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**Sustainable Leather Foundation  
Standard for Energy Efficiency and Equipment & Machinery**

**Reference:** FSE9.1

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**Peer Reviewed by:** R Arbeid

**Accredited by:** XXX

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## **FSE9 ENERGY EFFICIENCY AND EQUIPMENT & MACHINERY STANDARD AND BENCHMARK**

**Summary:** The SLF energy efficiency standard provides the context, audit of energy efficiency, and provides the facility under audit the methodology to analyse and report their energy efficiency to an interested party ensuring the reporting of total energy efficiency, and such that the environmental impact and comparisons of the facilities' use can be compared to global levels and to other facilities of similar size and type.



## 1. Scope

The International Standard for Energy Efficiency specifies the method and definition of Energy Efficiency for facilities (and their waste treatment plants) in the leather value chain. The facilities in the value chain include all facilities from the farm to the end of life of the leather.

The Standard on energy efficiency includes all direct thermal and electrical energy loss/gain mitigations of the facilities. The Energy Efficiency in question is only related to the Scope of the SLF audit (or mapped certification) that is being audited. The Scope of the Energy Efficiency Standard does not include indirect energy efficiencies that are related to the preparation of inputs - that are then used on the site (included within the Scope of the audit).

The difference between energy use and Energy Efficiency are outlined in this document. A facilities' consumption of energy should be distinct from their facilities' Energy Efficiency. The efficiency is captured in the facilities approach to using less energy through practices that seek to lower use.

The energy efficiency audit considers thermal and electrical use minimisation.

## 2. Normative references

The following referenced documents are useful in the understanding of this document and are provided for further guidance. In the case of dispute these references form the core of the evidence in support of the Standard used here:

BS 7671:2018+A1:2020 - Requirements for Electrical Installations. IET Wiring Regulations<sup>1</sup>

IEC 60034-30-1: 2014, "Rotating electrical machines – Part 30-1: Efficiency classes of line operated AC motors."<sup>2</sup>

4E Energy Efficient End-use Equipment International Energy Agency<sup>3</sup>

The Heating Hub Boiler Efficiency Guide<sup>4</sup>

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<sup>1</sup> <https://shop.bsigroup.com/products/requirements-for-electrical-installations-iet-wiring-regulations-3>

<sup>2</sup> <https://webstore.iec.ch/publication/136>

<sup>3</sup> <https://www.iea-4e.org/>

<sup>4</sup> <https://www.theheatinghub.co.uk/boiler-efficiency-guide-and-energy-saving-tips#:~:text=What%20is%20boiler%20efficiency%3F,as%20little%20as%2060%25%20efficient.>



### 3. Terms and definitions

**Insulation** – the action of insulating something against loss or gain, for the purposes of this standard, the definition focusses on the loss or gain of heat. Thermal insulation prevents unwanted movement of heat.

**RSI value** – is defined as the resistance to thermal flow per unit area (International Standard Unit, SI), for the purposes of this standard the unit area is the square metre, and the heat flow is given in Kelvin/Watt (K/W) – the overall unit is given as kelvin time square metre per watt (K.m<sup>2</sup>/W).

### 4. Principle

The energy efficiency audit considers whether the facility can show improvements that lower its thermal and electrical energy use. The facility should demonstrate that energy use in priority areas have been considered and that mitigations have been implemented (and continued) to lower the use of thermal and electrical energy.

### 5. Procedure

#### 5.1 Level of thermal insulation

The SLF certification (audit process) shall examine evidence of an internal, or third-party audit, that indicates that all doorways, windows (portholes, skylights, wall openings and similar), roofing, flooring to consider whether the design or construction minimises the loss (or gain) of thermal energy that would necessitate the facility to use thermal or electrical energy to regulate the environmental habitat inside the facility.

##### 5.1.1 Leakage report evidence/internal audit reports

The SLF certification (audit process) examine the evidence of an internal, or third-party, audit for thermal leakage of the facility to ascertain the RSI value (or similar) indicator to determine whether there is control of the flow of thermal energy into or out of the facility.

##### 5.1.2 Thermal measurements

The SLF certification (audit process) shall consider the evidence of an internal, or third-party, audit that demonstrates an evaluation of the thermal flows by infra-red photo- or videography.

#### 5.2 Condition of electrical wiring

The SLF certification (audit process) shall consider the evidence of an internal, or third-party, audit that demonstrates an evaluation of the condition of the electrical wiring.

#### 5.3 Energy use - use of energy saving lighting and movement activated lighting

The facility must show evidence that all lights are clearly marked with identifying numbers. The SLF certification (audit process) will verify that there is energy saving lighting and movement activated



switches that minimise energy use is seen on a facility walkthrough. It should be clear that the control measures for energy saving lighting and movement activated switches are in regular use.

#### 5.4 Energy rating of machinery and equipment

The SLF certification (audit process) shall consider the evidence of an internal, or third-party, audit that assesses the energy rating of the machinery and equipment that is being used in the facility. The SLF certification (audit process) will verify that the internal, or third-party, rating is consistent with visible evidence seen on a facility walkthrough.

#### 5.5 Boiler/Generators/Thermal plant efficiencies (devices)

The facility must show evidence that all boilers/generators/thermal plants are clearly marked with identifying numbers. The SLF certification (audit process) shall consider the evidence of an internal, or third-party audit, that assesses the device efficiency that is being used in the facility. The internal, or third-party, audit report must be clearly linked to the device identification number. The SLF certification (audit process) will verify that the internal, or third-party, rating is consistent with visible evidence (linked to identifiers) seen on a facility walkthrough.

#### 5.6 Use of time switches to automatically activate sleep-modes or low energy states

The facility must show evidence that all machines and equipment are clearly marked with identifying numbers. The SLF certification (audit process) shall consider the evidence of an internal, or third-party audits, that verifies that machinery and equipment that is being used in the facility has appropriate sleep-modes or cut-off switches that ensure low energy use in idle periods. The SLF certification (audit process) will verify that the internal, or third-party rating, is consistent with visible evidence (linked to identifiers) seen on a facility walkthrough.

#### 5.7 Energy recovery - use of residual heat/cooling strategies (Counter-current heat exchangers, overhead heat sinks, environmental conditions to replace energy use) to minimise energy use

The facility must show evidence that all machines and equipment are clearly marked with identifying numbers. The SLF certification (audit process) shall consider the evidence of an internal, or third-party audit, that verifies that machinery and equipment that is being used in the facility have energy recovery strategies (approved energy recovery strategies are listed in Annex A). The SLF certification (audit process) shall consider the evidence of an internal, or third-party audit, that verifies that the facility is making best use of environmental climate conditions that assist with energy minimisation. The SLF certification (audit process) will verify that the internal, or third-party, energy recovery systems are consistent with visible evidence (linked to identifiers) seen on a facility walkthrough.

##### 5.7.1 Water discharge temperature (optional)

The SLF certification (audit process) shall consider the evidence of an internal, or third-party audit, that records the discharge temperature of effluents leaving the facility.



## 6. Diagnostic parameters

### 6.1 Level of thermal insulation

The minimum level of conformance must demonstrate that the facility is taking precautions to minimise thermal energy flows between inside and outside environments.

#### 6.1.1 Leakage report evidence/internal audit reports

The minimum level of conformance must demonstrate that the facility has insulated RSI values (or equivalent) less than the RSI values of the facility uninsulated.

#### 6.1.2 Thermal measurements

The minimum level of conformance must demonstrate that the facility does not have unnecessary hotspots or cooling spots that indicate non-insulated flows of thermal energy.

### 6.2 Condition of electrical wiring

The minimum level of conformance must demonstrate that the facility does not have sub-standard wiring as defined by National/International Wiring Standards (e.g., BS 7671:2018+A1:2020).

### 6.3 Energy Use - use of energy saving lighting and movement activated lighting

The minimum level of conformance must demonstrate that the facility has more than 90% of all internal lights have been considered for energy saving bulbs. The minimum level of conformance must demonstrate that the facility has more than 20% of all internal lights have been considered for movement activated switches.

#### 6.3.1 Energy rating of machinery and equipment

The minimum level of conformance must demonstrate that the facility has linked its current machinery and equipment to an energy efficiency rating and that it sets year on year improvements and that it is meeting those yearly targets.

#### 6.3.2 Boiler efficiencies

The minimum level of conformance must demonstrate that the facility has linked its current boilers, heaters to an energy efficiency rating and that it sets year on year improvements and that it is meeting those yearly targets.

#### 6.3.3 Use of time switches to automatically activate sleep-modes or low energy states

The minimum level of conformance must demonstrate that the facility has more than 30% of all machines have been considered for smart energy use.

### 6.4 Energy Recovery - use of residual heat/cooling strategies (Counter-current heat exchangers, overhead heat sinks, environmental conditions to replace energy use) to minimise energy use



The minimum level of conformance must demonstrate that the facility has at least 50% of operations that involve high thermal energy use have energy recovery systems.

#### 6.4.1 Water discharge temperature (optional)

The minimum level of conformance must demonstrate that the facility controls the outgoing water temperature to room temperature to indicate no less than 30% loss/gain of thermal energy (compared to temperature pre-mitigation).

To achieve the overall conformance to this standard the facility must have scored a minimum conformance in each category, except Clause 6.4.1.

## 7. Report

The test report should include:

1. A reference to this Sustainable Leather Foundation Standard (i.e., FSE9.2: 2021)
2. The energy efficiency findings giving the conformance/non-conformances in the following areas:
  - a. Level of thermal insulation
    - i. Leakage report evidence/internal audit reports
    - ii. Thermal measurements
  - b. Condition of electrical wiring
  - c. Energy Use - use of energy saving lighting and movement activated lighting
    - i. Energy rating of machinery and equipment
    - ii. Boiler efficiencies
    - iii. Use of time switches to automatically activate sleep-modes or low energy states
  - d. Energy Recovery - use of residual heat/cooling strategies (Counter-current heat exchangers, overhead heat sinks, environmental conditions to replace energy use) to minimise energy use
    - i. Water discharge temperature (optional)
3. Whether the number of non-conformances (major/minor) constitute an overall non-conformance



## Annex A

Approved SLF energy recovery strategies:

1. Counter-current heat exchangers for climate conditioning, out-flow pipe exchange (e.g., vacuum drying)
2. Overhead drying systems that utilise heat up-flow sources
3. Natural airflow for cooling facilities
4. Sun-drying
5. Shade-drying
6. Hot climate air flows through driers
7. Pipe heating through black panelling
8. Ground source energy sources

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