

Quality criteria

How Kartesian defines useful driver performance and production consistency.

		The short idea A driver is not judged only by catalogue numbers. Kartesian quality criteria focus on what remains controlled when the loudspeaker is working: linear excursion, suspension stability, dynamic consistency and traceable production.	
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Two main criteria in product development

Low non-linearity over wide excursion Kartesian drivers integrate specific technologies to keep force, compliance and inductance controlled over useful membrane movement.	Validation in real use conditions Each product is evaluated with measurements and listening sessions in representative use cases, so technical results remain connected to sound quality.
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Linear excursion must be measured, not only calculated

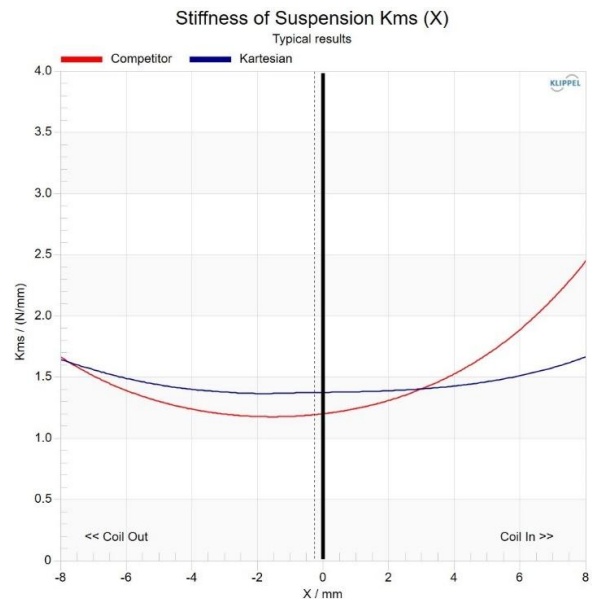
Kartesian definition

Linear excursion is the membrane movement range where $Bl(x)$, $Kms(x)$ and $Le(x)$ remain within 80% of their nominal value.

This is more demanding than a geometric voice-coil calculation, but it is also much more relevant.

Why the usual calculation is not enough

- It does not define the actual motor force.
- It ignores suspension stiffness.
- It does not predict the behavior of the driver under real excursion.



$Kms(x)$: Kartesian keeps stiffness controlled over a wider excursion range.

What the example shows

With the same 20% tolerance rule, the competitor remains linear around ± 3 mm, while the Kartesian woofer remains linear around ± 8 mm.

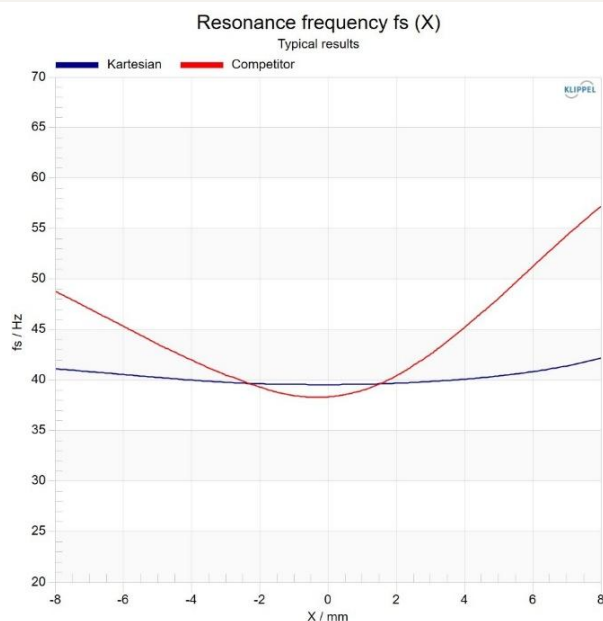
Playing bass with ± 3 mm or ± 8 mm of controlled suspension stiffness is not the same product behavior.

Demanding standards make better products

Conventional spiders often create two limits: stiffness is not perfectly symmetric around the rest position, and stiffness increases strongly as excursion grows. Both effects change the driver behavior when it is actually working.

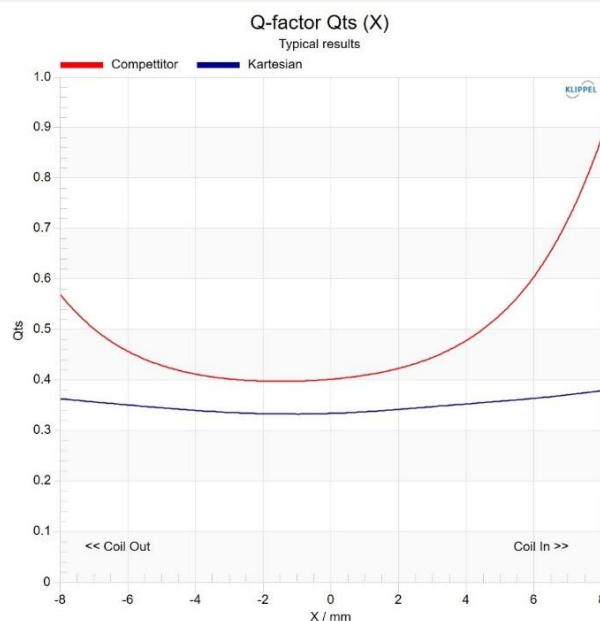
Fs stability

If suspension stiffness increases, resonance frequency increases as well. In the example, the competitor reaches 56 Hz at +8 mm, while the Kartesian woofer remains stable over the useful excursion range.



Qts stability

When F_s changes, Q_{ts} changes too. A driver can look correct around small signal values, but behave differently at high excursion. Stable T&S parameters preserve the low-frequency response.



Key point

Stable parameters under excursion ensure more consistent low-frequency performance.
This is why Kartesian defines quality on measured behavior, not only under small signal.

Quality must stay repeatable in production

1

Parts control

Cone, spider, voice coil and other key parts are checked before assembly.

2

Magnetic field control

The field is measured around the gap: 4 points for standard drivers, 8 points for _vKi.

3

Controlled assembly

The voice coil is positioned first in the motor, then spider, cone and surround are assembled at rest position.

4

Sweep and listening check

Each driver is played over a sweep signal to detect rub, buzz or abnormal noise.

5

Final QC report

Frequency response, impedance, sensitivity, THD, Mms, BI, Qts and polarity are measured for every single unit.
Uniq quality control number is noted on the driver and all measurements are archived.

Quality certificate is provided with every single _vKi driver, including mains measurements of the QC process



Traceability

Each loudspeaker that passes final QC receives a unique identification number. This number is stored in the Kartesian database and linked to production batches for full assembly traceability.

Quality criteria in one view

Linear excursion	Defined by measured $Bl(x)$, $Kms(x)$ and $Le(x)$, not by a simplified geometric calculation.
Suspension stability	Kartesian spiders keep stiffness more controlled and symmetric over useful excursion.
T&S stability	Stable F_s and Q_t s preserve low-frequency behavior when excursion increases.
Production control	Parts, magnetic field, assembly position, sweep listening and final measurements are controlled.
Traceability	Each validated driver receives a unique number linked to production data and batch history.

Non-contractual note

Kartesian continually improves its products and methods. This document is provided as a technical note and does not replace contractual specifications or datasheets.