR, Tovární 582, Prostějov, Mr. Šťastný

1x ZÚ in Olomouc, laboratory centre

Prepared Olomouc date 21.9. 2004

Performed by: Hana Šafářová

Supervised by : Dr. Bohuslav Dvorský

Laboratory center ZÚ in Olomouc

tel. 58 5719 262

The manager of the laboratory center

Dr. Vladimír Sázal