

String Material Properties' Effect on Sound

Background

Flatwound strings were invented in 1874 to replace gut strings. In 1962 the first bass roundwound string was introduced in Great Britain. There are people who polish their own roundwound strings, achieving more of a so-called halfwound string. By comparing flatwound, gut, synthetic gut and roundwound strings, we will analyze the material properties' affect on the string sound.

Question:

Do polished strings replicate the sound of gut strings?

Used guitar string types:

Unwound

Gut
Nylgut (synthetic gut)
Nylon
Metal

Wound

Flatwound (polished)
Roundwound
Gut
Nylgut (synthetic gut)

Method:

Mount each string type on the lab equipment and tune to the same fundamental frequency.

Collect for all string types:

- Frequency spectrum.
- Sound files of plucking.

(Optional) Polish roundwound strings with sandpaper in varying degrees and collect data.

Analyze partial amplitude, partial decay and inharmonicity. Describe the experienced sound quality of each type.

(Optional) Try to find a mathematical model that describes the effect of polishing the string.

Sources:

<https://www.jazzguitar.be/forum/guitar-amps-gizmos/80194-what-came-first-flatwound-roundwound-strings.html>

<https://bassmusicianmagazine.com/2019/12/the-birth-of-the-roundwound-bass-string/>