Concrete Sustainability Council

Annex: R-Module (V2.1) and R-Module Reuse

The Concrete Sustainability Council (CSC)

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Glossary

R-Material	<u>R-material:</u> recycled aggregates, secondary aggregates, reclaimed aggregates. <u>Recycled aggregate:</u> aggregate resulting from the processing of inorganic or mineral material previously used in construction, typically recycled concrete or bricks or recycled excavated soil. <u>Secondary aggregate:</u> aggregate of mineral origin derived from an industrial process, e.g. processed slag, china clay stent or other sources with well-proven applicability in concrete. <u>Reclaimed aggregate:</u> ● aggregate gained from returned concrete deliveries ("returned concrete") by washing fresh concrete ● crushing hardened concrete that has not been previously used in construction, e.g. hardened returned concrete or not delivered concrete products from precast manufacturing
Mobile crusher	Mobile equipment used to crush and classify aggregates into different size fractions.
R-Concrete	Concrete consisting of a certain fraction of R-Material
Reuse	Reusing (non-)structural concrete elements refers to the practice of removing concrete components (such as prefabricated panels, beams, or sections of cast-in-place walls) from an existing structure and employing them in a new construction project, while preserving their original form and function as much as possible. The process typically involves careful dismantling, possible refurbishment (such as cleaning or minor repairs), and transportation to a new site where the elements are integrated into a new building or structure. The key aspect of reuse is that the concrete element retains its nature and is used for the same or a similar purpose as before.
Recycling	Recycling concrete, in contrast, involves processing demolished concrete—usually by crushing it—into smaller pieces to produce recycled aggregates. These aggregates can then be used as a substitute for natural aggregates in new concrete production or as material for road bases, backfill, or other construction applications.

R2.01 Traced R-material supply

Applicable to region (s)	Criteria	Applicable sections		Evidence
Global		R-Module	x	Accepted evidence: ● Invoice or delivery note based tracking of R-material produced on site (by third parties) and third party supplied R-material ● Extract from the batching & production system ● Documentation via measurements via loader scale, conveyor scale etc. ● Volume based on-site calculation

R4.01 Quality management System

Applicable to region (s)	Criteria	Applicable sections		Evidence
Global		R-Module	x	Accepted standards are: ISO 9001 Procedures specified in: EN 206, and the related national application documents ASTM C94 Procedures built in line with EN 206 or ASTM C94
Australia		R-Module	x	Procedures specified in: AS 1379
India		R-Module	x	Procedures specified in: IS 4926

R4.02 Use of certified recycled material

Applicable to region (s)	Criteria	Applicable sections	Evidence

Global		R-Module	x	Accepted standards are:
Germany		R-Module	x	Accepted local standards are: ● DIN EN 12620 ● DIN EN 206-1, DIN 1045-2 ● DIN 4226-101 ● DIN 4226-102 ● DAfStb-Richtlinie: Beton nach DIN EN 206-1 und DIN 1045-2 mit rezyklierten Gesteinskörnungen nach DIN EN 12620 ● DAfStb-Richtlinie "Vorbeugende Maßnahmen gegen schädigende Alkalireaktion im Beton" For concrete product manufacturers: ● DIN EN 1338 ● DIN EN 1339 ● DIN EN 1340
Netherlands		R-Module	x	Accepted local standards are: ● Certified Crushers, recycled materials according to BRL2506 ● Material supplied from external sources certified with KOMO ● EN 12620 For concrete product manufacturers: ● NEN EN 1338 ● NEN EN 1339 ● NEN EN 1340
Belgium		R-Module	x	Accepted local standards are: ● Externally sourced materials need a CE2+ certification according to NBN EN 12620 AND the R-materials need to comply with the regional environmental legislation (i.e. VLAREMA in Flanders, SSD in Wallonia). For concrete product manufacturers: ● Algemeen Toepassingsreglement BENOR (ATR) 100

R5.01 Minimum R-material content

Applicable to region (s)	Criteria	Applicable sections		Evidence
R-material content & Ratings				
Global		R-Module	x	The volume of the aggregate fraction fully or partially replaced by R-material is rated as: Level 1 - 1 Star: - 10 % Level 2 - 2 Stars: - 20 % Level 3 - 3 Stars: - 40 % Level 4 - 4 Stars: - 80 % Level 5 - 5 Stars: - reuse full reuse of concrete construction elements - applicable for precast elements only Note: For RMX concrete, 3 Stars and above can contradict local standards in certain countries. Evidence: Actual content to be confirmed by the delivery slip or a producer confirmation with reference to the delivery slip.
Data Upload				
Global		R-Module	x	The following information of each mix-design covered by the R-Module needs to be uploaded in the CSC Toolbox: ● Distinctive identification number ● R-material content ● Number of stars claimed For reused concrete construction elements: ● Copy of the delivery notes ● Number of stars claimed In case of first time certification: ● R-material content for at least one individual R-material containing concrete mix design to be potentially delivered from the concrete plant that is targeting to obtain a CSC R-Module (see Data Validation / Verification).

Labelling				
Global		R-Module	x	R-material content to be confirmed by the delivery slip or a producer confirmation with reference to the delivery slip
Data Validation / Verification				
Global			x	**First time certification** ● The correct content of R-material used must be proven for at least one concrete mix design to be potentially delivered from the concrete plant that is targeting to obtain a CSC R-module. This can be done by means of a valid R-Material containing concrete recipe with a distinctive identification number. ● The CB must name the sample which has been assessed. ● The number of "stars" granted with the CSC R module is proven by the distinctive mix design. For reused concrete construction elements: ● Copy of the delivery notes ● Number of stars claimed ● 5 Stars can only be claimed for performed deliveries **Upgrade** ● Higher achievement levels claimed at a later point in time need to be proven by an upgrade certification which follows the same rules as the first time certification. **Annual assurance** ● Management confirms by means of an annual compliance declaration by the management that ○ the R-module has been issued only for the declared mix designs ○ all calculations are in line with the CSC R-criteria ● The annual compliance declaration must come with a list of all R-module

				deliveries of the previous year containing and include ○ Identification number ○ Concrete strength class ○ Volume supplied (per strength class or per mix design) ○ R-module performance (1-4 stars) ● Upload of the annual compliance declaration and R-module delivery list to the CSC toolbox (per document upload, or per tool entry) **Re-certification** ● Full check by the CB upon plant recertification (max. after 3 years), checking representative samples ○ n = 0.7*SQRT(number of identification numbers delivered as R-material concrete); with a cap at n_{max}=15 ○ n to be mathematically rounded, but at least = 1 ○ The CB must list and name the samples which have been assessed