

# GRAS 45CC

Headphone Test Fixture



Precise support for all headphone sizes  
High quality 1/2" and 1/4" measurement  
microphones  
IEC 60318-1 ear simulators  
ITU-T Rec. P51 mouth simulator  
Easy in-situ calibration

The 45CC is a flexible platform for dual-channel testing of headphones and headsets. It can be configured with microphones, IEC 60318-1 ear simulators and ITU-T P.51 mouth simulator. It can be adjusted very precisely to support different headphone/headset designs and sizes for high accuracy and repeatability. It is well suited for Research and Development, Quality Control and Production Line testing.

## Introduction

The 45CC Headphone Test Fixture is for dual-channel testing of headphones and headsets, and it is built on our vast experience in the field. With a focus on multiple configuration options and accurate and repeatable test results, the test fixture can easily be adapted to many different headphone/headset designs and sizes.

## Main features

- Dual-channel testing of headphones and headsets
- Multiple configuration options: microphones or IEC 60318-1 ear simulators - with or without a mouth simulator
- Distance between ears adjustable from 130 to 170 mm
- Headband holder height adjustable from 75 to 135 mm
- Reproducible positioning of DUT using 45CC's unique positioning guides
- High-quality measurement microphones
- IEC 60318-1 ear simulators
- ITU-T Rec. P51 mouth simulator with built-in power amplifier
- The microphones are mounted with snap fittings for easy calibration

All adjustments to headband position and height, as well as the distance between the ear plates, can be done quickly and very accurately. Precise scales make it easy to document all settings accurately, be it the headband position, the width between ears, or the position of the positioning guide. Therefore it is easy to set up other 45CCs to mirror the original setup.

Once the test fixture has been adjusted to fit a

certain headphone, the design of headband holder, ear plates and the unique positioning system ensure that when testing identical headphones you will get the same positioning and fit from one test to the next. Therefore repeatability in a production line testing environment will be second to none with the 45CC. This makes the 45CC the unrivaled choice for demanding Quality Control and Production Line applications, but can also be used for Research and Development.

## The Configurations

For your convenience, we have made 45CC available in a number of pre-configurations to suit specific testing needs. These are:

### 1/2" Microphones

- 45CC-1 with Externally Polarized 1/2" Microphones*
- 45CC-2 with Prepolarized 1/2" Microphones*

GRAS 45CC Headphone Test Fixture configured with 1/2" externally polarized or prepolarized microphones is primarily intended as a tool for Quality Control and Production Line testing of headphones.

### Ear Simulators and 1/2" Microphones

- 45CC-3 with IEC 60318-1 Ear Simulators and Ext. Polarized 1/2" Microphones*
- 45CC-4 with IEC 60318-1 Ear Simulators and Prepolarized 1/2" Microphones*

GRAS 45CC Headphone Test Fixture configured with IEC60318-1 ear simulators and 1/2" externally polarized or prepolarized microphones is primarily intended as a tool for Quality Control and Production Line testing of headphones. Where the acoustical load from an ear simulator is required, the use of the ear simulators also means that testing according to IEC 60318-1, IEC60268-7 and ITU-T Rec. P.57 is

possible.

### **Mouth Simulator and 1/2" Microphones**

*45CC-5 with Mouth Simulator and Ext. Polarized*

*1/2" Microphones*

*45CC-6 with Mouth Simulator and Prepolarized 1/2" Microphones*

GRAS 45CC Headphone Test Fixture configured with 1/2" externally polarized or prepolarized microphones and the GRAS 44AA Mouth Simulator is primarily intended as a tool for Quality Control and Production Line testing of communication headsets.

### **Mouth Simulator and Ear Simulators**

*45CC-7 with Mouth Simulator, IEC 60318-1 Ear Simulators, and Ext. Polarized 1/2" Microphones*

*45CC-8 with Mouth Simulator, IEC 60318-1 Ear Simulators, and Prepolarized 1/2" Microphones*

GRAS 45CC Headphone Test Fixture configured with IEC60318-1 ear simulators, 1/2" externally polarized or prepolarized microphones and the GRAS 44AA Mouth Simulator is primarily intended as a tool for Quality Control in R&D and Production Line testing of communication headsets.

### **1/4" Microphones**

*45CC-9 with Externally Polarized 1/4" Microphones*

*45CC-10 with Prepolarized 1/4" Microphones*

GRAS 45CC Headphone Test Fixture configured with 1/4" externally polarized or prepolarized microphones extends the frequency range to 70 kHz for high-frequency testing.

### **Mouth Simulator and 1/4" Microphones**

*45CC-11 with Mouth Simulator and Ext. Polarized 1/4" Microphones*

*45CC-12 with Mouth Simulator and Prepolarized*

### *1/4" Microphones*

GRAS 45CC Headphone Test Fixture configured with 1/4" externally polarized or prepolarized microphones and the GRAS 44AA Mouth Simulator is for testing of communication headsets. The microphones extends the frequency range to 70 kHz while the mouth simulator has a frequency range of 100 Hz to 16 kHz.

### **Warranty**

GRAS offers 5 years warranty against defective materials and workmanship.

### **Service**

If you accidentally damage the diaphragm on a GRAS microphone, we can—in most cases—replace it at a very reasonable cost and with short turn-around time. This not only protects your investment but also pleases your quality assurance department because you don't have to worry about new serial numbers, etc.

### **Calibration**

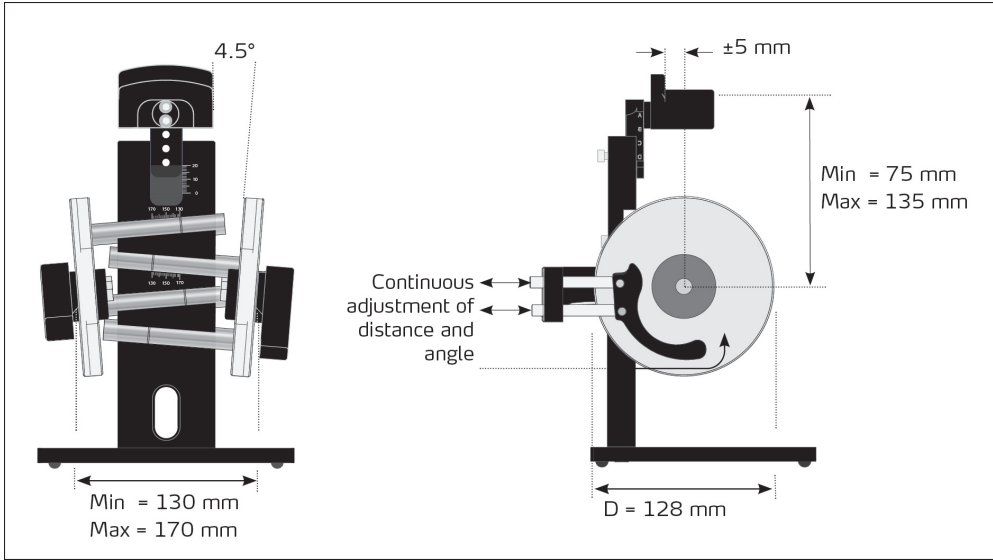
Before leaving the factory, all GRAS microphones are calibrated in a controlled laboratory environment using traceable calibration equipment.

Depending on the use, measurement environment, and internal quality control programs, we recommend recalibrating the microphone at least once a year.

CE/RoHS compliant/WEEE registered		yes/yes/yes
<b>1/2" MICROPHONES</b>		
Sensitivity	mV/Pa	12.5
Frequency Response ( $\pm 2$ dB)	Hz	3.15 Hz - 20 k
Dynamic range - 40AG (with 26AC preamp)	dB	25 dB(A) - 164
Dynamic range - 40AO (with 26CK preamp)	dB	25 dB(A) - 150
Standard		WS2P
<b>1/4" MICROPHONES</b>		
Sensitivity	mV/Pa	1.6
Frequency Response ( $\pm 2$ dB)	Hz	4 - 70 k
Dynamic range - 40BP (with 26AC preamp)	dB	39 dB(A) - 169
Dynamic range - 40BD (with 26CS preamp)	dB	44 dB(A) - 166
Standard		WS3P
<b>GRAS RA0039 EAR SIMULATOR</b>		
Standards		ANSI S3.7 IEC 60318-1 ITU-T Rec. P.57
<b>GRAS 44AA MOUTH SIMULATOR</b>		
Frequency response @ maximum output level	Hz	100 to 16 k
Maximum output	dB	100
Maximum power, continuous	W	20
Amplifier gain	dB	10
Input impedance	$\Omega$	20 k
Output impedance	$\Omega$	8
Power supply	V DC	24
Standards		ITU-T Rec. P51 IEEE 269-2010
<b>TEST FIXTURE</b>		
Width between ears	mm	Adjustable from 130 to 170

Height of headband holder	mm	Adjustable from 75 to 135
Horizontal position of headband holder	mm	Adjustable +/- 5
Ear plate angle	°	4.5 (ISO 4869-3)
Diameter of ear plate	mm	128
Positioning guides		Continuous adjustment of horizontal and vertical position. Two-point support for all headphone sizes
Weight	kg	3

GRAS Sound & Vibration reserves the right to change specifications without notice.



## Included items

### 45CC-1 - with Externally Polarized Microphones

45CC	Test fixture
GRAS 69CC-1	LEMO Pressure Mic. Set for 45CC, 2 pcs, comprising:
<a href="#">GRAS 40AG</a>	1/2" Ext. Polarized Pressure Microphone
<a href="#">GRAS 26AC-1</a>	Standard Preamplifier with 3 m Integrated Cable
<a href="#">GRAS GR0010</a>	Adapter for 1/4" preamplifier and 1/2" microphone

### 45CC-2 - with Prepolarized Microphones

45CC	Test fixture
GRAS 69CC-2	Pressure Mic. Set for 45CC, 2 pcs, comprising:
<a href="#">GRAS 40AO</a>	1/2" Prepolarized Pressure Microphone
<a href="#">GRAS 26CK</a>	1/2" CCP Preamplifier with Microdot Connector, Very Short
<a href="#">GRAS AA0070</a>	3 m Microdot-BNC Cable, 2 pcs

### 45CC-3 with IEC 60318-1 Ear Simulators and Externally Polarized Microphones

45CC	Test fixture
<a href="#">GRAS RA0039</a>	IEC 60318-1 Ear Simulator, 2 pcs
GRAS 69CC-1	LEMO Pressure Mic. Set for 45CC, 2 pcs, comprising:
<a href="#">GRAS 40AG</a>	1/2" Ext. Polarized Pressure Microphone
<a href="#">GRAS 26AC-1</a>	Standard Preamplifier with 3 m Integrated Cable
<a href="#">GRAS GR0010</a>	Adapter for 1/4" preamplifier and 1/2" microphone

### 45CC-4 - with IEC 60318-1 Ear Simulators and Prepolarized Microphones

45CC	Test fixture
<a href="#">GRAS RA0039</a>	IEC 60318-1 Ear Simulator, 2 pcs
GRAS 69CC-2	CCP Pressure Mic. Set for 45CC, 2 pcs, comprising:

<a href="#">GRAS 40AO</a>	1/2" Prepolarized Pressure Microphone
<a href="#">GRAS 26CK</a>	1/2" CCP Preampifier with Microdot Connector, Very Short
<a href="#">GRAS AA0070</a>	3 m Microdot-BNC Cable, 2 pcs

## 45CC-5 - with Mouth Simulator and Externally Polarized Microphones

45CC	Test fixture
<a href="#">GRAS 44AA</a>	Mouth Simulator according to ITU-T Rec. P51 with built-in power amplifier
<a href="#">GRAS AA0035</a>	BNC-BNC Cable
GRAS 69CC-1	LEMO Pressure Mic. Set for 45CC, 2 pcs, comprising:
<a href="#">GRAS 40AG</a>	1/2" Ext. Polarized Pressure Microphone
<a href="#">GRAS 26AC-1</a>	Standard Preampifier with 3 m Integrated Cable
<a href="#">GRAS GR0010</a>	Adapter for 1/4" preampifier and 1/2" microphone

## 45CC-6 - with Mouth Simulator and Prepolarized Microphones

45CC	Test fixture
<a href="#">GRAS 44AA</a>	Mouth Simulator according to ITU-T Rec. P51 with built-in power amplifier
<a href="#">GRAS AA0035</a>	BNC-BNC Cable
GRAS 69CC-2	CCP Pressure Mic. Set for 45CC, 2 pcs, comprising:
<a href="#">GRAS 40AO</a>	1/2" Prepolarized Pressure Microphone
<a href="#">GRAS 26CK</a>	1/2" CCP Preampifier with Microdot Connector, Very Short
<a href="#">GRAS AA0070</a>	3 m Microdot-BNC Cable, 2 pcs

## 45CC-7 with Mouth Simulator, IEC 60318-1 Ear Simulators and Externally Polarized Microphones

45CC	Test fixture
<a href="#">GRAS 44AA</a>	Mouth Simulator according to ITU-T Rec. P51 with built-in power amplifier
<a href="#">GRAS AA0035</a>	BNC-BNC Cable
<a href="#">GRAS RA0039</a>	IEC 60318-1 Ear Simulator, 2 pcs



GRAS 69CC-1	LEMO Pressure Mic. Set for 45CC, 2 pcs, comprising:
<a href="#">GRAS 40AG</a>	1/2" Ext. Polarized Pressure Microphone
<a href="#">GRAS 26AC-1</a>	Standard Preamplifier with 3 m Integrated Cable
<a href="#">GRAS GR0010</a>	Adapter for 1/4" preamplifier and 1/2" microphone

## 45CC-8 with Mouth Simulator, IEC 60318-1 Ear Simulators and Prepolarized Microphones

45CC	Test fixture
<a href="#">GRAS 44AA</a>	Mouth Simulator according to ITU-T Rec. P51 with built-in power amplifier
<a href="#">GRAS AA0035</a>	BNC-BNC Cable
<a href="#">GRAS RA0039</a>	IEC 60318-1 Ear Simulator, 2 pcs
GRAS 69CC-2	CCP Pressure Mic. Set for 45CC, 2 pcs, comprising:
<a href="#">GRAS 40AO</a>	1/2" Prepolarized Pressure Microphone
<a href="#">GRAS 26CK</a>	1/2" CCP Preamplifier with Microdot Connector, Very Short
<a href="#">GRAS AA0070</a>	3 m Microdot-BNC Cable, 2 pcs

## 45CC-9 - with Externally Polarized 1/4" Microphones

45CC	Test fixture
GRAS 69CC-3	LEMO Pressure Mic. Set for 45CC, 2 pcs, comprising:
<a href="#">GRAS 40BP</a>	1/4" Ext. Polarized Pressure Microphone
<a href="#">GRAS 26AC-1</a>	Standard 1/4" Preamplifier with 3 m Integrated Cable
GRAS GR2039	1/4" Microphone Holder

## 45CC-10 - with Prepolarized 1/4 Microphones

45CC	Test fixture
GRAS 69CC-4	CCP Pressure Mic. Set for 45CC, 2 pcs, comprising:
<a href="#">GRAS 40BD</a>	1/4" Prepolarized Pressure Microphone
<a href="#">GRAS 26CS</a>	1/4" CCP Preamplifier with Microdot Connector, Very Short

[GRAS AA0070](#) 3 m Microdot-BNC Cable, 2 pcs

## 45CC-11 - with Mouth Simulator and Externally 1/4" Polarized Microphones

45CC	Test fixture
<a href="#">GRAS 44AA</a>	Mouth Simulator according to ITU-T Rec. P51 with built-in power amplifier
<a href="#">GRAS AA0035</a>	BNC-BNC Cable
GRAS 69CC-3	LEMO Pressure Mic. Set for 45CC, 2 pcs, comprising:
<a href="#">GRAS 40BP</a>	1/4" Ext. Polarized Pressure Microphone
<a href="#">GRAS 26AC-1</a>	Standard Preamplifier with 3 m Integrated Cable
GRAS GR2039	1/2" Microphone Holder

## 45CC-12 - with Mouth Simulator and Prepolarized 1/4" Microphones

45CC	Test fixture
<a href="#">GRAS 44AA</a>	Mouth Simulator according to ITU-T Rec. P51 with built-in power amplifier
<a href="#">GRAS AA0035</a>	BNC-BNC Cable
GRAS 69CC-4	CCP Pressure Mic. Set for 45CC, 2 pcs, comprising:
<a href="#">GRAS 40BD</a>	1/4" Prepolarized Pressure Microphone
<a href="#">GRAS 26CS</a>	1/4" CCP Preamplifier with Microdot Connector, Very Short
<a href="#">GRAS AA0070</a>	3 m Microdot-BNC Cable, 2 pcs

GRAS Sound & Vibration reserves the right to change accessories without notice.

# GRAS Worldwide

Subsidiaries and distributors in more  
than 40 countries

## HEAD OFFICE, DENMARK GRAS SOUND & VIBRATION

Skovlytoften 33  
2840 Holte  
Denmark  
Tel: +45 4566 4046  
[www.grasacoustics.com](http://www.grasacoustics.com)  
[gras@grasacoustics.com](mailto:gras@grasacoustics.com)

## USA GRAS SOUND & VIBRATION

5750 S.W. Arctic Drive  
Beaverton, OR 97005  
Tel: 503-627-0832  
Toll Free: 800-231-7350  
[www.grasacoustics.com](http://www.grasacoustics.com)  
[sales-usa@grasacoustics.com](mailto:sales-usa@grasacoustics.com)

## CHINA GRAS SOUND & VIBRATION

Room 303, Building T6  
Hongqiaohui, 990, Shenchang Road  
Minhang District, Shanghai  
China, 201106  
Tel: +86 21 64203370  
[www.gras.com.cn](http://www.gras.com.cn)  
[cnsales@grasacoustics.com](mailto:cnsales@grasacoustics.com)



## 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.

**GRAS** Sound & Vibration