# Leonardo Guitar Research Project / a brief overview of the Research Findings

www.leonardo-guitar-research.com

#### Research Objective:

A comparative study of the sound preferences between guitars made from tropical woods, and guitars made from non-tropical woods.

Organised tests:

blind and non-blind playing and listening tests by

- Guitarists/Listeners (page 2 and 3)

- Public Audiences (page 4)

#### Tested guitars:

- 10 classical guitars made from non-tropical woods
- 5 classical guitars made from tropical woods
- All guitars of the same model: Torres FE19
- All guitars of the same high quality standard

Testing period: March > July 2014

A brief overview of the;

- METHODOLOGY
- MAIN RESULTS
- MAIN CONCLUSIONS

The complete Research Report and background information can be found at www.leonardo-guitar-research.com

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European Commission



All tops made out of euroean spruce with the same high qualities and the same bracing patern

# BLIND and NON BLIND TESTS by guitarists (G) and listeners (L) / Methodology, Results, Conclusions



Fig 1 (in full scale on next page)

#### **RESULTS & CONCLUSIONS**

Result: There was a strong consistency in the results per guitarist and listener across all of the three sessions. Conclusion: The tests were consistently good in quality and performance and therefore provide a reliable source of information .

Result: Score consistency for double pairs and double guitars in the groups is much better for guitarists than for the listeners (pair testing blind: average gitarists scores: 83 %, average listeners scores: 17 % / Fig 2)

Conclusion: Playing the guitars allows for a much better consistency in assessment than just 'passive' listening. Results of (playing) guitarists are therefore more reliable (although preference results between guitarists and listeners are very similar).

Result: Non-Tropical Guitars and Tropical Guitars were equally preferred for sound guality (around 50/50%. The only exception was Listener 1 in the pair test, but his consistency in this test was 0%).

**Conclusion**: Expierenced guitar players and listeners were unable to distinguish T's from NT's at better than chance levels. All blind tests show that it is possible to make equally good sounding guitars from both Tropical and Non-Tropical Woods.

Results: When guitarists and listeners could see the guitars, and they knew in which woods they were made, we see a very strong difference in sound perception: ± 50% fallback for the Non-Tropicals compared with the same Non-Tropicals in the 'blind' testing (from 50% blind to 25% non-blind, Fig 1)

Conclusion: Sound perception is strongly influenced by aesthetics and preconceptions of what are the 'best' woods for making guitars. Prejudices play an important role in what guitar players and listeners think sounds good or bad.

Note: Group testing blind was only conducted with the Guitarists, not with the Listeners

Finaly G was asked to explain, in his own words, why he found his favorite

and he was asked to say which guitar he found 'the best' in the group (He was allowed to give the same rating to more then 1 guitar if he wanted).

guitar the best out of the group.







### NON BLIND PAIR TESTING by publick audience



# BLIND and NON-BLIND TESTING by public audience in Belgium and Finland. METHOD

- Two audience test sessions were carried out: one in Belgium (44 listeners) , one in Finland (22 listeners).
- The same guitars were used as in the blind and non-blind pair tests for G's and L's (see page 2)
- A guitarist played the guitars in pairs (one T and 1 NT) to a 'Blind' audience (screened off from the guitarist) and subsequently to a Non-Blind audience (that could see the guitars and were told the woods used for backs and sides).
- The audience was asked to vote for their preferred guitar in each pair. Three preference possibilities: No. 1 / No. 2 / No Preference.
  In addition they had to note if they found the sound of the 2 guitars in one pair; Very close / Close / Different / Very Different.
  In the Audience Blind testing 2 pairs were presented twice (as in the Pair Test Blind, see page 2) to check consistency of voting preference.

# Results of the consistency of voting preferences (2 pairs were presented twice)



# Fig 5

Results of the Closeness/Difference rates						
	Very close /	Close	/	Different	/ Very	v different
Belgium			1			
Blind	14 %	41 %		<u>39 %</u> 6%		6%
Non-Blind	11 %	45 %		40 % 49		4%
Finland						
Blind	21 %	39 %		36 % 49		4%
Non-Blind	14 %	36 %		43 % 7%		7%

#### RESULTS & CONCLUSIONS Results:

- In the Audience Blind Tests NT guitars and T Guitars were equally rated for sound quality (around 50/50% / Fig 3 )
- Consistency in voting preferences was low. (Fig 5)
- The sound of the guitars in the pairs was generally rated as 'Close'. (Fig 6)

## Conclusions:

- It was very difficult to distinguish between tropical and non-tropical guitars under blind audience conditions.
   Listeners were unable to distinguish T's from NT's at better than chance levels.
- Non-tropical woods can be used to make guitars of equal sound quality to those made with tropical woods.

#### Note:

We see less difference between the Blind and Non-Blind audience tests, (Fig 3 and 4) than we did between the Blind and Non-Blind Pair Tests for guitarists/listeners (Fig 1). This is most likely due to the fact that the audience (particularly in Belgium) had a significant number of "Leonardo "guitar builders and supporters, and was consequently less biased towards tropical woods.

Fig 6