



DEWESoft[®]
measurement innovation

Reverberation Time - RT60

ROOM ACOUSTICS
REVERBERATION TIME -
ABSORPTION COEFFICIENT

DETERMINE THE ACOUSTIC PROPERTIES OF ROOMS AND
CALCULATE THE ABSORPTION OF MATERIALS -
SIMPLE AND EASY



INTRODUCTION

The acoustic properties of a room design should ensure that it is easy to both speak and listen with a high degree of intelligibility. Reverberation Time is the single most important parameter used to evaluate room acoustics.

The Dewesoft RT60 solution is the perfect tool for making reverberation time measurements. A combination of flexible hardware and easy to setup software provides reliable results for effective design and modification of room parameters.

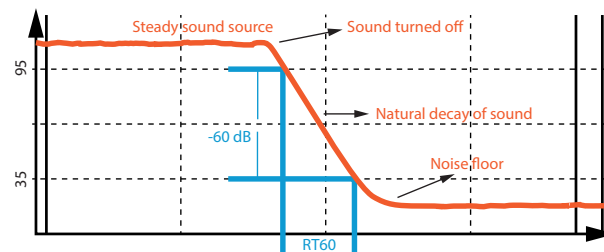
FUNCTIONALITY

Reverberation time (RT) is a measure for the time it takes sound to decay in an enclosure. Sound waves in a room will repeatedly bounce off reflective surfaces. When these reflections mix with each other, reverberation is created. Reverberation reduces when the reflections hit absorbent surfaces such as curtains, chairs, and tables.

RT60 plugin calculates the RT in different octave bands using integrated response or interrupted noise method with different evaluation ranges possible. The impulse response may be measured directly by using an impulse source, e.g. a pistol shot or balloon burst.

LEARN MORE:

<https://dewesoft.com/applications/acoustics/reverberation-time>



• Reverberation Time (RT60)

RT60 is defined as the time it takes for the sound pressure level to reduce by 60 dB, measured after the sound source is abruptly switched off. RT60 provides an objective reverberation time measurement.

• Sound absorption coefficient of materials (Alpha)

The absorption (alpha) coefficient of a material indicates the proportion of sound absorbed by a surface compared to the proportion reflected. It is calculated by two principles; Sabine equation (consistent with ISO 354:2004) or Eyring equation. Used in sound insulation measurements according to ISO 140 (all parts) and sound power measurements according to ISO 3740.

KEY FEATURES

- RT60 measurement compliant with ISO 354 using integrated response method.
- Different evaluation ranges for reverberation time estimation (T20, T30 and T60).
- Estimation of modal decay parameters using Lundby method.
- Absorption coefficient calculation - report template.
- Base for Sound power measurements - preliminary measurements to describe room properties.
- Free lifetime software support and upgrades.
- Optional: Octave filter and fractional octave filter calibration according to IEC 61260 and IEC 61672 for sound level meters.

APPLICATIONS

Room acoustic quality – sound comfort and intelligibility – of enclosed spaces such as domestic rooms, offices, workshops, factory halls, classrooms, lecture rooms, auditoria, concert halls, restaurants, sports halls, stairways, railway and airport terminals, vehicle cabins etc.



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more than 50 countries

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SOFTWARE: DEWESoft X3

Minimum

Processor:	Intel Atom Z3740
RAM:	2GB
Storage:	1GB of hard drive for software + Storage for data (32GB)
Graphic:	Open GL 4.0 support
OS:	Windows 7 (32bit - 64bit)
Other:	USB 2.0 or higher

Recommended

Processor:	Intel Core i5, 1.9 GHz
RAM:	4GB
Storage:	1GB of hard drive for software + Storage for data (32GB)
Graphic:	Open GL 4.0 support
OS:	Windows 7 (32bit - 64bit) or Windows 10 (64bit)
Other:	USB 2.0 or higher

MICROPHONE

Model	46AQ 1/2" CCP Random Incidence Standard Microphone Set
Frequency range (±1 dB)	12.5 Hz to 8 kHz
Frequency range (±2 dB)	3.15 Hz to 12.5 kHz
Frequency range (±3 dB)	3.15 Hz to 16 kHz
Dynamic range lower limit	17 dB(A)
Dynamic range upper limit	138 dB
Set sensitivity @ 250 Hz (±2 dB)	50 mV/Pa
Set sensitivity @ 250 Hz (±2 dB)	-26 dB re 1V/Pa
IEC 61094-4 Compliance	WS2P/D
Temperature range, operation	-30 to 85 °C
Temperature range, storage	-40 to 85 °C
TEDS	yes
Weight	33g

DAQ SYSTEM - SIRIUS ACC

Input types	Voltage, IEPE	
ADC Type	24bit delta-sigma dual core with anti-aliasing filter	
Sampling Rate	Simultaneous 200kS/sec	
Dual Core Low Range	±10V (±500mV)	±500mV (NA)
Input Accuracy (Dual Core)	±0.1% of reading ±10(1)mV	±0.1 of reading ±1(NA)mV
Dynamic Range@10kS (Dual Core)	140 dB (160 dB)	135 dB (NA)
Typ. SNR@50kS (Dual Core)	107 dB (125 dB)	100 dB (NA)
Typ. CMR @ 50Hz/1kHz	140/120 dB	140/120 dB
Gain Drift	Typical 10 ppm/K, max. 30 ppm/K	
Offset Drift	Typical 0.5 μV/K + 2 ppm of range/K, max 2 μV/K + 10 ppm of range/K	
Gain Linearity	<0.02%	
Inter Channel Phase-mismatch	0.02° * fn [kHz] + 0.1° (@ 200 kS/sec)	
Channel Cross talk	>160 dB @ 1kHz	
Input Coupling	DC, AC 0.1 Hz, 1Hz	
Input Impedance	1 MΩ (270kΩ for AC coupling ≥ 1Hz) in parallel with 100pF	
Overvoltage Protection	In+ to In-: 50 V continuous; 200V peak (10msec)	
IEPE mode		
Excitation	2, 4, 8, 12, 16 or 20mA	
Compliance voltage	25 Volt	
Output Impedance	>100 kΩ	
Sensor detection	Shortcut: <4Volt; Open: > 19Volt	
Additional Specifications		
Input connector BNC	BNC	
TEDS support	IEPE mode only	

ORDERING INFO

DEWESOFT RT60

- DEWESoft RT60: Reverberation Time Plugin
- SIRIUSm-4xACC: Sirius mini, 4 channels, including DEWESoft X3 software
- 46AQ: G.R.A.S. 1/2" CCP Random Incidence Standard Microphone Set
- 42AG: G.R.A.S. Multifunction Sound Calibrator, Class 1
- 42AG-CAL: Calibrator calibration IEC 60942 accredited
- AL0006: G.R.A.S. Tripod, general purpose, high quality
- AL0008: G.R.A.S. 1/2" Microphone Holder, POM

SOUND ANALYSIS - POWER

- DEWESoft SP: sound power plugin
- Sound analysis - Power (SP + SLM + RT60)
- 2x SIRIUS-8xACC: Sirius, 16 Channels, including DEWESoft X3 software
- 67HA-05: G.R.A.S. 1m 10 ch. CCP Sound Power Hemisphere
- 42AG: G.R.A.S. Multifunction Sound Calibrator, Class 1
- 42AG-CAL: Calibrator calibration IEC 60942 accredited

OPTIONAL

- IEC61672-CAL: Class1 chain calibration IEC 61672 accredited
- CPB-CAL: Filter calibration IEC 61260 accredited