

# Structural vibration

## Part 3: Effects of vibration on structures

# DIN

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Erschütterungen im Bauwesen – Teil 3: Einwirkungen auf bauliche Anlagen

*In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.*

### Contents

	Page		Page
<b>Foreword</b> .....	1	5.3 Effects on buried pipework .....	5
<b>1 Scope</b> .....	2	5.4 Measurement .....	5
<b>2 Normative references</b> .....	2	<b>6 Evaluating effects of long-term vibration</b> .....	5
<b>3 Concepts</b> .....	2	6.1 Effects on the structure as a whole .....	5
<b>4 Principles of evaluating the effects of vibration on structures</b> .....	2	6.2 Effects on floors .....	6
4.1 General .....	2	6.3 Effects on buried pipework .....	6
4.2 Determining stresses by measurement ...	3	6.4 Measurement .....	6
4.3 Determining stresses by analysis .....	3	<b>Appendix A</b> Sample test report form .....	7
4.4 Permissible stresses .....	3	<b>Appendix B</b> Measures for limiting the effects of vibration .....	8
4.5 Evaluating serviceability .....	3	<b>Appendix C</b> Effects of vibration on soil .....	9
4.6 Effects of vibration on soil .....	3	<b>Appendix D</b> Additional information on measurements on pipework and evaluation of frequencies .....	9
<b>5 Evaluating effects of short-term vibration</b> .....	3		
5.1 Effects on the structure as a whole .....	3		
5.2 Effects on floors .....	5		

### Foreword

This standard has been prepared by Technical Committee *Schwingungsfragen im Bauwesen; Einwirkungen auf bauliche Anlagen* of the *Normenausschuß Bauwesen* (Building and Civil Engineering Standards Committee).

### Amendments

The following changes have been made to the May 1986 edition.

- a) The standard now also covers the effects of vibration on buried pipework.
- b) The standard has been revised in form and content to reflect the current state of the art.

### Previous editions

DIN 4150-3: 1975-09, 1986-05.

Continued on pages 2 to 11.

Translation by DIN-Sprachendienst.

In case of doubt, the German-language original should be consulted as the authoritative text.

## 1 Scope

This standard specifies a method of measuring and evaluating the effects of vibration on structures designed primarily for static loading. It applies to structures which do not need to be designed to specific standards or codes of practice as regards dynamic loading.

This standard gives guideline values which, when complied with, will not result in damage that will have an adverse effect on the structure's serviceability. In some cases, guideline values for a simplified evaluation are also given.

## 2 Normative references

This standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the titles of the publications are listed below. For dated references, subsequent amendments to or revisions of any of these publications apply to this standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

DIN 1311-1	Vibration and shock – Vibration systems – Concepts, classification*)
DIN V 4150-1	Structural vibration – Principles and measurement of vibration parameters**)
DIN 4150-1	Structural vibration – Preliminary measurement of vibration parameters*)
DIN 45669-1	Mechanical vibration and shock measurement – Measuring equipment
DIN 45669-2	Mechanical vibration and shock measurement – Measurement procedure
DIN EN 1594	Gas supply systems – Pipelines – Maximum operating pressure over 16 bar – Functional requirements*)

## 3 Concepts

For the purposes of this standard, the following definitions apply in addition to those defined in DIN 1311-1.

### 3.1 Vibration

Mechanical vibration of solid bodies which may cause damage or discomfort.

### 3.2 Damage

Any permanent effect of vibration that reduces the serviceability of a structure or one of its components.

### 3.3 Guideline value

A value obtained through experience; compliance with this value ensures that damage will not occur.

### 3.4 Short-term vibration

Vibration which does not occur often enough to cause structural fatigue and which does not produce resonance in the structure being evaluated.

### 3.5 Long-term vibration

All types of vibration not covered by the definition of 'short-term vibration' in subclause 3.4.

## 4 Principles of evaluating the effects of vibration on structures

### 4.1 General

Clauses 5 and 6 specify methods of measuring and evaluating vibration parameters. If these methods are not used, then the dynamic stresses occurring in the structure are to be determined by measurement or analysis (e.g. as in subclauses 4.2 and 4.3, respectively) and the results then compared with the permissible stresses, taking their frequency of occurrence into account. Note that the methods described in subclauses 4.2 and 4.3 are not suitable for assessing minor damage as defined in subclause 4.5.

Sometimes, vibration cannot be classified as being only short-term or only long-term as defined in subclauses 3.4 and 3.5, respectively. In such cases, it shall be evaluated on the basis of both clause 5 and clause 6.

\*) Currently at draft stage.

\*\*) 1975 edition.