# ISO 362-3:2016-07 (E)

## Measurement of noise emitted by accelerating road vehicles - Eng ineering method - Part 3: Indoor testing M and N categories

## Contents

Page


Foreword ..... v

Introduction ..... vi

1 Scope ..... 1

2 Normative references ..... 1

3 Termsanddefinitions ..... 2

4 Symbols and abbreviated terms ..... 2

5 Acceleration for vehicles of categories M1 and M2 having a maximum authorized mass not exceeding 3 500 kg, and of category N1 ..... 5
5.1 General ..... 5
5.1.1 Applicability and conditions ..... 5
5.1.2 Calculation of total engine power ..... 5
5.1.3 Battery state of charge ..... 5
5.2 Calculation of acceleration ..... 5
5.2.1 Calculation procedure for vehicles with manual transmission, automatic transmission, adaptive transmission, and continuously variable transmission (CVT) tested with locked gear ratios ..... 5
5.2.2 Calculation procedure for vehicles with automatic transmission, adaptive transmission, and CVT tested with non-locked gear ratios ..... 5
5.3 Calculation of the target acceleration ..... 6
5.4 Calculation of the reference acceleration ..... 6
5.5 Partial power factor, kP ..... 6

6 Instrumentation ..... 6
6.1 Instruments for acoustical measurement ..... 6
6.1.1 General ..... 6
6.1.2 Calibration ..... 7
6.2 Conformity with requirements ..... 7
6.3 Instrumentation for speed measurement ..... 7
6.4 Meteorological instrumentation ..... 7

7 Test room requirements ..... 7
7.1 General ..... 7
7.2 Test room dimensions ..... 8
7.3 Acoustical qualification of the room ..... 10
7.3.1 General ..... 10
7.3.2 Validation of free-field conditions ..... 10
7.3.3 Qualification procedure ..... 13
7.4 Condition of the floor ..... 14
7.5 Cooling, ventilation, air temperature, exhaust gas management ..... 14
7.6 Background noise ..... 14

8 Dynamometer requirements ..... 15
8.1 Type of texture of the rollers ..... 15
8.2 Diameter of the rollers ..... 15
8.3 Reproducibility of the pass-by dynamics ..... 15

8.4 Single-axle or multi-axle operation ..... 16
8.5 Noise emission limit under operating conditions produced by the dynamometer rollers16
9 Test procedures ..... 16

9.1 General ..... 16
9.2 Microphone array -- Hardware and software ..... 16
9.3 Vehicle fixing system ..... 17
9.4 Conditions of the vehicle ..... 17
9.4.1 General conditions ..... 17
9.4.2 Test mass of the vehicle ..... 17

9.4.3 Tyre selection and tyre condition ..... 18
9.5 Operating conditions ..... 19
9.5.1 Vehicles of categories M1, M2 having a maximum authorized mass not exceeding 3 500 kg, and N1 ..... 19
9.5.2 Vehicles of categories M2 having a maximum authorized mass exceeding 3 500 kg, M3, N2 and N3 ..... 19
9.6 Measurement readings and reported values ..... 20
9.6.1 General ..... 20
9.6.2 Data compilation ..... 21
9.6.3 Vehicles of categories M1 and M2 having a maximum authorized mass not exceeding 3 500 kg, and of category N1 ..... 21
9.6.4 Vehicles of categories M2 having a maximum authorized mass exceeding 3 500 kg, M3, N2, and N3 ..... 21
9.7 Measurement uncertainty ..... 21

10 Test methods and test report ..... 22
10.1 General ..... 22
10.2 Variant A ..... 22
10.2.1 General ..... 22
10.2.2 Power train noise ..... 22
10.2.3 Tyre/road noise ..... 22
10.2.4 Calculation of the total vehicle noise using variant A ..... 23
10.3 Test report ..... 23

Annex A (normative) Validation of method ..... 24

Annex B (normative) Procedure for measurement, evaluation, and calculation of tyre/road noise when using variant A ..... 28

Annex C (informative) Procedure for measurement, evaluation, and calculation of tyre/ road noise when using variant B ..... 41

Annex D (informative) Measurement uncertainty -- Framework for analysis according to ISO/IEC Guide 98-3 ..... 43

Annex E (informative) Room length deviation from recommendation ..... 49

Bibliography ..... 51