AUDIOLOGY

# Pushing the Limits of Acoustic Precision: A GRAS and Knowles Success Story

**CUSTOMER**
Knowles

**PRODUCT**
- GRAS RA0401

**PERSON**
- **Charles King**
  Principal Engineer / Scientist at Knowles

## THE CHALLENGE: Outgrowing a Legacy Standard

For decades, the 711 coupler had been the industry's go-to ear simulator for testing hearing aids and headphones. Its reliability and ease of use made it a cornerstone in acoustic testing. However, as audio quality standards continued to rise—especially in the premium segment—the 711's limited high-frequency response became a growing obstacle.

Knowles, a global leader in micro-acoustic solutions, began facing this challenge head-on. Their latest generation of high-performance drivers demanded a test solution that could deliver accurate and repeatable results well beyond the traditional frequency range.

## THE COLLABORATION: Engineering Excellence Across Borders

GRAS Sound & Vibration and Knowles had already established a strong working relationship, but this challenge sparked a new level of collaboration.



Knowles engineer **Charles King** played a pivotal role in pushing for a solution that could match the evolving requirements of high-end transducer testing. Together with GRAS engineers, the team conducted deep technical evaluations and quickly pinpointed the issue: a pronounced resonance at **13 kHz** in the traditional 711 coupler that was distorting the results.

Rather than compromising on test quality, the joint team explored ways to extend the performance of the 711 design. The breakthrough came with the introduction of **targeted damping** to address the resonance. A custom version of the coupler was created specifically for Knowles—one that retained the known benefits of the 711 but extended its usability into higher frequencies.

GRAS
An Axiometrix Solutions Brand

knowles

## THE RESULT:
## From Custom Fix to Industry Standard

The solution not only met Knowles' needs—it exceeded expectations. The new coupler allowed them to accurately validate their high-quality drivers, and it quickly became their preferred solution.

What began as a custom development has since evolved into a key part of the GRAS product line: the **RA0401 High-Frequency Coupler.** Today, it serves as a high-precision tool for manufacturers and labs working at the forefront of audio innovation.

## ABOUT KNOWLES CORPORATION

Knowles is a global leader in advanced micro-acoustic microphones and balanced armature speakers used in hearing health, wearables, and premium audio products. With a relentless focus on innovation and engineering, Knowles helps customers deliver best-in-class sound experiences across industries. The company's long-standing partnership with GRAS reflects their commitment to quality, collaboration, and staying ahead of market demands.

## ABOUT GRAS RA0401

The RA0401 story is one of many that highlight GRAS' approach: listen closely to customer needs, dive deep into the physics, and engineer a solution that not only solves the problem—but often sets a new industry standard.

**GRAS RA0401**
High-Frequency Coupler
www.grasacoustics.com/products/ear-simulator/product/783-ra0401 >




### 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 the 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 is represented through subsidiaries and distributors in more than 40 countries and is part of Axiometrix Solutions, a leading test solutions provider comprised of globally recognized measurement brands.

GRAS Sound & Vibration
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