



## Notes on the method used to measure the performance of Kling & Freitag speaker systems:

Valid: September 2003

1. The measurement of the polar data for Ease 3.0 took place so to speak under free field conditions in the low-reflex measurement room of the RWTH Aachen and was carried out by Audio & Acoustics Consulting Aachen, Dr. Anselm Goertz.

The measurements were made hemispherically in 5° steps around the acoustic centre of the speaker systems.

The measurements were taken from a distance of 8 m. The standardization of the sound power level was achieved in accordance with the reference axis (0° axis).

2. Polar data for Ease 4.0 were calculated by converting the data from Ease 3.0.

3. The sound power level was measured from a distance of 8 m. The data were standardized by converting into a distance of 1 m.

4. In calculating the power-handling capability Ease 4.0 allows for several input procedures:

- a. RMS power-handling capability
- b. Programm power-handling capability
- c. Peak power-handling capability

At the time of this data input there was no clear standardization on determining power-handling capabilities for simulation programmes. The input methods used hitherto are in our view not sufficiently reliable in terms of calculating attainable maximum levels, the reason being that long-term load, THD and compression effects have up to now not been taken into account.

To calculate the data for the Kling & Freitag speaker systems K&F has for the reasons described above used its own measuring methods, based in part upon the American Norm EIA 426-B (Optimum Amplifier Power).

The resulting power-handling capabilities can thus be regarded as recommendations for maximum (optimum) amplifier power.

The data on power-handling capability are roughly equivalent to a "programm power-handling capability" but take into account additional factors such as THD, compression and long-term stability.

KLING & FREITAG GmbH  
Innovative Sound Systems

Mitglied folgender Verbände



Ust.-IdNr.: DE 115648826 · Amtsgericht Hannover: HRB 52497  
Geschäftsführer: Martin Kling, Jürgen Freitag  
Stadtparkasse Hannover: BLZ 250 501 80 · Konto 794 996  
Deutsche Bank 24 Hannover: BLZ 250 700 24 · Konto 4410601

Junkersstrasse 14 · D-30179 Hannover  
Phone: 0(049) 511 96 99 7-0  
Fax: 0(049) 511 67 37 94  
info@kling-freitag.de · www.kling-freitag.de



In calculating the data the following measuring methods were used:

I. Compression: Sweep with sine wave signals, frequency range: 40 Hz - 10 kHz, power: maximum, duration: 1 min.

II. Accelerated life: Compressed noise in accordance with EIA 426-B. Peaks at maximum power. Average level: 1/2 power amplifier power, duration: 8 hours.

III. THD (measured with Monkey Forrest): Sine wave bursts in 1/6 octaves; frequency range: lowest stated cut-off frequency (frequency range -10 dB) to 5 kHz. Power: maximum. Duration: 190 msec.

The speakers measured must survive the entire series of tests without damage and without exceeding the limits for compression and THD (see Norm EIA 426-B).

For measurement of compression and accelerated life any protective circuitry was deactivated.

Certain components were cooled during the "accelerated life" test in order to maintain their functional properties.

Final observation: With this measuring method K&F has in our view produced realistic data which are in practice highly relevant.

KLING & FREITAG GmbH

Martin Kling

Mitglied folgender Verbände



Ust.-IdNr.: DE 115648826 · Amtsgericht Hannover: HRB 52497  
Geschäftsführer: Martin Kling, Jürgen Freitag  
Stadtparkasse Hannover: BLZ 250 501 80 · Konto 794 996  
Deutsche Bank 24 Hannover: BLZ 250 700 24 · Konto 4410601

KLING & FREITAG GmbH  
Innovative Sound Systems

Junkersstrasse 14 · D-30179 Hannover  
Phone: 0(049) 511 96 99 7-0  
Fax: 0(049) 511 67 37 94  
info@kling-freitag.de · www.kling-freitag.de