MALAYSIAN STANDARD

MS EN 12390-5:2012

Testing hardened concrete - Part 5: Flexural strength of test specimens (Second revision)

ICS: 91.100.30

Descriptors: hardened concrete, flexural strength test, specimen

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Committee representation

The Industry Standards Committee on Building, Construction and Civil Engineering (ISC D) under whose authority this Malaysian Standard was adopted, comprises representatives from the following organisations:

Association of Consulting Engineers Malaysia
Construction Industry Development Board Malaysia
Department of Irrigation and Drainage Malaysia
Department of Standards Malaysia
Federation of Malaysian Manufacturers
Jabatan Bomba dan Penyelamat Malaysia
Jabatan Kerajaan Tempatan
Jabatan Kerja Raya Malaysia
Malaysian Timber Council
Malaysian Timber Industry Board
Master Builders Association Malaysia
Pertubuhan Akitek Malaysia
SIRIM Berhad (Secretariat)
Suruhanjaya Perkhidmatan Air Negara
The Cement and Concrete Association of Malaysia
The Institution of Engineers, Malaysia
Universiti Sains Malaysia
Universiti Teknologi Malaysia

The Technical Committee on Concrete and Concrete Products which recommended the adoption of the EN Standard as Malaysian Standard consists of representatives from the following organisations:

Association of Consulting Engineers Malaysia

Construction Industry Development Board Malaysia

Department of Irrigation and Drainage Malaysia

IKRAM QA Services Sdn Bhd

Jabatan Kerja Raya Malaysia (Cawangan Kejuruteraan Awam, Struktur dan Jambatan)

Jabatan Kerja Raya Malaysia (Cawangan Pengkalan Udara dan Maritim)

Master Builders Association Malaysia

National Ready Mixed Concrete Association

Pertubuhan Akitek Malaysia

SIRIM Berhad (Secretariat)

SIRIM QAS International Sdn Bhd

The Cement and Concrete Association of Malaysia

The Institution of Engineers, Malaysia

Universiti Teknologi Malaysia

Universiti Teknologi MARA

NATIONAL FOREWORD

The adoption of the EN Standard as a Malaysian Standard was recommended by the Technical Committee on Concrete and Concrete Products under the authority of the Industry Standards Committee on Building, Construction and Civil Engineering.

This Malaysian Standard is the second revision of MS 26: Part 2, *Methods of testing hardened concrete.*

This Malaysian Standard is identical with EN 12390-5, *Testing hardened concrete - Part 5: Flexural strength of test specimens*, published by the European Committee for Standardization (CEN). However for the purposes of this Malaysian Standard, this following apply:

a) in the source text, " this European Standard" should read "this Malaysian Standard",

b) the comma which is used as a decimal sign (if any), to read as a point; and

c) reference to European Standards should be replaced by corresponding Malaysian Standards as follows:

Referenced European Standards	Corresponding Malaysian Standards
EN 12350-1, *Testing fresh concrete - Part 1: Sampling*	MS 26-1-1*, Testing fresh concrete - Part 1: Section 1: Sampling*
EN 12390-1, *Testing hardened concrete - Part 1*: *Shape, dimensions and other requirements for specimens and moulds*	MS EN 12390-1, *Testing hardened concrete - Part 1*: *Shape, dimensions and other requirements for specimens and moulds*
EN 12390-2, *Testing hardened concrete - Part 2: Making and curing specimens for strength tests*	MS EN 12390-2, *Testing hardened concrete - Part 2: Making and curing specimens for strength tests*
EN 12390-4, *Testing hardened concrete - Part 4: Compressive strength - Specification for testing machines*	MS EN 12390-4, *Testing hardened concrete - Part 4: Compressive strength - Specification for testing machines*

This MS EN 12390 consists of the following parts, under the general title *Testing hardened concrete:*

Part 1: Shape, dimensions and other requirements for specimens and moulds

Part 2: Making and curing specimens for strength tests

Part 3: Compressive strength of test specimens

NATIONAL FOREWORD *(continued)*

Part 4: Compressive strength - Specification for testing machines

Part 5: Flexural strength of test specimens

Part 6: Tensile splitting strength of test specimens

Part 7: Density of hardened concrete

Part 8: Depth of penetration of water under pressure

This Malaysian Standard cancels and replaces MS 26: Part 2:1991.

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Compliance with a Malaysian Standard does not of itself confer immunity from legal obligations.

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 12390-5

February 2009

ICS 91.100.30

Supersedes EN 12390-5:2000

English Version

Testing hardened concrete - Part 5: Flexural strength of test specimens

Essai pour béton durci - Partie 5: Résistance à la flexion sur éprouvettes

Prüfung von Festbeton - Teil 5: Biegezugfestigkeit von Probekörpern

This European Standard was approved by CEN on 27 December 2008.

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 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 Management Centre has the same status as the official versions.

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

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 12390-5:2009) has been prepared by Technical Committee CEN/TC 104 "Concrete and related products", the secretariat of which is held by DIN.

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 2009, and conflicting national standards shall be withdrawn at the latest by August 2009.

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.

This document supersedes EN 12390-5:2000.

It is recognized good practice to include measurement of density prior to the determination of flexural strength, as a check on compaction of the concrete.

The two-point method of loading has been taken as the reference method, but the use of centre-point loading has been included as a normative annex. An inter-comparison of the two-point and the centre-point methods has been made as part of a test programme, part-funded by the EC under the Measurement and Testing Programme, contract MAT I-CT-94-CO43. The centre-point method gave results which were consistently 13 % higher than those from the two-point method.

This standard is one of a series concerned with testing concrete.

The series EN 12390 includes the following parts:

EN 12390 Testing hardened concrete –

Part 1: Shape, dimensions and other requirements for specimens and moulds;

Part 2: Making and curing specimens for strength tests;

Part 3: Compressive strength of test specimens;

Part 4: Compressive strength - Specification for testing machines;

Part 5: Flexural strength of test specimens;

Part 6: Tensile splitting strength of test specimens;

Part 7: Density of hardened concrete;

Part 8: Depth of penetration of water under pressure.

The following amendments have been made to the 2000-10 edition of this standard:

editorial revision

selected loading rate to be applied after the initial (not exceeding approx 20% of the anticipated failure load)

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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia,

Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.