

(ETC16/014)

**CEN/TC104 Survey of national provisions used in conjunction with EN 206:
2013 and national practice**

The aim of this survey is to update CEN/TR 15868: 2009 *Survey of national requirements used in conjunction with EN 206-1:2000*. The survey comprises two Parts. The first Part is to update the information that is still relevant in CEN/TR 15868. These questions should only be completed if the information in CEN/TR 15868 is not correct or if you did not participate in the original survey.

The second Part comprises new questions identified by CEN/TC104 as being relevant to EN 206: 2013 or to gain an understanding of developing national practices.

This survey has been sent as a Word document to facilitate completion. Please return as a Word document as this will facilitate compilation.

Please complete the survey as soon as possible and not later than and send the completed survey to John Gibbs (jc@ermco.eu) and Tom Harrison (thomas.harrison.lehon@orange.fr) who are tasked with compiling this information and drafting a new CEN/TR.

Thanks for your co-operation.

Country responding:

Contact person:

Contact person's e-mail address:

Part 1: Update of information in CEN/TR 15868: 2009

Q1. Location of national requirements used in conjunction with EN206: 2013.

As all the answers in CEN/TR 15868 refer to EN 206-1 it has been assumed that all CEN Members and affiliates will need to update this question.

Country	Location of national requirements

Q2. Exposure classes

As the exposure classes in EN 206: 2013 are the same as in EN 206-1: 2000, it has been assumed that the answers to the questions related to exposure classes are still correct.

	Yes	No
Is this assumption correct?		

If the assumption is incorrect, please provide information on the changes.

Q3. Constituent materials

Since the original survey, most constituents for concrete have been standardized at the European level. The questions below relate to constituents that are still standardized at the national level, e.g. limestone fillers as an addition, and not to the national selection of types, classes and categories from the European standard. Enter 'None' if you do not have any national standards for the constituent.

Constituent	Reference and title
Cements	
Additions	
Admixtures	
Fibres	

NOTE: Part 2 will contain some questions about the use of recycled aggregates.

Q4. National selection of natural aggregate categories from EN 12620

	Yes	No
Have your selection changed from those given in Annex A of CEN/TR 15868?		

If the answer is 'Yes' please enter the changes in the table below. If there is no change leave the cell blank.

Location of requirements:		
Aggregate categories EN 12620 table	Aggregate categories EN 12620 table	Aggregate categories EN 12620 table
Coarse aggregate grading categories	Table 2	
Graded coarse aggregate categories	Table 3	
All-in aggregate	4.3.5	
Flakiness Index categories	Table 8	
Shape Index categories	Table 9	
Shell content categories	Table 10	
Fines content categories for coarse aggregate, natural graded 0/8 mm aggregate, all-in aggregate and fine aggregate	Table 11	
Fines content categories	Table 11	
Los Angeles categories	Table 12	
Resistance to impact categories	Table 13	
Resistance to wear categories	Table 14	
Resistance to polishing categories	Table 15	
Resistance to surface abrasion (AAV) categories	Table 16	
Resistance to abrasion by studded tyres	Table 17	
Freeze-thaw resistance categories	Table 18	
Magnesium sulfate categories	Table 19	
Acid-soluble sulfate categories	Table 20	
Drying shrinkage not greater than 0,075 %	5.7.2	
Lightweight organic contaminators	6.4.1 and annex G.4	

Jean-Marc: Please will you check the table number and clause references against the version of EN 12620 that will be in use in about 3 months.

Q5. National recommended limiting values and cement types for an intended working life of 50 years

	Yes	No
Has your selection changed from those given in Annex B of CEN/TR 15868?		

If the answer is 'Yes' please enter the changes in the table below for the exposure classes where changes have occurred.

Exposure class:																																		
CEN member	Min. cover, mm	Comp. str. class	Max. w/c ratio	MCC, kg/m ³	Air entrainment req.?	CEM 1	CEM 1-SR	11/A-S	11/A-D	11/A-P	11/A-Q	11/A-V	11/A-W	11/A-T	11/A-L	11/A-LL	11/A-M	11/B-S	11/B-P	11/B-Q	11/B-V	11/B-W	11/B-T	11/B-L	11/B-LL	11/B-M	111/A	111/B	111/C	1V/A	1V/B	V/A	V/B	
Exposure class:																																		

Q6. LOI classes of fly ash

	Yes	No
Has your selection changed from those given in Table 6.2 of CEN/TR 15868?		

If the answer is 'Yes' please enter the changes in the table below.

CEN member	Category A ($\leq 5\%$)	Category B (2,0 % to 7,0 %)	Category C (4,0 % to 9,0%)

NOTE: Part 2 will contain some new questions on the use of additions.

Part 2: New questions

Q7. Relationship between 2:1 cylinder strength and cube strength for lightweight concrete

Table 13 of EN 206: 2013 permits other relationships between 2:1 cylinder strength and cube strength to be used.

	Yes	No
Do you have other established and documented relationships?		

If 'Yes' please provide the relationship and the type of lightweight concrete to which it applies.

Q8. Use of additions

Where additions are used, under what concept are they used?

Concept	Frequency of use				
	Always	Often	50%	Rarely	Never
k-value concept					
Equivalent concrete performance					
Combination concept					

Q9. Sources of aggregates

EN 12620, Table A.1 now permits a wide range of sources of aggregates. The following question is aimed at identifying which of these sources are permitted at the national level for reinforced structural concrete and, where required, the additional requirements. EN 12620, Table A.1 uses a grey shading to indicate no experience of use and the same shading is used in the following table.

As all CEN members permit the use of natural aggregates, this source is not included in the following table.

Source	Code	Specific material	Permitted (Yes/No)	Additional requirements
Construction and demolition recycling industries	A1	Reclaimed asphalt		
	A2	Crushed concrete		None required
	A3	Crushed bricks, masonry		None required
	A4	Hydraulically bound and unbound materials		None required
	A5	Mix A1, A2, A3 and A4		None required
Municipal solid waste incineration industry	B1	Municipal incinerator bottom ash (excluding fly ash) (MIBA)		
	B2	Municipal incinerator fly ash (MIFA)		
Coal Power generation industry	C1	Coal fly ash		None required
	C2	Fluidized bed combustion fly ash (FBCFA)		
	C3	Boiler slag		None required
	C4	Coal bottom ash		
	C5	Fluidized bed combustion bottom ash (FBC bottom ash)		
Iron and steel	D1	Granulated blast furnace		None required

industry		slag (GBS) (vitrified)		
	D2	Air-cooled blast furnace slag (ABS) (crystallized)		None required
	D3	Basic oxygen furnace slag (converter slag, BOS)		None required
	D4	Electric arc furnace slag (from carbon steel production, EAF C)		None required
	D5	Electric arc furnace slag (from stainless/high alloy steel production, EAF S)		
	D6	Ferrochromium Slag		
Non ferrous metal industry	E1	Copper slag		
	E2	Molybdenum slag		
	E3	Zinc slag		
	E4	Phosphorus slag		
Foundry industry	F1	Foundry sand		
	F2	Foundry cupola furnace slag		
Mining and quarry industry	G1	Red coal shale		
	G2	Refuse from hard coal mining (black coal shale)		
	G3	Pre-selected all-in from quarry/mining		
	G4	Spent oil shale		
Maintenance dredging works	H1	Dredge spoil sand		None required
	H2	Dredge spoil clay		
Miscellaneous	I1	Excavated soil		
	I2	Paper sludge ash		None required
	I3	Sewage sludge incineration ash (municipal)		
	I4	Biomass ash		
	I5	Crushed glass		

Q10. Rules for the use of coarse recycled aggregates

	Yes	No
Do you adopt the recommendations given in EN 206: 2013, Annex E for the use of coarse recycled concrete?		

If 'No' do you restrict or relax the recommendations in Annex E? Please provide details of your restrictions/relaxations.

Q11. Use of recycled aggregates

Where used, estimate the proportion of coarse recycled aggregates used in concrete in the different exposure classes.

Exposure classes	Percentage of the coarse recycled aggregate used in concrete
X0 and XC1	
XC3 and XC4	
XD1 and XD2	
XD3	

XS1 and XS2	
XS3	
XF1 and XF3	
XF2 and XF4	
XA1	
XA2 and XA3	

Are you happy with the packaging of the classes?

Should there be two tables, one for ready-mixed concrete and one for precast concrete?

Q12. Provisions valid in the place of use

Annex M of EN 206: 2013 lists clause where provisions valid in the place of use are required or permitted. The following questions identify what are the national provisions. After each requirement or permission a blank cell is provided for entering your national provisions. If there are no national provisions, write 'None' in the boxes provided.

1	Scope	Paragraphs (5) and (6)
4.1	Exposure classes related to environmental actions	Paragraphs (1) and (2)
5.1.1	General	Paragraph (2)
5.1.2	Cement	Paragraph (2)
5.1.3	Aggregates	Paragraphs (1) and (2)
5.1.5	Admixtures	Paragraph (2)
5.2.1	General	Paragraphs (2) and (5)
5.2.3.5	Resistance to alkali-silica reaction	Paragraph (1)
5.2.5.1	General	Paragraph (2), (4) and (5)
5.2.5.2.3	<i>k</i> -value for silica fume of class 1 conforming to EN 13263-1	Paragraph (4)
5.2.5.2.4	<i>k</i> -value for ground granulated blastfurnace slag conforming to EN 15167-1	Paragraph (1)

5.2.5.3	Equivalent Concrete Performance Concept	Paragraph (3)
5.2.8	Chloride content	Table 15, "Maximum chloride content of concrete", footnotes a and c
5.3.2	Limiting values for concrete composition	Paragraphs (1) and (3)
5.3.3	Performance-related methods	Paragraph (1)
5.4.2	Cement content and water/cement ratio	Paragraph (2)
6.1	General	Paragraph (2)
6.4	Specification of standardized prescribed concrete	Paragraph (2)
7.2	Information from the producer of the concrete to the user	Paragraph (4)
7.3	Delivery ticket for ready-mixed concrete	Paragraph (3)
8.2.1.2	Sampling and testing plan	Table 17, "Minimum rate of sampling for assessing conformity", footnote d
8.2.1.3.2	Criteria for mean results	Paragraph (11)
8.2.3.3	Conformity criteria for properties other than strength	Table 21, "Conformity criteria for consistence, air content and homogeneity of fibre distribution of fresh concrete at the point of delivery", footnote c
8.2.3.3	Conformity criteria for properties other than strength	Table 23, "Tolerances for target values of consistence and viscosity", footnote a
9.4	Testing	Paragraph (2)

9.7	Batching of constituents	Paragraph (2)
9.9	Production control procedures	Table 28, "Equipment control", row 3, column 4
10.2	Assessment, surveillance and certification of production control	Paragraph (1)
Annex A.4	Test conditions	Paragraph (5)
Annex D.2.1	Cement	Paragraphs (1) and (3)
Annex D.3.3	Water/cement ratio	Paragraph (1)
Annex D.3.4	Fresh concrete	Paragraph (2)
Annex F	Recommendation for limiting values of concrete composition	Paragraph (3)
Annex F	Recommendation for limiting values of concrete composition	Table F.1, "Recommended limiting values for composition and properties of concrete", footnote b

Q13. Matters covered by national provisions that are outside the scope of EN 206

There are some aspects of concrete supply, production and delivery that are outside the scope of EN 206, e.g. volume supplied, delivery times. Please list briefly those subjects covered by national provisions.

Where these provisions are specified:
List of topics covered that are outside the scope of EN 206:

Q14. Fibre concrete specified by performance

	Yes	No
Do you have provisions for specifying fibre concrete by performance?		

If 'Yes', please complete the Table below:

Aspect of performance specified	Typical range of requirements	Test method

Q15. Self-compacting concrete

This question identifies the SCC tests that are being used in practice.

Test	Standard	Frequency of use				
		Always	Often	50%	Rarely	Never
Slump-flow	EN12350-8					
V-funnel test	EN 11350-9					
L-box test	EN12350-10					
Sieve segregation test	EN12350-11					
J-ring test	EN12350-12					
Other (please describe briefly)						

Q16. Requirements for concrete used in geotechnical applications

After a number of problems where the concrete did not achieve what was intended, new requirements are being developed. This question identifies the test methods being used to support these new requirements.

For more information about these tests see **EFFC/DFI Best Practice Guide to Tremie Concrete for Deep Foundations**, which is available for free downloading.

Test	Standard	Frequency of use				
		Always	Often	50%	Rarely	Never
Rheology with rheometer						
Slump test	EN12350-2					
Flow table test	EN12350-5					
Slump-flow	EN12350-8					
L-box test	EN12350-10					
Slump, flow or slump-flow retention						
Knead bag test						
Stiffening time index test						
Visual stability index test						
Hardened visual stability Index test						
Static segregation test						
Bleeding test						

Concrete filter press test						
Bauer filtration test						
Composition of fresh concrete						

Q17. Durability related tests

CEN has developed a suite of performance-related test methods. These questions are aimed at establishing the ways in which these types of tests are used. The CEN tests are not cited as they are relatively new and similar to tests that are currently being used. Please tick all boxes that are relevant.

Type of test	Test reference (in table below give the full title of the standard in English if it is not an EN)	Uses of test			
		Research	Checking if current limiting values apply with new constituent	Type testing	Conformity testing
Carbonation testing at natural levels of CO ₂					
Accelerated carbonation testing					
Chloride diffusion testing					
Chloride migration testing					
Freeze-thaw scaling testing					
Freeze-thaw internal damage testing					
Sulfate resistance testing of concrete					
Testing for resistance to acids					
Testing for resistance to ASR					
Testing for resistance to alkali-carbonate reaction					
Resistivity					
Other (please define)					

Test reference	Title of test in English