MALAYSIAN STANDARD

MS EN 12390-2:2012

Testing hardened concrete - Part 2: Making and curing specimens for strength tests (Second revision)

ICS: 91.100.30

Descriptors: hardened concrete, specimen, curing

FOR SALE WITHIN MALAYSIA ONLY

DEPARTMENT OF STANDARDS MALAYSIA

DEVELOPMENT OF MALAYSIAN STANDARDS

The **Department of Standards Malaysia (STANDARDS MALAYSIA)** is the national standards and accreditation body of Malaysia.

The main function of STANDARDS MALAYSIA is to foster and promote standards, standardisation and accreditation as a means of advancing the national economy, promoting industrial efficiency and development, benefiting the health and safety of the public, protecting the consumers, facilitating domestic and international trade and furthering international cooperation in relation to standards and standardisation.

Malaysian Standards (MS) are developed through consensus by committees which comprise balanced representation of producers, users, consumers and others with relevant interests, as may be appropriate to the subject at hand. To the greatest extent possible, Malaysian Standards are aligned to or are adoption of international standards. Approval of a standard as a Malaysian Standard is governed by the Standards of Malaysia Act 1996 [Act 549]. Malaysian Standards are reviewed periodically. The use of Malaysian Standards is voluntary except in so far as they are made mandatory by regulatory authorities by means of regulations, local by-laws or any other similar ways.

STANDARDS MALAYSIA has appointed **SIRIM Berhad** as the agent to develop, distribute and sell the Malaysian Standards.

For further information on Malaysian Standards, please contact:

Department of Standards Malaysia
Ministry of Science, Technology and Innovation
Level 1 & 2, Block 2300, Century Square
Jalan Usahawan
63000 Cyberjaya
Selangor Darul Ehsan
MALAYSIA

Tel: 60 3 8318 0002
Fax: 60 3 8319 3131
http://www.standardsmalaysia.gov.my

E-mail: central@standardsmalaysia.gov.my

OR

SIRIM Berhad
(Company No. 367474 - V)
1, Persiaran Dato' Menteri
Section 2, P.O. Box 7035
40700 Shah Alam
Selangor Darul Ehsan
MALAYSIA

Tel: 60 3 5544 6000
Fax: 60 3 5510 8095
http://www.sirim.my

E-mail: msonline@sirim.my

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 12390-2:2009, *Testing hardened concrete - Part 2: Making and curing specimens for strength tests*, published by the European Committee for Standardization (CEN) with the exceptions as listed below.

MALAYSIAN STANDARD EXCEPTIONS

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;

c)

Clause/Subclause	**Modification**
NA National Annex	Adding "Curing of test specimens"

d) 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*

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

Part 4: Compressive strength - Specification for testing machines

Part 5: Flexural strength of test specimens

Part 6: Tensile splitting strength of test specimens

This standard is published with the permission of the European Committee for Standardization. Such permission is hereby acknowledged.

NATIONAL FOREWORD *(continued)*

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.

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

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 12390-2

March 2009

ICS 91.100.30

Supersedes EN 12390-2:2000

English Version

Testing hardened concrete - Part 2: Making and curing specimens for strength tests

Essai pour béton durci - Partie 2 : Confection et conservation des éprouvettes pour essais de résistance

Prüfung von Festbeton - Teil 2: Herstellung und Lagerung von Probekörpern für Festigkeitsprüfung

This European Standard was approved by CEN on 20 January 2009.

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

Contents

Page

Foreword

This document (EN 12390-2:2009) 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 October 2009, and conflicting national standards shall be withdrawn at the latest by October 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 12390-2:2000.

The results of a laboratory inter-comparison, part-funded by the EC under the Measurement and Testing Programme contract MATI-CT-94-0043, have been taken into account in the drafting of this European Standard.

The compaction of specimens in the moulds using hand tamping, vibrating table, or internal (poker) vibrator are accepted as equivalent. However, it was found in this programme that the use of an internal vibrator to compact specimens of air entrained fresh concrete should only be done with caution, if loss of entrained air is to be avoided.

Curing specimens in a closely regulated humidity chamber is recognised as being equivalent to curing in water.

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 of 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.

CAUTION — When cement is mixed with water, alkali is released. Take precautions to avoid dry cement entering the eyes, mouth and nose whilst mixing concrete. Prevent skin contact with wet cement or concrete by wearing suitable protective clothing. If cement or concrete enters the eye, immediately wash it out thoroughly with clean water and seek medical treatment without delay. Wash wet concrete off the skin immediately.

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

— editorial revision

— clarification of filling procedure of moulds

— clarification of compacting procedure of concrete.

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.