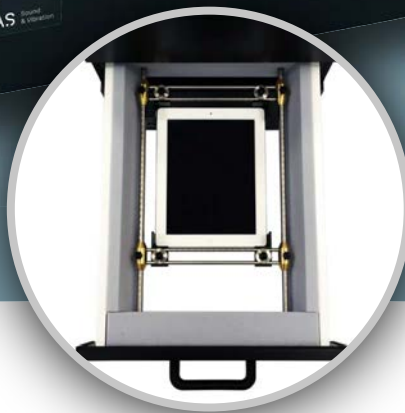


# Acoustic Test Chamber

GRAS AL0030-1, AL0030-2 and AL0030-3 for Production Line Testing

SIMPLE  
RELIABLE  
REPEATABLE



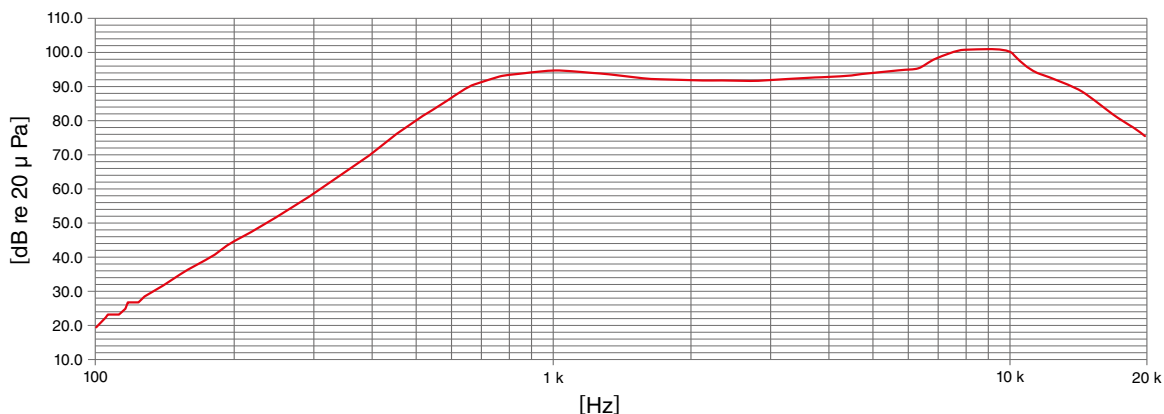
# Production Line Acoustic Test Chamber

The flexible production line acoustic test chamber is the latest in the range of anechoic chambers from GRAS and is built on our vast acoustic experience in the field. It is designed for quick and qualified acoustic test of cell phones, tablets, Bluetooth speaker systems etc. It can handle testing of frequency response, THD, Rub&Buzz and other microphone tests using optional sound sources. The chamber has a number of connections for injecting test and control signals to the Device Under Test (DUT).



Test jig with DUT and measurement microphone.

- Repeatable testing and reliable data
- Easy open/close for quick and safe change of DUT
- Flexible test jig for easy adjustment to new DUT
- Flexible microphone mounting for both front/back side speakers as well as edge-mounted speakers
- High quality, high sensitive 1/4" CCP measurement microphone included
- Individually calibrated frequency response (compared to a reference measurement in the room)



Graph showing 10 consecutive measurements on the same DUT



# Mounting Accessories

## Included in the basic configuration

- Acoustic test chamber (standard drawer or large drawer)
- Choice of one ¼" reference microphone (46BD, 46BE or 46BL)
- Choice of one set of DUT holders (OP0030, OP0031, OP0032, OP0033)
- Choice of one microphone holder (OP0040 or OP0041)
- One connector panel incl. 4 connectors of own choice
- One cable for microphone (AA0079)

## Optional equipment

- 44AA Mouth simulator with built-in Power Amp
- 44AB Mouth simulator for external Power Amp
- 43AH CCP Ear simulator for production line testing according to ITU-T P57 3.2 LL
- 43AI CCP Ear simulator for production line testing according to ITU-T P57 3.2 HL

## Optional cables

- AA0032 BNC–BNC cable 0.5 meter
- AA0033 BNC–BNC cable 1 meter
- AA0034 BNC–BNC cable 2 meter
- AA0035 BNC–BNC cable 3 meter
- AA0070 Microdot–BNC cable 3 meter
- AA0144 Microdot–BNC cable 1 meter

## Reference microphones

- 46BL-1 ¼" High sensitive pressure CCP microphone set
- 46BD ¼" Low sensitive pressure CCP microphone set
- 46BE ¼" Free Field CCP microphone set
- 46AO ½" Pressure CCP microphone set

## DUT holders

- OP0030 DUT holder with narrow edge and 40 mm deep mounting
- OP0031 DUT holder with wider edge and 40 mm deep mounting
- OP0032 DUT holder for thinner devices, narrow edge
- OP0033 DUT holder for thinner devices, wider edge

## Microphone holders

- OP0040 ¼" Microphone holder for mounting in top or bottom of chamber.
- OP0077 ½" Microphone holder for mounting in top or bottom of chamber.
- OP0041 ¼" Microphone holder for drawer mounting.
- OP0078 ½" Microphone holder for drawer mounting.

## Sound source holders

- OP0045 Holder with swivel head for GRAS 44AA
- OP0046 Heavy duty version of the above holder

## Connector panels

- OP0050 Connector panel for AL0030-1  
–Standard Drawer with space for 8 selectable connectors
- OP0050-S2 Connector panel for AL0030-2 and AL0030-3  
–Large Drawer with space for 10 selectable connectors

## List of selectable connectors

Look at page 6

Microphone Holder OP0040



Microphone Holder OP0041



Sound Source Holder OP0045



Sound Source Holder OP0046



# Build your own Acoustic Test Chamber

## Chamber functionality

The chamber acts like a mini anechoic chamber allowing test of acoustic devices without the hassle of going into a full scale anechoic chamber\*. The drawer allows quick exchange of the DUT without putting physical stress on the operator. A marked and flexible test jig enables easy adjustment to different size DUTs and for duplicating test setups from one chamber to the next. A large opening at the back of the chamber permits easy access for configuring the test setup. The chamber stands on four shock and vibration absorbing rubber feet to avoid vibration from other devices influencing the measurements.

The standard configuration includes the basic suite of accessories needed for immediate audio response testing, with an array of available options allowing you to customize settings according to your testing needs.

## Configurations

The chamber is available in 3 basic configurations:  
**AL0030-1:** Delivered with small drawer, for maximum DUT dimensions (WxDxH) 30 x 20 x 6,6 cm.

**AL0030-2:** Delivered with large drawer with fixture place in upper part of test space and maximum DUT dimensions (WxDxH) 30 x 20 x 22,8 cm.

**AL0030-3:** Delivered with large drawer with fixture place in lower part of test space and maximum DUT dimensions (WxDxH) 30 x 20 x 22,8 cm.

**For special requests contact your local GRAS sales partner.**

*\*Due to chamber size the anechoic performance is limited at lower frequencies.*

## Available connectors

The connector panel has space for either 8 connectors (AL0030-1) or 10 connectors (AL0030-2 and AL0030-3). All three versions are by default delivered with 4 connectors of your own choice. It is possible to select any of the connectors listed below. The remaining connector holes are either mounted with additional connectors from the below list or with blind plates.

CONNECTORS	
BNC Socket Female	AE2197
RCA socket Female	AE2198
XLR Connector 3 pol Female	AE2199
Loudspeaker connector plug, SpeakON, 4way	AE2200
S-VHS Female to S-VHS Female	AE2201
1/4" jack, 3 pol	AE2202
D-sub 9 pin	AE2203
HDMI-Connector	AE2204
Ethernet connector	AE2205
USB - A adapter	AE2206
USB - B adapter	AE2207

Your local GRAS sales person can help you configure the chamber according to your application and needs.

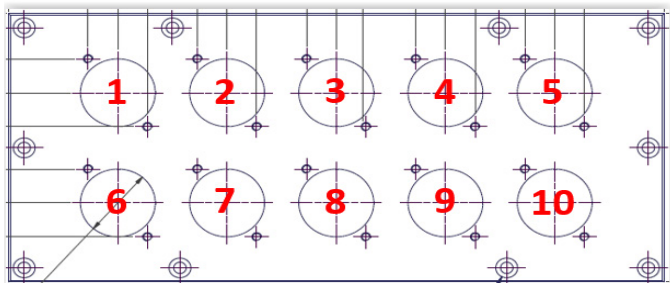
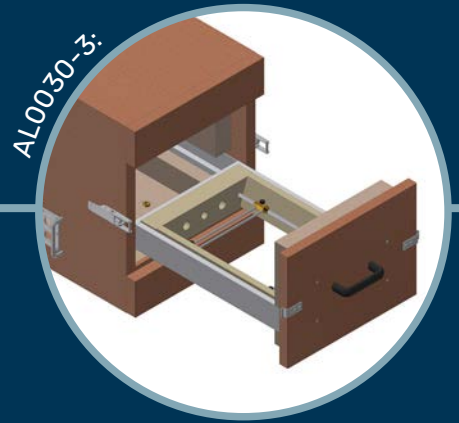
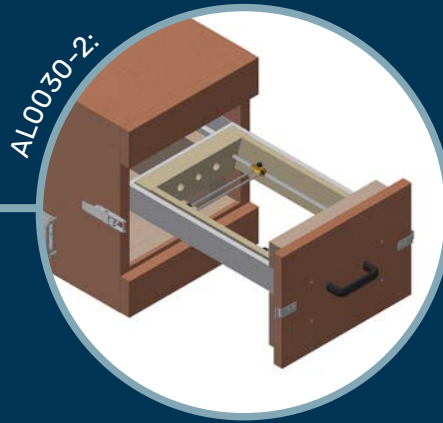
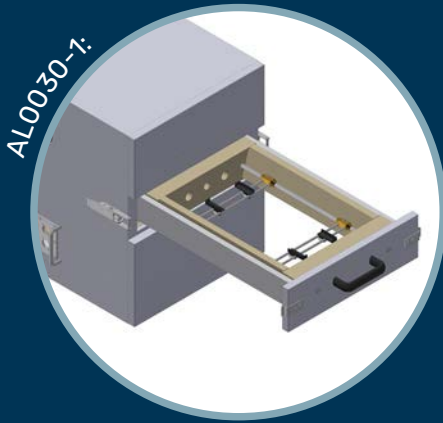


Fig 1. Connector PANEL AL0030-2 And AL0030-3 seen from the front. The connector panel for AL0030-1 has 8 connector holes.

# PROCESS FOR

## how to build your own test chamber:



### 1. Select the drawer size:

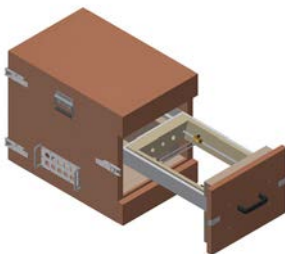


#### **AL0030-1:**

##### **Small drawer**

Used for test of relative flat DUT's such as smartphones, tablets, hearing aids, etc.

Max DUT dimensions (WxDxH) 30 x 20 x 6,6 cm.

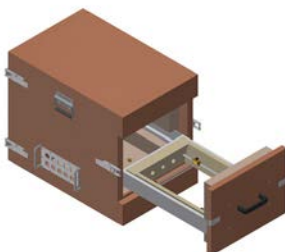


#### **AL0030-2:**

##### **Large drawer with DUT holder in upper part of the chamber.**

Used for test of DUT's with relative higher height that benefit from a holder placed high in the test chamber. Such as speakers, smart speakers etc.

Max DUT dimensions (WxDxH) 30 x 20 x 22,8 cm. Height above holder is 11,9 cm.



#### **AL0030-3:**

##### **Large drawer with DUT holder in lower part of the chamber.**

Used for test of heigh DUT's that benefit from a holder placed low in the test chamber. Such as speakers, smart speakers etc.

Max DUT dimensions (WxDxH) 30 x 20 x 22,8 cm.

## 2. Select DUT holder

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**OP0030 DUT holder with narrow edge** (holding flank) and a mounting depth of 40 mm.



**OP0032 DUT holder for thinner devices**, has narrow edge (holding flank) and a mounting height of 7,5 mm above the holder.



**OP0031 DUT holder with wider edge** (holding flank) and a mounting depth of 40 mm.



**OP0033 DUT holder for thinner devices**, has wider edge (holding flank) and a mounting height of 7,5 mm above the holder.



## 3. Select Test microphone

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**46BL-1, ¼" High sensitive pressure microphone**, 4 Hz -20 kHz, 24dB(A)-146dB.

**46BD, ¼" pressure microphone**, 5Hz-70kHz, 44dB(A)-166dB.

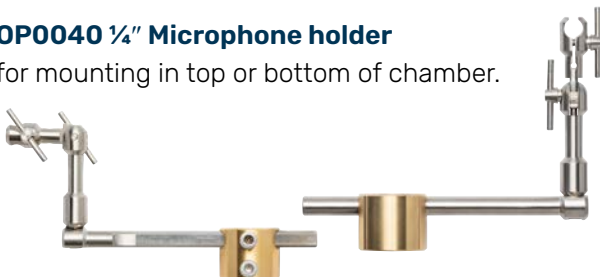
**46BE, ¼" freefield microphone**, 4Hz-80kHz, 35dB(A)-160dB.

**46A0 ½" pressure microphone**, 3Hz-20kHz, 25dB(A)-150dB.

## 4. Select microphone holder

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**OP0040 ¼" Microphone holder** for mounting in top or bottom of chamber.



**OP0077 ½" Microphone holder** for mounting in top or bottom of chamber *(looks like OP0040 with a ½" holder)*.

**OP0041 ¼" Microphone holder** for drawer mounting.



**OP0078 ½" Microphone holder** for drawer mounting *(looks like OP0041 with a ½" holder)*.

## 5. Select connectors for connector panel

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**AE2197** BNC Socket Female

**AE2198** RCA socket Female

**AE2199** XLR Connector 3 pol Female

**AE2200** Loudspeaker connector plug, SpeakON, 4way

**AE2201** S-VHS Female to S-VHS Female

**AE2202** ¼" jack, 3 pol

**AE2203** D-sub 9 pin

**AE2204** HDMI-Connector

**AE2205** Ethernet connector

**AE2207** USB-B adapter

**AE2206** USB-A adapter

**AE0103** Mini XLR male connector

# Specifications

## Acoustic test chamber

Frequency range:	100 Hz - 20 kHz
Noise insulation (SIL):	25 dB (3rd Octave)
Patch panel connections:	See selectable connectors
Dimensions (WxDxH):	42.4 x 63.8 x 52.8 cm
Inner dimensions (WxDxH):	36.8 x 47.05 x 26.4 cm
Max DUT dimensions: (WxDxH)	
- Small drawer:	30.0 x 20.0 x 6.6 cm
- Large drawer (upper):	30.0 x 20.0 x 22.8/11.9 cm
- Large drawer (lower):	30.0 x 20.0 x 22.8 cm
Drawer dimensions: (WxDxH):	
- AL0030-1:	10.0 x 40.0 x 22.0 cm
- AL0030-2, AL0030-3	29.5 x 40.0 x 22.0 cm
Weight:	39 kg

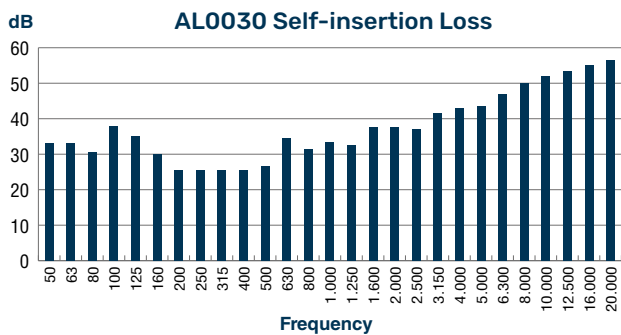


Figure shows SIL for GRAS AL0030 measured in reverberant conditions.

## Reference Microphones

<b>46BL-1</b>	Frequency range:	4 Hz - 20 kHz
	Dynamic range:	24 dB(A) - 146 dB
	Sensitivity:	20 mV/Pa
<b>46BD</b>	Frequency range:	5 Hz - 70 kHz
	Dynamic range:	44 dB(A) - 166 dB
	Sensitivity:	1,45 mV/Pa
<b>46BE</b>	Frequency range:	4 Hz - 80 kHz
	Dynamic range:	35 dB(A) - 160 dB
	Sensitivity:	3.6 mV/Pa
<b>46AO</b>	Frequency range:	3 Hz - 20 kHz
	Dynamic range:	25 dB(A) - 150 dB
	Sensitivity:	12 mV/Pa

## Mouth simulators 44AA & 44AB

Standards:	IEEE 269, 661 and ITU-T Rec. P51
Continuous DUTput level:	110 dB (200 Hz - 6 kHz) 100 dB (100 Hz - 16 kHz)
Loudspeaker:	8 $\Omega$ / 20 W (max)
Gain*:	10 dB
Power supply*:	24 Vdc
Weight:	1.3 kg

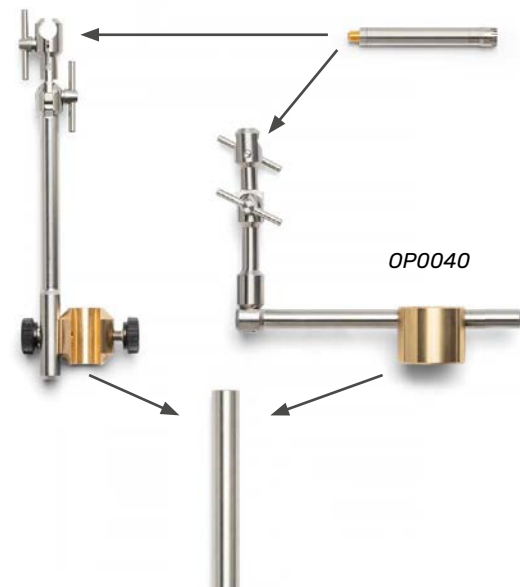
\*Only valid for 44AA

OP0041

46BL, 46BE, 46BD

OP0030, OP0031, OP0032

44AA, 44AB



# GRAS Worldwide

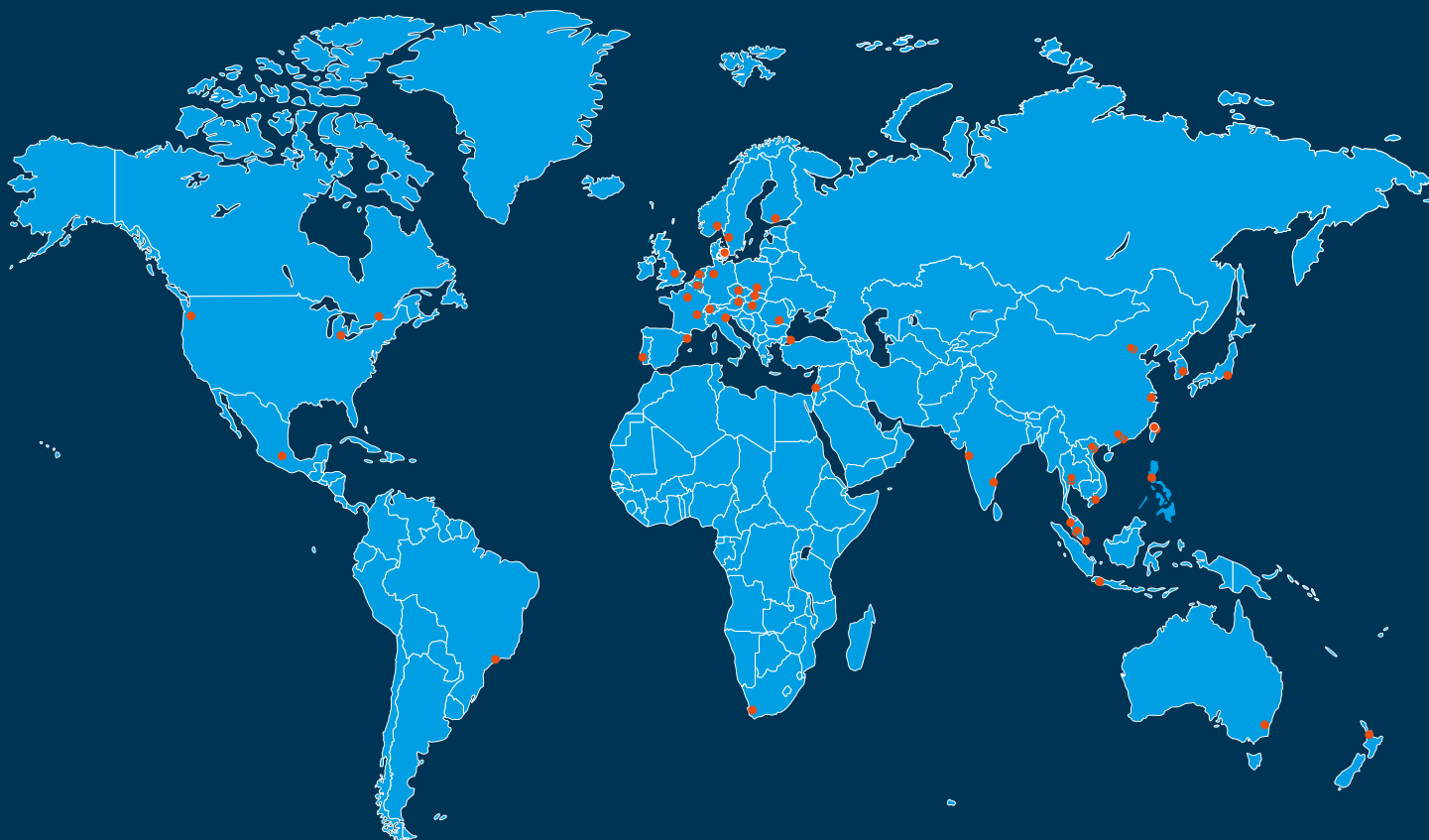
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## About GRAS Sound & Vibration

GRAS is a worldwide leader in the sound and vibration industry. We develop and manufacture state-of-the-art measurement microphones to industries where acoustic measuring accuracy and repeatability is of utmost importance in R&D, QA and production. This includes applications and solutions for customers within the fields of aerospace, automotive, audiology, and consumer electronics. GRAS microphones are designed to live up to the high quality, durability and accuracy that our customers have come to expect and trust.

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