
AEMALLET

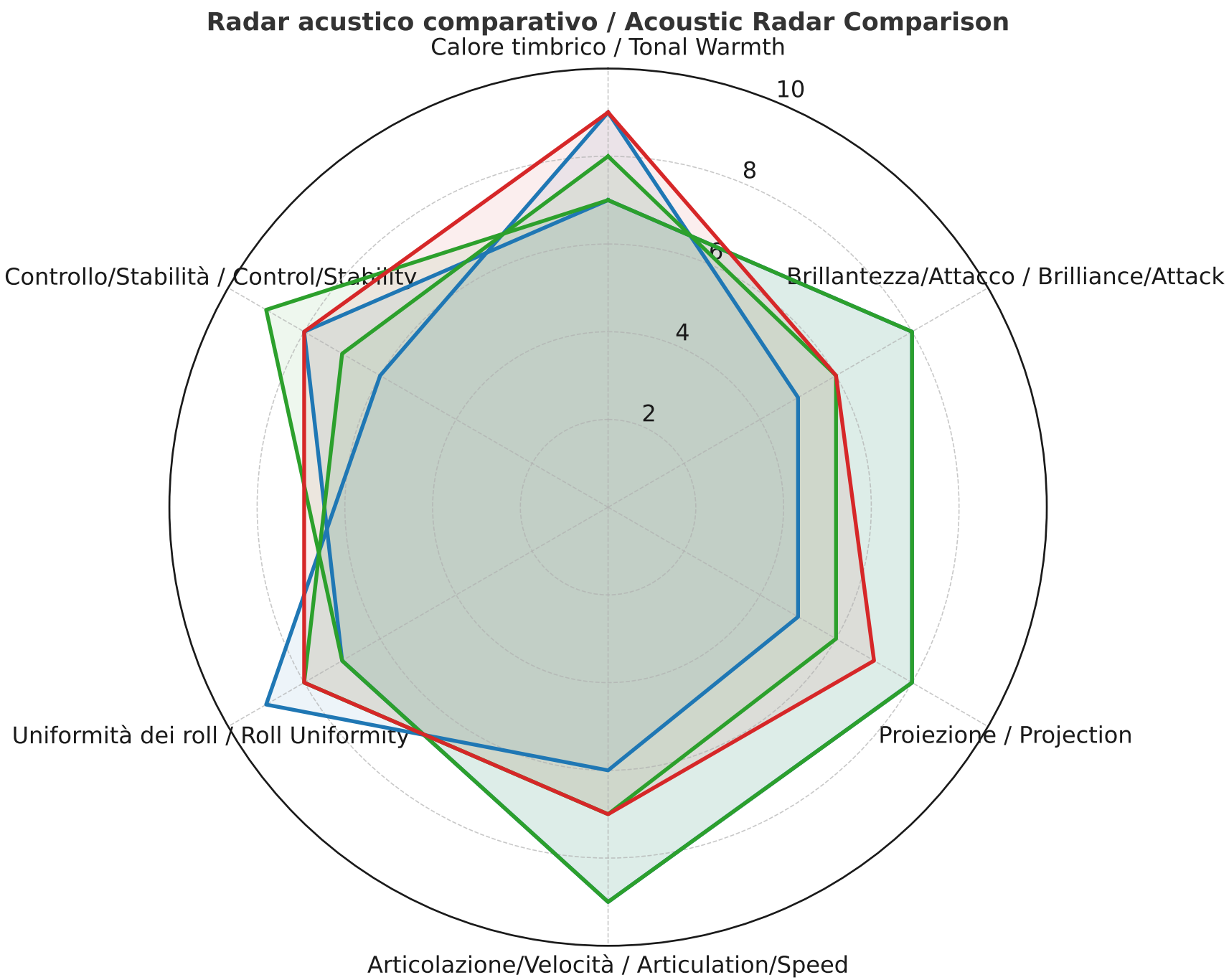
Cert. No. 11/2025

AEMallet

Performance Certificate – Acoustic & Mechanical Analysis

Material comparison:
Carbon Fiber (3/4 mm) • PEEK (7/8 mm) • Rattan (8→9 mm)

Official document of acoustic and mechanical comparison
for marimba and vibraphone mallets



Nota / Note: scala percettiva 1–10 su 6 dimensioni chiave / perceptual 1–10 scale on 6 key dimensions.

Certification Table – Mass & Center of Gravity

Shaft	Head	Shaft mass (g)	Net head mass (g)	Total mass (g)	CG from bottom (cm)	SM @330 mm (g·cm)
CF 3 mm	PTFE Ø30	4.6	30.8	35.4	37.0	142.2
CF 4 mm	PTFE Ø32	8.2	37.2	45.4	36.0	181.6
PEEK 7 mm	PTFE Ø30	20.5	29.4	49.9	31.7	-65.2
PEEK 7 mm	PTFE Ø32	20.5	36.1	56.6	32.5	-25.7
PEEK 8 mm	PTFE Ø30	26.8	28.9	55.7	30.4	-147.1
PEEK 8 mm	PTFE Ø32	26.8	35.5	62.3	31.3	-107.5
Rattan 8–9 mm (conical)	PTFE Ø30	14.0	28.9	42.9	33.3	13.1
Rattan 8–9 mm (conical)	PTFE Ø32	14.0	35.5	49.5	34.1	52.7

Calculation assumptions:
- Shaft length = 41 cm; SM reference at 33 cm from bottom
- Density [g/cm³]: PTFE = 2.20, PEEK = 1.30, CF = 1.60, Rattan = 0.60
- Head hole: Ø = shaft Ø, depth 20 mm
- Head modeled as solid sphere minus hole
- Rattan modeled as truncated cone

Note: indicative values for acoustic/mechanical comparison, without metallic inserts.

Signature and stamp _____

Technical-Acoustic Report

The comparative analysis highlights the correlation between the mechanical properties of the shafts and their acoustic performance.

Carbon Fiber (CF):
Provides high stiffness with a brilliant and articulated response.
Suitable for fast passages and modern solo repertoire.

PEEK:
Ensures a balance between mass and flexibility.
The 7 mm version emphasizes warmth and softness.
The 8 mm version guarantees precision and projection.

Rattan:
Preserves the traditional character of the marimba,
with a warm and natural tone.
Ideal for classical and romantic repertoire.

The mass and center-of-gravity table demonstrates how the balance point influences the feel in the hand,
while the static moment affects dynamic response.
The acoustic radar confirms that musicians' auditory perceptions match the measured physical parameters.

Conclusion:
Each material presents specific advantages.
This allows the soloist to select the configuration best suited to the performance context.

Rapporto tecnico-acustico

Fibra di Carbonio (FC): rigidità elevata, risposta brillante e articolata; ideale per passaggi veloci e repertori moderni.

PEEK: equilibrio massa-elasticità; 7 mm più caldo e morbido, 8 mm più brillante e stabile; adatto a contesti versatili.

Rattan: timbro caldo e naturale, carattere tradizionale; ottimo per repertori classici e romantici.

Conclusione: ogni materiale presenta vantaggi specifici che permettono al solista di scegliere la configurazione più adatta.

Technical-Acoustic Report

Carbon Fiber (CF): high stiffness with brilliant and articulated response; ideal for fast passages and modern repertoire.

PEEK: balance between mass and elasticity; 7 mm warmer/softer, 8 mm brighter and more stable; suitable for versatile contexts.

Rattan: warm and natural tone with traditional character; excellent for classical and romantic repertoire.

Conclusion: each material presents specific advantages allowing the soloist to select the most suitable configuration.