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Loudspeaker Test

Report

Manufacturer: Penton Uk Ltd

Type: Ceiling loudspeaker

Model: RCS3T

For: Penton UK Ltd

Report No.: 1622/LS/RCS3T

Prepared By: Tim Gully

July 2005

1.00 Object

1.01 The object of this Report is to present measurements of the acoustic performance of the RCS3T device.

2.00 Scope

2.01 The following characteristics were measured

- On-axis frequency response
- Polar response
- Impedance
- Applied voltage
- On-axis 3rd octave band sound pressure level

from which the following are calculated:

(i) Directivity Index (dB), tabulated and graphical

(ii) Directivity factor, Q

(iii) Effective octave band impedance

(iv) Octave band Sensitivity (dB @ 1m, 1W/oct)

(v) Overall Sensitivity: dBA @ 1m, 1W
dBlin @ 1m, 1W
250Hz-4kHz @ 1m, 1W
Speech shape @ 1m, 1W

(vi) Acoustic Power (dB-PWL @ 1W), tabulated and graphical

(vii) Octave band Power Apportionment (%)

(viii) Impedance bode plot

(ix) Expected maximum Sound pressure level (dB @ 1m)

(x) Frequency response chart

(xi) Polar response charts.

3.00 Method

3.01 The device was mounted in Free Space as shown in figure 1 - Mounting Method C.

3.02 The measurements were made in an anechoic chamber.

3.03 Measurements were made as detailed in AMS Test Method document No. IR/1a/LS/Meth.

3.04 All measurements were made in general accordance with BS EN 60268: Part 5: 2003.

4.00 Results

4.01 The On-axis 3rd octave frequency response of the device is shown graphically in the appendix.

4.02 The Impedance bode plot of the device is shown graphically in the appendix.

4.03 Polar plots of the device are shown graphically in the appendix.

4.04 Tabulated values of Directivity index, Directivity factor, Sensitivity, Acoustic Power, Power Apportionment, Impedance and Maximum SPL are shown in the Summary data sheet given in the appendix.

4.05 The Directivity Index has been calculated using Gerzon' equal angle, weighted area method.

5.00 Notes

5.01 Sensitivity

The octave band sensitivity is produced in its useful form for calculations. It should be noted that the octave band sensitivity is given as dB @ 1m, 1W/Oct. To determine the output when only the overall power is known, then only the overall dBA or dBlin values should be used. For more detailed information, refer to AMS Acoustics Data Sheet 'Loudspeaker Sensitivity – Interpretation of Results'.

5.02 Polar Plots

For convenience, each polar plot has been normalized to 0dB. For this reason, caution is advised when comparison of levels between octave bands are made. The reference axis frequency response should be used for comparison purposes.

6.00 Engineers Notes & Observations

Reference point located at the geometrical centre of the loudspeaker device.

Reference axis made normal to the grille and included the reference point.

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Loudspeaker Information

Manufacturer :	Penton Uk Ltd
Model Code :	RCS3T
Type :	Ceiling loudspeaker
Colour :	White
Serial No. :	None
Batch No. :	None
Other Markings :	None
Backbox :	None
Grille :	As Supplied
Weight (grammes) :	450
Depth (mm) :	50 mm
Width (mm) :	100 mm
Height (mm) :	100 mm
Special Features :	None

Internal Details

Driver Types/Sizes :	3 inch Cone
Driver Serial No.(s) :	None
Driver Markings :	None
Damping Material :	None
Available Tappings :	6W, 4W, 2W, (100V)

Electrical Details

Resonant Frequency(s) :	See Impedance Plot
Cross-Over Frequency(s) :	N/A
Nominal Impedance (ohms):	8
Inductance :	NM
Capacitance :	NM

NM = Not Measured, NA = Not Applicable

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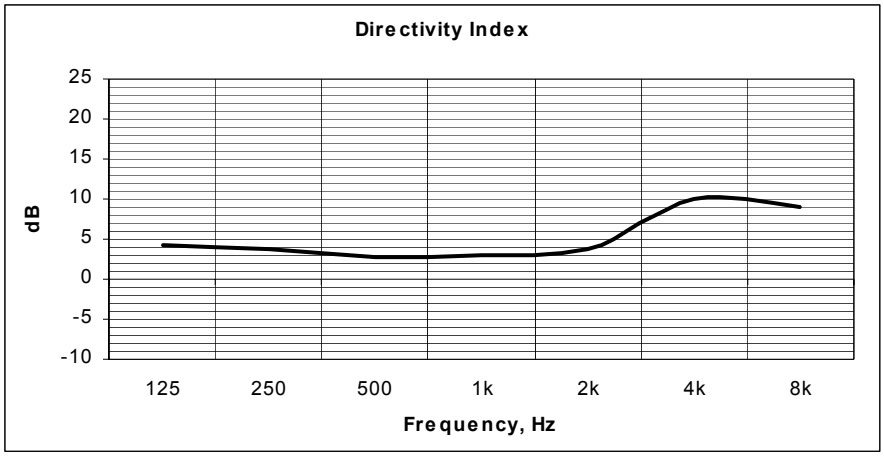
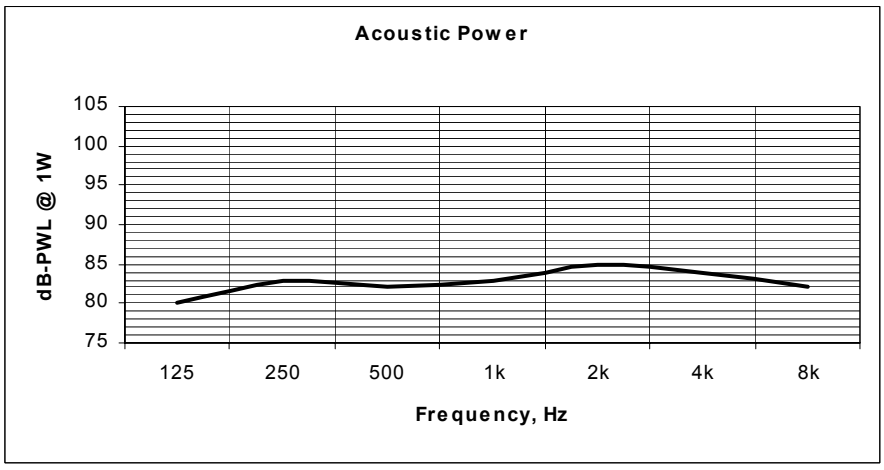
Manufacturer : Penton Uk Ltd
Model Code : RCS3T
Mounting : Half-Space, Free Field
Transformer Tapping : 6W

Reference Axis Located at : 0 degrees

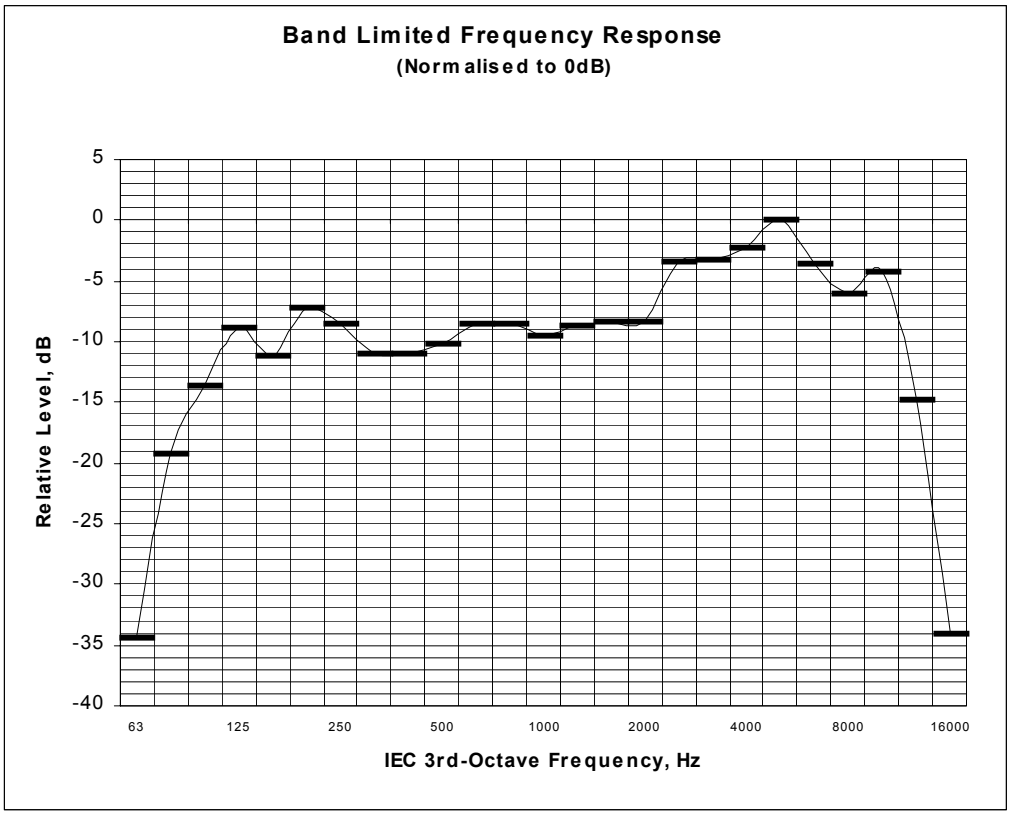
	Frequency (Hz)								
Parameter	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dB**	**dBA**
Axial Q	2.7	2.4	1.9	2.0	2.4	9.8	7.7		
Directivity Index (dB on Axis)	4.3	3.8	2.8	3.0	3.8	9.9	8.9		
Sensitivity (dB @ 1m, 1W/Oct)	82	84	82	83	86	91	90	87	86
Sensitivity(dB @ 1m, 1W)250Hz-4kHz								87	87
Sensitivity(dB @ 1m, 1W)Speech Shape								83	79
Acoustic Power (dB-PWL @ 1W)	80	83	82	83	85	84	82		
Apportioned Power (%)	15	14	16	15	15	13	9		
Effective Impedance (Ohms)	1703	1916	1569	1597	1719	2063	2939		
Expected maximum SPL (dB @ 1m)	81	83	82	83	86	90	87	94	94

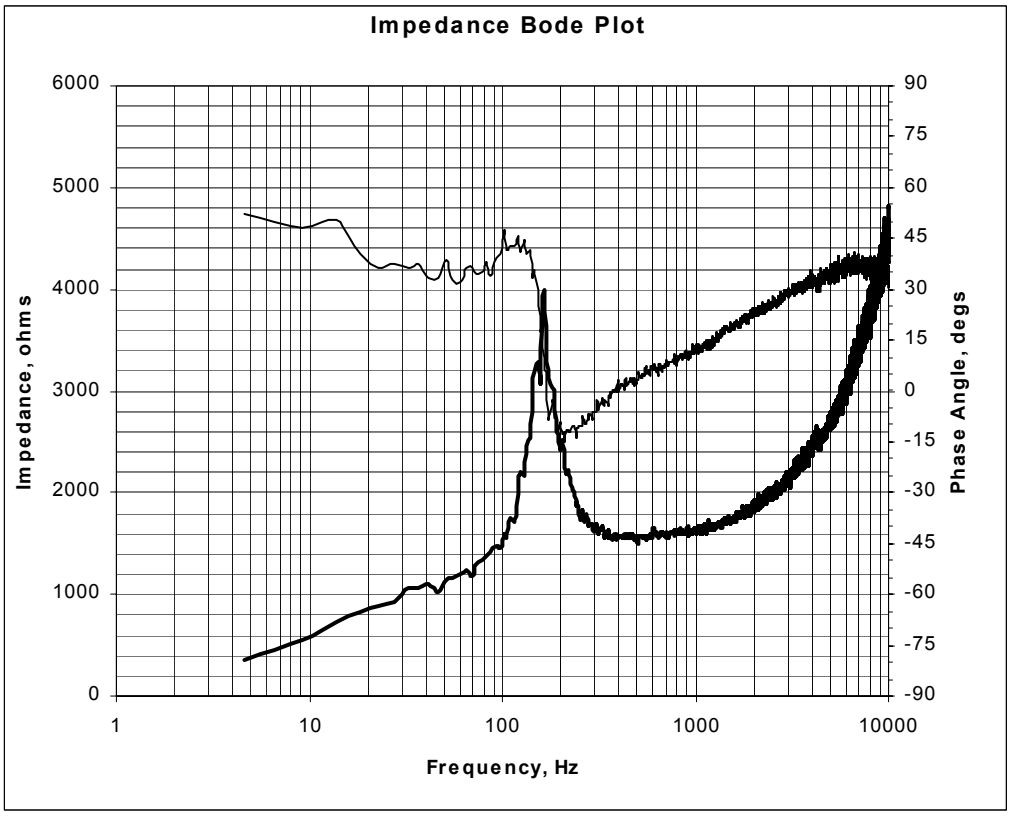
Test Signal: Pink Noise(100Hz-10kHz, 3rd octave bands)





RCS3T


Band Limited Frequency Response
(Normalised to 0dB)
Relative Level, dB
5
0
-5
-10
-15
-20
-25
-30
-35
-40
63
125
250
500
1000
2000
4000
8000
16000
IEC 3rd-Octave Frequency, Hz


Impedance Bode Plot
Impedance, ohms
6000
5000
4000
3000
2000
1000
0
Phase Angle, degs
90
75
60
45
30
15
0
-15
-30
-45
-60
-75
-90
1
10
100
1000
10000
Frequency, Hz

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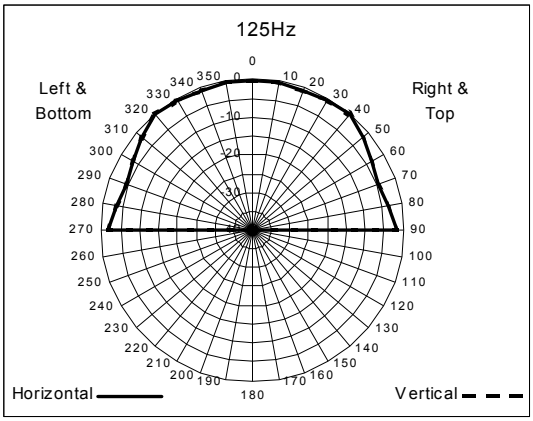
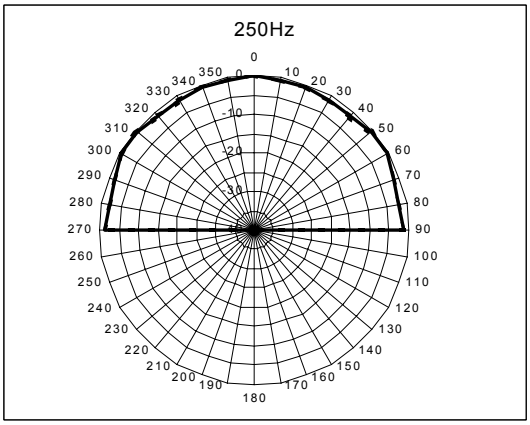
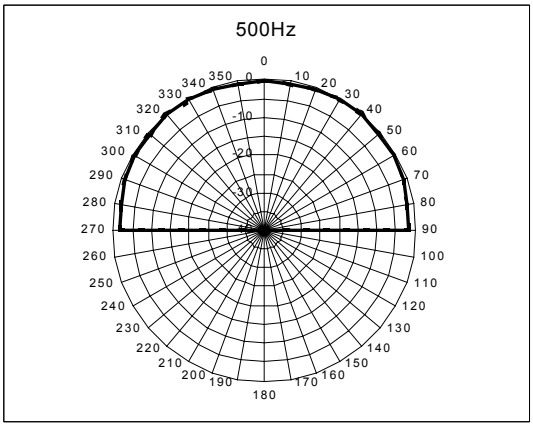
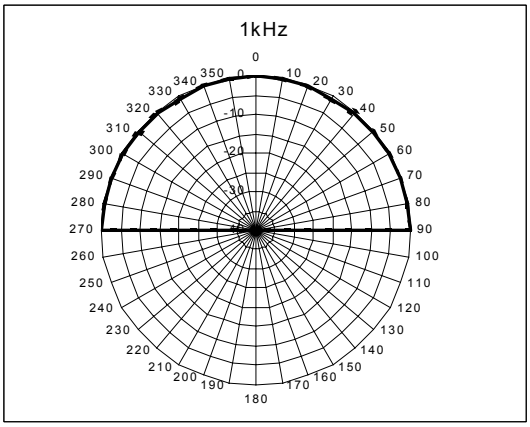
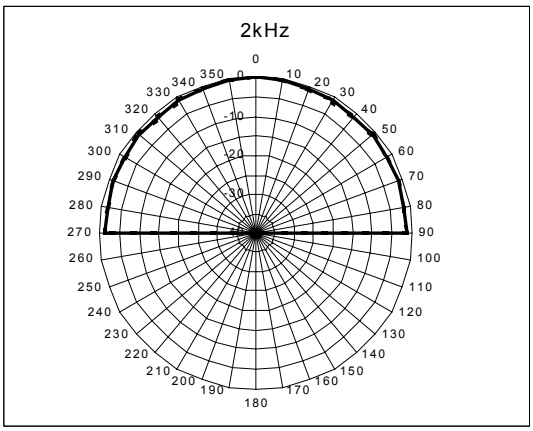
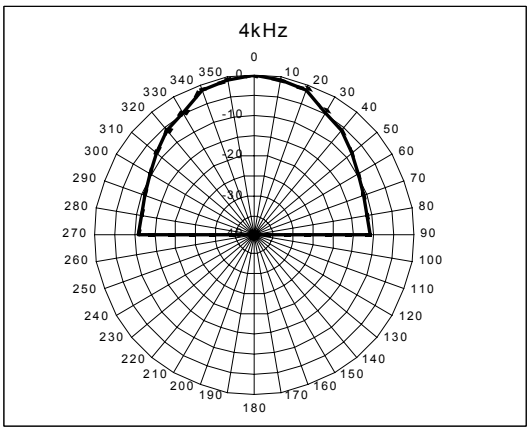


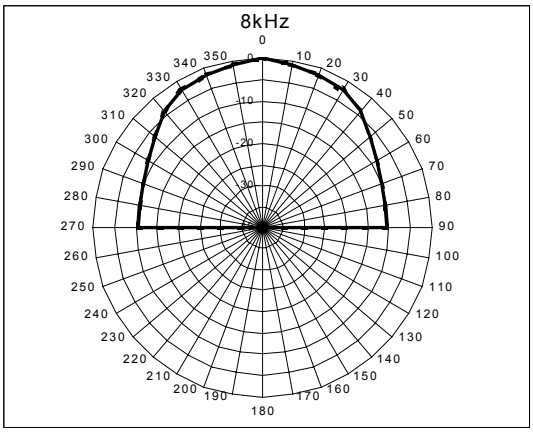


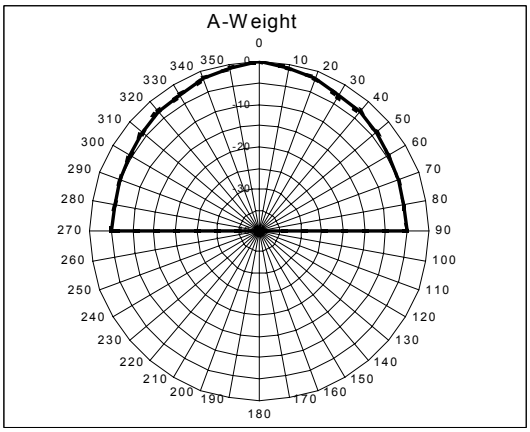






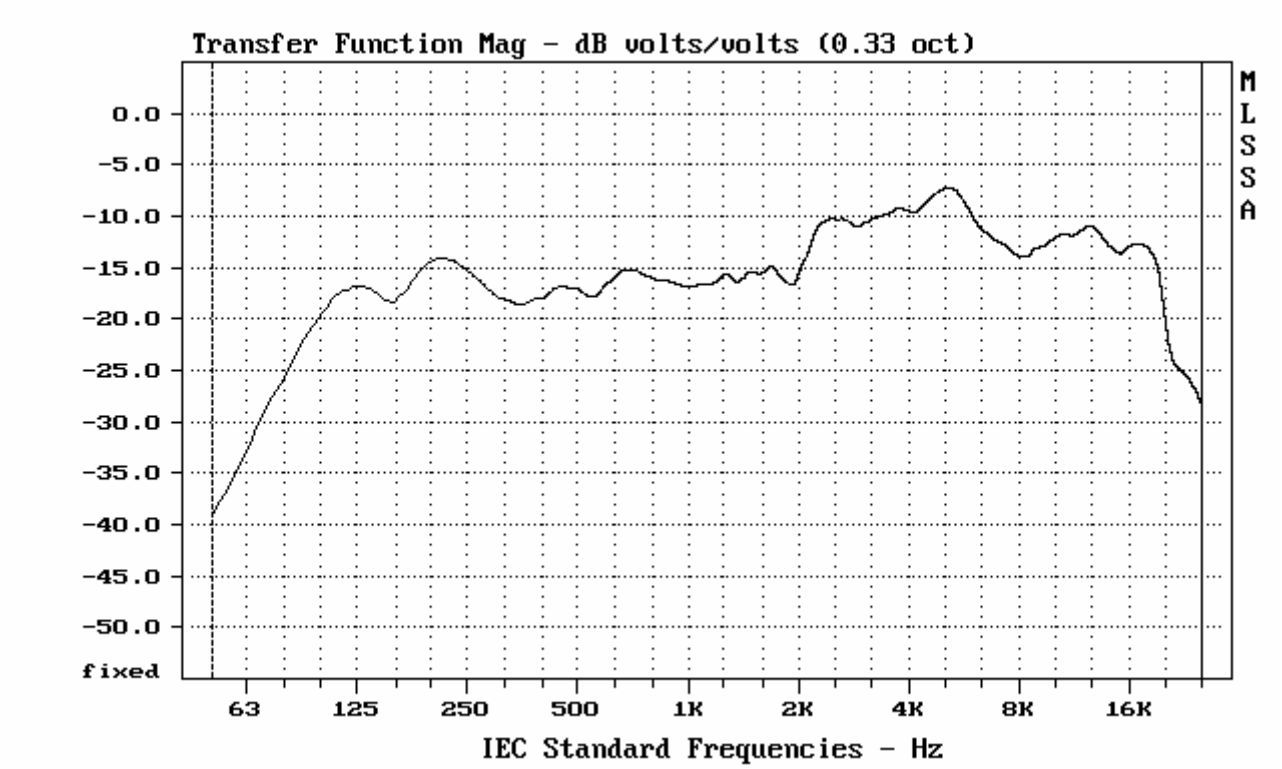






RCS3T

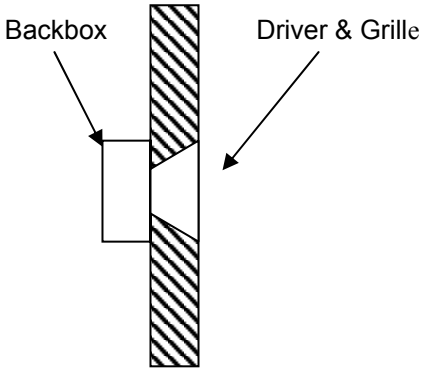
Wide Band Frequency Response
(Valid from 63Hz to 20kHz)



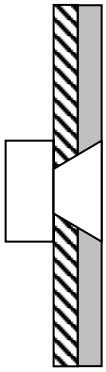
Note: The wide band frequency response is derived using MLS methods and does not necessarily relate to the sensitivity values given in the summary table.

Signed: Countersigned:

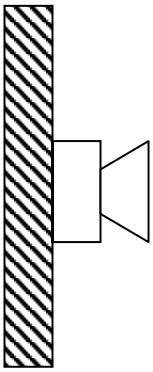
Loudspeaker Mounting Methods



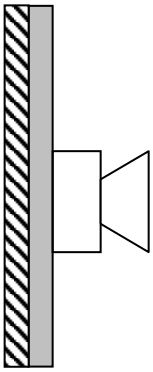
Mounting Method A
Loudspeaker Mounted
in a Reflective Baffle



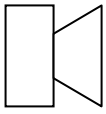
Mounting Method B
Loudspeaker Mounted
in an Absorbent Baffle



Mounting Method C
Loudspeaker Mounted
on a Reflective Baffle



Mounting Method B
Loudspeaker Mounted
on an Absorbent Baffle



Mounting Method E
Loudspeaker not Attached to any
Surface and Radiation Unaffected
by nearby Reflecting Surfaces