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## **Helmet test special**

The ultimate motor cycle helmet test by Motorrad Reisen und Sport; on the test bench:

14 helmets in the 300 euro plus price class.

In particular when it comes to helmets, noise is "out" and although the protective capacity of the helmet is tested according to stringent standards, aerodynamics, acoustics and ventilation are not laid down in any official system. Motorrad Reisen und Sport took the top of the range helmet models into the wind tunnel, and collated the relevant data. We have produced a summary of the acoustic results.

No official figures are available, so estimates as to how many new motor cycle helmets are sold every year in Germany range widely from 800,000 to 1.5 million. The truth is probably somewhere in between, but what is certain is that the market for this particular type of protective head gear is worth a small fortune.

## **Acoustics**

Part two of the test procedure: the acoustic measurements. For this test routine, a dummy with artificial head is mounted on an unshielded motor cycle, whilst the wind tunnel simulates speeds of 100 and 130 km/h. Remarkable discrepancies were identified. The quietest helmet, the Schuberth S1, at these speeds generated 81.6 and 88.1 dB (A), respectively. The noisiest test object, the Shoei XR 1000, pummels the ears of the rider at these same speeds with levels of 99 and 105.2 dB (A) respectively. By way of comparison, a pneumatic drill bombards the environment with 100 dB (A). According to German regulations for measures for employee protection (comparable with the Dutch ARBO Health and Safety at Work

laws), the maximum permitted exposure to a level of 101 dB (A) at the work place is not more than one hour per week.

However, in this comparative test, the Shoei is not the only noise monster. At the recommended maximum speed on the motorway, the Arai RX-7, IXS HX 600, KBC AR-1, OGK FF4, Suomy SPEC 1R and X-Lite X-901 all (mis)treat their owners to a diet of more than 100 dB (A). On the other hand, the Baehr Silencer II, BMW SportIntegral and Schuberth S1 demonstrate that lower levels can be achieved. If you want to know how much noise these helmets let through at 200 km/h, then follow the rule of thumb: the value at 100 km/h plus 12. In principle, according to this formula, at 200, the helmets are approximately twice as noisy as at 100 km/h, because an increase of 7 decibel (A) is equivalent to a doubling of the noise. This means, for example that the Vemar VSX burdens its wearer travelling at 200 km/h with almost 106 dB (A).

The noise itself is one matter, but the composition of that noise is quite another. With some helmets, a whistle is generated, with others, the wind swirls around the spoiler, whilst still others buzz and hum. Such differences cannot be perceived by an artificial head, however smart it may be; this is where the human ear comes into play. In this battery of tests, it is observed that the less noisy than average Shark 1974 RSR gets on the rider's nerves with a clearly perceivable wind roar at the back of the head. The human test rider is also able to observe that the Arai whistles just as loud as the KBC or the Schuberth and the BMW, with the face mask vent open.

It should however of course be noted that with a quiet helmet, the rider does hear additional noises which in the noisier helmets are lost in the overall cacophony. Specialists refer to this as the so-called "camouflage effect". It was interesting to note that there were practically no discrepancies observed in the dB measurement with the air supply and discharge openings in open and closed position. The difference is around one decibel, a discrepancy which goes entirely unobserved by the rider. The change in noise levels as a result of attaching or removing a wind guide beneath the chin (if such an option is available) is of approximately the same order of magnitude.

**On balance, the overall conclusion remains that any motor cyclist travelling at or above the specified maximum speed on the motorway, for long periods of time, will in the long term be doing his ears a favour, by putting in a set of earplugs.**

Producer	Model	dB 100 km/h	dB 130 km/h
Arai	RX 7	94,1	100,1
Baehr	Silencer II	90,1	95,3
BMW	SportIntegral	86,3	92,4
IXS	HX 600	96,3	101,9
KBC	AR-1	94,5	100,4
OGK	FF4	95,8	120,1
Premier	Avenger	93,4	98,9
Schuberth	S1	81,6	88,1
Shark	RSR	91,6	97,3
Shoei	XR 1000	99,0	105,2
Suomy	SPEC 1R	96,4	102,0
Uvex	Supersonic	91,2	97,8
Vemar	VSX	93,9	99,4
X-Lite	X-901	93,9	100,6
Average		<b>92,7</b>	<b>98,7</b>

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