¼ " MEASUREMENT MICROPHONE
EMX-7150

ACOUSTIC & VIBRATION DIVISION EMX7150-US-r03

PRODUCT DATA

TYPICAL APPLICATIONS

- ✓ Sound-power and sound-field analysis
- ✓ Industrial Acoustics
- ✓ Room acoustics analysis
- ✓ Sound reinforcement
- ✓ Real time analyzers

The EMX-7150 is a ¼" microphone made from stainless steel and using state of the art water tight Neutrik*3 connectors have a very accurate frequency response combined with the capability to measure high sound pressure levels up to 145dBspl.
It is a low impedance measurement microphone that can be operated from 12…52 V Phantom Power which is available on most professional microphone preamplifiers and professional computer interfaces. With its mechanically robust design it is well suited for harsh environment use such as open air sound reinforcement measurements. Its class 1 frequency response *(NOTE: NOT A CLASS 1 MICROPHONE)*1 makes it predestined for room acoustics analysis including recording studios and home theaters. It can normally be used without the included freefield calibration data file for compensation. In this case take the individual calibration data as proof of its superb performance.

ATTENTION The EMX-7150 should not be plugged or unplugged into a mixer console or PA system unless the input channel is muted. If the system does not have a muting option the volume should be turned off. This avoids loud popping noise that can cause damage in speakers and/or affect your hearing.

Our super protection windshield SWS -7 is highly recommended for open air use when possibilities of limited amounts of spraying or trickling water can impact the microphone.

FEATURES

- ✓ Frequency range **10Hz…20kHz**
- ✓ Sensitivity **6mV/Pa** typ.
- ✓ Dynamic range ~30… >140dBspl
- ✓ 3% distortion limits **145dBspl** typ.
- ✓ **Calibration** chart and calibration data files included on CD
- ✓ **IEC 61672 class 1** frequency response*1
- ✓ Dimensions: acoustic port dia. **¼" (7mm)**
  Microphone body **0.75" (**19mm)
  Overall length 6**" (152mm)**
- ✓ Weight **0.3oz (75 grams)**

ACTUAL SIZE

Small windshield included →

High SPL capability
freefield calibration data →
diffusefield calibration data*2

1/4" acoustical port →

Long microphone body
reduces early reflection effects →

All stainless steel body →

Factory replaceable electronics & capsule →

O-Ring seal →

Water tight connection
when using Neutrik*3 NC-3FX-HD connector →

**1: Class 1 Freq.Response unter limited conditions (23°C ± 3°C, 1013 mbar ± 30mbar)*
**2: approximated by 90deg incidence response*
**3 The corporate names and names of the products stated in this brochure are trademarks or registered trademarks of the respective companies.*

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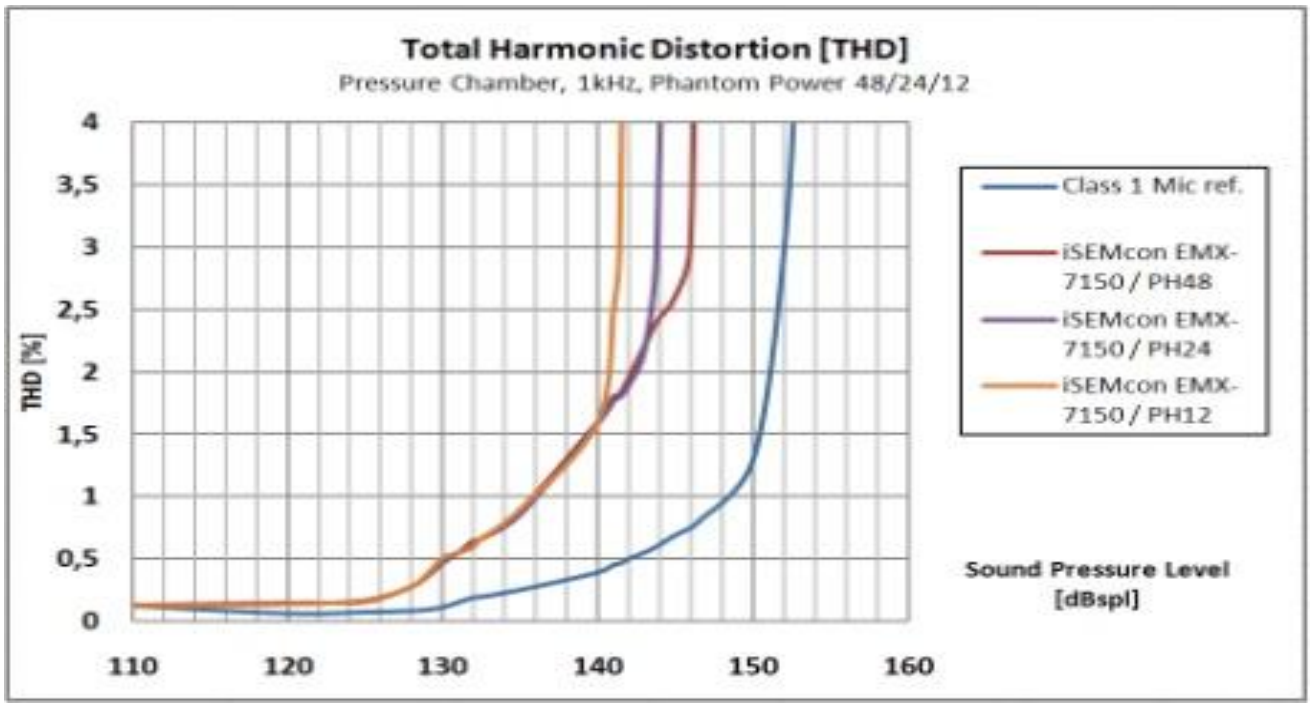
SPECIFICATIONS

Values for 23° Celsius and 48V Phantom Power

PERFORMANCE	
Frequency Response characteristic	Free-Field
Polarization Voltage	Prepolarized
Nominal Sensitivity @1kHz	6mV/Pa
Microphone Polarity	Non-Inverting
Frequency Response calibrated	10…20.000 Hz
Frequency Response IEC61672 *1	class 1
Inherent Noise100-10000 Hz	<30dB typ.
Inherent Noise 1/3 Oct.	<15dB typ.
Max. SPL. (3% distortion limit)	> 140dBspl
Max. SPL. (3% distortion) typ.	146 dBspl
ENVIRONMENTAL	
Operating Temperature range	-10…+55°
Storage Temperature Range	-20…+70°
Operating Humidity Range	0…90%r.H.
Axial Vibration Sensitivity	~ 50dB

ELECTRICAL	
Output Impedance	< 200 Ω
Phantom Power	12…52Vdc
PHYSICAL	
Housing Material	Stainless Steel
Sealing	O-ring/Polyurethane/Epoxy
Output Connector	XLR male
Dimensions	Ø ¼“(7mm) x 6“(152mm)
Weight	0.3 oz (75g)
CONFORMITY	
	IEC 61000-6-1;
	IEC 61010-1
SPECIAL FUNCTIONALITY	
Voltage surge protection	✓

THD , ref 1kHz



CALIBRATION DATA FILE FORMAT

Human readable ASCII file: 1/12 octave

www.iSEMcon.com freefield
Sensitivity 5.88 mV/Pa @1kHz
10.00 -0.02
11.26 0.10
…….
19992.19 0.93
^ frequency (Hz) ^amplitude response (dB

FREQUENCY RESPONSE (Calibration Chart)

iSEMcon ACOUSTIC & VIBRATION DIVISION

Microphone Frequency Response Measurement Report

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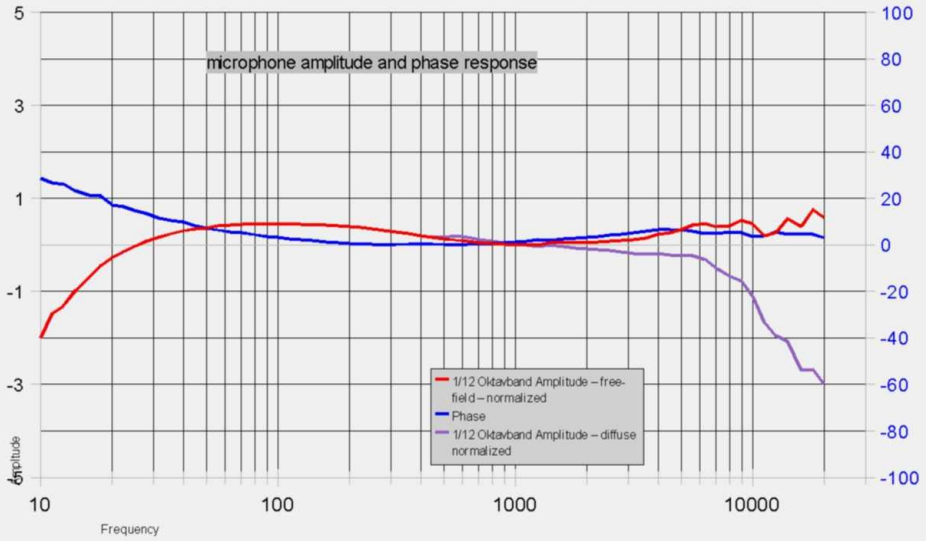
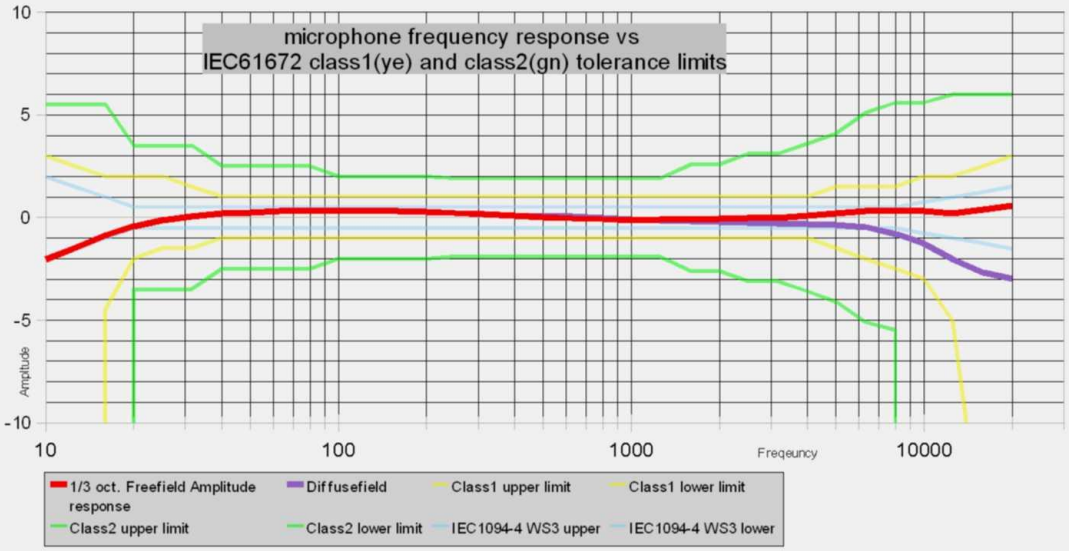
Microphone Manufacturer:	iSEMcon GmbH	Model:	EMM-13D082/H-P48/RM
Serial No.:	30061101	Preamp:	
Measurement Date:	30.06.11 dd-mm-yy	Temperature:	23,8 °C / 74,84 °F
Humidity:	34 %r.F. / r.H.	Pressure:	1011 mbar / 14,66 psi



1/3 Oktav-Center-f	Amplitude
10	-1,908
12,5	-1,363
16	-0,740
20	-0,295
25	-0,003
31,5	0,184
40	0,317
50	0,377
63	0,430
80	0,454
100	0,460
125	0,449
160	0,432
200	0,399
250	0,352
315	0,287
400	0,204
500	0,135
630	0,089
800	0,052
1000	0,000
1250	0,026
1600	0,047
2000	0,059
2500	0,094
3150	0,122
4000	0,233
5000	0,340
6300	0,453
8000	0,432
10000	0,444
12500	0,343
16000	0,522
20000	0,692



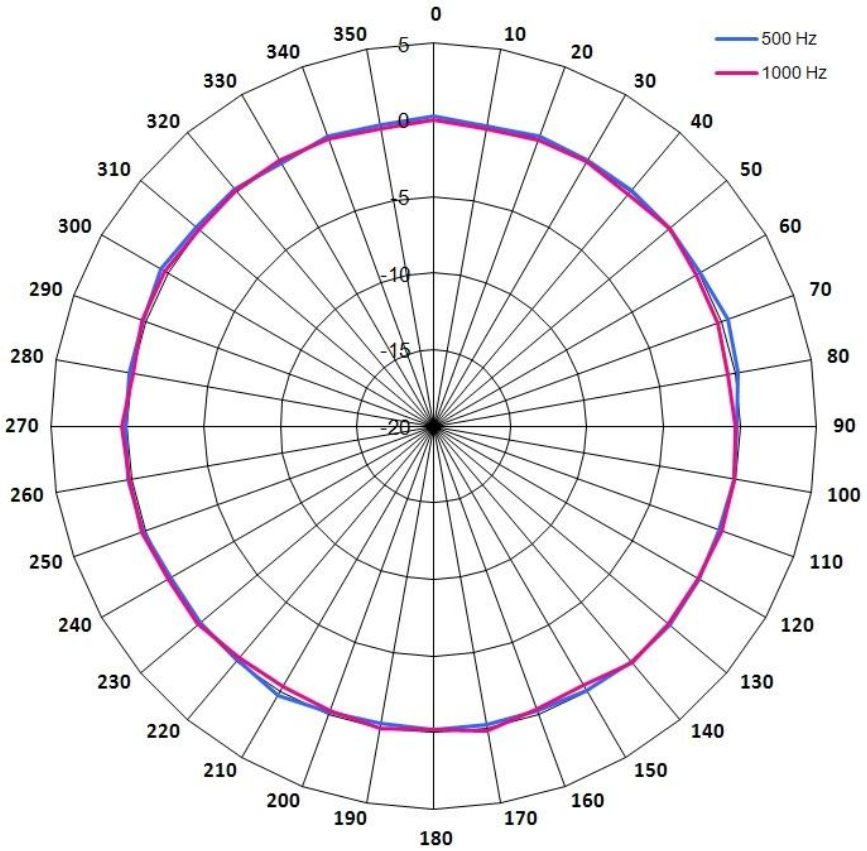
Microphone sensitivity:	P48: 6,93	P24: 6,84	P12: 6,69	mV @ 94dBspl,1kHz
Microphone power supply:	Phantom 12V / 24V / 48V			

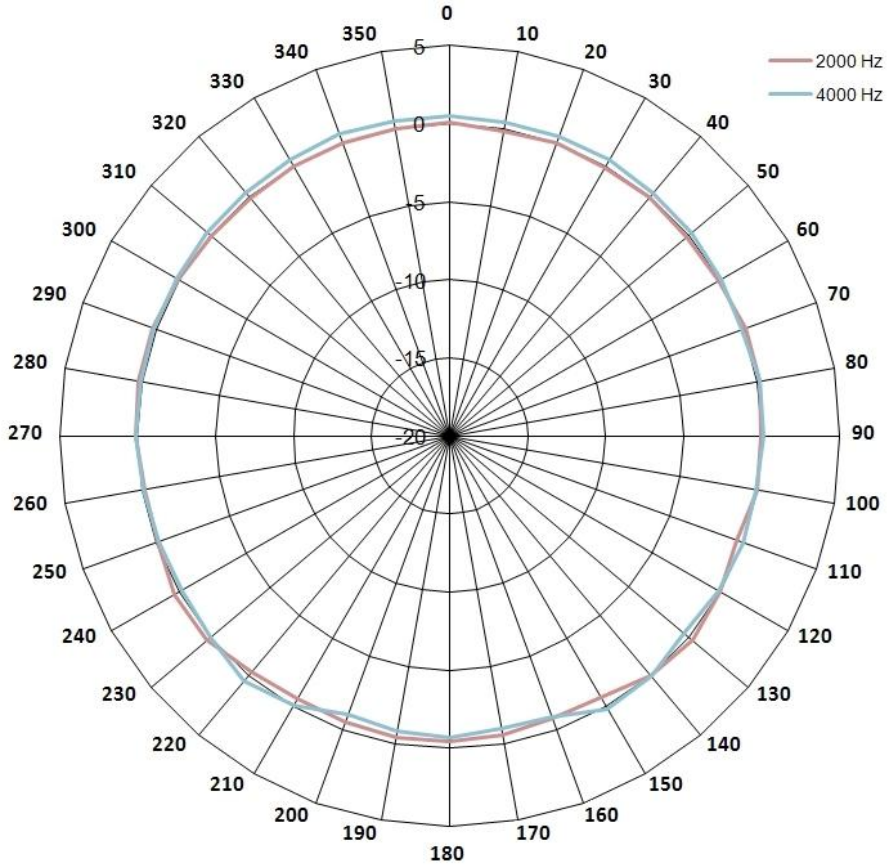
Reference microphone:	Brüel & Kjaer 4133
Sound calibrator:	Quest CA-22

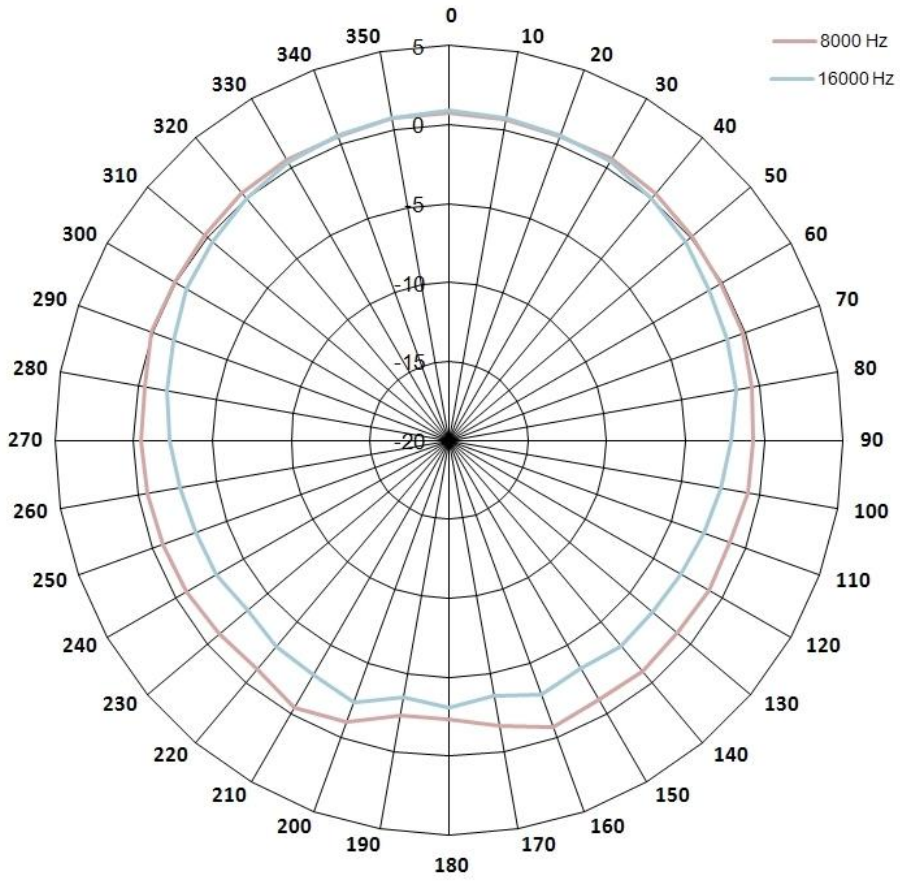
This document doesn' t represent a NIST (USA) or PTB (Germany) traceable calibration.
Die dokumentierten Kalibrierdaten sind weder auf die NIST (USA) noch auf die PTB (Germany) rückführbar.

This calibration sheet does not classify the microphone being class1 or class2 compliant as per IEC61672 .
Es erfolgt keine Einordnung des Mikrofons gemäß IEC61672 Klasse 1 oder Klasse 2.

POLAR PATTERNS, typical







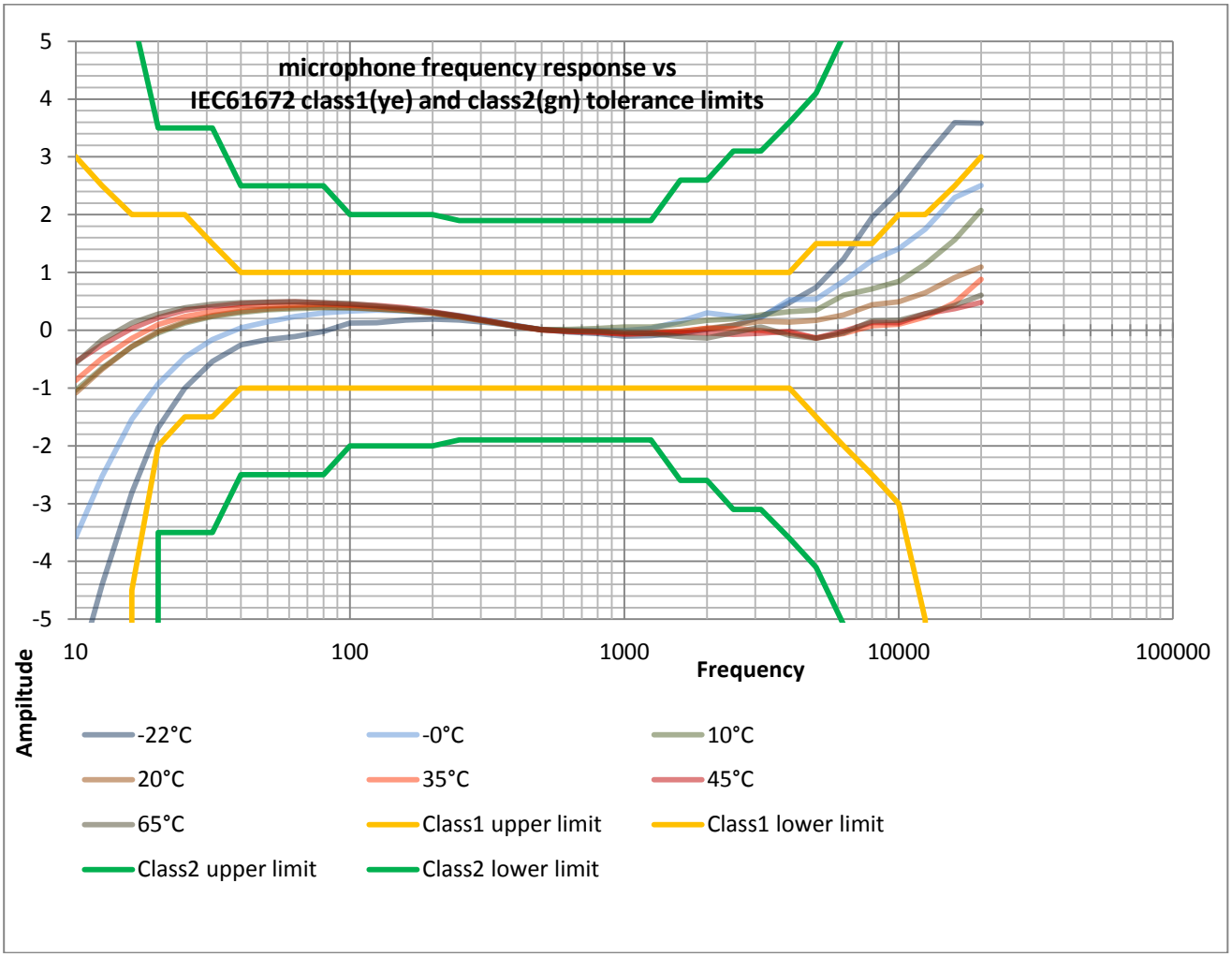
TEMPERATURE STABILITY

The temperature characteristics of the sensitivity of an electret condenser microphone depends on the electrical characteristics of the microphone capsule built-in impedance converter and signal conversion circuitry as well as the acousto-mechanical characteristics of the diaphragm equivalent stiffness. iSEMcon is one of the first microphone manufacturers disclosing the secret about the temperature behavior of electrets based measurement microphones.

		Frequency	
		250Hz	**1kHz**
Temperature	**-22°C**	6,8	6,4
	0°C	6,9	6,5
	10°C	7,1	6,6
	20°C	7,2	6,7
	35°C	7,3	6,8
	45°C	7,4	6,9
	65°C	7,5	7,0

The range for the measurement was set at -20 to 65 C which is more than iSEMcon microphones are normally used at. The most important temperatures are 10 °C up to about 55°C which covers indoor as well as open air use. It will give you a good predictable performance whether it is used in a cold autumn night or if the hot summer sun “burns” microphone body.

The right table shows the microphone sensitivity change at 250Hz and 1kHz. The diagram on next page shows how temperature affects the frequency response behavior of an EMX-7150 microphone. The microphone capsule itself is the part being responsible for most of the temperaturechange. *(see also: Temperature characteristics of electret condenser microphones Acoust. Sci. & Tech. 27, 4 (2006))*



SUPPLIED ACCESSORIES

Small windshield	Universal holding clamp		
			

OPTIONAL ACCESSORIES

MH-SH19 Shockmount	SWS-7 windshield	MB-230-BOX	SOUND CALIBRATOR SC-1
Features Shock absorbent. For use with our EMX-7150 microphone. Use from diameter 19…22 mm	Metal grid guard covered from impregnated foam. Protects microphone port from spraying water. Slide on retainer with O-ring prevents from trickle water	O-Ring seal Water protection Dust protection **Dimensions [mm]** 210 x 167 x 90	94dBspl and 110dBspl switchable. Standard and custom size adapters. Calibration data included (includes individual pressure chart)
			

**1: Class 1 Frequency Response under limited conditions only (23°C ± 3°C, 1013 mbar ± 30mbar). It does not meet the IEC 61672 over pressure, temp and long term stability.*

APPLICATION NOTE: FREEFIELD vs. DIFFUSEFIELD USE

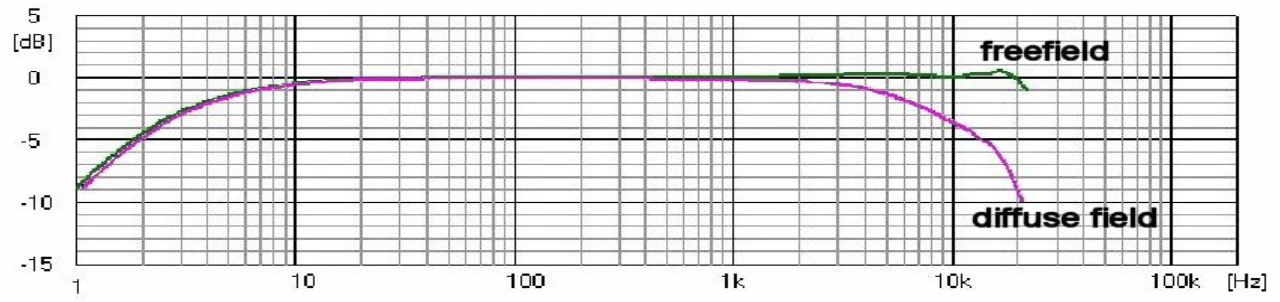
Only a small percentage of all acoustical measurements are performed in a well defined and/or well controlled environment of an e.g. acoustical laboratory – on the contrary most acoustical measurements are done under not really controlled conditions. Here are some hints on how to use our microphone.

Sound Fields:

Free field: There are no reflecting objects, only the microphone disturbs the sound field.
Diffuse field: There are many reflecting surfaces or sound sources so that the sound waves arrive from all directions.
Pressure field: This is found in small confined spaces like sound calibrators.

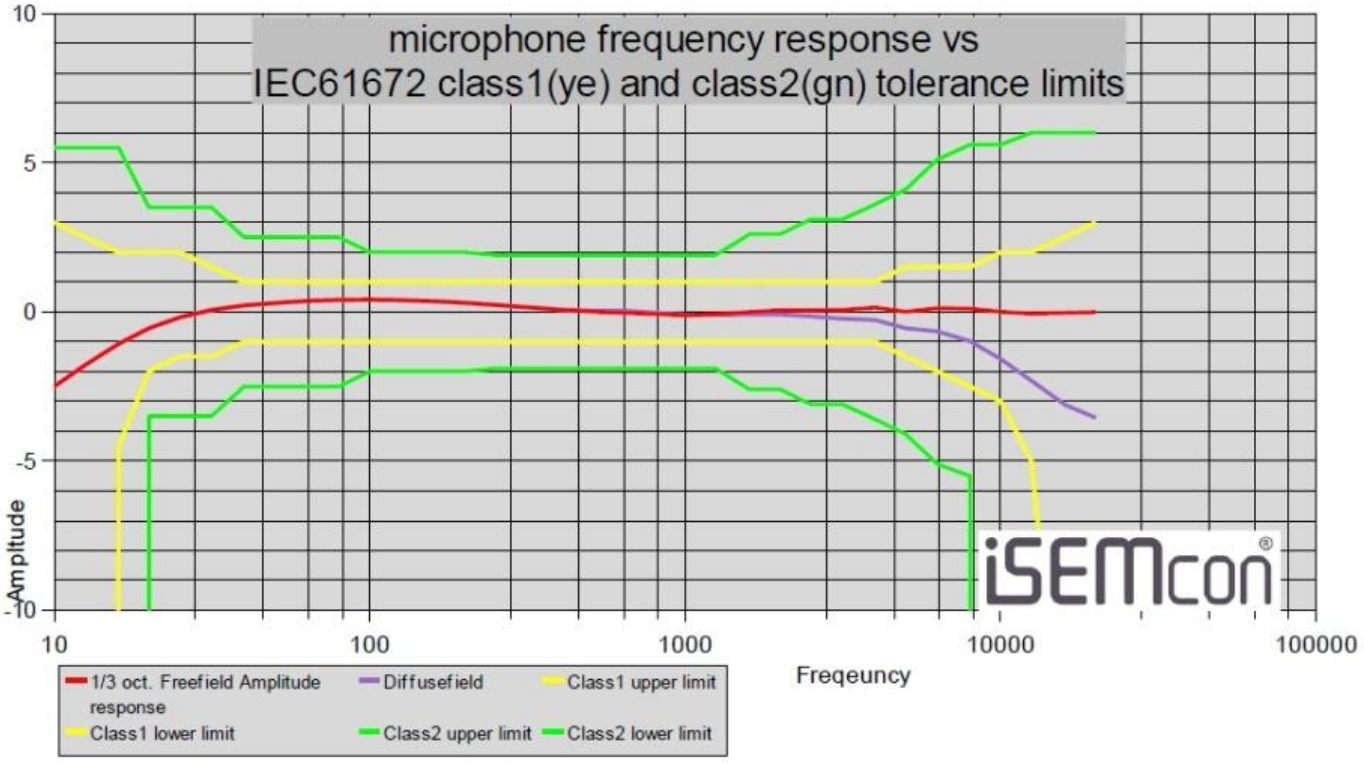
Depending on the nature of the sound field an appropriate microphone, which is optimized for the sound field could be selected. Unfortunately there are many practical situations where the sound field is not really of a well defined type. This application note should give you an idea on how to measure with a free field response microphone.

The free field microphone is the most common in use, chosen on tradition but we should know about the sound field. The following picture shows both the free field and the diffuse field response of a free field microphone.



The diffuse field response is not easy to measure, because it is not easy to generate a truly diffuse sound field over a wide frequency range but there is a known procedure to estimate the diffuse frequency behavior of a free field microphone. From literature we know, that a microphone's random (diffuse) incidence response can be approximated by measuring the 90 deg incidence response relative to a single sound source.

While it is an approximation only iSEMcon has measured the 90deg response of many EMX-7150 microphones and used the averaged data to generate a 19th order polynomial. This is now used to approximate the "diffuse field" response from the microphones free field response data.



Typical freefield measurement:

Speaker measurement. The microphone should target to the sound source (speaker)

Typical diffusefield measurements:

Concert SPL monitoring (normally at FOH), Room Acoustics measurement (RT60): the microphone should not target to the sound source. Let it target to the ceiling. This is the most practical way.

Picture left shows EMX-7150 microphone together with shockmount and floor-stand.