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**Aeronavtika - Ekoučinkovitost naprav za gostinstvo - 2. del: Oprema za pečico**

Aerospace series - ECO efficiency of catering equipment - Part 02: Oven equipment

Luft- und Raumfahrt - ECO Effizienz von Cateringgeräten - Teil 02: Öfen

Série aérospatiale - Indice d'écocoefficacité - Partie 02 : Fours

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49.095	Oprema za potnike in oprema kabin	Passenger and cabin equipment
97.040.20	Štedilniki, delovni pulti, pečice in podobni aparati	Cooking ranges, working tables, ovens and similar appliances

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
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**Aerospace series - ECO efficiency of catering equipment -  
Part 02: Oven equipment**

Série aérospatiale - Écoefficacité du matériel de  
restauration - Partie 02 : Fours

Luft- und Raumfahrt - ECO-Effizienz von  
Cateringgeräten - Teil 02: Öfen

This European Standard was approved by CEN on 12 August 2019.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## European foreword

This document (EN 4855-02:2020) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2020, and conflicting national standards shall be withdrawn at the latest by August 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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## Introduction

During aircraft operations, the food preparation in the cabin is mandatory to maintain the catering on board. There exist different equipment types to heat up the prepared meals for the passengers in the cabin. On the one hand meals can be heated by usage of steam (steam ovens); on the other hand it can be heated by usage of hot and dry air (convection oven). To meet the target to determine an energy efficiency index for aircraft oven equipment the purpose of this document is to standardize the test procedure and efficiency calculations for this equipment type.

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## 1 Scope

This European standard describes a test procedure to identify performance characteristics and a weight rating of convection and steam ovens used on aircraft. Furthermore it describes the calculation procedure to determine an energy consumption index and a performance index. There is no direct correlation between the Eco efficiency and cooking performance in terms of food quality and appearance. The two index values represent the Eco efficiency.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 4855-01, *Aerospace series — ECO efficiency of catering equipment— Part 1: General conditions*<sup>1</sup>

EN 60350-1, *Household electric cooking appliances — Part 1: Ranges, ovens, steam ovens and grills — Methods for measuring performance*

ARINC 810, *Definition of standard interfaces for galley insert (gain) equipment physical interfaces*<sup>2</sup>

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 4855-01 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <https://standards.iteh.ai/catalog/standards/sist/ff0e399c-79c3-4e86-b68f-11d1-4060-2000-0000-0000-000000000000>

— ISO Online browsing platform: available at <http://www.iso.org/obp>

— IEC Electropedia: available at <http://www.electropedia.org/>

### 3.1

#### **catering equipment**

equipment installed in an aircraft to provide or support food or beverage service

Note 1 to entry: Includes ovens, beverage makers, water heaters and chilling equipment.

### 3.2

#### **oven equipment**

equipment with a cavity to heat, bake and roast food or meals to elevated temperatures

Note 1 to entry: This equipment type includes convection and steam ovens.

#### 3.2.1

##### **steam oven**

heating mode with usage of steam to heat up the food in the inner cavity of the oven

<sup>1</sup> Published as ASD-STAN Prestandard at the date of publication of this standard by AeroSpace and Defence Industries Association of Europe – Standardization (ASD-STAN) ([www.asd-stan.org](http://www.asd-stan.org)).

<sup>2</sup> Published by Rockwell Collins ([www.rockwellcollins.com](http://www.rockwellcollins.com))

**EN 4855-02:2020 (E)****3.2.2****convection oven**

heating mode with usage of dry air to heat up the food in the inner cavity of the oven

**3.3****test medium**

standardized bricks are used as a thermal mass in the cavity of the EUT

**3.4****warm-up time**

duration of heating the test medium in an oven from starting temperature to 71 °C

**3.5****electrical energy consumption**

measured apparent power integrated over a period of time

**3.6****energy consumption index****ECI**

aspect of sustainability of catering equipment regarding the energy consumption and performance during aircraft operation

Note 1 to entry: ECO efficiency in this context does not consider the whole life cycle assessment of catering equipment.

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**3.7****performance index****PI**

index (dimensionless) describing the warm-up time of EUT related to the warm-up time of a reference

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**4 Symbols and abbreviations**

ARINC Aeronautical Radio Incorporated

ATLAS airline consortium

ECI Energy consumption index

EUT Equipment under test

N/A Not applicable

PI Performance index

PN Part number

SN Serial number

## 5 General test conditions

### 5.1 Measurements and calculations for oven equipment

The measurements and calculations shall be done as follows:

- a) measurement of warm-up time and electrical power during warm-up plus 4 min heating;
- b) measurement of standby power;
- c) weight measurement of convection and steam ovens;
- d) calculation of ECI and PI.

### 5.2 Environmental conditions

Environmental conditions shall be according to EN 4855-01.

### 5.3 Power supply and voltage

Power supply and voltage shall be according to EN 4855-01.

### 5.4 Measurement equipment

Measurement equipment shall be according to EN 4855-01.

### 5.5 Test set up

Test set up shall be according to EN 4855-01.

### 5.6 Test medium

A moistened brick shall be used as a test medium. Each oven shall be equipped with the maximum amount of test media according to the different galley standards e.g. those included but not limited in Table 1.

**Table 1 — Oven loading**

Oven standard	Meal capacity
Atlas	32
Extended Atlas	48
ARINC 810	32

### 5.7 General conditions for weight measurement

General conditions for weight measurement shall be according to EN 4855-01.