

4 CONGRESO  
NACIONAL  
DE DEMOLICIÓN  
Y RECICLAJE



15 INTERFORUM  
RECYCLING  
DE LA F.I.R.



# **4 Congreso Nacional de Demolición y Reciclaje 15 Interforum Recycling de la F.I.R.**

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Zaragoza / España**



# Standards under TC 154 "Aggregates"

## Oppportunity or threat for recycling?

Ing. Nico Vonk  
[www.bmc-cert.nl](http://www.bmc-cert.nl)



## **BMC-Certification**

Certification Institute for ready-mixed concrete, mortar, asphalt, cement, bound and unbound aggregates

Product- and process certification, Technical approvals, Management system certification, Notified Body for CE-marking

Ing. Nico Vonk  
[www.bmc-cert.nl](http://www.bmc-cert.nl)





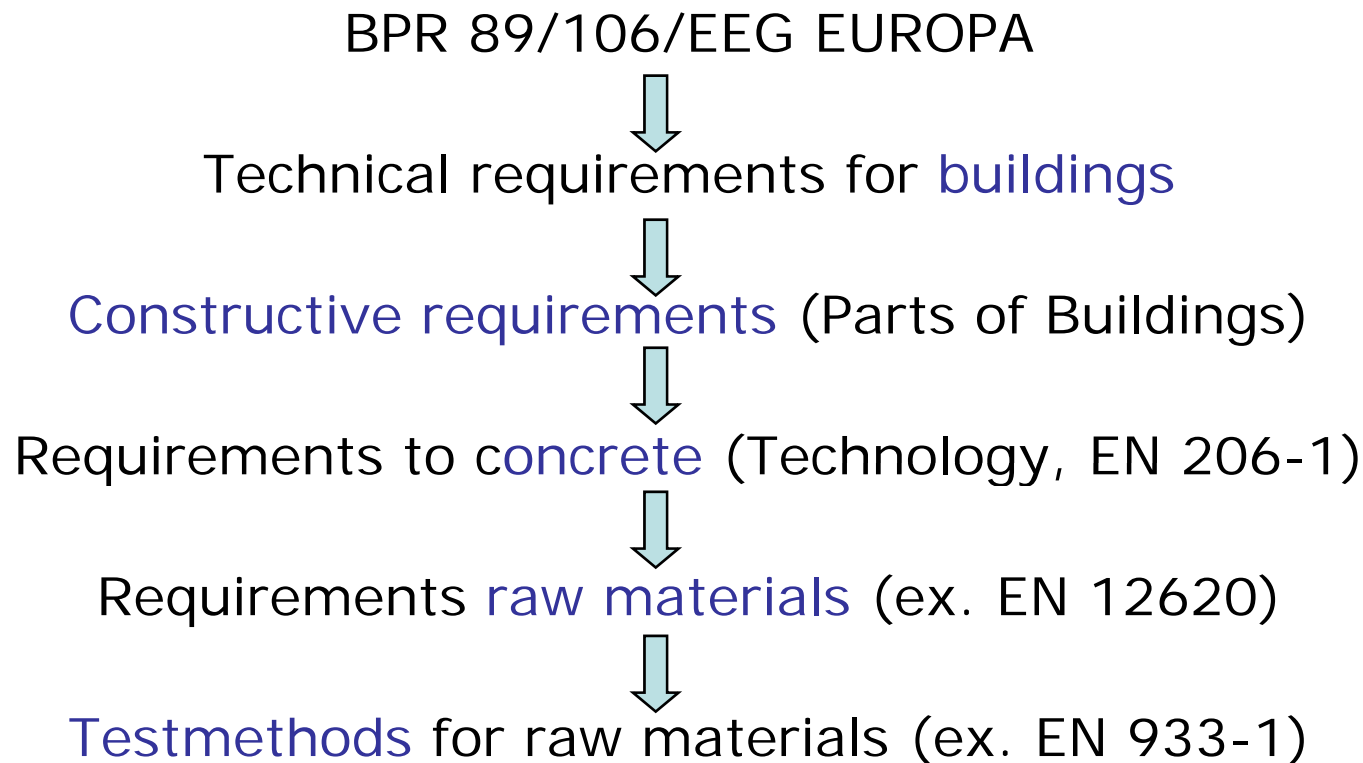
## Why standardization?

- Basis for quality
- Basis for contracts
- Basis for third part certification
- Instrument for an open market
- Communication between partners in business
- Collective memory



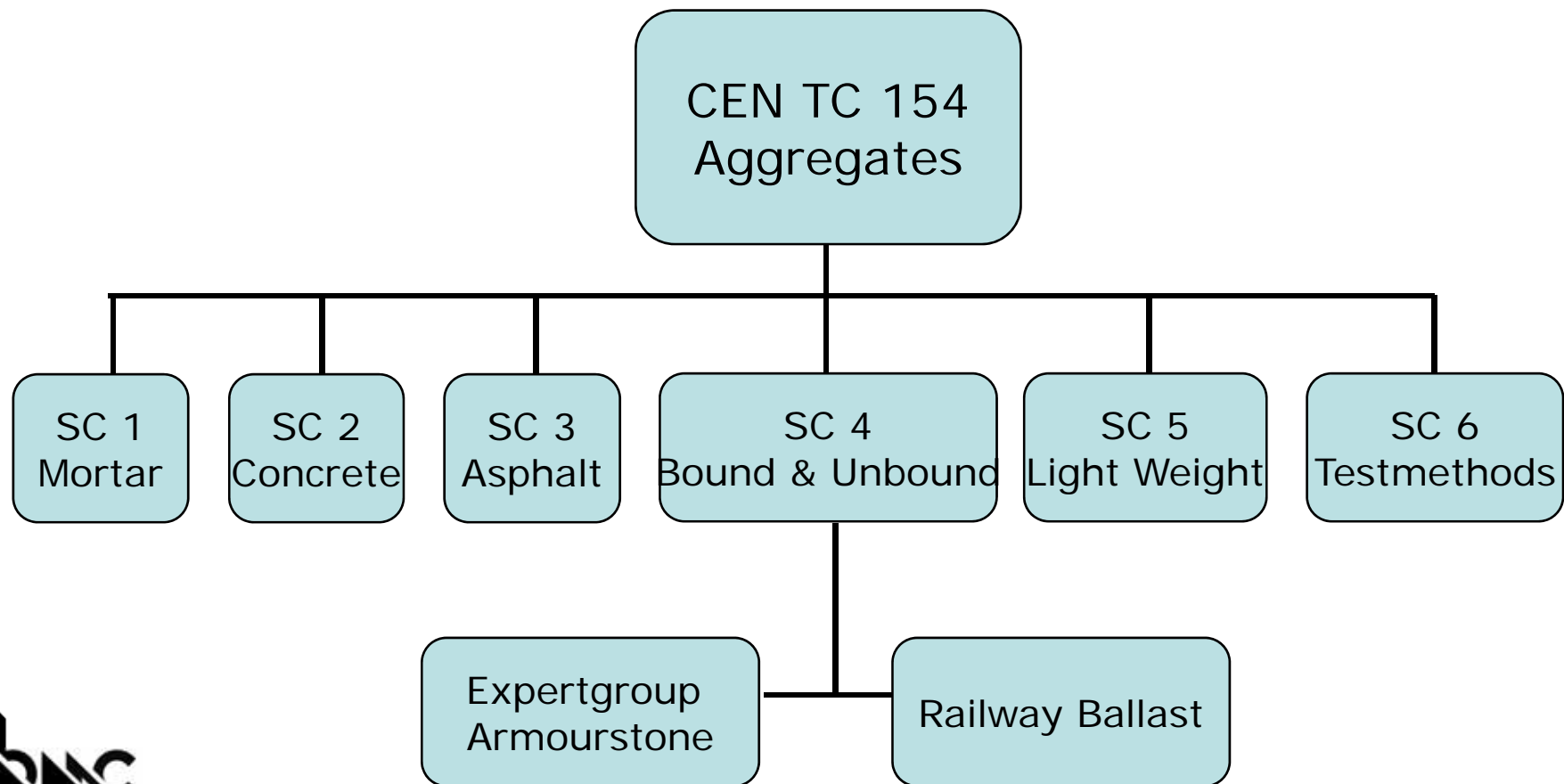


# Structure standardization (for concrete)



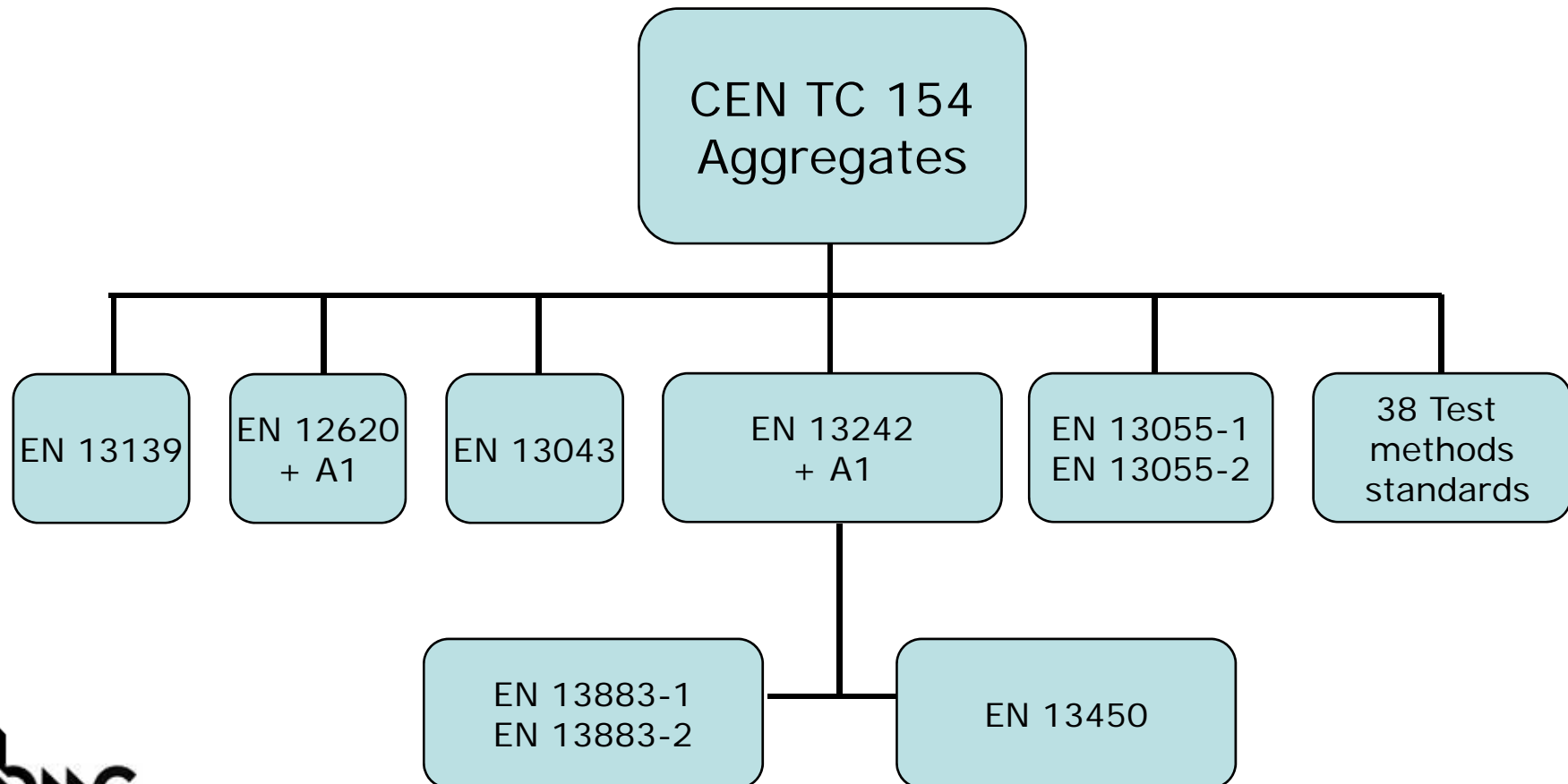


## Structure of CEN TC 154





## Standards under CEN TC 154





# Making European standards was not always easy!





## General Scope:

*This European Standard specifies the properties of aggregates obtained by processing natural or manufactured or **recycled** materials for XXXXX*

So: recycled aggregates is incorporated and has to fulfil all the requirements of the Standards when using them in certain applications.



## Clauses about:

- Geometrical requirements:
  - grading, fines, flackiness, crushed etc
- Physical requirements:
  - resistance to fragmentation, polishing, abrasion etc
- Chemical requirements:
  - chloride, sulphate, constituents effect hardening of cement etc



## Recycling aggregates in standards TC 54

SC 1: Mortar	Still in discussion
SC 2: Concrete	Clauses for constituents (Table 20, for coarse aggregates)
SC 3: Asphalt	Still in discussion
SC 4: Bound & Unbound	Clauses for constituents (Table 12, for coarse aggregates)
SC 5: Light Weight	Still in discussion
Armourstone/ Railway Ballast	No clauses Still in discussion



## Recycled aggregates in EN 12620

For concrete applications

Constituents	Content [%m/m]	Categories
Rc	XYZ	$R_{CXX}$
Rc+Ru	XYZ	$R_{CUXX}$
Rb	XYZ	$R_{bXX}$
Ra	XYZ	$R_{aXX}$
X + Rg	XYZ	$X_{XX}$
FL	XYZ [cm <sup>3</sup> /kg]	$FL_{XX-}$



## Example I of declaration (EN 12620)

Aggregates from crushed concrete for use in concrete:

Constituents	Testresult [%m/m]	Category
Rc	86	<i>Rc80</i>
Rc+Ru	91	<i>R<sub>cu</sub>90</i>
Rb	9	<i>Rb10-</i>
Ra	<1	<i>Ra1-</i>
X +Rg	<0,5	<i>X<sub>0,5-</sub></i>
FL	<2 [cm <sup>3</sup> /kg]	<i>FL<sub>2-</sub></i>



## Recycled aggregates in EN13242

For bound&unbound applications

Constituents	Content [%m/m]	Categories
Rc	XYZ	$R_{Cxx}$
Rc+Ru+Rg	XYZ	$R_{cugxx}$
Rb	XYZ	$R_{bxx}$
Ra	XYZ	$R_{axx}$
R <sub>g</sub>	XYZ	$R_{gxx}$
X	XYZ	$X_{xx}$
FL	XYZ [cm <sup>3</sup> /kg]	$FL_{xx-}$



## Example II of declaration (EN 13242)

Aggregates from mixed building and demolition waste (MBDW) for use in road foundations:

Constituents	Testresult [%m/m]	Category
Rc	55	<i>Rc</i> <sub>50</sub>
Rc+Ru+Rg	61	<i>R<sub>cug</sub></i> <sub>50</sub>
Rb	36	<i>Rb</i> <sub>50-</sub>
Ra	2	<i>Ra</i> <sub>5-</sub>
R <sub>g</sub>	<2	<i>Rg</i> <sub>2-</sub>
X	<1	<i>X</i> <sub>1-</sub>
FL	<5 [cm <sup>3</sup> /kg]	<i>FL</i> <sub>5-</sub>



## CE-labelling

- By producer!
- Is no quality-label!
- Declaration that product fulfils the harmonized standard
- Annex ZA for:
  - Answer to the EC-Mandate given to CEN
  - Attestation on Conformity





## Important items of CEN TC 154

- TC 154:
  - Regulated Dangerous Substances (RDS), ER-3
  - Merging standards (13139, 12620, 13043, 13242)
- SC1, SC3, SC5: Discussion on including clauses for recycled aggregates
- SC2: Alkali Silica Reaction in Concrete (Partner-Project)
- SC6: Develop new test methods standards for recycled aggregates. prEN 933-11 Classification test for the constituents of coarse recycled aggregates



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