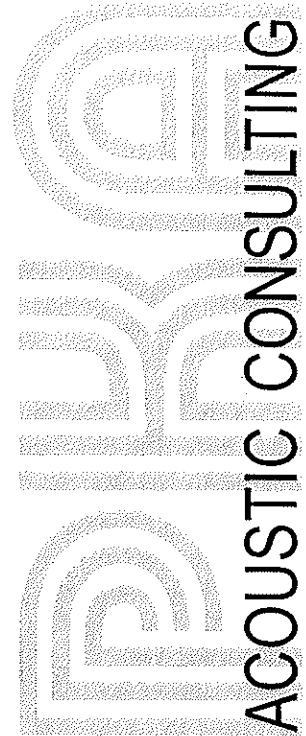

**Test Report for Telezygology
Sound Transmission Loss of a
Future Wall System
with Various Acoustic Infills**

201 084

June 2001

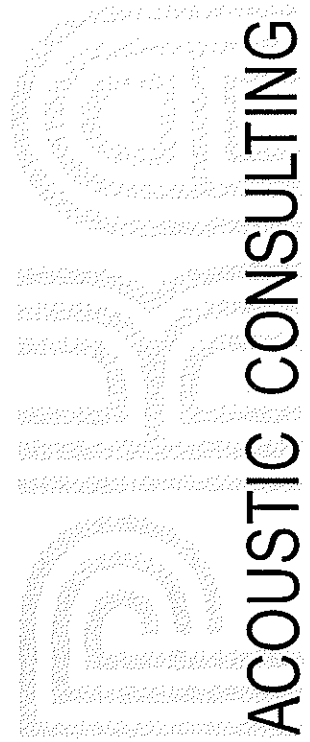


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Document Information

File: 201 084R01 Future Wall Tests.doc

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Checked:

Revision: Final

Distribution:

Date	Copies	Version	To:	By:
18 th June 2001		1.0	Margo Kouvaris	Fax
26 th July 2001	4	Final	Margo Kouvaris	Post

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1 INTRODUCTION

This report provides the results of Sound Transmission Loss tests for a Future Wall demountable partition system installed in a half-size acoustic laboratory. The partition was tested with normal MDF panels and no acoustic infill. Tests were then carried out with a polyester infill of nominal thickness 65mm and then glasswool infills of 50mm and 75mm thickness.

The tests were carried out on a 5.2m² sample installed in Rintoul's acoustic development laboratory located at their plant at Seven Hills. The test facilities comprise a source room constructed of plasterboard, which is connected via a transmitting port to a floating receiving room also constructed of plasterboard. The test aperture is comprised of a timber and steel reveal on both the source and receiving sides. The laboratory is capable of Sound Transmission Class 71 from the source room to the receiving room.

1.1 SUMMARY OF STC AND Rw TEST RESULTS

The following table presents a brief description of each test sample, the measured Sound Transmission Class, STC, and the Weighted Sound Reduction Index, Rw.

	STC	Rw
Standard partition 12 MDF no cavity infill	34	34
Standard partition 12 MDF with Insulco TSB 3 polyester in the cavity	36	36
Standard partition 12 MDF with 50 CSR Bradford Supertel Glasswool in the cavity	39	38
Standard partition 12 MDF with 75 CSR Bradford Supertel Glasswool in the cavity	39	38

The results are as anticipated, however the partition system is showing greater potential. The performance is limited by the coincidence frequency of the MDF board. If this is corrected a result of STC 42 seems possible.

2 TEST SPECIMEN DESCRIPTIONS

The partition comprised a tri-channel aluminium stud that allowed partition face panels to be clipped into the channel. The system provided an air cavity of 68mm between the rear faces of the clip in panels. For the test series the face panels were 12mm thick Medium Density Fibreboard. The aluminium stud frames and floor and top track were sealed into the laboratory test opening, using resilient foam tape. Proofing tests carried out before the main tests confirmed that the stud frame, floor and top tracks had been adequately sealed.

The first test was the standard partition system with no cavity infill.

For the second test, the panels on one side were unclipped and Insulco TSB 3 polyester insulation placed in the cavity. The panels were clipped in place. It was noted that the polyester insulation was described on the packaging as being 65mm thick, but the material used was typically 30mm thick. It is understood that this

may be the result of vacuum packaging of the polyester where there appears to be little or no recovery of the polyester upon release.

For the third test, the panels were unclipped, the polyester removed and then replaced with 50mm thick, 32 Kg per cubic metre CSR Bradford Supertel glasswool insulation. The panels were clipped back in place.

For the fourth test, the panels were unclipped, the 50mm thick Supertel glasswool was removed and replaced with 75mm thick 32 Kg per cubic metre CSR Bradford Supertel glasswool insulation. The panels were clipped back into place resulting in a slight compression of the glasswool insulation.

Notes

The transmitting port of the test chamber is 2.165m high x 2.4m wide (+3mm, -0mm), for a sample size of 5.20m². The transmitting port between the two chambers is in two halves, with a 310mm hardwood and steel reveal on the send room side and a 140mm hardwood reveal on the receiving (floating) room side. A gap of 20mm, filled with resilient mastic, is provided between the two reveals. Test samples were installed only on the reveal on the sending room side.

3 TEST PROCEDURE

The measurements were carried out in general accordance with Australian Standard AS 1191-1985 *Acoustics - Method for Laboratory Measurement of Air Borne Sound Transmission Loss of Building Partitions*. STC results were calculated using the procedure in Australian Standard AS1276 (1979) *Methods for Determination of Sound Transmission Class and Noise Isolation Class of Building Partitions*. Rw results were calculated using the procedure in Australian Standard AS1276 (1999) *Acoustics – Rating of sound insulation in buildings and of building elements Part 1: Airborne sound insulation*. Differences between the test method used and the Standard are due to the size of the test samples and room volumes.

Pink noise was amplified and reproduced by two loudspeakers in the Send room. The loudspeakers were located in the corners of the room opposite the partition being tested. Determination of the space average sound field in the source and receiving rooms was carried out using a Type 1 Precision Sound Level Meter and measuring the average Sound Pressure Level in each room. The sound field in both source and receive rooms was sampled for 64 seconds using a continuous traverse to obtain a space-time average, as described in the Standard. The equipment used comprised the following: -

- Svantek Svan 912AE Real Time Sound and Vibration Analyser
- Bruel & Kjaer Type 4230 Sound Level Calibrator
- PKA sound source with portable CD player, 2x50W RMS amplifier, and two separate speakers.
- Portable laptop PC with sound card, running Windows 98, for recording and analysing reverberation decays.
- JBL Smaart Pro acoustic analysis software for analysing reverberation time decays.

Full results of testing and calculation are included in the Appendix at the end of this report.

3.1 ROOM VOLUME OF SOURCE AND RECEIVING ROOMS

The room volumes are small, as the facility is a development laboratory. Using the formula given in AS 1191, the room is suitable for measurements of 200 Hz and above. In accordance with the Standard, the source and receiving room vary in volume by more than 10% and the ratio of room dimensions are in accordance with Appendix A.3.1.3 of the Standard. The sound field within both rooms has been calibrated and has been found to be uniformly distributed, even down to 100 Hz. Quadratic diffusers located on the wall and ceiling surfaces achieve sound diffusion within the room.

Measurements of standard plasterboard acoustic walls made in the Rintoul facilities compare very favourably with measurements of the same wall systems made in laboratories with 200 cubic metre source and receiving rooms. It is considered that the accuracy above 200 Hz is extremely good

4 DISCUSSION

The co-incident frequency of about 2500Hz of the MDF panels held back the sound insulation performance of the Future Wall. The use of steel panels as a backing to the MDF face sheets may change the co-incident frequency to a higher value and as a result the overall rating increase to about Rw 42. It is understood that steel panel backing is sometimes used for security purposes.

5 FUTURE WALL DETAILS

The details on the following pages show the section and plan of the Future Wall as tested.

6 SOUND TRANSMISSION LOSS RESULTS

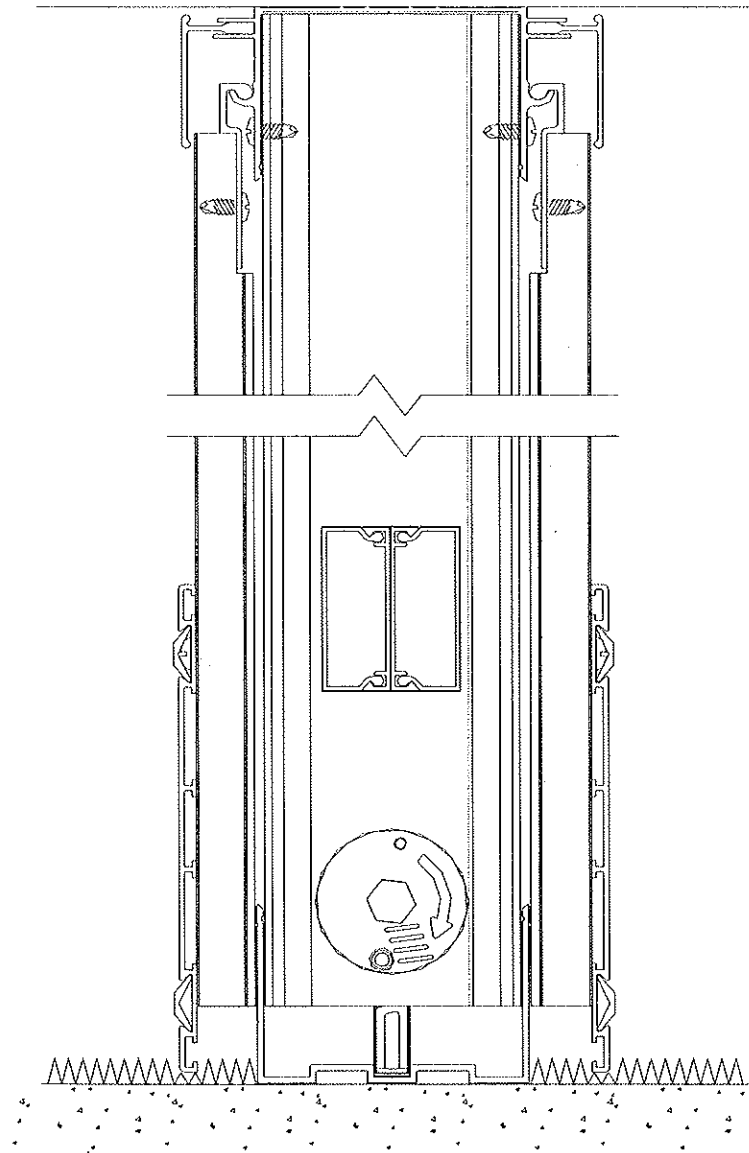
The measured results and corrections together with graphical presentation of the results are all contained on the following pages. The sequence of results are:

FutureWall no infill to cavity

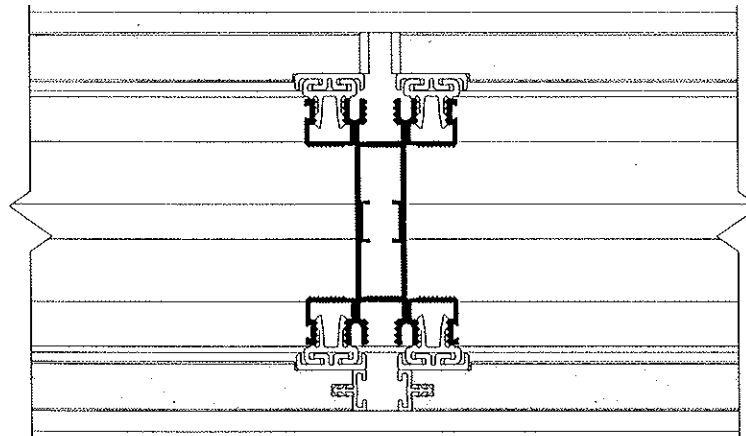
FutureWall with TSB3 polyester insulation blanket in cavity

FutureWall with 50 CSR Bradford Supertel glasswool in cavity

FutureWall with 75 CSR Bradford Supertel glasswool in cavity



Section

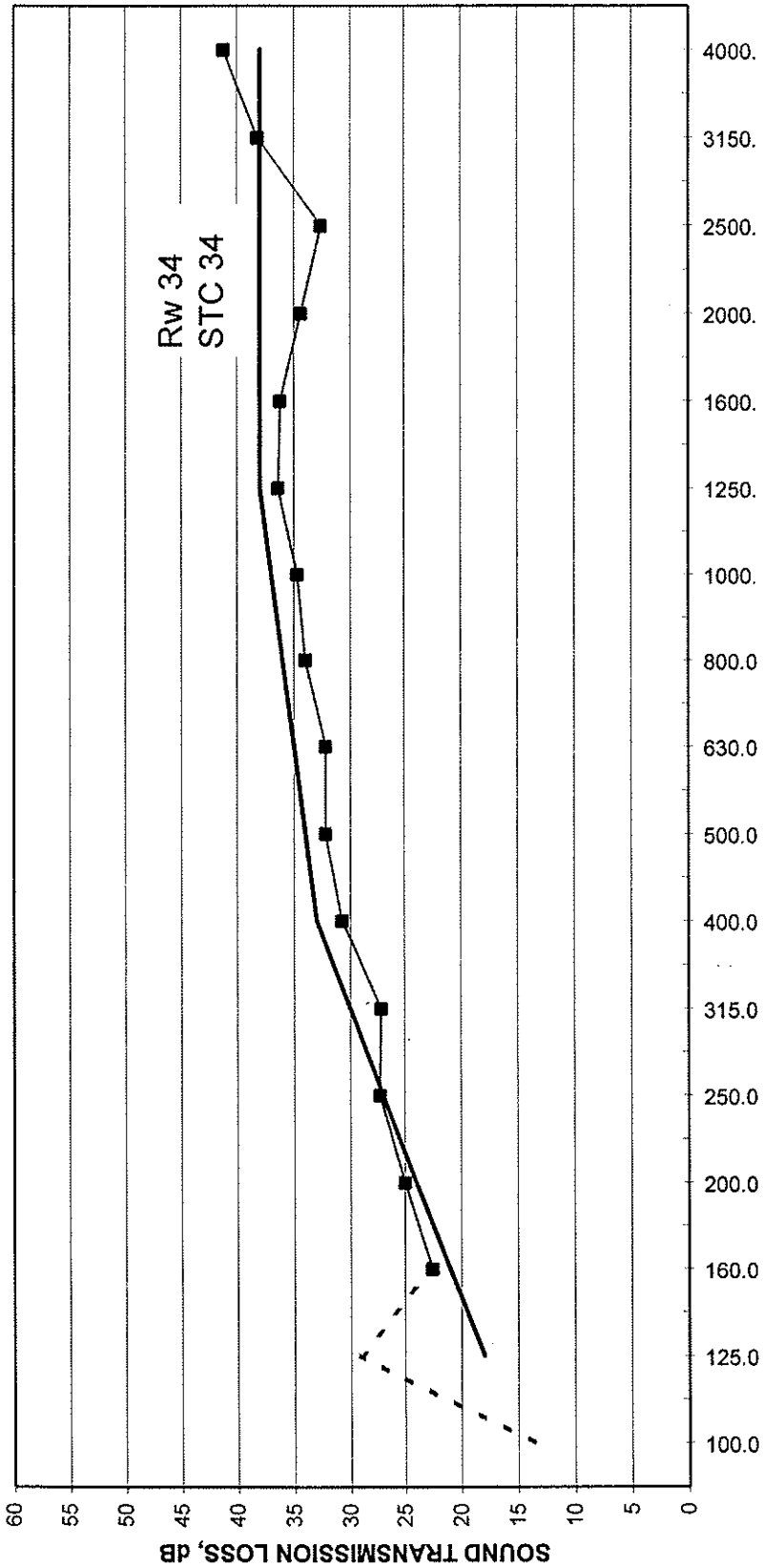


Plan

Test: 1		100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
Description	File	82	97	99	100	99	99	99	98	98	98	97	97	94	93	91	90	87	0
		71	70	79	79	76	76	72	69	68	66	64	62	59	60	60	53	47	0
Ambient		41	32	30	28	22	19	18	14	13	16	16	15	12	11	10	9	9	0
Amb. Corr'n		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0
Amb. Chk																			*
LVI Diff		11.0	27.0	20.0	21.0	23.0	23.0	27.0	29.0	30.0	32.0	33.0	35.0	35.0	33.0	31.0	37.0	40.0	4.0
Vol / RT60		22.57	1.29	1.14	1.27	1.75	1.86	1.85	1.47	1.16	1.11	1.04	0.96	0.92	0.97	1.01	0.93	0.93	0.82
S / Rm corr'n		5.196	2.7	2.1	2.6	4	4.3	3.7	3.2	2.2	2	1.7	1.4	1.2	1.4	1.6	1.2	1.2	0.7
STC / TL		34	13.7	29.1	22.6	25.0	27.3	27.2	30.7	32.2	34.0	34.7	36.4	36.2	34.4	32.6	38.2	41.2	4.7
Deficiencies		-27				0	-3	-2	-2	-3	-2	-2	-2	-2	-4	-5	0		
Comments 12mm MDF snap connected to aluminium posts 70mm air gap no insulation in cavity																			
RW		34																	

Future Wall Sound Transmission Loss Test

No Insulation Infill 9/4/2001



Rw 34
STC 34

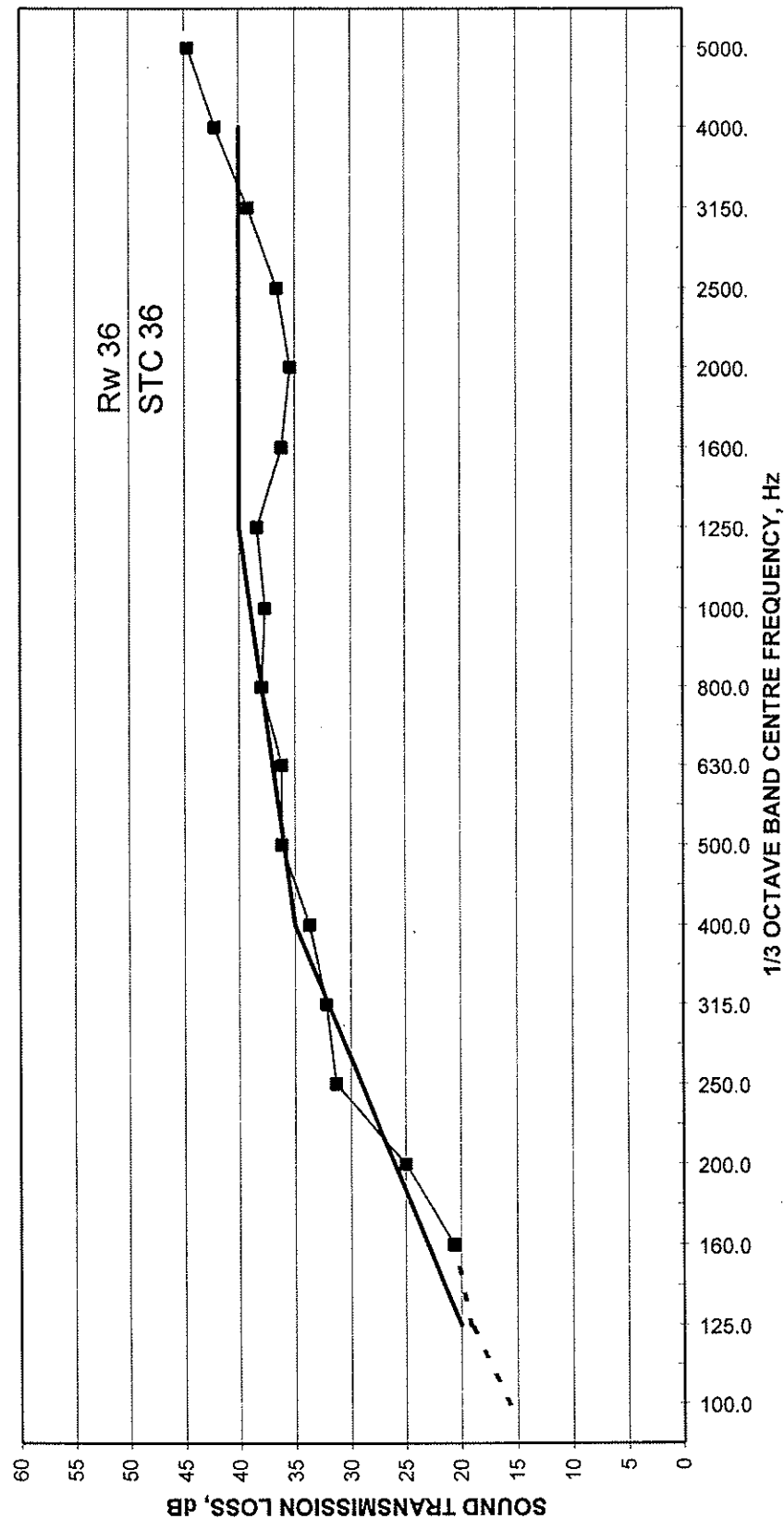
1/3 OCTAVE BAND CENTRE FREQUENCY, Hz

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Test: 2		100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
Description	File	82	92	94	95	96	95	95	95	94	95	94	94	91	91	89	88	86	85
SRC		69	75	76	74	69	67	65	62	60	59	58	57	56	57	54	50	45	41
REC		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ambient		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Amb. Corr		13.0	17.0	18.0	21.0	27.0	28.0	30.0	33.0	34.0	36.0	36.0	37.0	35.0	34.0	35.0	38.0	41.0	44.0
Amb. Chk		22.57	1.14	1.27	1.75	1.86	1.85	1.65	1.47	1.16	1.11	1.04	0.96	0.92	0.97	1.01	0.93	0.93	0.82
Lvl Diff		2.7	2.1	2.6	4	4.3	4.2	3.7	3.2	2.2	2	1.7	1.4	1.2	1.4	1.6	1.2	1.2	0.7
Vol/RT60		15.7	19.1	20.6	25.0	31.3	32.2	33.7	36.2	36.2	38.0	37.7	38.4	36.2	35.4	36.6	39.2	42.2	44.7
S/Rm corr		36	-1	-2	-1	0	0	-1	0	-1	0	-1	-2	-4	-5	-3	-1		
STC/TL		-22																	
Deficiencies																			
Comments	12mm MDF snap connected to aluminium posts 70mm air gap Insulco TSB3 polyestr insulation in cavity																		
Rw	36																		

Future Wall Sound Transmission Loss Test

Insulco TSB3 Infill 9/4/2001

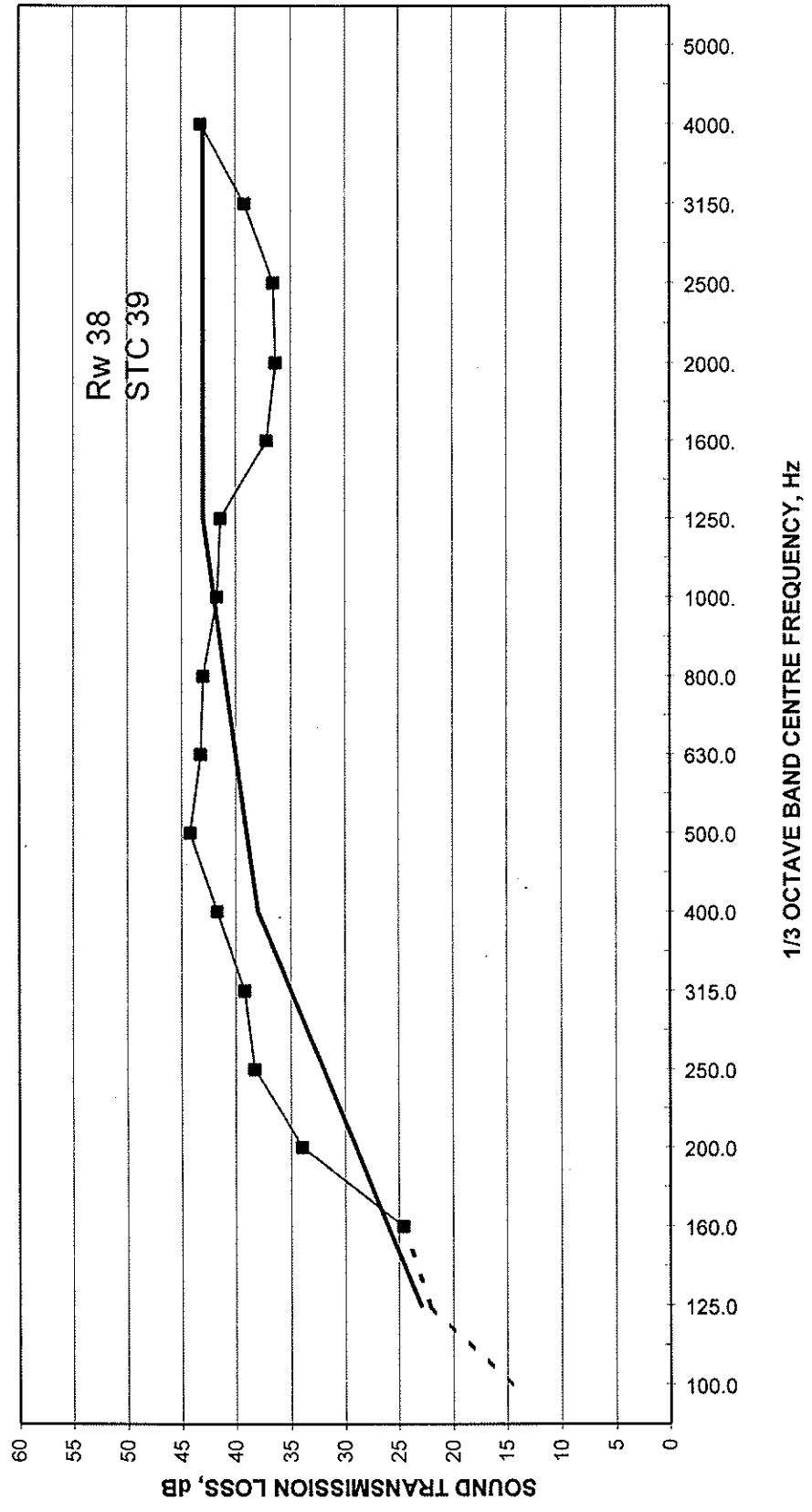


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Test: 3		100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
Description	File	82	96	98	99	100	99	99	99	98	98	97	97	94	93	91	90	87	
SRC		70	76	76	69	66	64	61	58	57	57	57	57	58	58	56	52	45	
Ambient		42	31	30	27	22	19	18	14	13	16	16	15	12	11	10	9	9	0
Amb. Corn		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0
Amb. Chk																			*
Lvl Diff		12.0	20.0	22.0	30.0	34.0	35.0	38.0	41.0	41.0	41.0	40.0	40.0	36.0	35.0	35.0	38.0	42.0	4.0
Vol / RT60		22.57	1.29	1.14	1.27	1.75	1.86	1.85	1.47	1.16	1.11	1.04	0.96	0.92	0.97	1.01	0.93	0.82	0.82
S / Rm corr		5.196	2.7	2.1	2.6	4	4.3	4.2	3.2	2.2	2	1.7	1.4	1.2	1.4	1.6	1.2	1.2	0.7
STC / TL		39	15	22	25	34	38	39	42	43	43	42	41	37	36	37	39	43	5
Deficiencies		-27	-1	-1								0	-2	-6	-7	-6	-4	0	
Comments 12mm MDF snap connected to aluminium posts 70mm air gap 50mm Supertel in cavity																			
Rw 38																			

Future Wall Sound Transmission Loss Test

50 Supertel Infill 9/4/2001

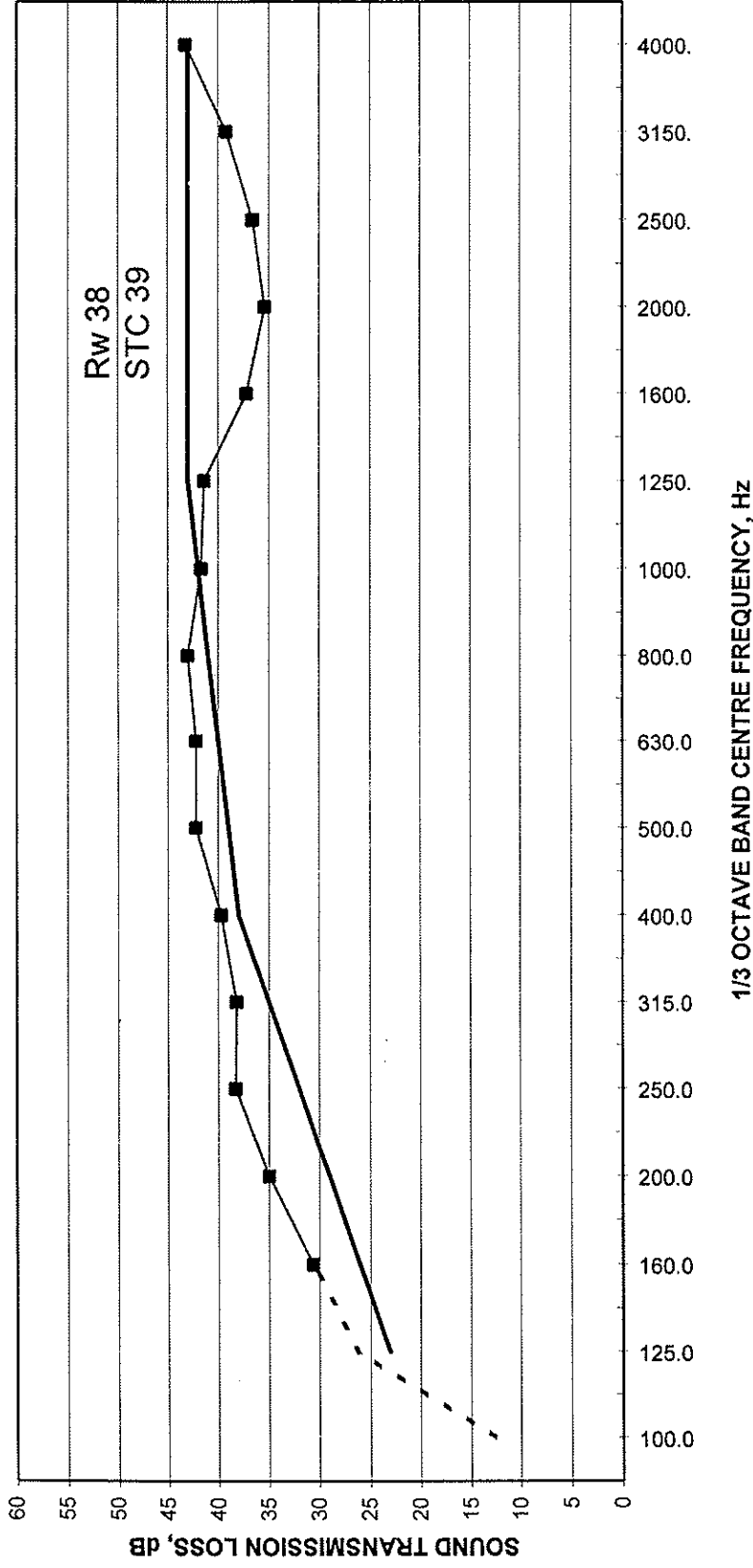


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Test: 4		100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	
Description	File	82	72	70	68	66	65	63	60	58	57	57	57	58	59	56	52	45		
SRC		82	96	98	99	100	99	99	99	98	98	97	97	94	93	91	90	87		
REC		72	72	70	68	66	65	63	60	58	57	57	57	58	59	56	52	45		
Ambient		42	31	30	27	22	19	18	14	13	16	16	15	12	11	10	9	9	0	
Amb. Corr		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	
Amb. Chk																			*	
Lvl Diff		10.0	24.0	28.0	31.0	34.0	34.0	36.0	39.0	40.0	41.0	40.0	40.0	36.0	34.0	35.0	38.0	42.0	4.0	
Vol / RT60	22.57	1.29	1.14	1.27	1.75	1.86	1.85	1.65	1.47	1.16	1.11	1.04	0.96	0.92	0.97	1.01	0.93	0.82	0.82	
S / Rm corr	5.196	2.7	2.1	2.6	4	4.3	4.2	3.7	3.2	2.2	2	1.7	1.4	1.2	1.4	1.6	1.2	1.2	0.7	
STC / TL	39	12.7	26.1	30.6	35.0	38.3	38.2	39.7	42.2	42.2	43.0	41.7	41.4	37.2	35.4	36.6	39.2	43.2	4.7	
Deficiencies	-26											0	-2	-6	-8	-6	-4	0		
Comments	12mm MDF snap connected to aluminium posts 70mm air gap 75mm Supertel in cavity																			
Rw	38																			

Future Wall Sound Transmission Loss Test

75 Supertel Infill 9/4/2001



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