

ERP2026 Regulation Guide

Comprehensive Overview of EU Regulation 2024/1834

Ecodesign Requirements for Fans

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1. Introduction to ERP2026

1.1 Background and Purpose

The ErP Directive 2009/125/EC establishes a framework for setting minimum environmental performance requirements for energy-related products sold in the European Union. These requirements are implemented for motors and speed controls per Commission Regulation (EU) No. 2019/1781 and for fans per Commission Regulation (EU) No. 327/2011.

The new **Fan Regulation (EU) 2024/1834** represents a significant update to the existing framework, introducing stricter efficiency requirements and a system-based assessment approach that evaluates fans holistically rather than as individual components.

1.2 Key Objectives of ERP2026

The revision of the Fan Regulation addresses several important objectives:

- **Climate Target Achievement:** Helping the EU achieve its climate and energy targets through improved energy efficiency
- **Environmental Protection:** Reducing the environmental impact of fans throughout their product lifecycle
- **Market Harmonization:** Ensuring fair competition by establishing clear, consistent requirements across the EU market

- **Innovation Stimulation:** Encouraging manufacturers to develop more efficient fan technologies

1.3 Key Changes in ERP2026

The new regulation introduces several significant changes compared to the previous framework (EU 327/2011):

Aspect	Previous Regulation	ERP2026
Assessment Method	Component-based	System-based
Efficiency Thresholds	Lower requirements	Significantly increased
Partial Load Focus	Limited	Emphasized
Resource Efficiency	Not covered	Included
Information Obligations	Basic	Extended

1.4 Legal Framework

ERP2026 is part of the broader Ecodesign regulatory framework:

- **Primary Directive:** Directive 2009/125/EC (ErP Directive)
- **Implementing Regulation:** Commission Regulation (EU) 2024/1834
- **Motor Regulation:** Commission Regulation (EU) 2019/1781
- **Energy Labeling:** Regulation (EU) 2017/1369

2. Scope and Applicability

2.1 Products Covered

The regulation applies to fans with an electrical input power between **125 watts and 500 kilowatts**. This includes:

Fan Types: - Axial fans (with and without diffuser) - Centrifugal fans (forward-curved and backward-curved) - Mixed flow fans (diagonal fans) - Tangential blowers (cross-flow fans)

Application Categories: - Stand-alone fans - Fans embedded in other products (e.g., HVAC units, air handling units) - Fans as components in larger systems

2.2 Power Range Breakdown

Power Range	Typical Applications
125 W - 250 W	Small industrial ventilation, cabinet cooling
250 W - 10 kW	Medium-sized ventilation systems, process cooling
10 kW - 100 kW	Industrial process fans, large HVAC systems
100 kW - 500 kW	Heavy industrial applications, power plant ventilation

2.3 Exceptions and Exclusions

The following fans are **NOT** covered by the regulation:

- Fans specifically designed for use in means of transport for passengers or goods
- Fans in clothes dryers
- Fans designed for fire detection or suppression systems
- Fans intended for use in potentially explosive atmospheres (ATEX-certified equipment)
- Fans with specific performance requirements that cannot be met with standard efficiency designs

2.4 Standalone vs. Embedded Fans

Standalone Fans: Fans sold as independent products that can be used in various applications.

Embedded Fans: Fans that are components of other products (e.g., integrated into HVAC units, air conditioners, or industrial machinery). These are also subject to the regulation's requirements.

3. Efficiency Requirements

3.1 Minimum Efficiency Grades (MEG)

The regulation establishes Minimum Efficiency Grades (MEG) that fans must meet. Efficiency is measured as the ratio of useful power output to electrical power input.

Efficiency Measurement Types: - **Static Efficiency:** Measures fan performance excluding diffuser losses - **Total Efficiency:** Measures overall system performance including diffuser

3.2 Phase 1 Requirements (Effective July 2026)

The following minimum efficiency requirements apply from **24 July 2026**:

Fan Category	Sub-Category	Static Efficiency	Total Efficiency
Axial Fans	Without diffuser	50%	—
Axial Fans	With diffuser	—	64%
Centrifugal Backward Curved	With housing	64%	—
Centrifugal Backward Curved	Without housing	67%	—
Centrifugal Forward Curved	With housing	58%	—
Centrifugal Forward Curved	Without housing	62%	—
Mixed Flow	—	67%	—

Fan Category	Sub-Category	Static Efficiency	Total Efficiency
Centrifugal Radial	—	58%	—

3.3 Phase 2 Requirements (Effective January 2027)

Stricter efficiency requirements take effect from **1 January 2027**:

Fan Category	Sub-Category	Static Efficiency	Total Efficiency
Axial Fans	Without diffuser	52%	—
Axial Fans	With diffuser	—	66%
Centrifugal Backward Curved	With housing	67%	—
Centrifugal Backward Curved	Without housing	69%	—
Centrifugal Forward Curved	With housing	60%	—
Centrifugal Forward Curved	Without housing	64%	—
Mixed Flow	—	69%	—
Centrifugal Radial	—	60%	—

3.4 Comparison: ERP2015 vs. ERP2026

Fan Type	ERP2015 (EU 327/2011)	ERP2026 Phase 1	ERP2026 Phase 2
Axial (static)	40%	50%	52%
Axial (total)	58%	64%	66%
Centrifugal BC (with housing)	61%	64%	67%
Centrifugal BC (without housing)	64%	67%	69%
Centrifugal FC (with housing)	52%	58%	60%
Mixed Flow	62%	67%	69%

This represents an average increase of **8-10 percentage points** across all fan types.

3.5 Measuring Fan Efficiency

Fan efficiency must be measured at the **Best Efficiency Point (BEP)** using standardized procedures:

Key Parameters: - Air flow rate (m^3/s or CFM) - Pressure increase (Pa or inches water gauge) - Electrical input power (W or kW)

Test Standards: Tests should be conducted according to ISO 5801 or equivalent standards, ensuring measurements are taken at stable operating conditions.

4. Implementation Timeline

4.1 Key Dates and Milestones

Date	Event	Description
April 2024	Publication	Commission Regulation (EU) 2024/1834 published in Official Journal
April 2024 - July 2026	Transition Period	Manufacturers prepare for new requirements
July 2024	Early Compliance	Products can be placed on market under new requirements
24 July 2026	Phase 1 Enforcement	Phase 1 efficiency requirements become mandatory
1 January 2027	Phase 2 Enforcement	Stricter Phase 2 requirements become mandatory

4.2 Transition Period Activities

During the transition period, manufacturers should:

1. **Audit Current Products:** Identify which products need updates to meet new requirements
2. **Contact Suppliers:** Ensure component suppliers are preparing compliant products
3. **Update Documentation:** Review and update technical files and user documentation
4. **Plan Inventory:** Transition away from non-compliant stock before deadlines
5. **Train Staff:** Ensure technical teams understand new requirements and testing methods

4.3 Market Implications

From the enforcement dates: - Only compliant products may be placed on the EU market - Existing non-compliant stock cannot be sold after deadlines - Importers assume full responsibility for imported products' compliance

5. System-Based Assessment

5.1 What is System-Based Assessment?

Unlike the previous regulation that evaluated components (motor, impeller, housing) separately, ERP2026 requires assessing the **complete fan system** as an integrated unit. This holistic approach ensures that all components work together efficiently.

5.2 Components Under Assessment

The system assessment includes evaluation of:

1. Rotor/Impeller - Blade geometry and aerodynamic design - Material selection for weight reduction - Balance and vibration characteristics - Performance at various operating points

2. Motor - Motor efficiency at operating point - Variable speed control capability - Power electronics integration - Compatibility with system requirements

3. Stator/Housing - Aerodynamic flow path design - Diffuser effectiveness (where applicable) - Pressure recovery optimization - Structural integrity

4. Control Electronics - Speed controller efficiency - Power electronics losses - Intelligent interface capabilities - Demand-based control features

5.3 Benefits of System Assessment

- Ensures optimal overall system performance
- Prevents efficiency losses from component mismatches
- Encourages integrated design approaches
- Reflects real-world operating conditions

5.4 Partial Load Behavior

A key aspect of system assessment is evaluation of **partial load behavior**. Fans rarely operate continuously at full load; therefore, efficiency at reduced operating points is critical:

- Variable speed operation efficiency
- Part-load performance characteristics
- Control system effectiveness
- Energy savings potential

5.5 Resource Efficiency Considerations

ERP2026 also emphasizes resource efficiency throughout the product lifecycle:

- **Durability:** Product lifespan and reliability
 - **Repairability:** Availability of spare parts and service options
 - **Recyclability:** End-of-life disposal considerations
 - **Material Efficiency:** Optimization of material usage
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6. Compliance Responsibility

6.1 Understanding Your Role

The responsibility for ERP compliance depends on how fans are sourced and assembled. Understanding your position is crucial for ensuring regulatory compliance.

6.2 Four Scenarios of Compliance

Scenario 1: Complete Fan System from Single Supplier

When you purchase a complete EC fan from us with motor, rotor, and stator: - We determine overall efficiency on suitable test benches - We declare EC conformity and affix CE mark - **Your responsibility is minimal**

Scenario 2: Incomplete Fan - Option A

When you complete the fan per our specifications using supplied components: - Supplier provides all relevant components (stator, rotor, motor) - You complete fan according to supplier specifications - OR supplier provides motor and rotor; you manufacture stator per supplier drawing - **You must declare EC conformity yourself**

Scenario 3: Incomplete Fan - Component Assembly

When you use motor and rotor with dimensionally different stators: - Supplier provides rotor and motor components only - You complete fan with your own or third-party stators - **You become the fan manufacturer legally** - Full responsibility for compliance

Scenario 4: Import from Non-EU Countries

When you import complete fans from non-EU countries: - You are considered the “manufacturer” under EU law - Must ensure products meet all applicable EU regulations - **Full responsibility for correctness of documentation**

6.3 Responsibilities Table

Scenario	Compliance Responsibility	CE Marking	Testing Required
Complete system	Supplier	Supplier	Supplier
Self-assembly (per specs)	You	You	You (can use supplier data)
Component assembly	You (manufacturer)	You	You (system testing)
Import	You (importer)	You	You (verification)

7. EC Conformity Declaration

7.1 What is EC Conformity?

The EC Declaration of Conformity is a legal document confirming that a product meets all applicable EU regulations. For fans, this includes the ErP requirements.

7.2 Requirements for Declaration

To issue an EC Declaration of Conformity, you must:

1. **Verify Compliance:** Confirm the product meets all applicable requirements
2. **Maintain Documentation:** Keep technical files supporting compliance
3. **Conduct Testing:** Perform or commission required efficiency tests
4. **Apply CE Marking:** Affix the CE mark to the product
5. **Sign Declaration:** Take legal responsibility for the declaration

7.3 Documentation Requirements

Technical documentation must include:

- Product description and specifications
- Design drawings and circuit diagrams
- Test reports from accredited laboratories
- Calculation records for efficiency verification
- User manuals and installation instructions
- Declaration of Conformity signed by manufacturer

7.4 Retention Period

Documentation must be kept for **10 years** after the last product is placed on the market.

7.5 CE Marking Requirements

The CE mark must be: - Visible, legible, and indelible - Applied before product is placed on market - Accompanied by the EC Declaration of Conformity - Follow specific size and format requirements

8. Technical Documentation

8.1 Technical File Structure

A complete technical file should include:

Section A: Product Information - Product identification (name, model, serial numbers) - General description and intended use - Exploded views and parts lists - Technical drawings

Section B: Design Information - Design specifications and calculations - Materials and components list - Software specifications (if applicable) - Design verification records

Section C: Test Reports - Efficiency measurement reports - Test laboratory credentials - Measurement uncertainty documentation - Test conditions and procedures

Section D: Quality Records - Production quality records - Inspection and testing records - Non-conformance reports and resolutions - Corrective actions implemented

Section E: User Documentation - Installation instructions - Operating manuals - Maintenance procedures - Safety warnings

8.2 Test Report Requirements

Test reports should include: - Laboratory identification and accreditation - Test standard used (e.g., ISO 5801) - Measurement equipment calibration records - Test conditions (temperature, humidity, etc.) - Raw measurement data - Calculated efficiency values - Measurement uncertainty statement

8.3 Labeling Requirements

Products must be labeled with: - Product identification - Manufacturer name and address - Model/type designation - Serial number or batch identification - CE mark - Required efficiency information

9. Resources and Tools

9.1 Selection Software

FanScout Selection Software - Quickly find ideal products meeting ErP2026 requirements - Automatic efficiency compliance verification - Download from manufacturer websites

9.2 Downloadable Resources

Resource	Format	Description
Ecodesign Flyer	PDF	Comprehensive overview of regulations
Efficiency Matrix	Excel	All MEG values for quick reference
Compliance Guide	PDF	Step-by-step compliance instructions
Technical Documentation	PDF	Detailed technical specifications

9.3 Contact Information

For expert guidance on ERP2026 compliance:

- **Technical Support:** Available for product selection assistance
- **Compliance Team:** Help with regulatory questions
- **Sales Team:** Product availability and ordering information

9.4 Additional Information Sources

- **EU Commission:** Official regulation texts
- **Industry Associations:** Guidelines and best practices
- **Standards Organizations:** Test method specifications

Appendix A: Glossary

Term	Definition
BEP	Best Efficiency Point - Operating condition where fan efficiency is maximum
CE Mark	Conformité Européenne - Mark indicating compliance with EU directives
EC Motor	Electronically Commutated motor with integrated electronics
Ecodesign	Systematic approach to designing products with environmental impact in mind
ErP	Energy-related Products - EU directive covering product energy efficiency
MEG	Minimum Efficiency Grade - Required efficiency threshold
VFD	Variable Frequency Drive - Device for controlling motor speed

Appendix B: Reference Regulations

- Directive 2009/125/EC (ErP Directive)
- Commission Regulation (EU) 2024/1834 (Fan Regulation)
- Commission Regulation (EU) 2019/1781 (Motor Regulation)
- Regulation (EU) 2017/1369 (Energy Labelling Framework)
- ISO 5801: Industrial fans - Performance testing using standardized airways

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This document is provided for informational purposes. For legal compliance, consult with qualified professionals and refer to the official EU regulation texts.