ISO 10494:2018 (E)

Turbines and turbine sets — Measurement of emitted airborne noise — Engineering/survey method

Contents

Foreword

Introduction

1 Scope

2 Normative references

3 Terms and definitions

4 Acoustic environment

- 4.1 Criteria of adequacy of the test environment
- 4.2 Criteria for background noise
- 4.3 Wind
- 4.4 Special measurement methods

5 Instrumentation

6 Installation and operation of turbine set

- 6.1 General
- 6.2 Mounting of turbine set
- 6.3 Operation of turbine set during test
- 6.4 Auxiliary equipment and coupled machines

7 Sound pressure levels on the measurement surface

- 7.1 Reference surface and measurement surface
- 7.2 Location and number of microphone positions
- 7.2.1 General
- 7.2.2 Additional microphone positions on measurement surface
- 7.2.3 Surface noise
- 7.3 Conditions of measurement
- 7.3.1 General
- 7.3.2 Calibration
- 7.3.3 Measurement of the A-weighted sound pressure level
- 7.3.4 Measurement of sound pressure spectrum

8 Calculation of surface sound pressure level and sound power level

- 8.1 Corrections for background noise
- 8.2 Calculation of sound pressure level averaged over the measurement surface
- 8.3 Calculation of surface time-averaged sound pressure levels
- 8.4 Calculation of sound power level
- 8.5 Calculation of directivity index and directivity factor

9 Information to be recorded

- 9.1 General
- 9.2 Noise source under test
- 9.3 Acoustic environment
- 9.4 Instrumentation
- 9.5 Acoustical data
- 9.6 Date and location

10 Test report

Annex A (normative) Qualification procedures for the acoustic environment

- **A.1 General**
- **A.2 Environment conditions**
- **A.2.1 Properties of reflecting plane**
- **A.2.1.1 Shape and size**
- **A.2.1.2 Absorption coefficient**
- **A.2.2 Precautions for outdoor measurements**
- **A.3 Determination of the environmental correction based on room absorption**
- **A.3.1 General**
- **A.3.2 Reverberation method**
- **A.3.3 Determination of the equivalent absorption area A with a reference sound source (direct method)**
- **A.3.4 Approximate method for measurements made with A-weighting**
- **A.4 Qualification requirements for measurements outdoors**

Annex B (normative) Gas turbines

- **B.1 General**
- **B.2 Sound sources**
- **B.2.1 Intake-inlet noise**
- **B.2.2 Compressor-inlet noise**
- **B.2.3 Turbine-exhaust noise**
- **B.2.4 Exhaust-outlet noise**
- **B.2.5 Total noise**
- **B.2.6 Auxiliary equipment and driven machines**
- **B.3 Microphone positions gas turbine**
- **B.3.1 Surface noise**
- **B.3.2 Key microphone positions on the measurement surface**
- **B.3.3 Additional microphone positions on measurement surface**
- **B.3.4 Intake-inlet noise**
- **B.3.5 Compressor-inlet noise**
- **B.3.6 Turbine exhaust noise**
- **B.3.7 Exhaust-outlet noise**

Annex C (normative) Steam turbines

- **C.1 General**
- **C.2 Sound sources**
- **C.2.1 Auxiliary equipment and driven machines**
- **C.3 Microphone positions steam turbine**
- **C.3.1 Surface noise**
- **C.3.2 Key microphone positions on the measurement surface**
- **C.3.3 Additional microphone positions on measurement surface**
- **C.3.4 Steam Turbine outlet noise**

Annex D (informative) Calculation of directivity index and directivity factor using a hemispherical microphone array

Page count: 37