



NSAI
Standards

Irish Standard
I.S. EN ISO 11011:2015

Compressed air - Energy efficiency - Assessment (ISO 11011:2013)

I.S. EN ISO 11011:2015

Incorporating amendments/corrigenda/National Annexes issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation — recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):

NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.

This document is based on:

EN ISO 11011:2015

Published:

2015-03-25

This document was published under the authority of the NSAI and comes into effect on:

2015-04-11

ICS number:

NOTE: If blank see CEN/CENELEC cover page

NSAI
1 Swift Square,
Northwood, Santry
Dublin 9

T +353 1 807 3800
F +353 1 807 3838
E standards@nsai.ie
W NSAI.ie

Sales:
T +353 1 857 6730
F +353 1 857 6729
W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

EUROPEAN STANDARD

EN ISO 11011

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2015

ICS 23.140

English Version

Compressed air - Energy efficiency - Assessment (ISO 11011:2013)

Air comprimé - Efficacité énergétique - Évaluation (ISO 11011:2013)

Druckluft - Energieeffizienz - Bewertung (ISO 11011:2013)

This European Standard was approved by CEN on 19 March 2015.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

EN ISO 11011:2015 (E)

Contents

Page

Foreword.....3

Foreword

The text of ISO 11011:2013 has been prepared by Technical Committee ISO/TC 118 “Compressors and pneumatic tools, machines and equipment” of the International Organization for Standardization (ISO) and has been taken over as EN ISO 11011:2015 by Technical Committee CEN/TC 232 “Compressors, vacuum pumps and their systems” the secretariat of which is held by SIS.

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 September 2015, and conflicting national standards shall be withdrawn at the latest by September 2015.

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

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

Endorsement notice

The text of ISO 11011:2013 has been approved by CEN as EN ISO 11011:2015 without any modification.

This page is intentionally left blank

**INTERNATIONAL
STANDARD**

**ISO
11011**

First edition
2013-09-15

**Compressed air — Energy
efficiency — Assessment**

Air comprimé — Efficacité énergétique — Évaluation



Reference number
ISO 11011:2013(E)

© ISO 2013

ISO 11011:2013(E)



COPYRIGHT PROTECTED DOCUMENT

© ISO 2013

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
3.1 General.....	2
3.2 Flow.....	3
3.3 Pressure.....	4
3.4 Storage.....	5
3.5 Volume.....	5
4 Roles and responsibilities	6
4.1 Identification of assessment team members.....	6
4.2 Site management support.....	7
4.3 Communications.....	7
4.4 Access to equipment, resources, and information.....	7
4.5 Assessment objectives and scope.....	7
4.6 Identification of other assessment team members.....	7
4.7 Objective check.....	7
5 Assessment methodology	8
5.1 General.....	8
5.2 Systems engineering methods.....	8
5.3 Systems engineering process.....	8
5.4 System assessment process.....	9
6 Parameters and their determination	10
6.1 General.....	10
6.2 Measurement.....	10
6.3 Pressure.....	10
6.4 Flow rate.....	11
6.5 Power.....	12
7 Initial data collection and evaluation	13
7.1 General.....	13
7.2 Plant background.....	13
7.3 Plant function.....	13
7.4 Compressed air system definition.....	13
7.5 Inventory of key end-use air demands.....	13
7.6 Heat recovery.....	13
7.7 Baseline period and duration of data logging.....	14
7.8 Energy use.....	14
7.9 Compressed air system supply efficiency.....	14
7.10 System volume.....	14
7.11 Pressure.....	15
7.12 Flowrate.....	15
7.13 Critical air demands.....	15
7.14 Compressed air waste.....	15
7.15 Air treatment.....	15
7.16 Compressor control.....	16
7.17 Storage.....	16
7.18 Maintenance.....	16
7.19 Ambient intake conditions.....	16
8 Analysis of data from assessment	16
8.1 General.....	16

ISO 11011:2013(E)

8.2	Baseline profiles	17
8.3	System volume	19
8.4	Pressure profile	19
8.5	Perceived high-pressure demand	21
8.6	Demand profile	22
8.7	Critical air demands	23
8.8	Compressed air waste	24
8.9	Optimized air treatment	25
8.10	Reduced system operating pressure	26
8.11	Balance of supply and demand	27
8.12	Maintenance opportunities	27
8.13	Heat recovery opportunities	28
9	Reporting and documentation of assessment findings	28
9.1	Assessment report	28
9.2	Confidentiality	29
9.3	Energy-saving opportunities	29
9.4	Data for third-party review	29
Annex A (informative) Introduction to energy assessment		30
Annex B (informative) Assessment activities — General		32
Annex C (informative) Assessment activities — Supply		37
Annex D (informative) Assessment activities — Transmission		43
Annex E (informative) Assessment activities — Demand		47
Annex F (informative) Competencies		50
Bibliography		51

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received. www.iso.org/patents

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

The committee responsible for this document is ISO/TC 118, *Compressors and pneumatic tools, machines and equipment*, Subcommittee SC 6, *Air compressors and compressed air systems*.

ISO 11011:2013(E)

Introduction

This International Standard has been developed with reference to available documentation¹⁾ (see Bibliography) relating to energy assessment of compressed air systems.

This International Standard is produced to support the objectives of energy management for those organisations utilizing compressed air and wishing to improve the energy efficiency of such systems. Remembering the words of Lord Kelvin who said in 1883, “If you cannot measure it, you cannot improve it”, this International Standard aims to assist with measurement and provide the knowledge to enable improvement.

The prime consideration for any compressed air system is the ability to generate air with the least amount of energy. Having done this, the next consideration is to transmit energy from the point of generation to the point of use with the least loss. The final consideration is to eliminate waste and use the least amount of air for the production process.

This International Standard uses speciality terms which relate the needs of assessment activities to those of compressed air systems. Many terms will appear new to the users of this International Standard who are familiar with general compressed air terms.

A general introduction to energy assessment is given in [Annex A](#).

1) Extracts from ASME EA-4-2010 were used with permission from ASME. The core elements used are from Scope and Introduction, Organizing the Assessment, Analysis of Data From the Assessment, Reporting and Documentation, and Mandatory Appendices — I, Preliminary Data Collection Matrix.

Compressed air — Energy efficiency — Assessment

WARNING — Users of this International Standard are advised that energy-related judgements should not compromise safety issues.

1 Scope

This International Standard sets requirements for conducting and reporting the results of a compressed air system assessment (hereafter referenced as an “assessment”) that considers the entire system, from energy inputs to the work performed as the result of these inputs.

This International Standard considers compressed air systems as three functional subsystems:

- supply which includes the conversion of primary energy resource to compressed air energy;
- transmission which includes movement of compressed air energy from where it is generated to where it is used;
- demand which includes the total of all compressed air consumers, including productive end-use applications and various forms of compressed air waste.

This International Standard sets requirements for

- analysing the data from the assessment,
- reporting and documentation of assessment findings, and
- identification of an estimate of energy saving resulting from the assessment process.

This International Standard identifies the roles and responsibilities of those involved in the assessment activity.

This International Standard provides indicative information in [Annexes B, C, D](#), and E of the type of data to be collected to assist in a successful assessment. The information provided is not exhaustive and therefore is not intended to restrict the inclusion of other data. The form and presentation of the information given in the annexes is also not intended to restrict the manner of presentation of the reporting to the client.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1217, *Displacement compressors — Acceptance tests*

ISO 5598, *Fluid power systems and components — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1217 and ISO 5598 and the following apply.

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
 - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-