Coming CEN and ISO standard for the execution of concrete structures

Dansk Betonforening
København, oktober 2007

EU & EFTA 30 nations, some 480 mill citizens

Why standardisation on a European level ?

.. to facilitate free flow of goods and services

To achieve this, the EU Commission has issued :

- Commission decision of 1985 "New Approach" (Attestation of Confirmity)
- Construction Products Directive – CPD, from 1989 (89/106/EØF)
- Directive on Public Procurement (98/4/EC)

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CPD

All construction products placed on the market have to fullfill the 6 "Essential Requirements":

1. Mechanical resistance and stability
2. Safety in case of fire
3. Hygiene, health and the environment
4. Safety in use
5. Protection against noise
6. Energy economy and heat retention

The fullfillment has to be declared by an "Attestation of Conformity" from the producer

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To realize this ambition, the Commission has made an agreement with the European Committee for Standardization, CEN, to transfer the 6 ER into operational standards.

This programme includes the "EuroCodes"

European Commitee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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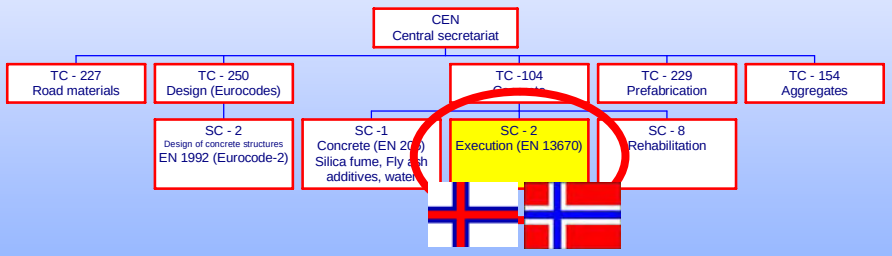
Main technical committees related to concrete works



European Commitee for Standardization
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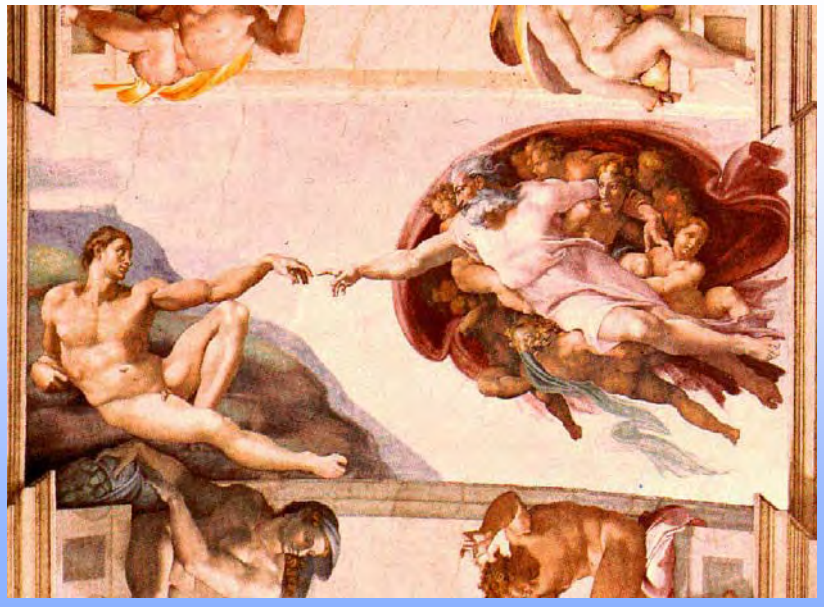

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"Execution of concrete structures"
(Concrete related activities on a building site)

First generation of European concrete standards:

- EuroCode-2 Design of concrete structures (ENV 1992:1992)
- ENV 206-1:1990 (Concrete, production)

…. together embedded the provisions for site activities

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To reflect the normal split of work between the different actors in the construction industry, a new hierarchic structure was launched in the 1990s

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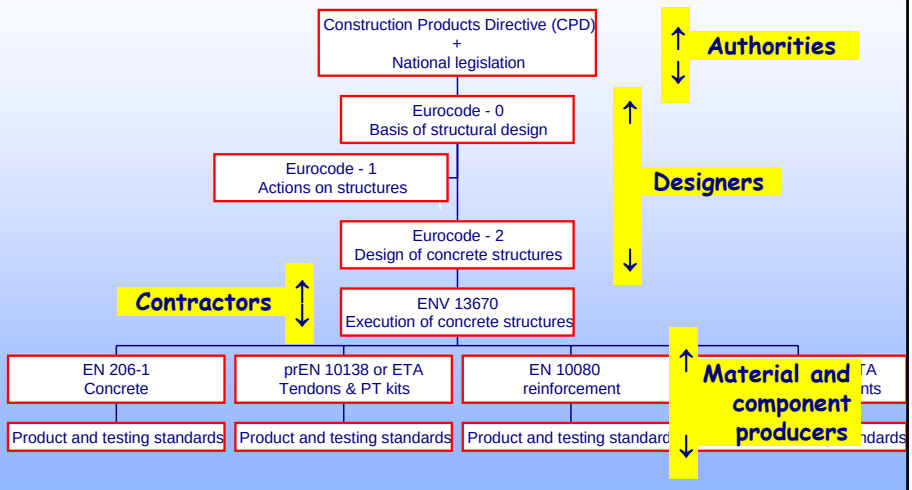

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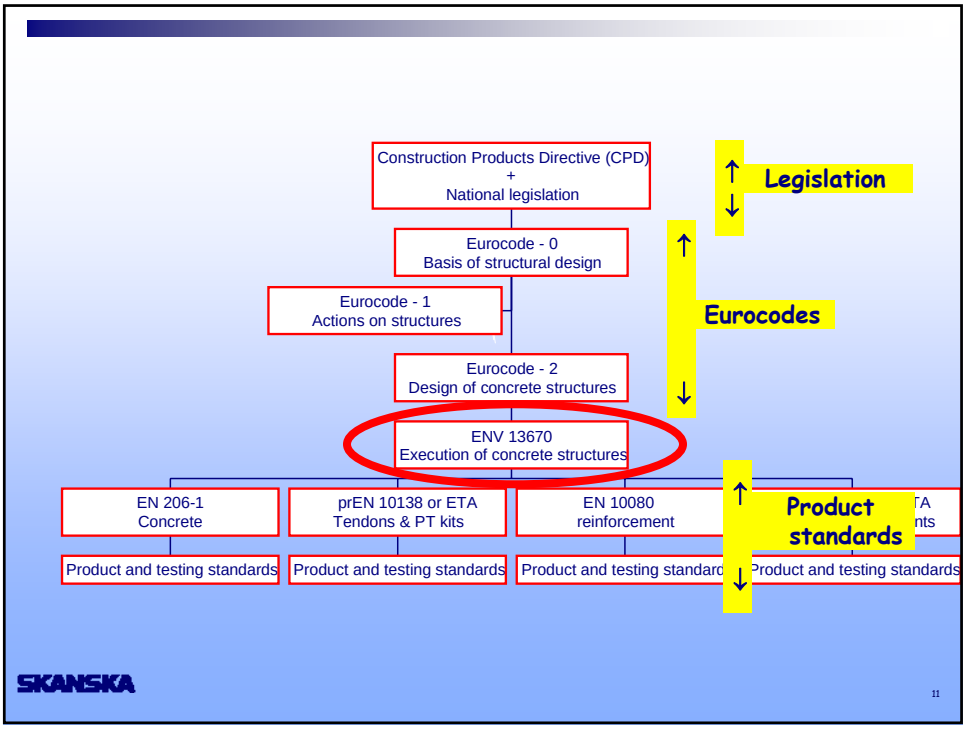

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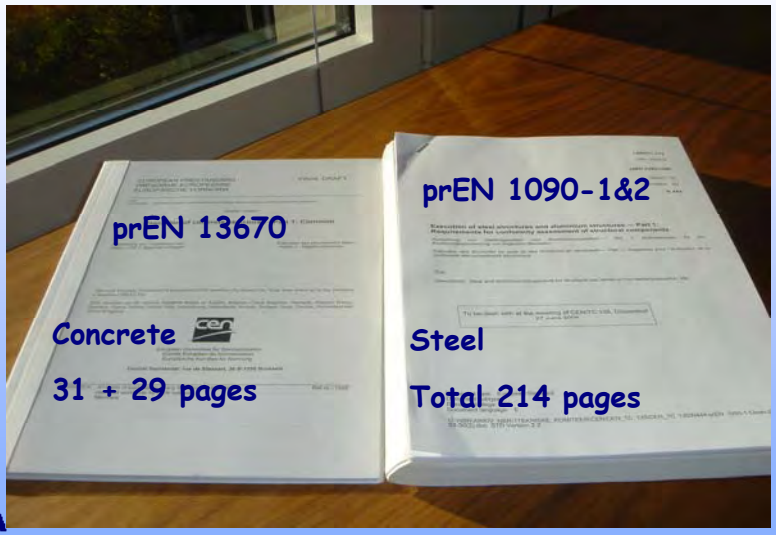
The revisions of the coming European execution standards for concrete aluminium and steel works are all coordinated



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Both the EU Commission and CEN respects the national authority on certain issues as:

- "level of protection"
- Climatic and geographical differences
- Needed skill of workforce
- etc

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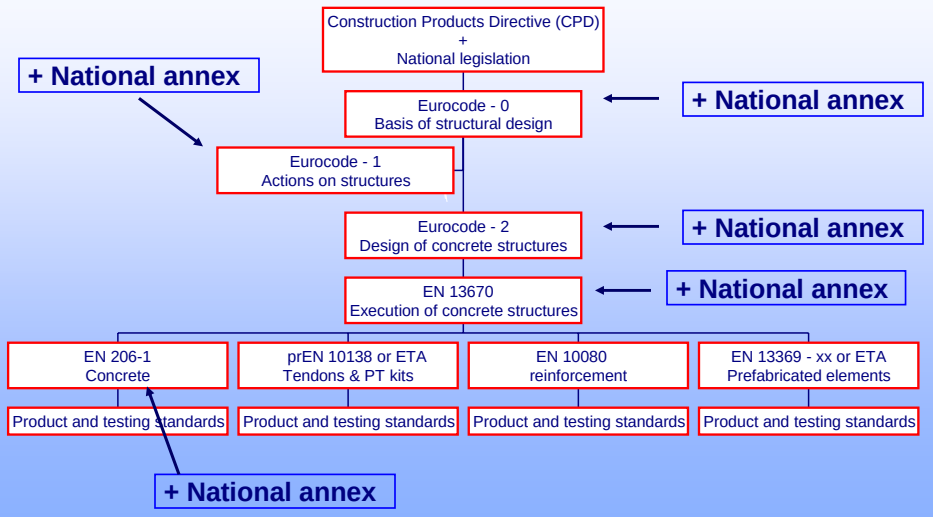
Present (or near future) situation in 30 European countries



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The Execution Specification according to EN 13670 will comprise provisions on 3 levels:

- Provisions identical for all European sites
  → EN 13670

  +

- Provisions identical within a member state
  → National annex

  +

- Provisions unique for each construction site
  → "Project Specification" i.e. (choice of classes, drawings etc)

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prEN 13670 Execution of concrete structures

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Quality Management

- Execution class 1, 2 and 3 based on the importance of the structure
- The Execution class includes inspection and might include planning
- The Execution classes are in accordance with Eurocode-0 and are coordinated with the steel and aluminium sector (prEN 1090)
- Further detailing to be given in the national annex

Competance of site staff and personnel

Norwegian requirements to:

- Production leader
- Foreman
- Worker
- Welder
- Prestressing
- Erection of elements
- control

NS 3465, Kap. 5
"Arbeidsledelse og personale"

	Kontroll klasse	Ingeniør	fagbrev	Bet.tekn. kurs	praksis
Bas	NK & UK		x	x	x
Formann	NK & UK		x	x	x
Produksjons-leder	NK		x	x	x
	UK	x		x	x

Formwork

Reinforcement

European chaos

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Prestressing

- This section is prepared in close cooperation with fib commission 9
- This section in particular focus on corrosion protection of PT-systems
- This section reflects the latest international state-of-the-art as reflected in recent fib-documents

fib CEB-FIP

Commission 9

Reinforcing and prestressing materials and systems

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Prestressing

Reference to

EN 445: 2007

EN 446: 2007

EN 447: 2007

On grouting

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Informative reference to

CEN Workshop Agreement CWA 14646:2003 "Requirements for the installation of post-tensioning kits for prestressing of structures and qualification of the specialist company and its personnel"

River Schelde bridge,

Belgia

Collapsed in 1992

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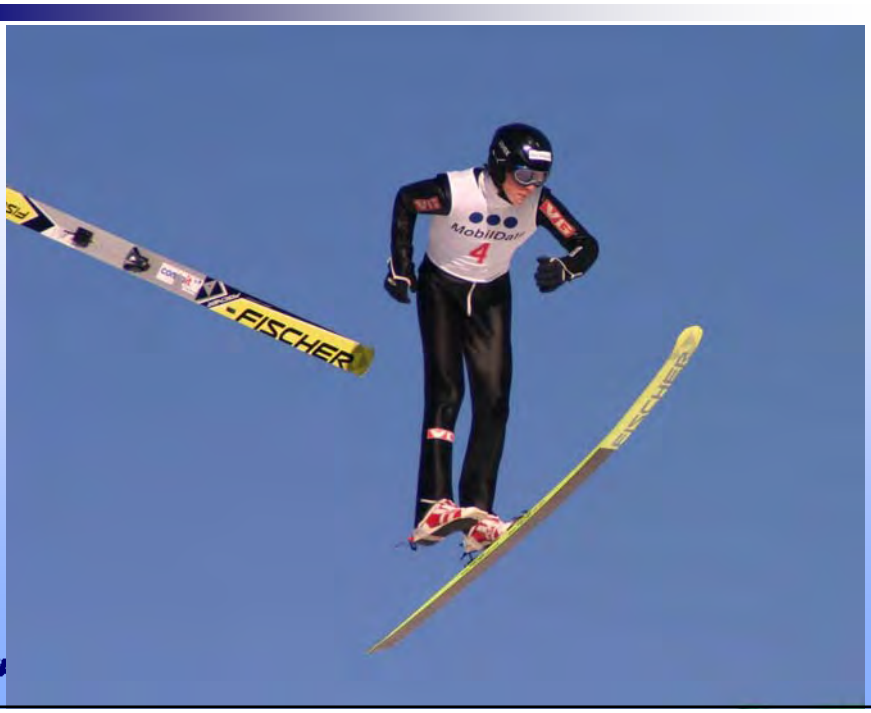


New Holmenkollen

JDS Architects, Vesterbrogade, CPH

Concreting

Self Compacting Concrete

Concreting

§ 8.5.3 - SCC

"……. Working procedures for the actual cast shall be established based on the constructor's experience and/or pretesting, to enable the required compaction to be obtained. Additional requirements to those given in EN 206 to the fresh concrete properties and its conformity criteria shall be agreed with the producer"

Self Compacting Concrete

Concreting

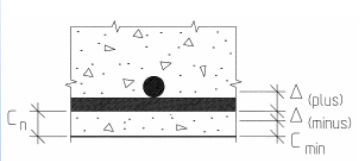
Curing Class 1	-	--
Curing Class 2	-	35 %
Curing class 3	-	50 %
Curing class 4	-	70 %

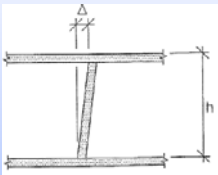
Curing

Precast elements

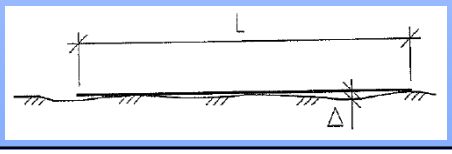
Geometrical tolerances are given in 2 levels

- Level 1 are the "design assumptions" on which Eurocode-2 is based





- Level 2 are those with relevance for serviceability and placing compatibility, but with limited structural influence



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There have been some negative reactions to abandon well-operating national standards

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- The draft prEN 13670 has just passed the public inquiry among the CEN members.
- Only 2 of 30 member states signalled a negative vote
- 53 pages with comments. No one considered as problematic
- The committee, TC-104/SC2, will consider the received comments during this autumn/winter.
- The standard is expected to go for Formal Vote in 2008.
- When published, it will serve as THE specification for annually some 350 000 000 m^3 concrete and related formwork and reinforcement

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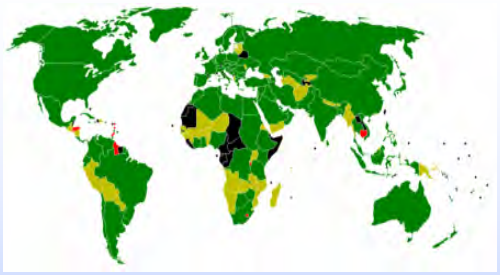
Some of the comments reflect the lack of DK participation in SC-2 as the text has already been subject to careful balance between the MS, some comments should be taken care of by a DK national annex

According to EU's directive on public procurement all public (or public controlled) agencies or organizations are forced to abandon their traditional technical specifications and be loyal to the new CEN standards, including the EN 13670.

This includes also national road administrations

International Organization for Standardization



ISO is the "umbrella" for 158 national standardization bodies.

An ISO standard is only mandatory if the national standardization body has implemented it as national standard, for instance as DIN-ISO, BS-ISO etc.

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International Organization for Standardization

European Commitee for Standardization
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- ISO and CEN formed in 1991 the "Vienna Agreement" for cooperation.
- On parallel documents, either ISO or CEN shall take the lead

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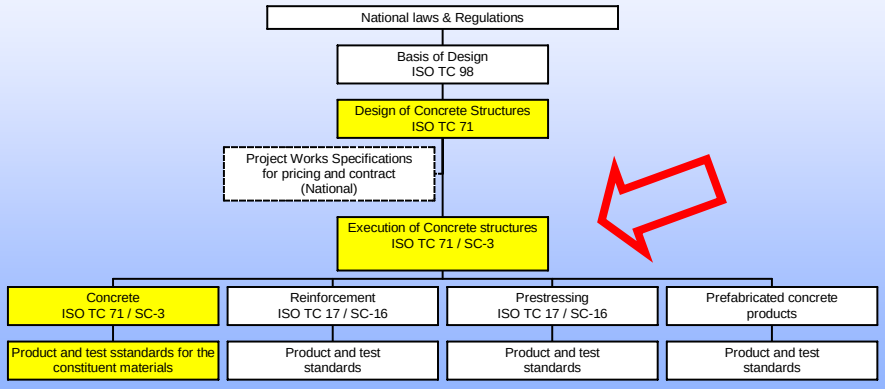
ISO TC-71 "Concrete" (secretariat ANSI/USA under Gene Corley) is dealing with design, materials and execution of concrete structures



ISO 2394 "General principles on reliability for structures" formed the basis for Eurocode-0, and together with fib Model Code, the basis for Eurocode-2

- ISO TC-71 asked in 2001 fib to work out a Model Code on Service Life Design of Concrete Structures.
- Fib TG 5.6 got its document approved by fib General Assembly in 2006
- ISO TC-71 appointed me to chair a committe responsible for implementing fib MC SLD as an ISO standard at its meeting in Brazil this June.

CEN EN 206-1:2000 "Concrete" formed the basis for ISO 22965:2007 "Concrete"

ISO/WD 22966 "Execution of concrete structures"

CEN draft prEN 13670 forms the basis for ISO/WD 22966:2006 "Execution of concrete structures".

Standard Norge chair this work

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end