

Referencegruppemøde, Teknologisk, 28. oktober 2015

CEN Durability design

JWGT C 104/SC1 – TC 250/SC2

- Udarbejdet et foreløbigt forslag til durability design – to notater:
- N25 – Durability Exposure Resistance Classes
- N26 – Exposure resistance classes
- Danmark har kommenteret forslaget i et to-siders notat efter en workshop på Teknologisk den 18. november 2014
- Andre – som Spanien, Finland, Frankrig og Cembureau – har tilsvarende kommenteret
- Derfor er der oprettet:
CEN/TC 104/SC 01/WG 01 - Exposure Resistance Classes (RC)



Exposure Resistance Classes

- Carbonation Resistance – low/medium/high
 - Chloride Resistance – low/medium/high
 - Freeze/thaw resistance – medium/high
 - Chemical Aggressiveness – medium/high
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- I praksis står diskussionen omkring Chlorid klasser
 - FT og CA mangler fuldstændigt modeller
 - Er carbonatisering interessant?

Table 5 Exposure resistance classes, definitions, classification standards and deemed to satisfy values for various binder compositions (example, preliminary values)

N25

<i>Preliminary values</i>	Carbonation resistance class RC				Chloride resistance class RSD			Frost resistance class RF	
	RC20	RC30	RC40	RCX0 ¹	RSD45	RSD60	RSD75	RF2	RF10
Definition of class, depth of front after 50 years (mm)	20	30	40	-	45	60	75		
Classification standard	EN xxx	EN xxx	EN xxx	EN xxx	EN yyy	EN yyy	EN yyy	EN zzz	EN zzz
Deemed to satisfy	Maximum w/b-ratio b is the sum of cement and additions in the concrete, within the limits defining the cements according to EN 197-1								
CEM I	0,55	0,60	0,65	0,90	NA	NA	0,45 ²		
CEM II-A	0,45	0,55	0,65	0,90	0,40	0,50	0,60		
CEM II-B	0,40	0,50	0,60	0,75	0,40	0,50	0,60		
CEM III-A	NA	0,45	0,55	0,75	?	?	?		
CEM III-B	NA	NA	0,45	0,65	0,38	0,45	0,55		
Minimum binder content (kg/m ³)	280	280	280	240	280	280	280		

¹ Class RCX0 shall only be allowed in exposure class X0

² CEM I shall only be used with minimum 4% silica fume

NA means that no deemed to satisfy values are given for that combination of binder and resistance class

Table 6 Minimum cover (recommended values) for the various combinations of exposure classes, exposure resistance classes and design working lives (example, preliminary values for illustration purpose)

N25

Preliminary values		Minimum cover for 50, 100 and 200 years design working life, recommended values (preliminary)						
Exposure Class		RC20 (RCH) ² RSD45 (RSDH)			RC30 (RCM) ² RSD60 (RSDM)		RC40 (RCL) ² RSD75 (RSDL)	
	(S4) ³	50	100	200(?)	50	100	50	100
X0 ¹	(10)	$c_{min,b}$	$c_{min,b}$	$c_{min,b}$	$c_{min,b}$	$c_{min,b}$	$c_{min,b}$	$c_{min,b}$
XC1	(15)	10	15	20	10	20	10	20
XC2,	(25)	15	20	30	20	30	25	35
XC3	(25)	15	20	30	20	30	25	35
XC4	(30)	15	20	30	20	30	25	35
XD1,	(35)	15	20	30	20	30	25	35
XS1	(35)	15	20	30	20	30	25	35
XD2,	(40)	45	55	65	55	70	70	NA
XS2	(40)	45	55	65	55	70	70	NA
XD3	(45)	55	65	75	70	NA	80	NA
XS3	(45)	55	65	75	70	NA	80	NA

¹ In exposure class X0 concrete in carbonation resistance class RCX0 may be used with a minimum cover of $c_{min,b}$

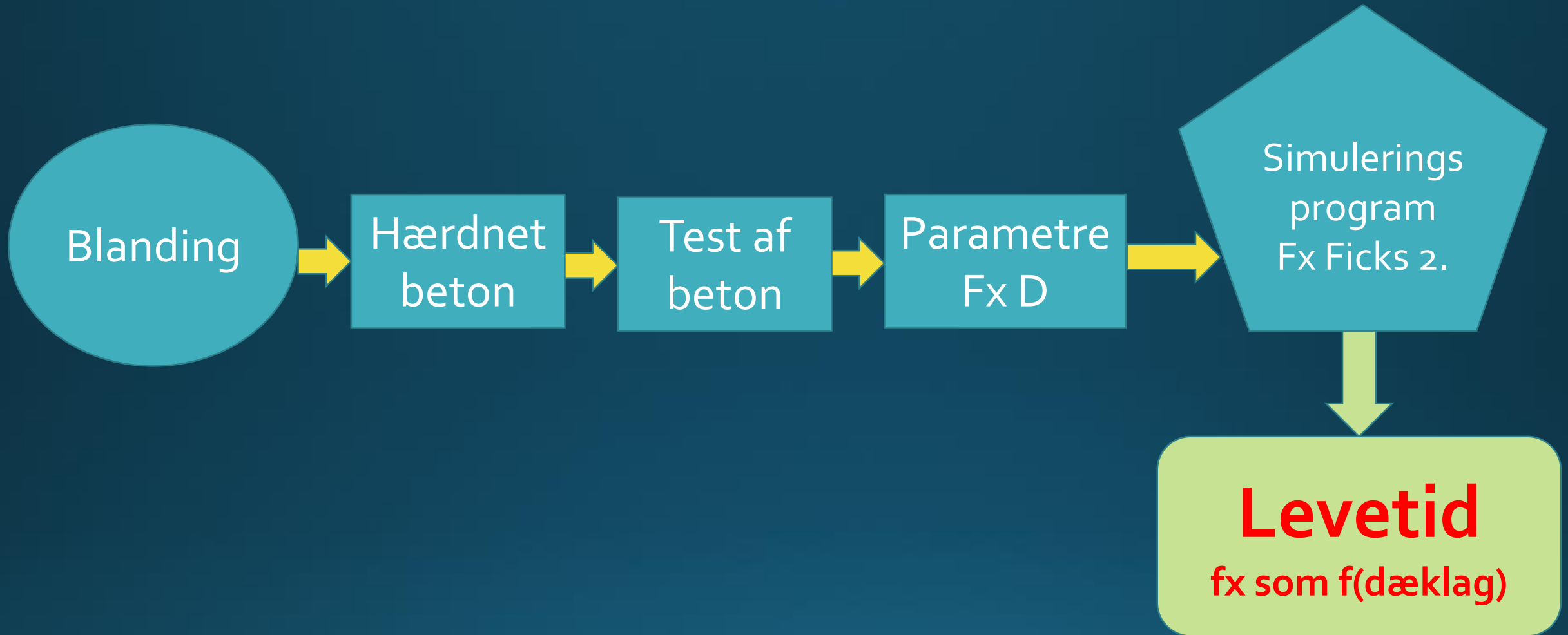
² On the tension side of beams the cover shall be increased by 5mm in RC20 and by 10 mm in RC30 and RC40 for exposure classes XC2, XC3, XC4, XS1 and XD1.

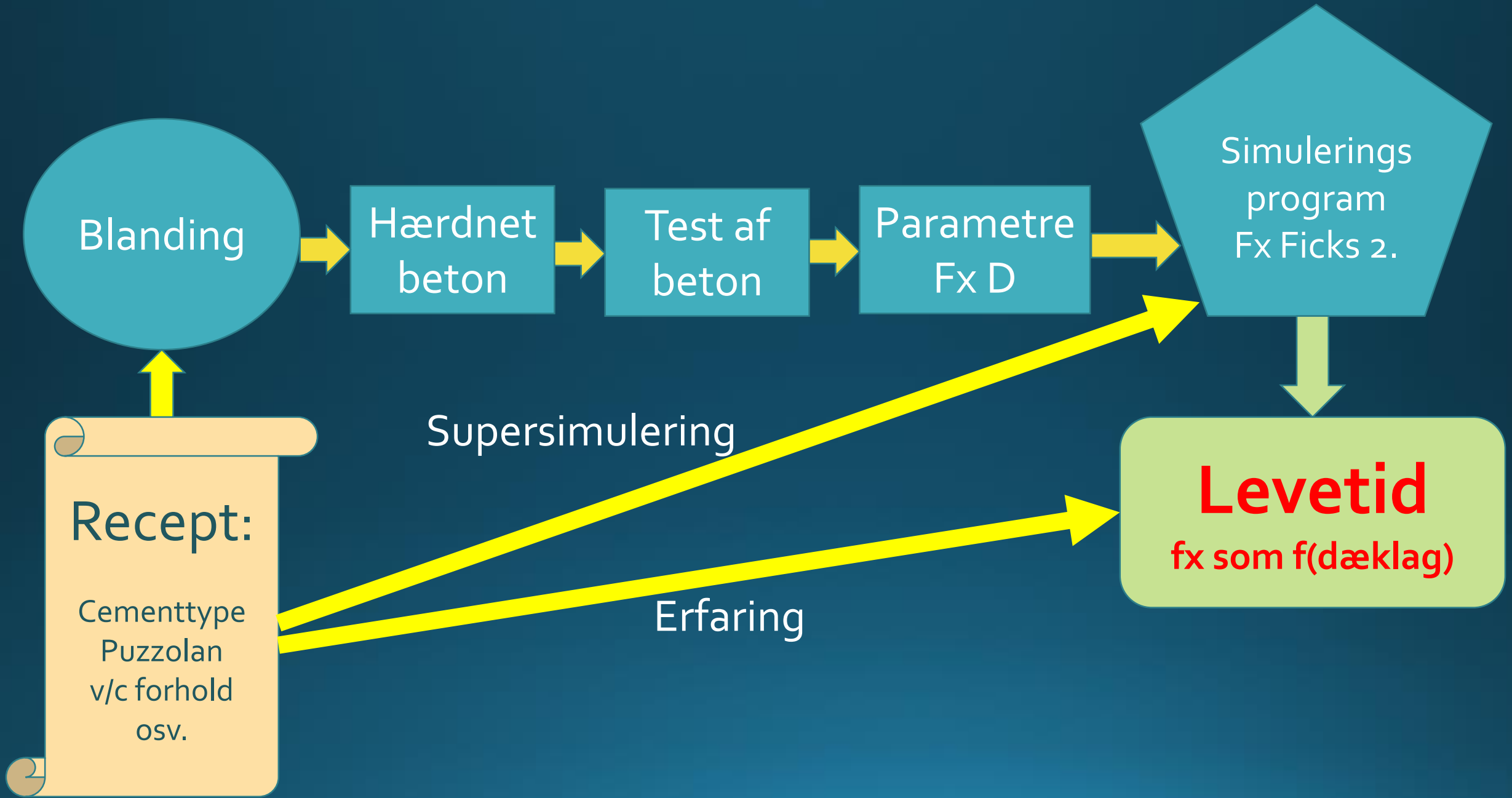
³ Values for minimum cover in EN1992-1-1 given as "base case" given for illustration only



Revner ?







Hvad sker der?

- Danske delegater i WG 01:
- Christian Munch-Petersen, Emcon
- Jens Mejer Frederiksen, Alectia
- Første møde den 14. december 2015 i Berlin
- Vi har brug for en dansk følgegruppe!

