

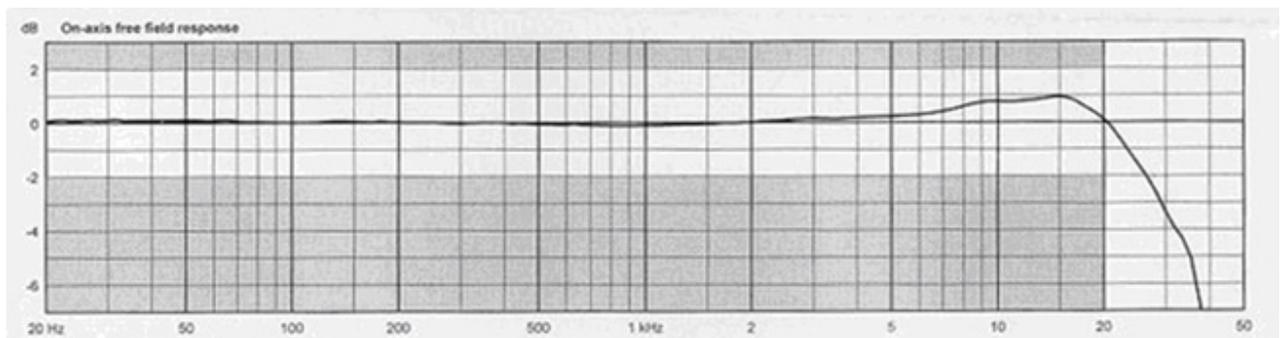
# DPA Microphones

## Matching microphones

Carefully matched stereo pairs and surround sets is one of your keys to successful multi-channel recordings. When selecting microphones for stereo and surround recording, it is crucial to ensure that the frequency response and sensitivity are identical.

### Tolerance and deviation

Each microphone of a specific type should perform within a consistent tolerance range, e.g. a frequency range from 20 Hz to 20 kHz with a deviation of maximum +2 dB and minimum -2 dB. If the frequency response exceeds this tolerance limit, the microphone should be rejected. In theory, a 4 dB difference at a certain frequency is possible and permitted. In practice, however, it is extremely rare.



*On-axis free field response of DPA 4052*

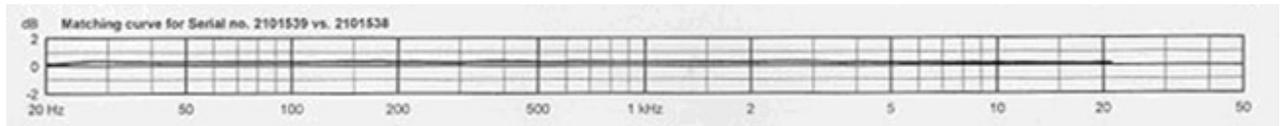
### What's in a match?

Some manufacturers state that all their microphones are matched to make a nice stereo pair as long as they are within the individual frequency response tolerance. This is not the case. If the tolerance is  $\pm 2$  dB there may be a 4 dB difference at some frequencies, and you are not informed about how the microphones might be different in frequency response within the range.

A single microphone can be chosen for its linear and natural response, but a certain frequency character might also be the reason behind a particular choice. When a number of microphones are set up to cover an acoustic field, you do not clearly hear the individual response – what you hear is rather the possible difference between the microphones.

### Demand documentation

This is why matching is paramount when choosing microphones for stereo and surround. Expect some documentation from the manufacturer as to how well the microphones are calibrated to each other. At DPA Microphones we select pairs that are identical within an extremely narrow tolerance and substantiate it with a matching curve:



*Matching curve for a stereo pair of DPA 4052*

Note that even though the 4052 has a subtle and intended high frequency rise, the matching curve is horizontal, showing that the two 4052s have the same high frequency lift. Individual microphone linearity is not the issue here; we are looking for consistent and identical responses across microphones.

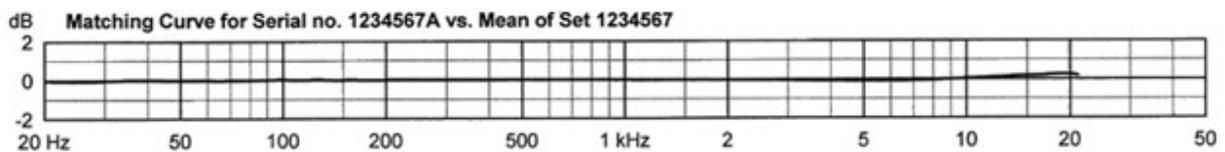
**Check your stereo mics**

Grab your favorite stereo pair and place them as close as possible in the same spot. Gain them equally, sum them to mono, and invert the phase on one of them. With an ideal matched pair you should not hear anything. If you do hear something, you hear the difference.

There might be a level difference which is one point where microphones may not make an ideal pair. Also on sensitivity there is a production tolerance and therefore a reason to keep an open eye on matching accuracy.

**Surround matching**

For surround microphone kits containing five or more of the same microphone it can be a challenge to keep a sense of perspective on sensitivity and frequency differences. A reasonable method to prove that the surround kit will be perceived as identical is to show a frequency difference curve to the mean-of-set frequency response.



*Matching curve for a DPA 4006-TL to mean of set of five 4006-TL's*

**DPA's matching tolerances**

To ensure a neutral and vivid sound image and a realistic multi-channel audio experience, each microphone in DPA stereo and surround kits is individually calibrated to meet these extremely

precise matching tolerances. Matching tolerances are applicable within the microphone's entire frequency range.

<b>Product</b>	<b>Matching tolerance on sensitivity and frequency response</b>
<a href="#">3503</a> Stereo kit w. 4003 omni mics	± 0.5 dB
<a href="#">3506</a> Stereo kit w. 4006-TL omni mics	± 0.5 dB
<a href="#">3511</a> Stereo kit w. 40011-TL cardioid mics	± 1 dB
<a href="#">3521</a> Compact stereo kit w. cardioid mic	± 1 dB
<a href="#">3532</a> Stereo kit w. 4041-S omni mics	± 0.5 dB
<a href="#">3552</a> Compact stereo kit w. omni mics	± 0.5 dB
<a href="#">5006</a> Surround kit w. 4006-TL omni mics	± 0.5 dB
<a href="#">5006-11</a> Surround kit w. 4006-TL omni and 4011-TL cardioid mics	± 0.5 dB (4006-TL); ± 1 dB (4011-TL)
<a href="#">5015</a> Surround kit w. 4015-TL wide cardioid mics	± 1 dB