

TECHNICAL DOCUMENTATION

# Piano Voicing

*Timbral diagnostics: a guide*

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# Tuning and voicing: two distinct interventions

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Before looking at voicing in detail, it is worth clarifying a distinction that is often misunderstood but essential to understanding what this work involves.

## Tuning

Concerns the pitch of the notes — their fundamental frequency — ensuring that each key produces the correct note and that octaves, fifths and thirds are in the correct harmonic relationship with one another.

## Hammer voicing

Is a different intervention: it acts on the instrument's timbre — its tone colour and sound quality — by modifying the structure of the hammer felt through needling, filing or specific treatments.

## Why the distinction matters

A piano can be perfectly in tune and still sound harsh, metallic or dull: it is voicing that restores balance, roundness and expressive range to the sound. It is not about "tuning better", but about working on an entirely different parameter of the instrument.

## Working on the timbre

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Traditional voicing relies on a handful of established techniques, chosen and dosed according to the condition of the felt and the desired tonal result.

- **Needling.**

Inserting fine needles into the hammer felt to soften specific points, reducing hardness and harshness in the sound.

- **Filing.**

Controlled removal of material from the felt surface to restore the hammer's correct shape, where wear has created grooves or flat spots.

- **Steam treatment.**

A technique used to restore elasticity to compressed felt, often as preparation before needling.

- **Lacquer treatment.**

Targeted application of lacquer to harden the felt where the sound is excessively soft or lacks projection.

Every intervention requires note-by-note evaluation, since the felt's response varies from hammer to hammer and over time.

## An objective support for timbral evaluation

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Ivan Pisino has developed a timbral diagnostic system that complements professional listening with an objective, note-by-note measurement of sound.

The system is built on a SuperCollider/FluCoMa architecture for audio signal analysis, with a Python/PyQt5 interface managing the workflow. Four spectral parameters are measured for each note:

### Centroid

The spectrum's energy centre of gravity, linked to the perceived brightness of the sound.

### Rolloff

The frequency below which most of the sound's energy is concentrated.

### Spread

The dispersion of energy around the spectral centroid.

### Flatness

The ratio between the geometric and arithmetic mean of the spectrum, indicating how tonal or noise-like the sound is.

These values are compared against a calibratable reference profile, built around the timbral characteristics desired for the specific instrument. During the intervention, the system provides real-time suggestions on the most suitable operation note by note — needling, filing, steam treatment or lacquer — based on the measured deviation from the profile.

The client can indicate the desired timbral profile for their instrument, guiding the intervention toward a warmer, brighter or more balanced sound depending on repertoire and personal preference. At the end of the work, a PDF report is generated with the measurement data, useful as documentation of the instrument's condition and as a reference for future interventions.

## A method, not a shortcut

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The timbral diagnostic system does not replace the professional judgement of the ear, which remains the primary reference at every stage of the work; it is a complementary support.

It is useful for objectively documenting the state of an instrument's timbre and for comparing results over time, months or years after the last intervention.

The service is intended for private pianists who want a deeper understanding of their instrument, music schools with multiple instruments to monitor over time, and dealers and warehouses that require a systematic evaluation of the pianos in their catalogue.

### For information about the service

To learn more about the voicing and timbral diagnostic service, or to request an intervention, feel free to write or call directly.

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