PRODUCT CERTIFICATION BODY

ISO/IEC 17065:2012

P16-F01

Cybenetics Certification Scheme for PSU and Cooling Product Performance

Version 02

Prepared By (signature, name, title)	Approved By (signature, name, title)	Date
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1. PURPOSE

The purpose of this Cybenetics Certification Scheme is to provide a technically rigorous and transparent mechanism for evaluating and certifying the real-world performance characteristics of computer power supply units (PSUs) and cooling fans. This scheme aims to support consumers, manufacturers, system integrators, and retailers by delivering standardized, laboratory-tested performance data in key areas, including:

- Electrical efficiency under dynamic load conditions,
- Acoustic performance (noise output) in accordance with ISO methodologies,
- Electromagnetic Interference (EMI) with relevant regulatory standards, and
- Fan reliability metrics, including bearing health and start-up performance.

The certification scheme enables:

- Informed purchasing decisions based on independently verified metrics,
- Product differentiation for manufacturers through credible performance labeling, and
- Increased transparency in marketing and technical specification claims.

Certification is based on testing representative product samples by ISO/IEC 17025-accredited Laboratory, with results evaluated against predefined performance classes, following Cybenetics' PSU and Fan Test Protocols:

- The Complete Cybenetics Test Protocol, Including Energy Efficiency, Output Noise, And Overall Performance Calculation of AC-DC Power Supplies
- The Phi Fan Performance Standard (PFPS)
- Cybenetics EMI testing protocol

The scheme does not involve ongoing surveillance of production and follows the structure of a **Type 1a** product certification scheme as defined in ISO/IEC 17067, with extended metrics beyond traditional single-parameter evaluations.

Cybenetics is the Scheme Owner of the present Scheme titled '**Cybenetics Certification Scheme for PSU and Cooling Product Performance'**

2. SCOPE

Cybenetics' certification scheme is designed to provide a comprehensive evaluation of key performance metrics in products such as power supply units (PSUs) and fans. These schemes focus on performance aspects that include efficiency, noise, airflow, static pressure, EMI emissions, ensuring transparent and reliable benchmarks for manufacturers and consumers alike. Certifications target entire production lines by analyzing representative samples to validate product quality and consistency. By incorporating advanced testing methodologies from the ETA, LAMBDA, PHI and EMI programs, as well as protocols outlined in Cybenetics' white papers, these certification schemes reflect the highest standards of precision and integrity.

The test evaluates one representative sample from the production line. A second sample may undergo testing only if there are technical issues or discrepancies with the first, ensuring cost-effectiveness without compromising accuracy. This approach highlights Cybenetics' commitment to balancing accessibility and transparency in its certification programs.

Cybenetics' certification programs are voluntary and intended to validate performance in specific aspects (efficiency, noise, airflow, static pressure, and EMI emissions) without imposing excessive costs on clients.

3. Normative References

ISO/IEC 17067:2013 – Fundamentals of product certification

ISO/IEC 17065 – Conformity assessment requirements for certification bodies

ISO/IEC 17025 – Testing laboratory competence

IEC 62301 – Measurement of standby power

ISO 3741 – Acoustic measurement

EN55032 / CISPR 32– EMC testing

ISO 10302 – Acoustics for axial fans

4. Certification Objectives

The primary objectives of Cybenetics' certification schemes are structured to promote quality, reliability, and informed decision-making:

1. **Define Performance Metrics**: Certification programs establish transparent performance levels for specific product aspects, including energy efficiency, acoustic comfort, thermal performance and EMI compliance.
2. **Detect and Resolve Issues**: The evaluation process identifies potential design or production issues, allowing manufacturers to address deficiencies before they affect end-users.
3. **Independent Validation**: Certifications provide unbiased third-party testing, enhancing credibility and offering valuable feedback during the product development lifecycle.
4. **Consumer Empowerment**: By categorizing products into clear performance tiers, certifications enable future buyers to make well-informed purchasing decisions based on independently verified metrics.

5. Sampling Methodology

The sampling process emphasizes impartiality and fairness, ensuring that test results reflect the production line's overall quality:

- **Random Sample Selection**: Manufacturers submit two random samples from the production line. These samples represent the quality and consistency of the entire production batch.
- **Declaration of Authenticity**: Each sample must be accompanied by a formal declaration affirming that it is a standard production-grade unit, identical to those sold to consumers. This ensures that no "Golden samples" (specially optimized units) are submitted.
- **Re-Evaluation for Anomalies**: If the first sample encounters technical issues or its performance raises concerns, the second sample is tested. If there are significant discrepancies between the two samples, manufacturers may be required to submit additional units for comprehensive re-evaluation.

This methodology prevents manipulation and ensures that certification results accurately represent real-world production quality.

6. Evaluation and Testing Criteria

Cybenetics employs advanced and rigorous protocols to evaluate submitted products. Testing spans multiple critical metrics, integrated with the ETA, LAMBDA, PHI and EMI methodologies:

6.1 Efficiency Testing with ETA

ETA certification evaluates the energy efficiency of PSUs, leveraging innovative methodologies to provide unparalleled precision. Highlights include:

- **Load Combination Testing**: Over 1.450 load combinations are applied, which through interpolation can generate up to 25.000 measurement points. This eliminates the possibility of manufacturers from tuning their PSUs for specific load levels, offering a holistic evaluation of energy efficiency across the PSU's entire operational range.
- **Comprehensive Metrics**: Testing measures voltage regulation, power factor, ripple levels, and vampire power consumption. Vampire power—energy consumed when the device is idle—must remain below strict thresholds (<0,25 W for most tiers).
- **5VSB Rail Efficiency**: Efficiency on the 5VSB rail is measured in increments of 0,05 A, up to the maximum output current. The average efficiency must meet or exceed 70%, with stricter thresholds for higher certification levels.
- **Certification Tiers**: ETA certifications are awarded across six (6) tiers: **Bronze**, **Silver**, **Gold**, **Platinum**, **Titanium**, and **Diamond**, representing increasing levels of energy efficiency.

6.2 Noise Testing with LAMBDA

LAMBDA certification focuses on the acoustic performance of PSUs, using advanced decibel (dB) scaling techniques:

- **Logarithmic Adjustments**: Noise levels are converted to sound pressure units (Pa) for averaging, then converted back to dB. This approach ensures accuracy and reliability, even for borderline cases.
- **Evaluation Levels**: Noise performance is categorized into seven tiers, ranging from Standard (40-45 dB(A)) to A++ (<15 dB(A)), enabling consumers to distinguish between quiet and noisier PSUs.

6.3 Fan Testing with PHI

The PHI certification evaluates the cooling performance of fans, emphasizing airflow and static pressure under realistic conditions:

- **Normalized Noise Output**: Fans are tested at 25 dBA, a threshold balancing acoustic comfort and cooling efficiency. This noise level ensures that fans spin fast enough to perform effectively without producing disruptive sound.
- **Performance Metrics**: Airflow and static pressure are evaluated, with classifications tailored to fan size (120mm or 135-140mm). Higher categories like Titanium and Diamond represent fans with exceptional cooling efficiency and static pressure capabilities.
- **Certification Tiers**: Fans are ranked using a six-tier system (Bronze to Diamond) based on their performance in airflow and static pressure tests.

6.4 Types of Electromagnetic Emissions

- Radiated Emissions: Electromagnetic waves transmitted into free space—typically caused by high-frequency switching, PCB traces, and power cables.
- Conducted Emissions: Electrical noise traveling through power lines, affecting devices on the same electrical network.
    - Common Mode (CM) Emissions: Noise flowing in the same direction through conductors (often due to parasitic coupling).
    - Differential Mode (DM) Emissions: Noise flowing in opposite directions, caused by asymmetries in switching circuits.

6.4.1 EMC Testing Equipment & Process

- Spectrum Analyzer / EMI Receiver → Captures and analyzes interference across 150 kHz - 30 MHz frequency range.
- Quasi-Peak, Peak & Average Detectors → Evaluate signal impact on real-world devices.
- Line Impedance Stabilization Network (LISN) → Standardizes power line impedance for conducted emissions testing.

6.4.2 EMI Compliance Requirements

EN55032 / CISPR 32 Frequency Range (MHz)	Quasi-Peak Limit (dBµV)	Average Limit (dBµV)
0,15 – 0,50	66 to 56	56 to 46
0,50 - 5	56	—
5 - 30	60	46

6.5 Products must meet these limits to pass Cybenetics certification.

Detailed Part Analysis: A meticulous part analysis is conducted on all submitted samples to document the components used and ensure compliance with declared specifications. If future production batches involve part changes, Cybenetics compares them to the original test data to detect deviations. Significant changes may necessitate re-certification to maintain validity.

7. Certification Decision

Cybenetics bases its certification decisions on the outcomes of the testing process:

7.1 Approval

A DUT meeting all evaluation criteria is certified as compliant and awarded corresponding certification badges (ETA, LAMBDA, PHI and EMI) representing their performance levels.

7.2 Denial:

If a DUT fails to meet the required benchmarks, certification is denied. Manufacturers receive a detailed report outlining reasons for failure.

8. Limitations and Disclaimer

Certifications rely solely on the samples submitted for testing, assuming that the quality of all production units matches the evaluated samples.

The detailed part analysis documents all components and safeguards against deviations in production quality. If significant changes in materials, parts, or production methods occur, manufacturers must notify Cybenetics and submit updated samples for evaluation.

9. Cost Implications

The testing process is optimized to minimize costs by evaluating one representative sample initially, with a second sample tested only if required.

Re-testing additional samples is offered when failures or anomalies occur, ensuring fairness and reliability in certification processes.

Cybenetics maintains a transparent fee structure, ensuring accessibility without hidden charges.

10. Certification Validity

Certifications remain valid unless significant changes are made to the production process. Through its open-access database, Cybenetics tracks testing results and part analyses, enabling stakeholders to monitor compliance over time. If deviations are reported, manufacturers may be required to undergo re-certification.

11. Voluntary Nature

Participation in this scheme is voluntary. It is designed to provide added product value without imposing undue financial burdens, which will ultimately be passed to end-users.

12. Transparency and Recordkeeping

Transparency is central to Cybenetics' certification process:

Comprehensive Documentation: Records of all sampling, testing, and evaluations are meticulously maintained for audit purposes.

Detailed Reporting: Manufacturers receive complete testing results reports, including observations, performance metrics, and compliance levels.

Public Database: All certified products are listed in an open-access database, allowing consumers, laboratories, and other stakeholders to verify claims and track consistency.

13. Validation Procedure

The validation procedure ensures consistent quality, accuracy, and adherence to the performance metrics outlined by Cybenetics. This is achieved through a structured process involving multiple checks and cross-referencing mechanisms:

13.1 Pre-Evaluation Phase

13.1.1 Manufacturer's Declaration

All submitted samples must include a signed declaration confirming that the units are identical to those sold in the market.

13.1.2 Documentation Review

The technical specifications and declared metrics of the submitted units are reviewed for consistency with manufacturer claims.

13.2 Initial Validation

13.2.1 Benchmark Comparison

Test results are compared against established benchmarks for the respective certification (e.g., ETA, LAMBDA, PHI). This step ensures that the sample performance aligns with expectations for the intended certification tier.

13.2.2 Performance Data Verification

Data from submitted samples is cross-checked against historical testing data and industry standards for deviations or irregularities.

13.3 Ongoing Monitoring and Periodic Re-Evaluations

13.3.1 Randomized Re-Testing

Certified products may be randomly selected for periodic re-testing to validate that their production quality remains consistent over time.

13.3.2 Database Consistency Checks

Results from re-tested samples are matched with initial data stored in Cybenetics' open-access database to identify discrepancies.

13.3.3 End-User Feedback Analysis

Reports from end-users, warranty claims, or third-party testing labs are analyzed to detect potential quality issues.

13.4 Part Change Validation

If manufacturers alter materials, parts, or production methods, updated samples must be submitted for a secondary evaluation.

Comparison testing ensures that any changes do not negatively impact performance, compliance, or certification validity. Products failing to meet original certification standards may require recertification.

13.5 Qualification Criteria for Auditors

Auditors must have formal qualifications in relevant fields such as engineering, quality control, or product testing (e.g., degrees in Electrical or Mechanical Engineering or equivalent certifications).

- **Experience:** Auditors should possess at least six months of experience in performance evaluation or certification processes for electronic components or related fields.
- **Impartiality**: Auditors must have no financial or personal ties to the manufacturers being evaluated to avoid conflicts of interest.
- **Technical Proficiency**: Auditors should be proficient in the specific testing methodologies employed by Cybenetics, including ETA, LAMBDA, EMI, and PHI protocols.
- **Attention to Detail**: Auditors must demonstrate a proven track record of meticulous work, ensuring thorough and precise evaluations.
- **Ethics**: Auditors are required to adhere to strict ethical guidelines, safeguarding the integrity and transparency of the certification process.

13.6 Corrective Action Procedure

If discrepancies or substandard performance are identified during validation, Cybenetics will notify the manufacturer and request corrective actions.

Affected certifications are temporarily suspended until new testing confirms compliance. A detailed report is issued to the manufacturer outlining necessary steps for reinstatement.

14. ETA Certification Tiers

The ETA certification measures the energy efficiency of Power Supply Units (PSUs). It evaluates how effectively a PSU converts power from the wall outlet into usable energy while minimizing waste. This includes metrics such as overall efficiency, power factor (PF), vampire power consumption, and 5VSB rail efficiency. Here's a breakdown of the tiers:

14.1 Diamond

- Overall Efficiency: At least 93%.
- Power Factor (PF): ≥ 0,985.
- 5VSB Rail Efficiency: Over 79%.
- Vampire Power: Less than 0,10 W.
- Significance: Diamond-certified PSUs are the pinnacle of energy efficiency, ideal for users who demand maximum energy savings without compromising performance.

14.2 Titanium

- Overall Efficiency: Between 91% and <93%.
- Power Factor (PF): ≥ 0,980.
- 5VSB Rail Efficiency: Over 77%.
- Vampire Power: Less than 0,13 W.
- Significance: Titanium PSUs balance exceptional efficiency with slightly relaxed criteria compared to Diamond, offering a high level of performance.

14.3 Platinum

- Overall Efficiency: Between 89% and <91%.
- Power Factor (PF): ≥ 0,975.
- 5VSB Rail Efficiency: Over 76%.
- Vampire Power: Less than 0,16 W.
- Significance: Platinum-certified PSUs are efficient and suitable for most demanding applications, such as workstations and gaming setups.

14.4 Gold

- Overall Efficiency: Between 87% and <89%.
- Power Factor (PF): ≥ 0,970.
- 5VSB Rail Efficiency: Over 75%.
- Vampire Power: Less than 0,19 W.
- Significance: Gold PSUs strike a balance between energy efficiency and cost-effectiveness, ideal for general use in mid-range systems.

14.5 Silver

- Overall Efficiency: Between 85% and <87%.
- Power Factor (PF): ≥ 0,960.
- 5VSB Rail Efficiency: Over 73%.
- Vampire Power: Less than 0,22 W.
- Significance: Silver-certified PSUs offer solid efficiency for entry-level or budget systems without sacrificing quality.

14.6 Bronze

- Overall Efficiency: Between 82% and <85%.
- Power Factor (PF): ≥ 0,950.
- 5VSB Rail Efficiency: Over 71%.
- Vampire Power: Less than 0,25 W.
- Significance: Bronze PSUs represent the basic level of energy efficiency, suitable for low-cost systems where efficiency is not the primary concern.

15. LAMBDA Certification Tiers

The LAMBDA certification evaluates the acoustic performance of PSUs, focusing on noise levels under operating conditions. It categorizes products based on their decibel (dB) output using advanced logarithmic scaling techniques for precise measurement.

15.1 A++

- Noise Level: Below 15 dB(A).
- Significance: Virtually silent operation, ideal for noise-sensitive environments such as professional studios or quiet workspaces.

15.2 A+

- Noise Level: Between 15 dB(A) and <20 dB(A).
- Significance: Extremely quiet operation suitable for systems prioritizing minimal noise, including high-performance gaming PCs or productivity setups.

15.3 A

- Noise Level: Between 20 dB(A) and <25 dB(A).
- Significance: Quiet systems for general use, balancing performance and acoustic comfort.

15.4 A-

- Noise Level: Between 25 dB(A) and <30 dB(A).
- Significance: Moderately quiet operation, acceptable for most standard applications where noise is less of a concern.

15.5 Standard++

- Noise Level: Between 30 dB(A) and <35 dB(A).
- Significance: Slightly noisier systems, suitable for environments where absolute silence is not required.

15.6 Standard+:

- Noise Level: Between 35 dB(A) and <40 dB(A).
- Significance: Noise levels that are tolerable in less noise-sensitive spaces.

15.7 Standard

- Noise Level: Between 40 dB(A) and <45 dB(A).
- Significance: The loudest certified tier, suitable for budget systems where noise reduction is not a primary consideration.

16. PHI Certification Tiers

The PHI certification, also known as the Phi Fan Performance Standard (PFPS), evaluates fan cooling efficiency based on airflow and static pressure under normalized noise levels of 25 dBA. Fans are categorized by size: 120mm or 135-140mm.

16.1 120mm Fans

16.1.1 Diamond

- Airflow: ≥ 55 CFM.
- Static Pressure: ≥ 2 mmAq.
- Significance: Exceptional cooling efficiency for high-performance systems.

16.1.2 Titanium

- Airflow: Between 50–55 CFM.
- Static Pressure: Between 1,75–2 mmAq.
- Significance: High cooling capability suitable for demanding tasks.
- 3. Platinum:
- Airflow: Between 46–50 CFM.
- Static Pressure: Between 1.5–1.75 mmAq.
- Significance: Reliable cooling performance for mainstream applications.

16.1.3 Gold

- Airflow: Between 42–46 CFM.
- Static Pressure: Between 1.25–1,5 mmAq.
- Significance: Balanced cooling efficiency ideal for general-purpose systems.

16.1.4 Silver

- Airflow: Between 38–42 CFM.
- Static Pressure: Between 1–1,25 mmAq.
- Significance: Adequate cooling for low-cost configurations.

16.1.5 Bronze:

- Airflow: Between 34–38 CFM.
- Static Pressure: Between 0,8–1 mmAq.
- Significance: Basic cooling performance.

16.2 135-140mm Fans

16.2.1 Diamond

- Airflow: ≥ 70 CFM.
- Static Pressure: ≥ 1,7 mmAq.
- Significance: Premium cooling performance for larger systems.

16.2.2 Titanium

- Airflow: Between 65–70 CFM.
- Static Pressure: Between 1,5–1,7 mmAq.
- Significance: Effective cooling for high-demand tasks.
- 3. Platinum:
- Airflow: Between 60–65 CFM.
- Static Pressure: Between 1,3–1,5 mmAq.
- Significance: Reliable cooling suitable for everyday usage.

16.2.3 Gold

- Airflow: Between 55–60 CFM.
- Static Pressure: Between 1,1–1,3 mmAq.
- Significance: Balanced cooling for standard applications.

16.2.4 Silver

- Airflow: Between 50–55 CFM.
- Static Pressure: Between 0,9–1,1 mmAq.
- Significance: Good cooling for budget-friendly configurations.

16.2.5 Bronze

- Airflow: Between 45–50 CFM.
- Static Pressure: Between 0,7–0,9 mmAq.
- Significance: Typical cooling performance for entry-level systems.

17. Bibliographic References

[1] CYBENETICS, The Complete Cybenetics Test Protocol, Including Energy Efficiency, Output Noise, And Overall Performance Calculation of AC-DC Power Supplies Revision 3.4

[2] CYBENETICS, Conducted Emissions Testing Procedure Revision 1.0

[3] CYBENETICS, The Phi Fan Performance Standard (PFPS) Revision 1.1

[4] CYBENETICS, A Simplified Way To Predict The Cybenetics Efficiency Ratings Revision 1.2

[5] IEEE Std 1515-2000, IEEE Recommended Practice for Electronic Power Subsystems: Parameter Definitions, Test Conditions, and Test Methods.

[6] IEC 62301:2011, Household Electrical Appliances – Measurement of Standby Power.

[7] ISO7779: 2018 - Acoustics - Measurement of airborne noise emitted by information technology and telecommunications equipment.

[8] ISO 11201:2010 (E) - Acoustics - Noise emitted by machinery and equipment – Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections.

[9] ECMA-74 (17th Edition) – Measurement of Airborne Noise emitted by Information Technology and Telecommunications Equipment - ECMA International. December 2019.

[10] IEC / EN 62368-1 – Audio/video, information and communication technology equipment – Safety requirements

[11] IEC / CENELEC 2018 Απαιτήσεις ηλεκτρικής ασφάλειας για PSU

[12] IEC 61000-3-2 / EN 61000-3-2 IEC / CENELEC 2019 Όρια αρμονικών ρευμάτων (EMC)

[13] IEC 61000-4-3 / EN 61000-4-3 IEC / CENELEC 2020 Δοκιμές ανοσίας σε ηλεκτρομαγνητικά πεδία

[14] Οδηγία 2014/35/ΕΕ (LVD – Low Voltage Directive) Ευρωπαϊκή Ένωση 2014 Ασφάλεια ηλεκτρικού εξοπλισμού

[15] Οδηγία 2014/30/ΕΕ (EMC Directive) Ευρωπαϊκή Ένωση 2014 Ηλεκτρομαγνητική συμβατότητα

[16] ISO 3741 – Acoustic measurement

[17] EN55032 / CISPR 32– EMC testing

[18] ISO 10302 – Acoustics for axial fans

Modification Table

Version	Changes Description	Date
01	Initial Issue	10-5-2025
02	Added bibliographic references in section 17, as of CYS-CYSAB Pre-assessment 3-10-2025, finding 2/8	10-10-2025

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