

# GRAS 40BE

1/4" Prepolarized Free-Field  
Microphone



Freq range: 4 Hz to 80 kHz  
Dyn range: 30 dB(A) to 168 dB  
Sensitivity: 4 mV/Pa

---

The 40BE is an IEC 61094 WS3F 1/4" prepolarized free-field microphone with rear-venting. The externally polarized equivalent is 40BF.

### Introduction

It is a high-precision condenser microphone made according to IEC 61094-4 requirements. Its dynamic range makes it suitable for high-frequency or high-level measurements, as well as acoustic transient measurements. It is extremely robust and reliable and can measure sound pressure levels up to 168 dB in the range of 4 Hz to 100 kHz.

40BE is individually factory-calibrated and delivered with a calibration chart stating its specific open-circuit sensitivity and pressure frequency response.

### Typical applications and use

The 40BE is ideal for sound measurements at very high frequencies and levels, as well as acoustic transient measurements. It is suitable for general purpose measurements in open acoustic fields.

The 40BE is included in the [GRAS 46BE](#) 1/4" free-field microphone set

### Compatibility

The 40BE requires a standardized 1/2" or 1/4" CCP preamplifier and an input module that supports this technology with a BNC, SMB, or Microdot connector.

### System verification

For daily verification and check of your measurement setup, we recommend using a calibrator like [GRAS 42AG](#) Sound Level Calibrator.

For proper sensitivity calibration, we recommend using a pistonphone like [GRAS 42AP](#) Intelligent Pistonphone.

### Calibration

When leaving the factory, all GRAS microphones have been calibrated in a controlled laboratory environment using traceable calibration equipment. Depending on the use, measurement environment

and internal quality control programs we recommend that the microphone is recalibrated at least once a year.

We offer two kinds of calibration as an optional after-sales service: GRAS Traceable Calibration and GRAS Accredited Calibration.

GRAS Traceable Calibration is a traceable calibration performed by trained personnel under controlled conditions according to established procedures and standards. This is identical to the rigorous calibration that all GRAS microphones are subjected to as an integral part of our quality assurance.

GRAS Accredited Calibration is performed by the GRAS Accredited Calibration Laboratory that has been accredited in accordance with ISO 17025 by DANAK, the Danish Accreditation Fund.

If you want a new microphone set delivered with an accredited calibration in stead of the default factory calibration, specify this when ordering.

Learn more at [gras/calib](https://www.gras.com/calib).

### Quality and warranty

All GRAS microphones are made of high-quality materials that will ensure life-long stability and robustness. The microphones are all assembled in verified clean-room environments by skilled and dedicated operators with many years of expertise in this field.

The microphone diaphragm, body, and improved protection grid are made of high-grade stainless steel, which makes the microphone resistant to physical damage, as well as corrosion caused by aggressive air or gasses.

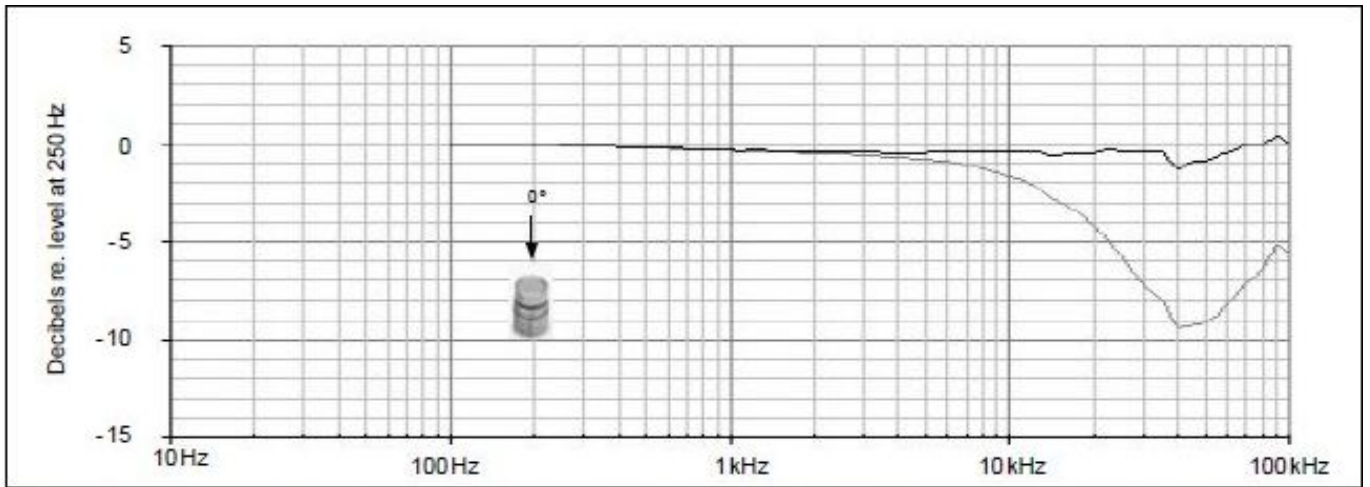
This, combined with the reinforced gold-plated microphone terminal which guarantees a highly reliable connection, enables GRAS to offer 5 years

warranty against defective materials and workmanship.

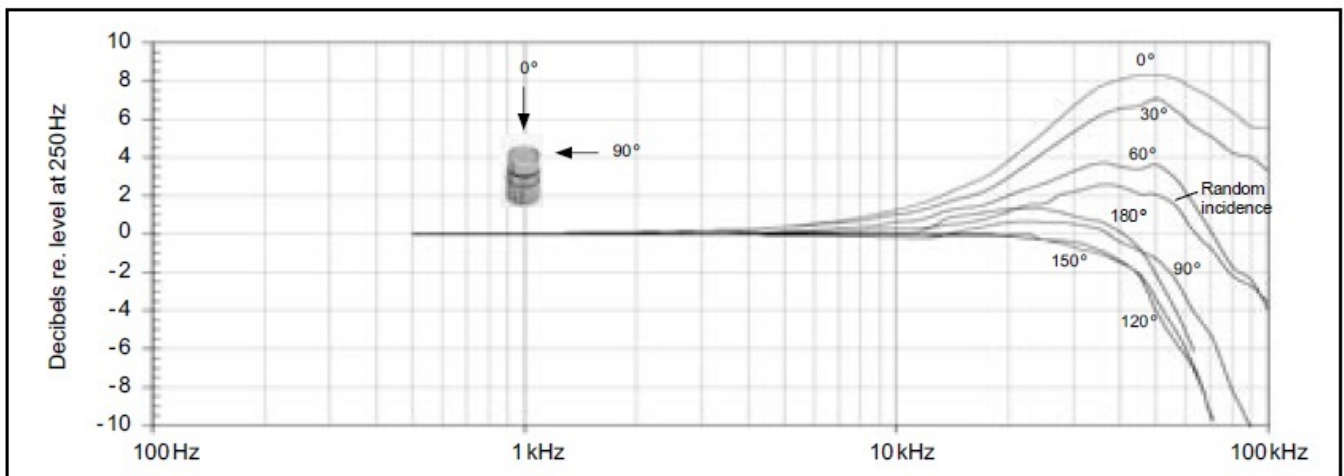
## **Service**

If you accidentally damage the diaphragm on a GRAS microphone, we can—in most cases—replace it at a very reasonable cost and with a 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.

Polarization/Connection		0 V / CCP
Frequency range ( $\pm 1$ dB)	Hz	10 to 40 k
Frequency range ( $\pm 2$ dB)	Hz	4 to 80 k
Frequency range ( $\pm 3$ dB)	Hz	4 to 100 k
Dynamic range lower limit (microphone thermal noise)	dB(A)	30
Dynamic range lower limit with GRAS preamplifier	dB(A)	35
Dynamic range upper limit	dB	168
Dynamic range upper limit with GRAS preamplifier @ +28 V / $\pm 14$ V power supply	dB	164
Dynamic range upper limit with GRAS preamplifier @ +120 V / $\pm 60$ V power supply	dB	168
Dynamic range upper limit with GRAS CCP preamplifier	dB	160
Open-circuit sensitivity @ 250 Hz ( $\pm 3$ dB)	mV/Pa	4
Open-circuit sensitivity @ 250 Hz ( $\pm 3$ dB)	dB re 1V/Pa	-48
Resonance frequency	kHz	100
Microphone cartridge capacitance, typ.	pF	5
Microphone venting		Rear
IEC 61094-4 Designation		WS3F
Temperature range, operation	$^{\circ}\text{C} / ^{\circ}\text{F}$	-40 to 120 / -40 to 248
Temperature range, storage	$^{\circ}\text{C} / ^{\circ}\text{F}$	-40 to 85 / -40 to 185
Temperature coefficient @250 Hz	dB/ $^{\circ}\text{C}$ / dB/ $^{\circ}\text{F}$	-0.01 / -0.006
Static pressure coefficient @250 Hz	dB/kPa	-0.013
Humidity range non condensing	% RH	0 to 90
Humidity coefficient @250 Hz	dB/% RH	-0.001
Influence of axial vibration @1 m/s <sup>2</sup>	dB re 20 $\mu\text{Pa}$	60
CE/RoHS compliant/WEEE registered		Yes / Yes, Yes
Weight	g / oz	1.75 / 0.062



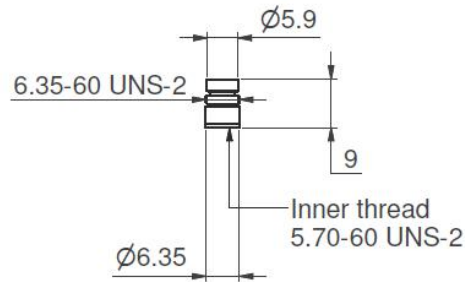
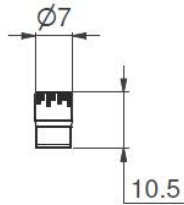
Typical frequency response (without protection grid). Upper curve shows free-field response for 0°, lower curve shows pressure response.



Free-field corrections for different angles of incidence

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

Dimensions in mm



GRAS CA0001	Traceable Calibration of Microphone
GRAS CA2001	Accredited Calibration of Microphone

GRAS Sound & Vibration reserves the right to change specifications and 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.gras.dk](http://www.gras.dk)  
[gras@gras.dk](mailto:gras@gras.dk)

## USA GRAS SOUND & VIBRATION

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

## 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@gras.dk](mailto:cnsales@gras.dk)



## 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