

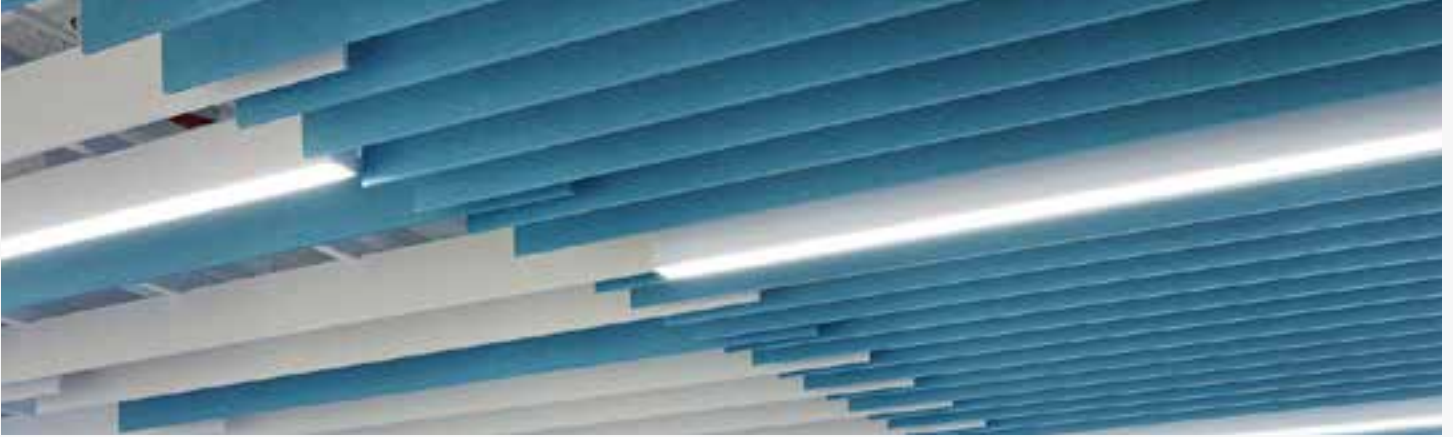


A R K T U R A

Get the Truth

A Guide to **True NRC**[®] Acoustic Rating

INTRODUCTION



Our Industry Does Not Regular NRC Claims by Manufacturers - Equip Yourself With Knowledge

Every day, it seems more acoustic solutions enter the market, with many manufacturers citing misleading information about performance and test results. With all the misinformation out there, it becomes increasingly difficult to navigate the sea of available options. Arktura believes you should not have to be an acoustic expert to make an accurate, informed decision when shopping for an acoustic system. **True NRC®** is an initiative born out of Arktura's dedication to transparency and accuracy in acoustic ratings. The following pages provide an introduction to acoustic terminology and the **True NRC®** methodology. With it, we hope to bring you the peace of mind to guide you through your next acoustic project.

INTRODUCTION



What We'll Cover

Understanding Acoustics - Key Terms

Start with a review of key acoustical terminology before diving into the specifics of **True NRC®**.

Testing: The Right Way

This section breaks down various mounting types utilized in acoustic testing. Learn how to accurately determine and compare NRC results .

Why True NRC®?

True NRC® brings transparency and education - to empower you to deliver the best results for your clients. We break down how our NRC calculations are achieved - utilizing independent third party testing.

Truth in Acoustics

True NRC® was born out of Arktura's commitment to providing accurate and appropriate acoustic data for our products. We break down common tactics employed by manufacturers to inflate NRC numbers.

UNDERSTANDING ACOUSTICS

Key Acoustic Terms to Know



Absorption

In acoustics, absorption refers to the dampening - or reduction of - sound as it strikes a given surface. The higher the absorption, the more the sound is reduced.



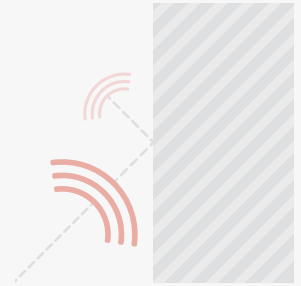
Decibel

The most commonly used measurement of sound level. It is a logarithmic scale that starts at 1 (mouse) and can range upwards of 140 (jet engine). The most desirable office environment decibel level hovers around 50.



Diffusion

The efficacy with which sound is evenly distributed throughout a given environment. A well-diffused acoustic environment results in a balanced, and typically, attractive sound response.



Reverberations

The persistence in a sound after that sound is produced. An echo is a form of reverberation, and is particularly offensive in an office environment.



Sabin

A unit of sound measurement indicating how well a surface of one square foot is able to absorb sound reflections. The total sabins of a product or space is the sound coefficient multiplied by the square footage of absorbing material is the total sabins of a product or space.



Sound Transmission Class (STC)

STC is a rating of how well a building partition blocks the transfer of airborne sound. It is used to compare the effectiveness of interior partitions, ceilings, floors, doors, windows, and exterior wall configurations by the sound transmission reduction between rooms.



NRC and SAA

Numeric representations of the level of sound absorption of a given surface. The scale goes from 0 (perfect reflection) to 1 (perfect absorption). This scale is used to measure the effectiveness of ceiling tiles, baffles, and other acoustic design elements. Depending on the test setup, some results can exceed 1.

NRC vs SAA

The **Noise Reduction Coefficient (NRC)** rating is the average of the sound absorption coefficients of 4 frequencies: 250, 500, 1000, and 2000hz.

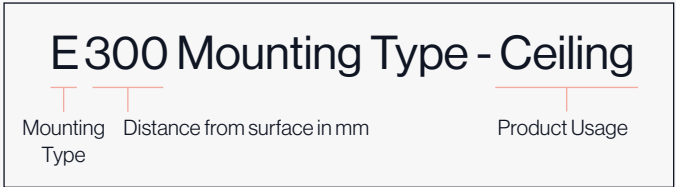
The **Sound Absorption Average (SAA)** rating is the average of the sound absorption coefficients of an octave range that includes 12 frequencies between 200 and 2500hz.

TESTING THE RIGHT WAY

Make Sure Tests Reflect Real Life Conditions

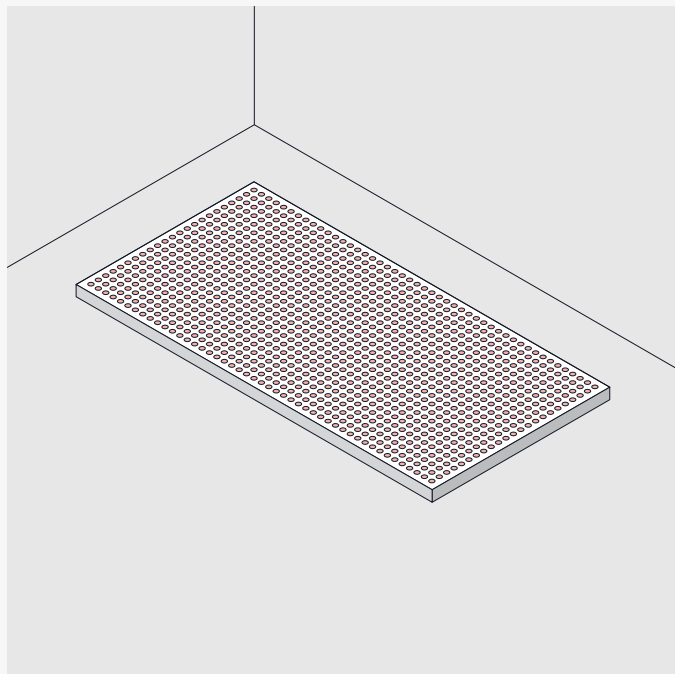
NRC results can vary drastically depending on the mounting type used in testing; different mounting types recreate specific use cases. **Manufacturers often withhold testing conditions and other information while using the most favorable mounting type to inflate NRC results. True NRC®** is our pledge to provide transparency and accuracy - so you can rest assured proper testing methods were used - and results will reflect real-life conditions. Each mounting type is tested on the floor, which for the sake of acoustics performance, has equivalent performance as a ceiling or wall. Learn more about mounting types below.

Name Breakdown



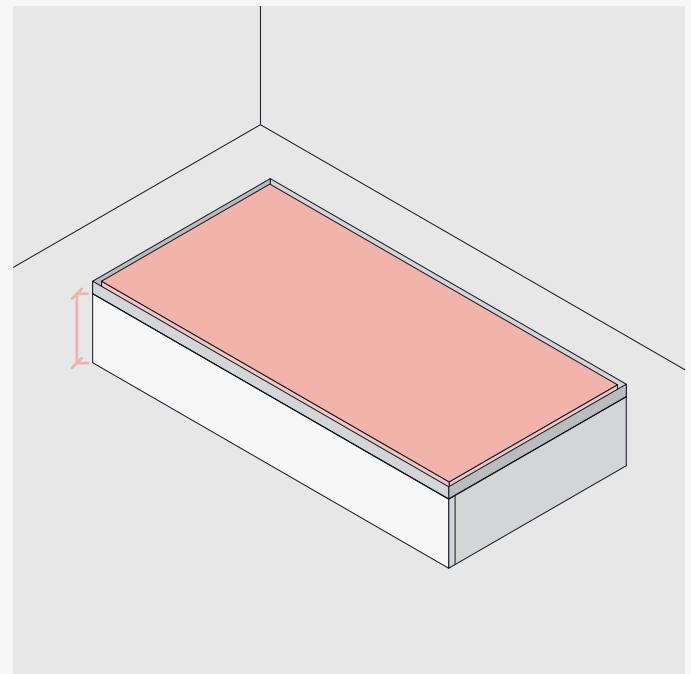
Type A

Specimen is placed directly on top of the floor. Intended for carpet, wall panels, or any product that will **be laid directly on floor or attached to a wall with adhesive or mechanical fasteners.**



Type E

Specimen is suspended and enclosed with air space below it. Intended to simulate a drop ceiling. **Air space is measured from the bottom of the panel.**

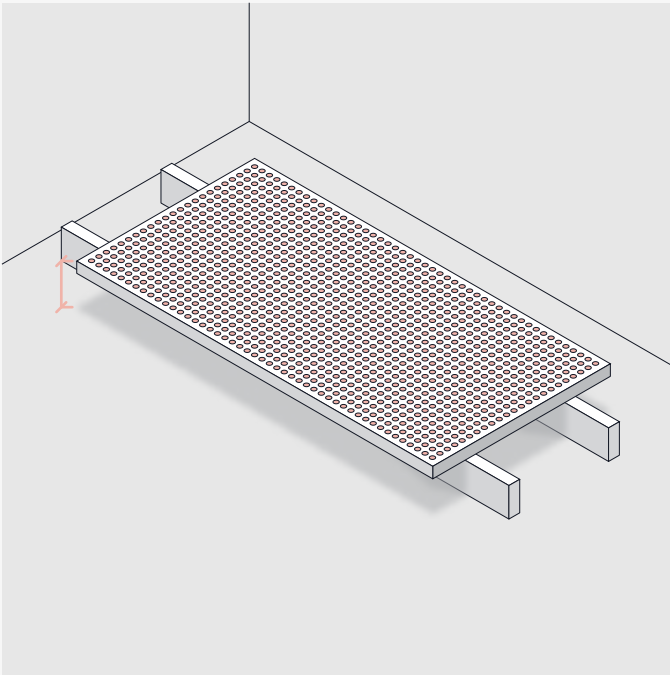


i These are representations of ASTM E795 Mounting Types for Sound Absorption Tests

TESTING THE RIGHT WAY

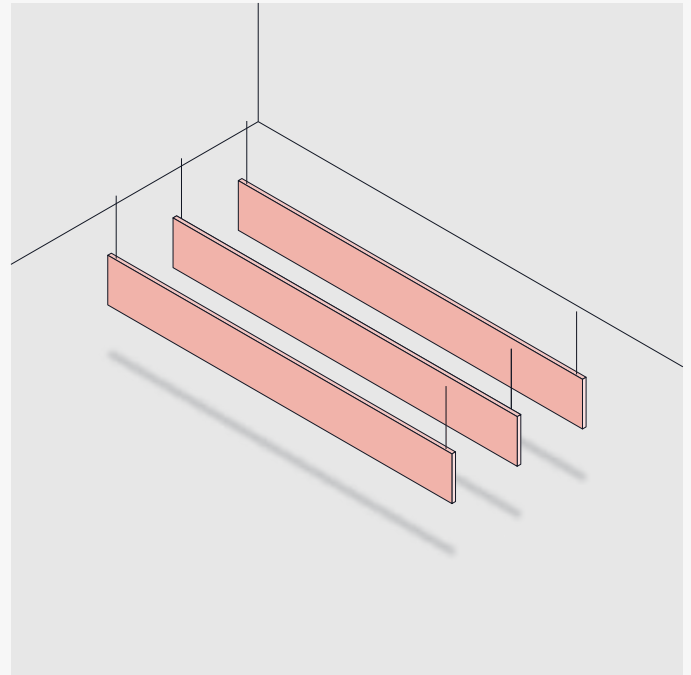
Type F

Specimen is separated from floor with spacers. Intended to simulate normal use of a product containing spacers or spacing clips. **Air space is measured from the top of the panel.**



Type J

Specimen is suspended vertically. Each 2' by 4' piece is separated from each other, unless an array that simulates actual installation is provided.



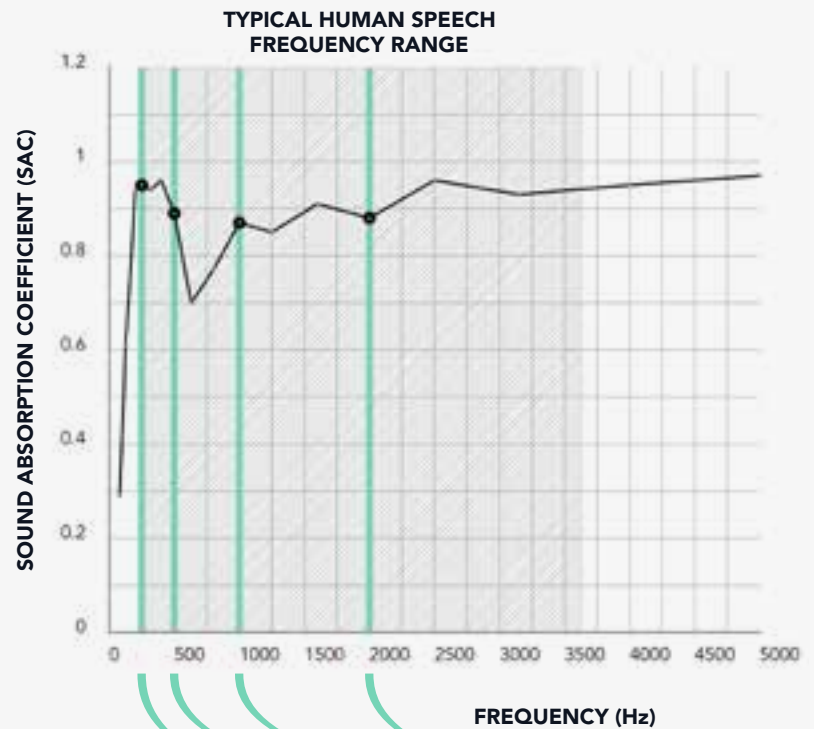
WHY TRUE NRC®?

Get to Know the True NRC® Methodology

Arktura provides both NRC and SAA results, but places an emphasis on **True NRC®** because it is more widely accepted and established in the architectural industry. **True NRC®** delivers transparency and honesty. **It pairs realistic conditions with realistic frequencies - based around typical speech patterns** (as is standard of NRC testing).

The example below utilizes the E300 Mounting Type, approximating a typical ceiling panel arrangement and pulling key frequencies to accurately reflect realistic conditions. The diagram below shows how NRC is calculated from ASTM C423 SAC testing.

FREQUENCY (Hz)	SOUND ABSORPTION COEFFICIENT (SAC)
80	0.29
100	0.42
125	0.61
160	0.75
200	0.94
250	0.95
315	0.94
400	0.96
500	0.89
630	0.70
800	0.77
1000	0.87
1250	0.85
1600	0.91
2000	0.88
2500	0.96
3150	0.93
4000	0.95
5000	0.97



$$\frac{\sum \text{SAC}_{(250 \text{ Hz}, 500 \text{ Hz}, 1000 \text{ Hz}, 2000 \text{ Hz})}}{4} = \text{NRC}$$

SAC * SQFt = Sabins

Test Arrangements

E300 Mounting Type - Ceiling - NRC : 0.90
 In this mounting type, the specimen is an array of spaced sound absorbing panels suspended from a T-Grid system approximately 300mm (11.8") above the horizontal test surface. This approximates the mounting method of a typical ceiling panel installation. Panels were evenly distributed in a 2x4 arrangement 1/16" apart in all directions.

F70 Mounting Type - Wall - NRC : 0.75
 In this mounting type, the specimen is separated from the floor 70mm (2.87") from the back of the panel with spacers. This is intended to simulate normal use of the product with the Vertika® wall mount system.

F150 Mounting Type (Material Only) - NRC : 0.90
 In this mounting type, the specimen is separated from the floor 150mm (6") from the back of the panel with spacers. This is intended to simulate normal use of the product with spacers or spacing clips.

True NRC™: 0.90

SAA: 0.89

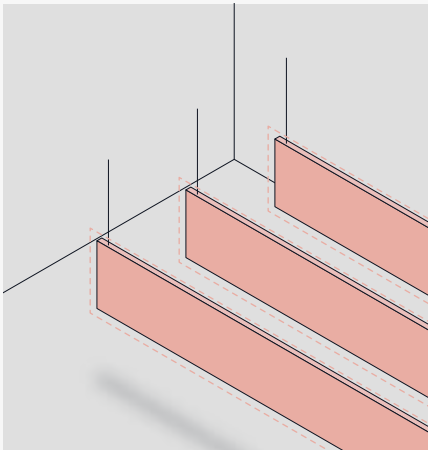
Test Results for Ceiling spelling with E300 Mounting Type.

TRUTH IN ACOUSTICS

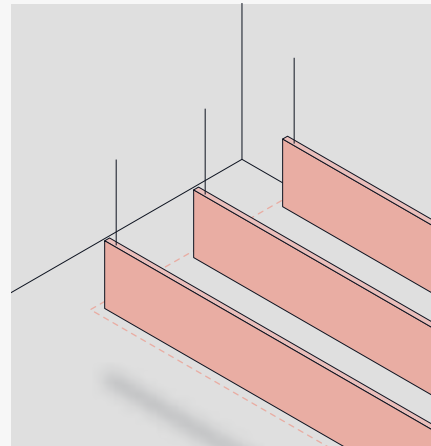
Look for Real Life Testing Scenarios

It is important to know the truth about how manufacturers test their baffle products. Type J mounting (illustrated below, left) allows manufacturers to calculate NRC based off of the surface area of their product instead of the total area and layout of a series of baffles. **This can result in highly misleading numbers.** With **True NRC®** you know you can trust results to be accurate.

“This method is favored by some material manufacturers since it yields very high NRC figures, but does not provide a fair comparison with other ceiling tile or wall panel products.”
– How testing agencies describe Type J calculations.



Material Surface Area
Calculation (Type J)
NRC 1.55



Installed Area
Calculation (Type E)
TRUE NRC® 0.55



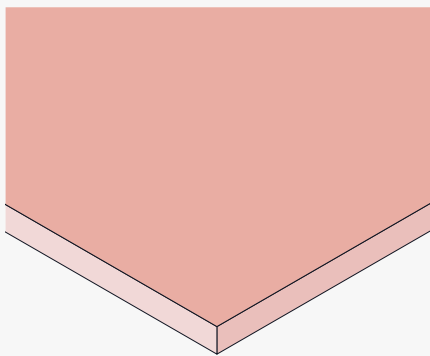
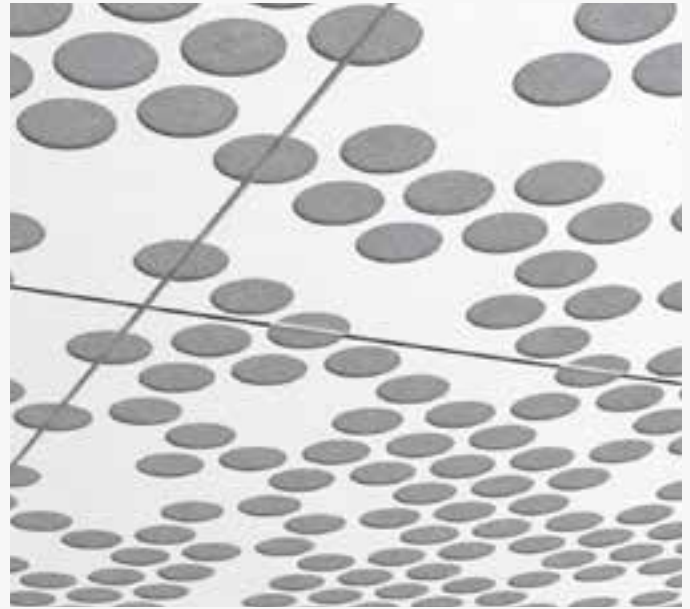
HOW WE TEST OUR BAFFLE SYSTEMS

**NRC tests setups can vary wildly.
True NRC® delivers realistic results.**

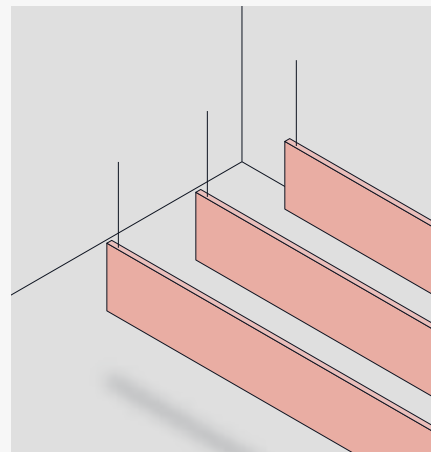
TRUTH IN ACOUSTICS

Material Ratings Differ From Design Ratings

An architectural system rarely has an NRC as high as the acoustic material by itself. If you encounter a system that claims to match its acoustical material performance, request the laboratory testing report. If they are unwilling to share it, do not trust the results. **True NRC®** never distorts the truth, it accurately reflects variations in design and composition.



Acoustic Material Only
NRC 0.90



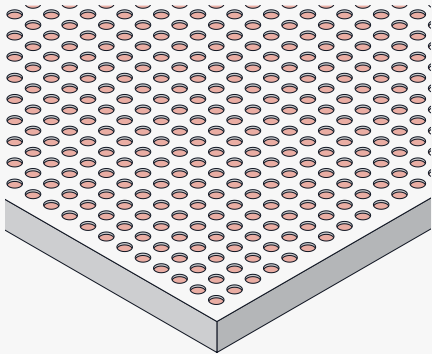
Architectural System with
Same Acoustic Material
TRUE NRC® 0.70

It's rare for the NRC of an architectural system to match the acoustic material alone.

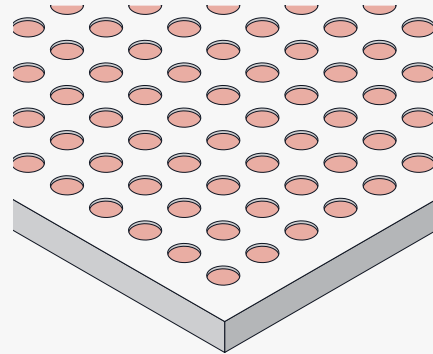
TRUTH IN ACOUSTICS

Pattern Openness Affects Ratings

Many manufacturers provide a blanket NRC for all configurations and patterns. **The truth is NRC results are highly dependent on specific geometry and pattern.** If the product is advertised as one rating fits all, your actual NRC could be much lower. This is one of the many common issues addressed by **True NRC®**.

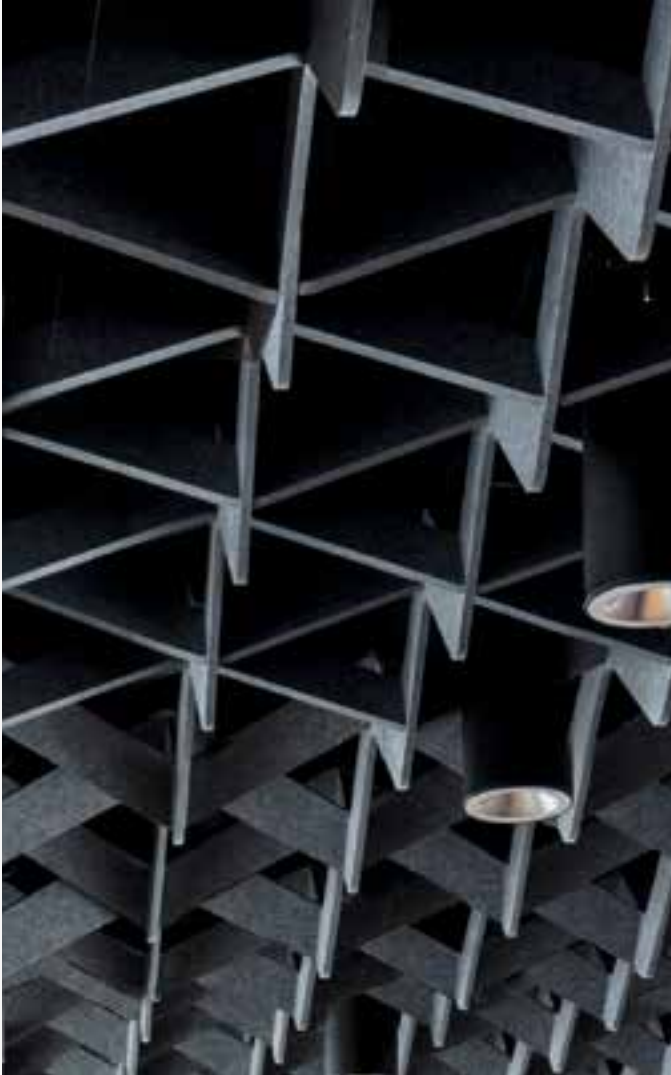


5% Openess
~~NRC 0.70~~
Actual NRC 0.50



25% Openess
TRUE NRC® 0.70

Beware of the same result for all products. NRC is specific to geometry and pattern.



Want to Know More?

Have questions? Arktura's representatives are happy to assist.
Contact your local sales representative for more information. Find yours at arktura.com/contact/

Just ask, we provide reports upon request.

Don't forget! Browse our full selection of acoustical systems to find the right solution for your next project.

FIND YOUR REP TO LEARN MORE

Special thanks to Tomas Schindler, Senior Vice President of San Francisco based acoustic, audiovisual, telecommunications, and security firm Charles M Salter Associates Inc.