



IPHA TECHNICAL SEMINAR



TU – DELFT

7 and 8 November 2005

EUROPEAN STANDARD

EN1168

Jan de Wit



EN 1168 - Hollow core slabs

Topics of the presentation

- Results of inquiry introduction EN1168
- What is lately changed in EN1168
- What has to be changed



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IPHA members from next countries gave a reaction

- **Belgium**
- **Finland**
- **France**
- **Germany**
- **Italy**
- **Netherlands**
- **Spain**
- **Sweden**
- **UK**



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Date of integration

- **France** **Nov 2005**
- **Germany** **Feb 2006 is the aim**
- **Belgium** **Mrt 2007**
- **Finland** **Earliest in 2007 or else 2010
at the adoption of EC-2**
- **Sweden** **wait for publication of
dates in NANDO database**
- **In the other countries it is not clear yet**



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Way of integration

Complete integration in:

- Belgium, France, Italy and the UK

Without design rules in:

- Finland and the Netherlands

Not decided yet in:

- Sweden, Germany and Spain



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Changes in comparison with nat. rules

No or small changes in:

- Belgium and the Netherlands

Geometry X-section and strand positions

- Finland and Sweden less favourable

Shear calculation:

- France up to 30% higher values
- Italy other formula
- UK reduction of capacity and also of serv. resist. moment



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Changes in comparison with nat. rules

Slabs $h > 450$ mm:

- **Finland**



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Question:

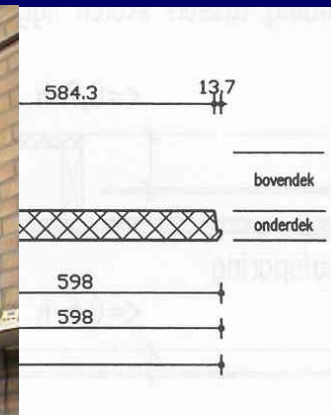
- **What happens with HC production which does not match the EN1168 ?**



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Question:

- What is part of the code ?





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Additional rules

No additional rules in:

- Belgium, Finland, Italy, UK, Spain
Netherlands
- Germany integrates rules of EN1168 in existing German codes as DIN 1045 and Zulassung

Additional rules in:

- France for design and erection
- Finland and the Netherlands for design until EC-2 is working



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Changes to the product due to EN1168

No changes in:

- France, Italy, Netherlands, UK, Germany and Spain,

Changes in:

- Belgium Tests after annex J are extra
- Finland Regular third party QC will be omitted
- Sweden Minor changes in QS



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Opportunities for HC

No changes in all countries



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Opportunities for (more) export

No changes for most countries

- **Italy** **Expects to export to France**
- **Finland** **Finish machine producers expect to make machines more standard**



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Method of CE-marking

Method 3 will be used in:

- **Finland, France, Italy and the UK**

Simplified label will be used by:

- **Belgium, France, Netherlands and Spain**

Type of method is not decided in:

- **Germany, Netherlands and Sweden**



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General opinion to EN 1168

The general opinion goes from too many conservative rules to very positive.



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General opinion to EN 1168

The remarks are diverse as:

- **Updates and improvements are needed**
- **More development is necessary**
- **Soon revision for formula shear strength**
- **Updates for calculation of shear capacity and load distribution**
- **Rules for punching shear capacity and splitting resistance are too conservative**
- **Some formulas need more explanation**
- **Annex C is not clear**
- **Annex G is too favourable**
- **To much references to EN13369 and EC2**



What is changed in EN1168

- **Some minor text revisions**
- **Revision of Annex J**



What has to be changed?

- Rules for slabs with $h > 450$ mm ?
- Better formulas for shear and torsion ?
- Design rules for slabs or in EC 2 ?
- Annex J ?
- Better formulas for punching shear and splitting ?
- More clear text in EC ?
- Rethink of all formulas ?
- Better explanation of formulas ?
- No references to EC 9 and EC2, better to take over text and/or formulas in EN 1992-1-1





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**Thank you for your answers and
your attention**

