



TWARON® Unicorn Hair for “Silence in the Depth”

TWARON® Unicorn Hair is a speaker cabinet filler for acoustic damping purpose which is produced by Thüringisches Institut für Textil- und Kunststoff-Forschung (TITK), Germany, exclusively for MUNDORF company, Germany.

Unicorn Hair is predominantly made from cleaned and karded TWARON® fibres as user-friendly “endless” strings. It was especially developed to absorb and damp the lower audio frequency range (<1 kHz) in subwoofers, transmission line tubes, insulation panels, etc. The material is easy to work with and does not age. The damping performance of TWARON® compares so favourably with that of all other known damping materials that it is today a “must” for many well-known developers and manufacturers of high-end speakers.

The extremely thin TWARON® fibres are karded into an extremely soft and dense so-called Horsetail Hair we named Unicorn Hair. In contrast to fibreglass and other plastic fibres, TWARON® conducts heat generated vibrations away very well and absorbs this type of acoustic motion energy in an entirely different manner than all conventional materials which are commonly used for damping purpose. Owing to the endless fibre tapes used in Unicorn Hair, the effective functional frequency-range is lower in comparison with the Angel Hair described below. It constitutes a significantly better alternative to the damping materials which are otherwise used in transmission line systems. In short, Unicorn Hair results in a very direct and dry bass reproduction in (sub-) bass cabinets, and in transmission-line tubes. The low-frequency vibrations are attenuated so efficiently that an extremely deep and clean bass reproduction “like by itself” is achieved.



TWARON® Angel Hair as “God Lives in The Details”

TWARON® Angel Hair is a speaker cabinet filler for acoustic damping purpose which is produced by Thüringisches Institut für Textil- und Kunststoff-Forschung (TITK), Germany, exclusively for MUNDORF company, Germany.

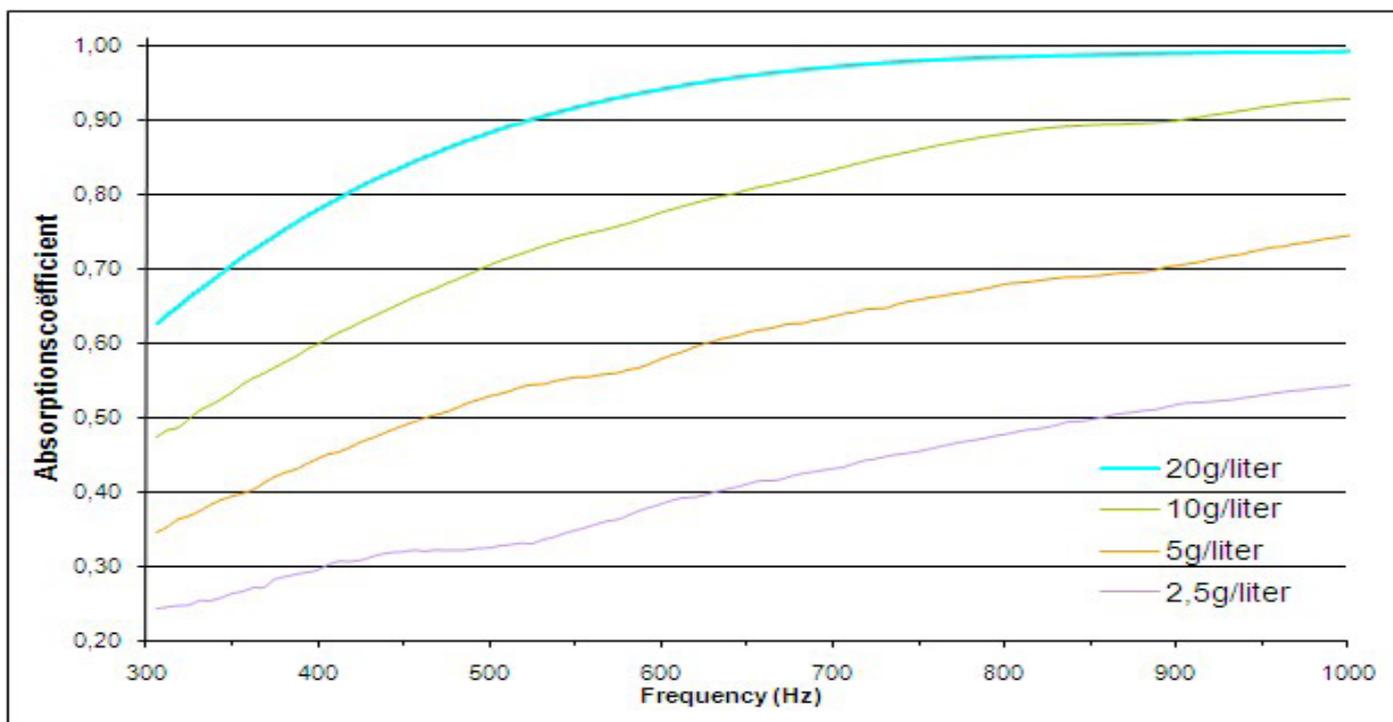
For to make Mundorf Angel Hair, the TWARON® base fibres are processed several times: The TWARON® fibres with their immense number of hairs are first cut into 60 mm long sections, hereafter karded, mixed and finally carefully pressed into a mass. In contrast to fibreglass and other plastic fibres, TWARON® conducts heat generated vibrations away very well and absorbs this type of acoustic motion energy in a fundamentally different manner than other known materials which are commonly used for this purpose.

The material is easy to work with, does not age, is almost incombustible and does not slip since it constantly tends to expand and therefore always fills the available space. It is very light and soft without other residual materials. For optimal cabinet insulation, just 3-5 grams are needed for 1 litre of volume.

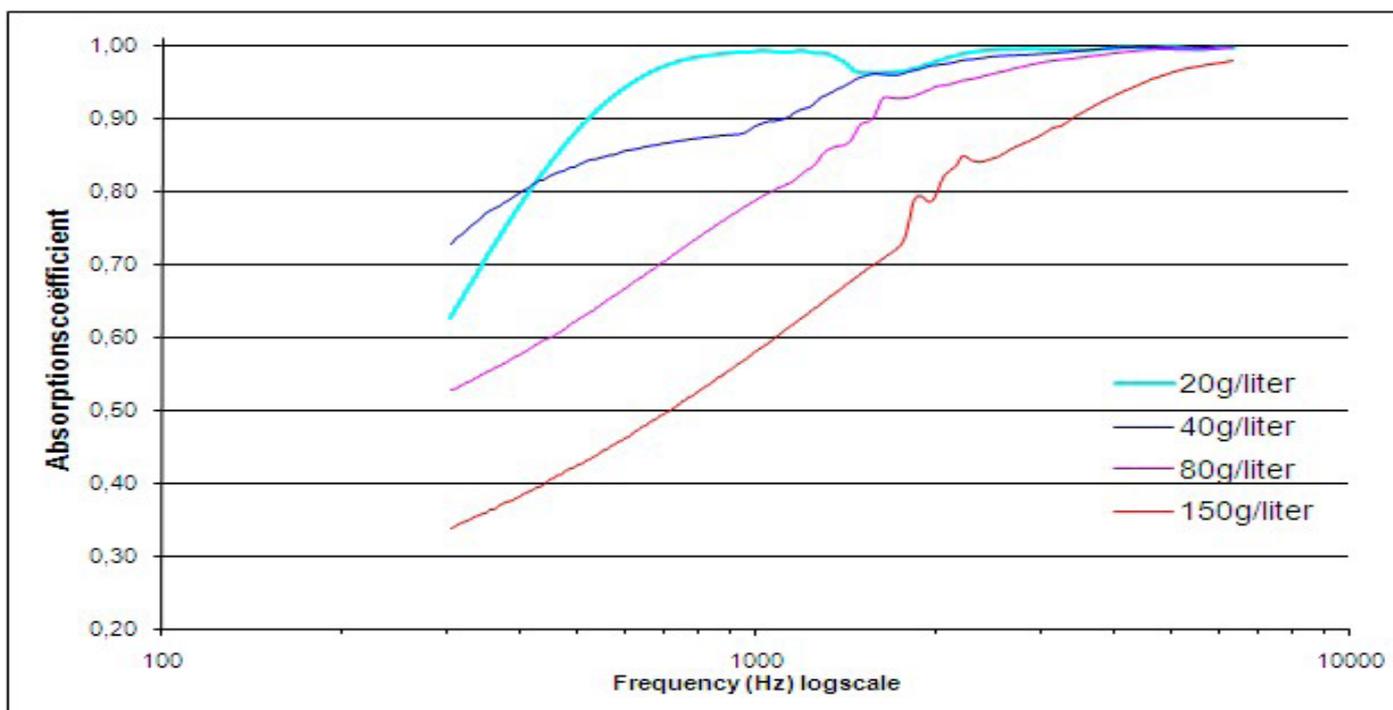
The choice of the right fibre lengths and the right process for combing them into a workable mass leads to remarkable acoustic results which were first discovered by audio professionals. The improvement in the sound quality (fine dynamics in the midrange, “more airy” reproduction of voices and instruments, better 3D properties, etc.) is absolutely comparable with replacing cheaper standard connections with high-end cables. With the difference that Angel Hair is much less expensive.

Comparisons with the kg-price for conventional fibres can make Angel Hair look expensive at first glance, but you only need approx. 10-20% of the weight of other materials. More importantly: the sound quality improves significantly; this can particularly be heard in the signal definition in the midrange and in bass reproduction. In comparison with the costs for high quality cables or equipment such as absorbers etc., Angel Hair is an extremely cost-effective way of improving the sound quality.

The following frequency/damping performance diagrams show how the low and medium audio frequency range can be adjusted very easily with the correct quantity of Angel Hair filling.



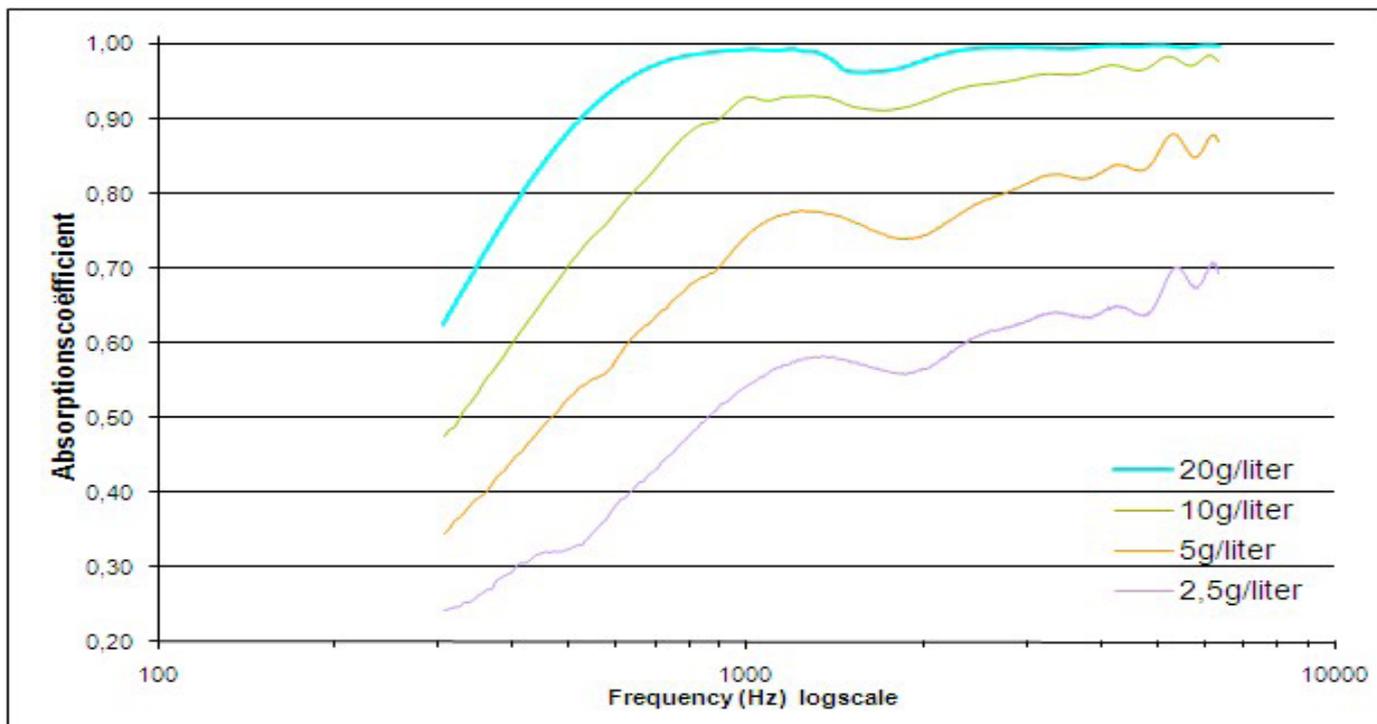
Fill diagram A) from top to bottom: 20, 10, 5, 2.5 grams/litre (logarithmic scale)
Measurements: TITK



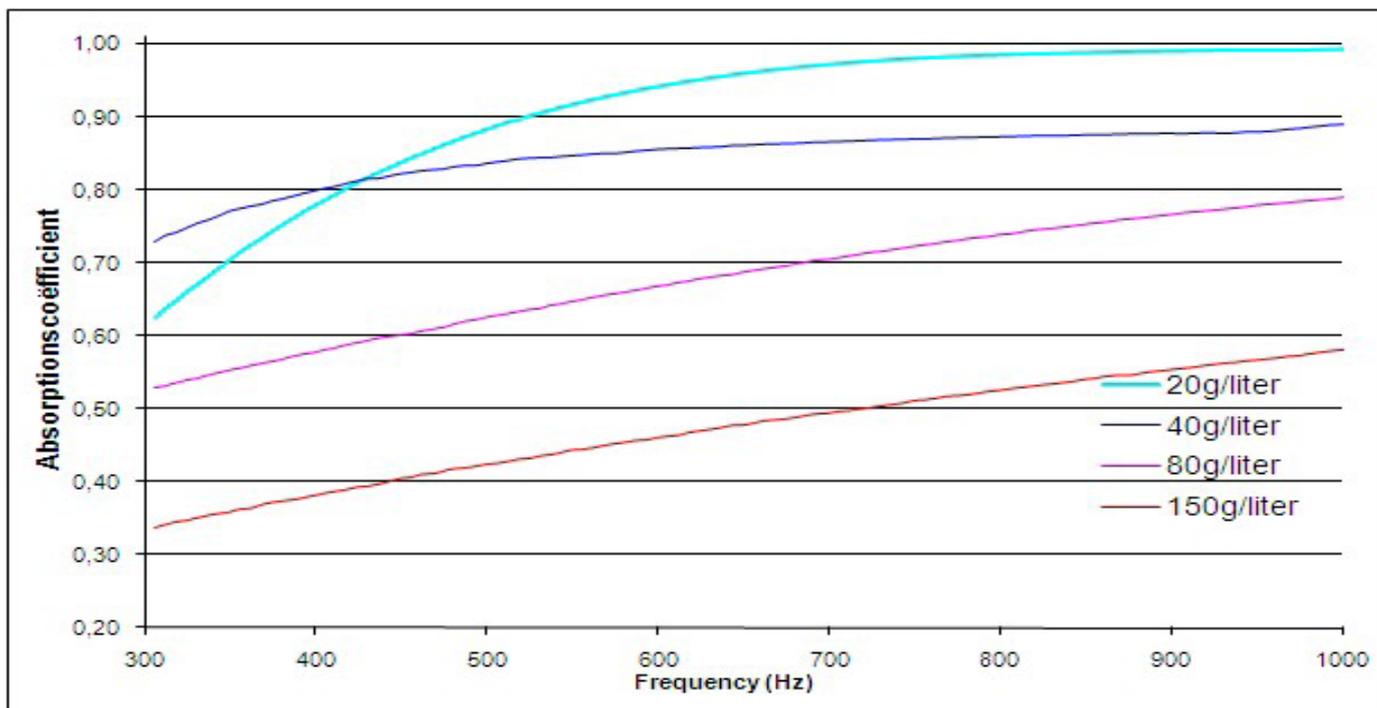
Fill diagram B) from top to bottom: 20, 10, 5, 2.5 grams/litre (linear scale <1000 Hz)
Measurements: TITK

In contrast to other insulating materials, the insulating properties of Angel Hair are almost linear from 700 Hz. As shown in the diagrams, 3-10 grams/litre of volume in speaker systems is an appropriate quantity, depending on the damped frequency range and the size and design of the speaker cabinet. It is certainly never necessary to fill large speakers and bass reflex boxes completely! At best, this would have a negative effect on the acoustics of your speaker system. For such cases, we recommend just filling the space behind the woofer. And another tip: by exchanging the standard BAF filler for Angel Hair, you generally achieve a further increase in the precision of the bass reproduction for existing speakers.

The diagrams C and D below show how absorption-specific room reflections in the midrange/ upper range can be achieved through filling of absorption boards or insulation backdrops with Angel Hair.



Fill diagram C) from top to bottom: 20, 40, 80, 150 grams/litre (logarithmic scale)
Measurements: TITK



Fill diagram D) from top to bottom: 20, 40, 80, 150 grams/litre (linear scale <1000 Hz)
Measurements: TITK

A close-up photograph of a thick, curly mass of light-colored synthetic hair. The hair is dense and has a soft, fibrous texture. The lighting is even, highlighting the individual strands and their natural-looking wave pattern.

TWARON® UNICORN HAIR

A close-up photograph of a thick, curly mass of light-colored synthetic hair, similar to the Unicorn Hair but with a slightly different texture. The hair is dense and has a soft, fibrous texture. The lighting is even, highlighting the individual strands and their natural-looking wave pattern.

TWARON® ANGEL HAIR

The logo for Mundorf, featuring a stylized red graphic of a staircase or a series of parallel lines on the left, followed by the word "MUNDORF" in a bold, red, sans-serif font. A registered trademark symbol (®) is positioned to the upper right of the word. A horizontal red line underlines the word "MUNDORF".

MUNDORF®