45CC
Headphone Test Fixture

For R&D, Production Engineering (PE) and Production Line (PL) Testing

www.GRASacoustics.com/45CC

GRAS

An Axiometrix Solutions Brand

Advanced and Aligned Testing

Align your tests across the entire production chain

The need for optimizing test strategies, specifications and alignments between R&D and Production Line units is steadily growing. Simultaneously, increased complexity and functionality of headphones and headsets require more advanced test rigs. This is why GRAS is introducing four new variants to the existing line of 45CC Test Fixture configurations, allowing manufacturers to perform simple-to-use, rapidly reconfigurable and inexpensive tests.

With these 4 new configurations, GRAS offers 10 different configurations – all with a mouth simulator option. The new variants include new ear plates and rods to facilitate mounting of IEC 60318-4 / high-frequency IEC 60318-4 ear simulators and anthropometric pinnae.

The test rig itself is the only affordable tabletop version on the market that includes high-frequency ear simulators and anthropometric pinnae. We call it the desktop solution.

Fast Test Setup

The 45CC Headphone Test Fixture produces accurate and reproducible test results and can be easily adapted to many different headphone or headset designs and sizes. The distance between ears and head height is adjustable and settings can easily be recreated.

- ✓ Adjustable dimensions allow you to change test setup quickly and easily
- ✓ Flexible solution gives you the possibility to test on any headset
- ✓ Distance between ears adjustable from 130 to 170 mm
- ✓ Head height adjustable from 75 to 135 mm

Adjustable distance between ear plates.

Adjustable head height to accommodate different head band sizes.

New 45CC Configurations

Ideal for use in R&D Development and to align testing on the Production Line

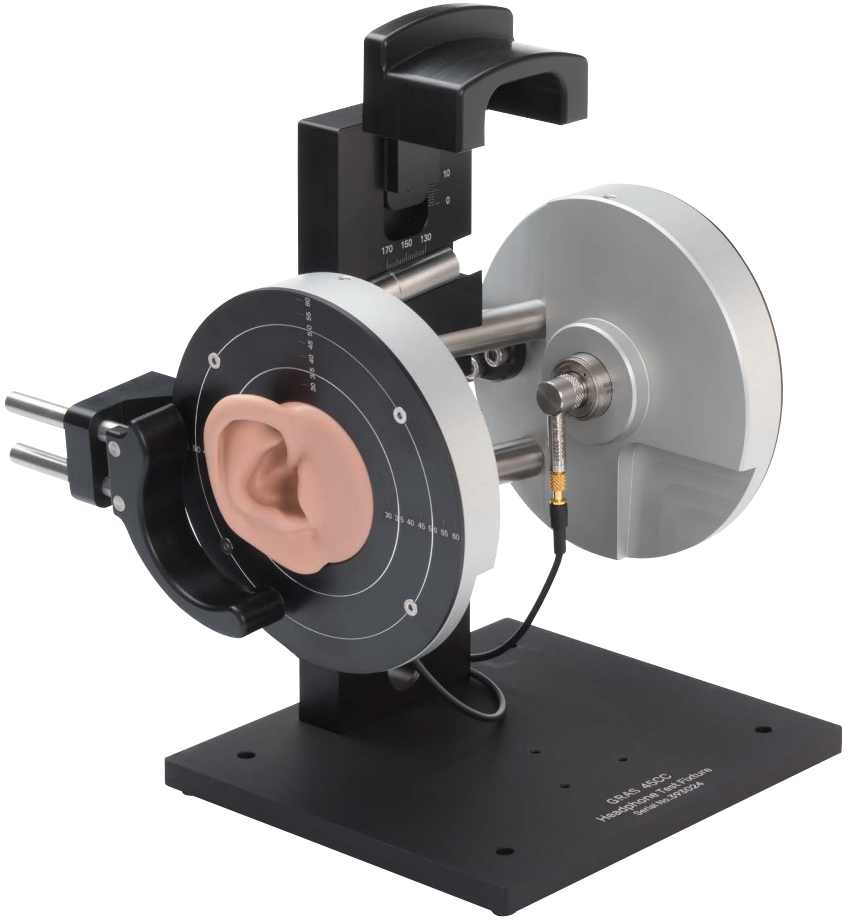
NEW

45CC-14 and 45CC-15 Externally Polarized and Prepolarized IEC 60318-4 Ear Simulators and Pinnae

A 2-channel acoustic headphone and headset* test fixture with ear simulators, anthropometric pinnae and TEDS compatibility.

USES AND FEATURES:

- For test scenarios that require adherence with IEC 60318-4.
- For test scenarios that require or benefit from realistic human-like acoustic loading and ear geometry.
- For human-like testing of any headphone or earphone type: around ear, on ear, in ear and insert.



45CC-16 and 45CC-17 Externally Polarized and Prepolarized High-frequency IEC 60318-4 Ear Simulators and Pinnae

A 2-channel acoustic headphone and headset* test fixture with high-frequency ear simulators, anthropometric pinnae and TEDS compatibility.

USES AND FEATURES:

- For test scenarios up to 20 kHz that require adherence with IEC 60318-4.
- For test scenarios that require or benefit from realistic human-like acoustic loading and ear geometry.
- For human-like testing of any headphone or earphone type: around ear, on ear, in ear and insert.

45CC-18 and 45CC-19 Externally Polarized and Prepolarized High-resulotion IEC 60318-4 Ear Simulators and Pinnae

A 2-channel acoustic headphone and headset* test fixture with high-resulotion ear simulators, anthropometric pinnae and TEDS compatibility.

USES AND FEATURES:

- For high-resolution test scenarios that require adherence with IEC 60318-4.
- For test scenarios that require or benefit from realistic human-like acoustic loading and ear geometry.
- For human-like testing of any headphone or earphone type: around ear, on ear, in ear and insert.

* Option with mouth simulator (44AA/44AB) is available for all of the above configurations.

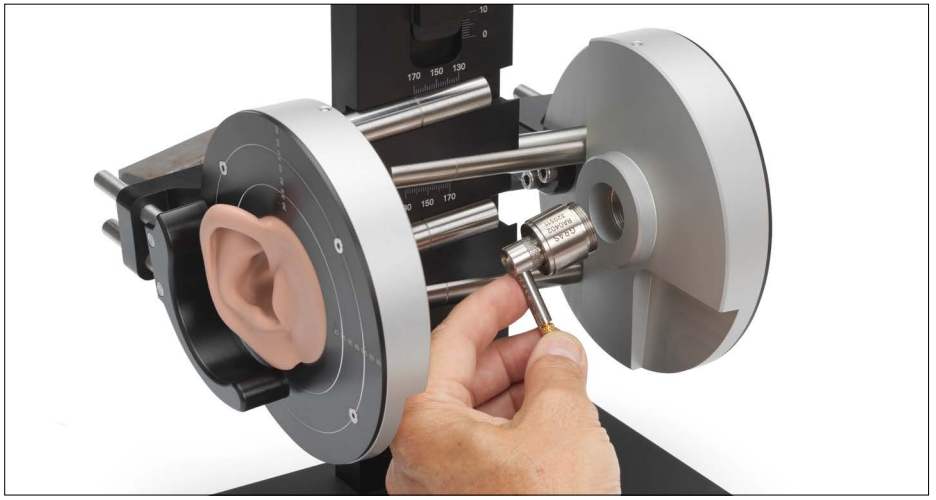
Suitable for Testing Any Headphone or Headset

The 45CC is available in a number of pre-configurations to suit specific testing needs.

- ½″ and ¼″ pressure microphones, CCP or LEMO
- IEC 60318-1 CCP or LEMO ear simulators
- IEC 60318-4 CCP or LEMO ear simulators
- Mouth simulator placed in ITU-T position for test of headset microphone

Configurations with and without mouth, ear simulator or microphones.

Easy Verification



It can be time consuming to verify the microphone/ear simulator, but due to a special integrated adaptor, it is possible to easily remove and reattach the GRAS microphone with no need for any tools.

- No tools required
- Special integrated adaptor for easy removal/reattachment of microphones

Practical, Reproducible, Repeatable

The headset can be placed in the exact same position every time using the positioning guide. This feature is compatible with most headsets.

- Reproducible positioning of DUT using 45CC's unique positioning guide
- The positioning guide is a first-in-market feature

The headphones can easily be placed in the same position using the Positioning Guide.

Existing 45CC Configurations

Ideal for use on the Production Line

45CC-1 and 45CC-2 Externally Polarized and Prepolarized 1/2″ Microphones

A basic 2-channel acoustic headphone and headset* test fixture with flush-mounted ½″ microphones.

USES AND FEATURES:

- ✓ For basic tests where no acoustic loading is needed, for example, in quick-turnaround prototype refinement.
- ✓ For testing up to 20 kHz with on- and around-ear headphones and headsets.

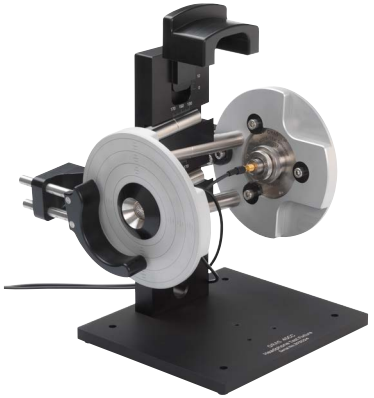
45CC-9 and 45CC-10 Externally Polarized and Prepolarized 1/4″ Microphones

A basic 2-channel acoustic headphone and headset* test fixture with flush-mounted ¼″ microphones.

USES AND FEATURES:

- ✓ For basic tests where no acoustic loading is needed, for example, in quick-turnaround prototype refinement.
- ✓ For testing where frequencies above 20 kHz (up to 70 kHz) are also of interest, for example, hi-res on- and around-ear headphones.

45CC-3 and 45CC-4 Externally Polarized and Prepolarized IEC 60318-1 Ear Simulators



A 2-channel acoustic headphone and headset* test fixture with artificial ear simulator and ½″ microphones

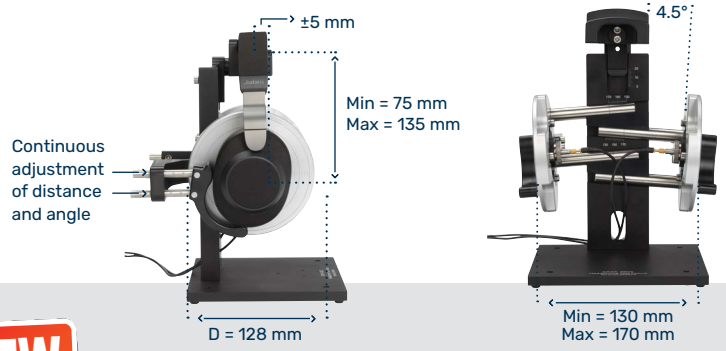
USES AND FEATURES:

- ✓ For test scenarios that require acoustic loading and adherence with IEC 60318-1.
- ✓ For testing in environments that require a highly durable ear simulator.
- ✓ For testing focused on on-ear and around-ear headphones and that does not include in-ear devices.

* Option with mouth simulator (44AA/44AB) is available for all of the above configurations.

45CC

Headphone Test Fixture



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EXISTING CONFIGURATIONS

45CC-1 45CC-2	Externally Polarized or Prepolarized 1/2″ Microphones
45CC-9 45CC-10	Externally Polarized or Prepolarized 1/4″ Microphones
45CC-3 45CC-4	Externally Polarized or Prepolarized IEC 60318-1 Ear Simulators

IEC 61094-4 1/2″ Microphones in the Ear Plate Plane (45CC-1, 45CC-2)	
Frequency response	3.15 Hz - 20 kHz
40AG dynamic range	25 dB(A) - 164 dB
40AO dynamic range	25 dB(A) - 150 dB

IEC 61094-4 1/4″ Microphones in the Ear Plate Plane (45CC-9, 45CC-10)	
Frequency response	4 Hz - 70 kHz
40BP dynamic range	39 dB(A) - 169 dB
40BD dynamic range	44 dB(A) - 166 dB

IEC 60318-1 Ear Simulators (45CC-3, 45CC-4)	
Standards	IEC 60318-1
	ANSI 3.7
	ITU-T Rec. P. 57 type 1 artificial ear
Frequency range	100 Hz to 10 kHz according to IEC 60318-1

NEW CONFIGURATIONS

NEW

45CC-14 45CC-15	Externally Polarized or Prepolarized IEC 60318-4 Ear Simulators, Pinnae and TEDS
45CC-16 45CC-17	Externally Polarized or Prepolarized High-Frequency IEC 60318-4 Ear Simulators, Pinnae and TEDS
45CC-18 45CC-19	Externally Polarized or Prepolarized High-Resolution IEC 60318-4 Ear Simulators, Pinnae and TEDS

IEC 60318-4 Ear Simulators
- 45CC-14-45CC-15
- 45CC-16-45CC-17 (High-frequency)
- 45CC-18-45CC-19 (High-resolution)

Standards		IEC 60318-4
		ANSI 3.7
		ITU-T Rec. P.57 type 3.3 artificial ear
Resonance frequency	(45CC-14-45CC-15)	13.5 kHz
	(45CC-16-45CC-17)	13.5 kHz (damped by approx. 14 dB)
	(45CC-18-45CC-19)	13.5 kHz
Frequency range	(45CC-14-45CC-15)	100 Hz - 10 kHz according to IEC 60318-4
	(45CC-16-45CC-17)	100 Hz to 10 kHz according to IEC 60318-4
		10–20 kHz within ± 2.2 dB
	(45CC-18-45CC-19)	100 Hz - 10 kHz according to IEC 60318-4
		10–20 kHz within ± 2.2 dB
		20–50 kHz within ± 3.2 dB

TECHNICAL SPECIFICATIONS

Width between ears adjustable from	130–170 mm
Height of headband holder adjustable	75–135 mm
Horizontal position of headband holder	± 5 mm
Ear plate angle	4.5° (ISO 4869-3)
Diameter of ear plate	128 mm
Weight (without microphones or mouth simulator)	3 kg
Positioning guide	For horisontal and vertical adjustments

OPTIONAL

Mouth Simulators		44AA	44AB
Standards		IEEE 269, 661 and ITU-T Rec P51	
Max. continuous output level		110 dB (200 Hz - 6 kHz) 100 dB (100 Hz - 16 kHz)	
Loud-speaker	Impedance	8 Ω	
	Max. power, continuous	20 W	
Amplifier	Gain	10 dB	N/A
	Input impedance	20 kΩ	N/A
	Max. input voltage	2 V RMS	N/A
Weight		1.3 kg	0.93

GRAS Sound & Vibration

EUROPE
Phone: +45 4566 4046
gras@grasacoustics.com

USA
Phone: 503-627-0832
sales-usa@grasacoustics.com

CHINA
Phone: +86 21 64203370
cnsales@grasacoustics.com

Visit our website www.GRASacoustics.com to find your local GRAS representative.

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