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FRAUNHOFER INSTITUTE FOR
INTEGRATED CIRCUITS IIS

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VALIDATION OF WEARABLES WITH SUBJECT-BASED STUDIES

**Fraunhofer Institute
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UNVEIL THE REAL ACCURACY OF WEARABLES

Wearable technology is a booming business: new devices are pushing onto the market claiming innovative algorithms and scores.
The accuracy of physiological monitoring is critical for both training optimization and health protection. However, how accurate are the measured data and what is behind parameters such as Fitness Level?

Validation of Wearables

As an independent research institute, we offer smart testing solutions for the validation of wearables with a subject-based study. The test persons perform typical sports movements and are measured with both wearables and the appropriate gold standard methods.

To compare parameters measured by wearables and apps with the reference values, we analyze the raw data. Based on this analysis, we calculate manufacture's individual scores, compare it with latest scientific literature and validate them.

In close cooperation with the customer, we specify the kind of wearables to be tested as well as the individual requirements. This defines the kind of acquired data, the subject peer group as well as the data analysis.

Measurement and analysis modalities

- Heart rate and heart rate variability
- Respiratory quotient: volume, frequency and minute volume
- Aerobic threshold
- Ventilatory and anaerobic thresholds (calorie consumption)
- Electrodermal activity (EDA) and muscle activity (EMG)
- Movement parameters (accelaration, decelaration, speed)
- Event detection of specific movements (jumping, court-transition)

Further metrics are available on request.

The advantages at a glance

- We are an independent research institute with flexible network structures and in-house capacities.
- We have long-term experience in sensor development, textile integration and biosignal analysis.
- We have a testing center and sports lab with comprehensive equipment and reference systems.
- Full transparency – no black box: The client will receive all data as well as a scientific interpretation.
- We have an extensive network of medical experts in cardiology, neurology and sports medicine.