

6. hrvatski forum o održivoj gradnji



Holcim

Cement. Beton. Agregat.



SVEUČILIŠTE U ZAGREBU
GRADEVINSKI FAKULTET
UNIVERSITY OF ZAGREB
FACULTY OF CIVIL ENGINEERING

*pazite čime gradite
danas kako biste
jeftinije rušili sutra*

6. Croatian Forum

on

Sustainable Construction

01. 12. 2012

ZAGREB

Recycling of C & D – waste

Ing. Günter Gretzmacher

Managing Director of

OEKOTECHNA

Entsorgungs- und Umwelttechnik GmbH

Vienna /Austria

and

President of the Austrian Construction Materials

Recycling Association (ÖBRV)



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OEKOTECHNA

Business Activities

- ◆ Waste Management
 - „Sorting isle“ for separate collection on Construction sites in order to increase the recycling rate
 - sorting plant for C & D – waste
- ◆ Recycling
 - 3 mobile recycling facilities
 - 2 stationary recycling plants
 - production of quality controlled recycling-granulate-material of about 350.000 to/p.a.

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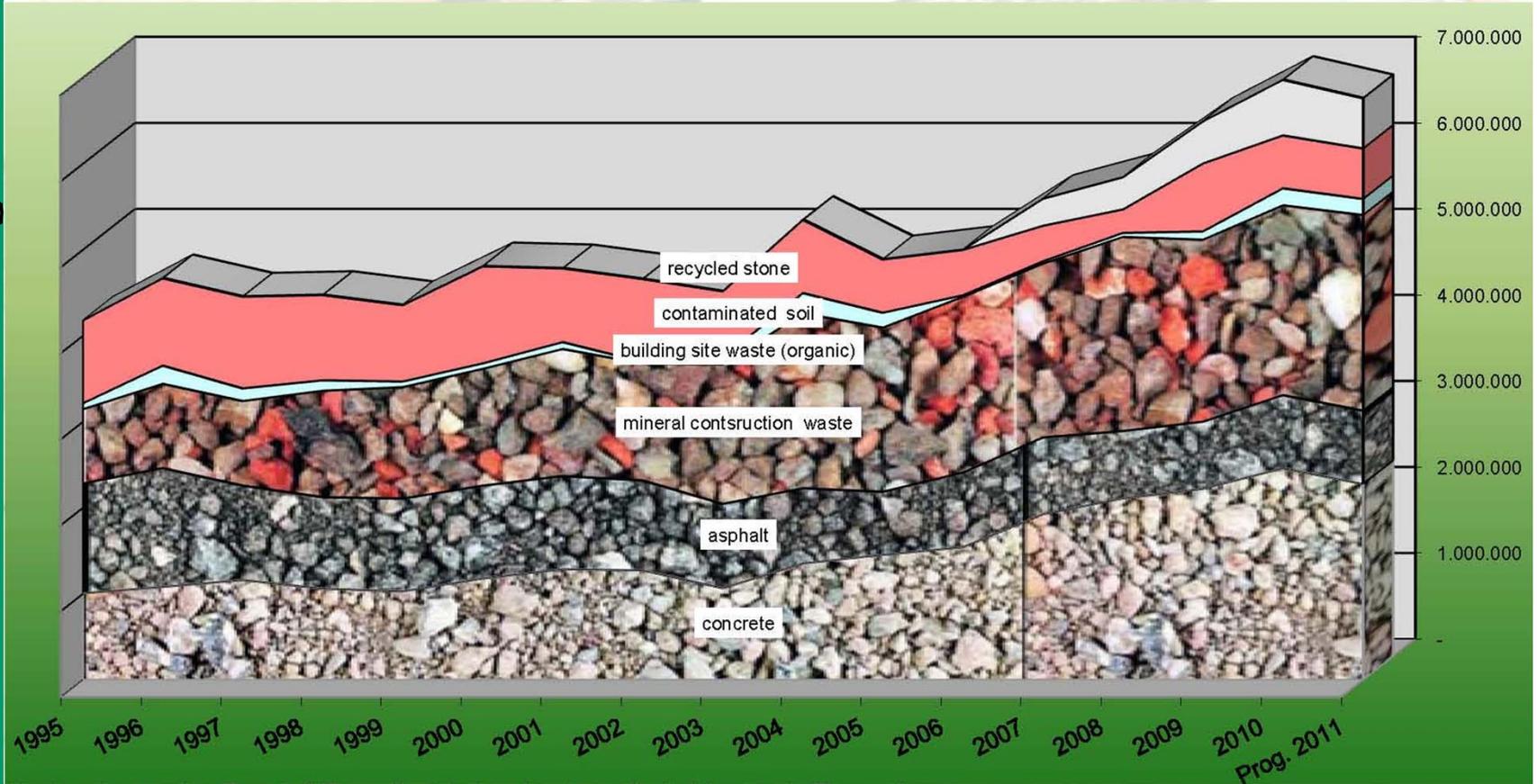
- ◆ landfill for excavation and demolition materials (300.000 t/a)
- ◆ Remediation of landfills and contaminated soils
- ◆ landfill constructions
- ◆ Redevelopment of contaminated constructions (e.g. asbestos)
- ◆ research and development

Recycling Materials in Austria

- Waste accumulation (C&D-waste): 6,5Mio. t
- Rate of recycling: 80 %
- Proportion of recycled material on prime building material: 10 %
- Number of BRV recycling plants: 120
- Recycling plants with quality certificate 15
- Members of BRV: 75

Recycling Construction Waste in Austria

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Waste directives, laws and guidelines in Austria

- 1989 ALSAG : Introduction of taxes for deposit of C & D – waste in landfills
- 1990 AWG : Obligation for reuse, reutilization, recycling
- 1991 BRM-Trenn-VO – Decree for the separation of construction waste
- 1992 Guideline for Recycled Construction Material
- 1996 DVO – directives for landfills
- 2002 Quality label for Recycling Construction Materials
- 2009 Guideline 8th edition, including the targets of EN 13242 and EN 12620
- 1990/91 Austria Construction Materials Recycling Association (BRV)
Austrian Construction Materials Quality Assurance Association (GSV)

Act on the Remediation of Contaminated Sites (landfill tax)

The landfilling of waste is subject to the so called „ALSAG fee“ which has to be paid in following situations:

- landfilling with non-hazardous waste
- storage longer than allowed
- adaptations of site (dams, railway tracks, foundations)
- backfilling of excavation material
- burning of waste
- export

Applicable Law

Act on the Remediation of Contaminated Sites

AISAG fee (landfill tax)

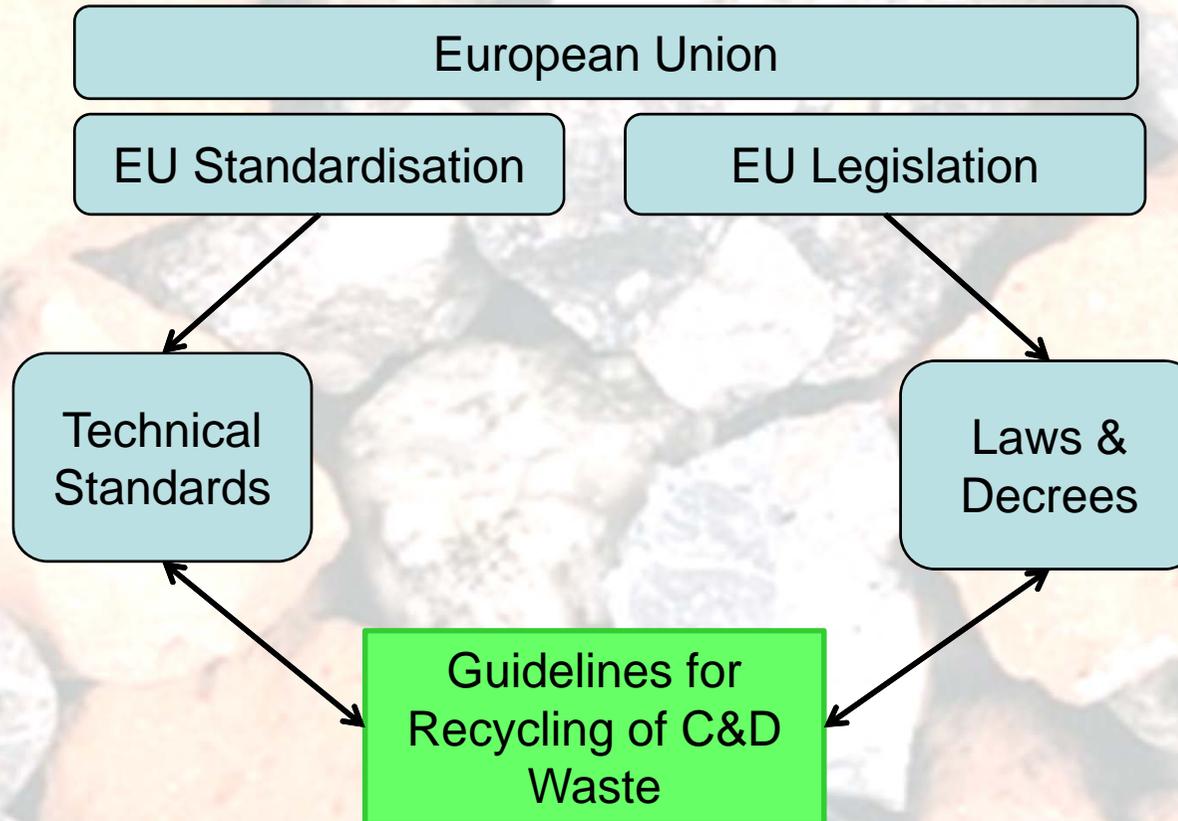
Classes / subclasses of landfills Waste classification	Since 1st January 2012 per ton
Landfills for non-hazardous wastes	
Demolition debris	€ 9,20
Residual material	€ 20,60
Mass waste	€ 29,80

Information: No landfills for hazardous waste in Austria (incineration facilities)

Waste Hierarchy



Development of Guidelines



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cen

Comité Européen de Normalisation

Europäisches Komitee für Normung

Aggregates

Aggregates for mortar

→ EN 13139

Aggregates for concrete

→ EN 12620

Aggregates for bituminous mixtures and surface treatments for roads, airfields and other trafficked areas

→ EN 13043

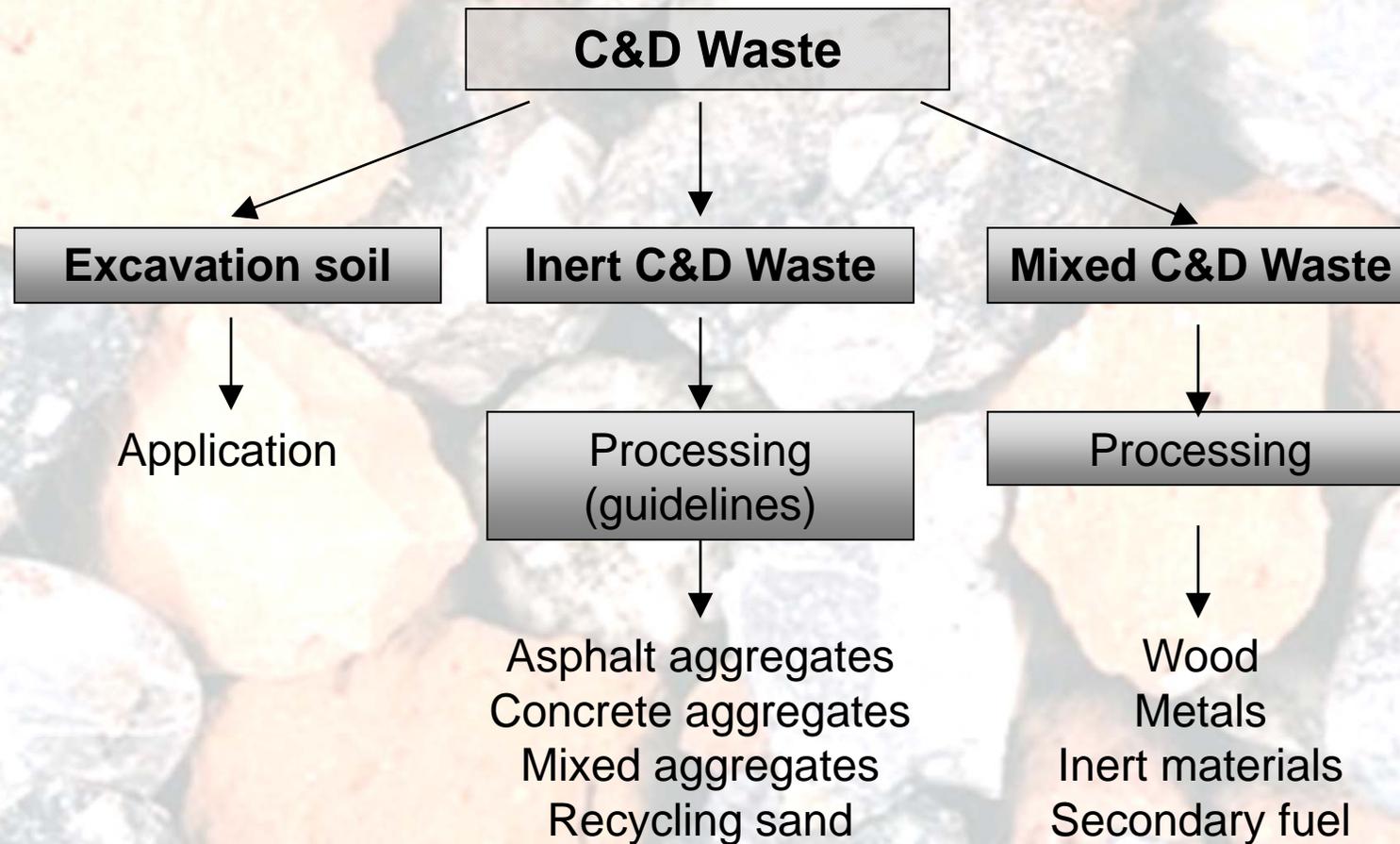
Aggregates for unbound and hydraulically bound materials for use in civil engineering work and road construction

→ EN 13242

Purpose

The aim of these additional orders is, to complement existing harmonized product standards in order to fulfil the environmental performance requirements; however, just to the extent that an CE marking is possible in Member States without installing further national requirements.

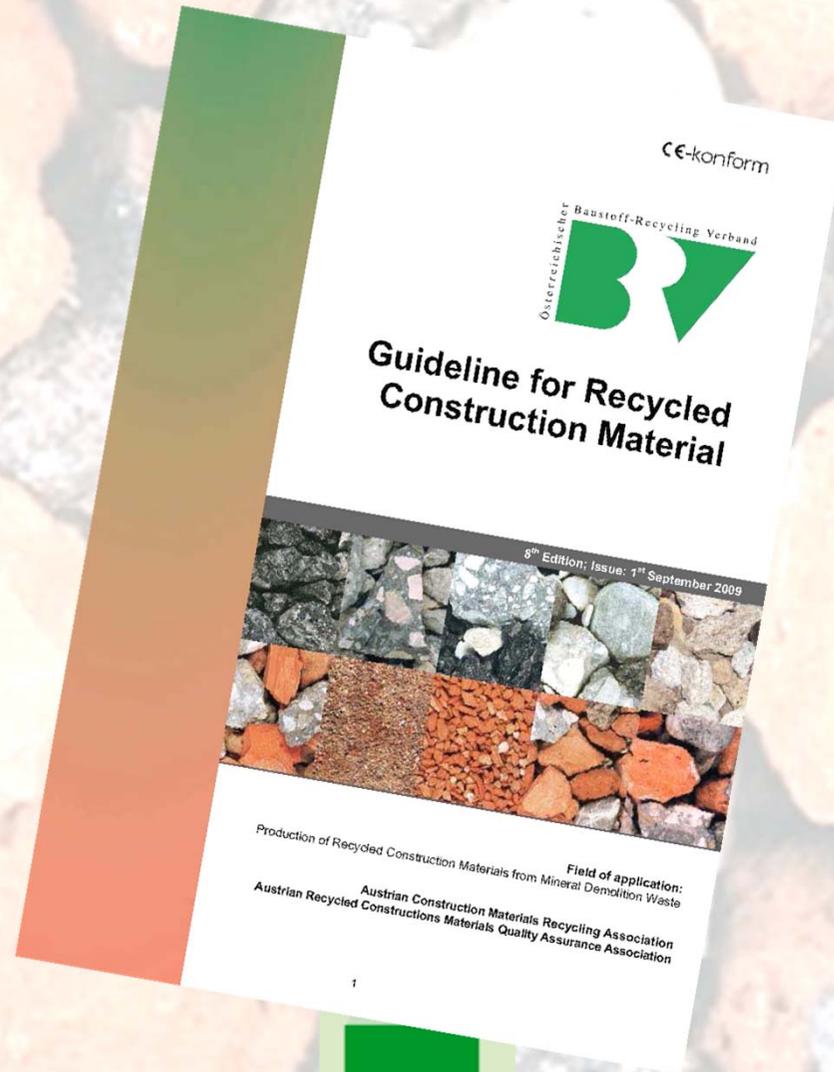
Development of Guidelines



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Guideline for Recycled Construction Material

8th Edition; Issue: 1st September 2009



Technical Guidelines and Bulletins

Guideline for Recycled Building Materials:

Field of application

Norms and technical regulations

General requirements

Engineering properties – grading regulations

Environmental compatibility – quality regulations

Applications

Grade and quality surveillance

Acquiring of quality marks for recycled building materials

Field of application

This guideline regulates the production of quality proven recycled construction materials made from demolition waste for standardized applications. Setting grade and quality standards it also determines the kind and the extent of assessments which have to be carried out on recycled construction materials.

Designation of recycled construction materials Quality of Use

RA – Recycled crushed asphalt granulate

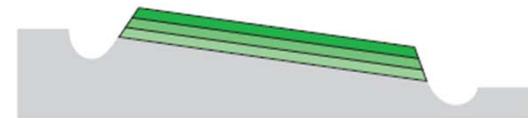


RA

Recycled crushed asphalt granulate



Quality building materials for upper unbound base layers, lower unbound base layers, bound base agricultural roads, Aggregate for asphalt production



RB – Recycled crushed concrete granulate

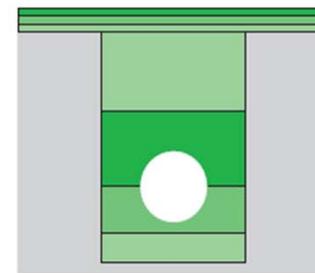


RB

Recycled crushed concrete granulate



Quality building materials for unbound top and bottom base layers, cement-bound base, agricultural roads, Aggregate for concrete production, quality backfilling for trenches, drainage layers



Quality of Use

RAB – Recycled crushed mixed asphalt and concrete granulate

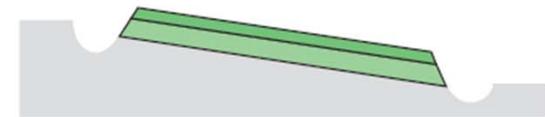


RAB

Recycled crushed mixed asphalt and concrete granulate



Quality building materials for upper unbound base layers, lower unbound base layers, bound base, agricultural Infrastructures



RM – Recycled crushed granulate mix of concrete and asphalt.

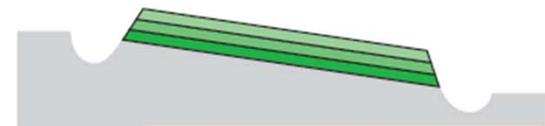


RM

Recycled crushed granulate mix of concrete and/or asphalt with a maximum content of stone (natural and/or recycled) of 50%



Quality building materials for upper unbound base layers, lower unbound base layers, bound base



Quality of Use

RZ - Recycled brick sand;
recycled brick

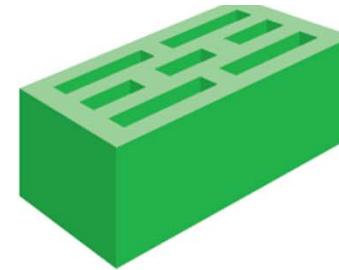


RZ

Recycled sand from
bricks; recycled
gravel from bricks



Quality building materials for
Additive for the production of
Masonry stone, concrete and
lightweight concrete,
Stabilization, drainage layers,
Fillings, embankments



RHZ – Recycled brick sand as
well as brick gravel gained from
above-ground construction

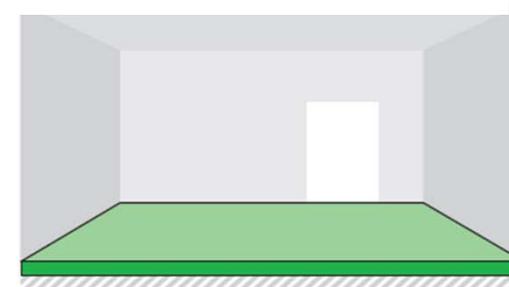


RHZ

Recycled sand from bricks
used for above ground
structures; recycled gravel
from bricks used for above
ground structures

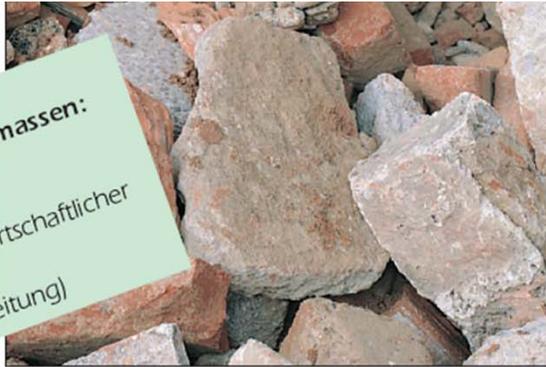


Quality building materials for
Additive for the production of
Masonry stone, concrete and
lightweight concrete,
Stabilizations, fills, embankments,
screeds



Quality of Use

RH – Recycled sand or gravel from above-ground construction



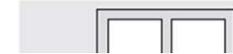
RH

Recycled sand from above ground structures; recycled gravel from above ground structures



Qualitätsbaustoff für

stabilisierte Schüttungen, stabilisierte Künnettenverfüllungen, Bauwerkshinterfüllungen, Sportplatzbau



Quality building materials for stabilized embankments, backfilling for trenches stabilized, backfilling for constructions, construction of sport fields

RMH – Recycled mineral demolition wastes from above ground construction

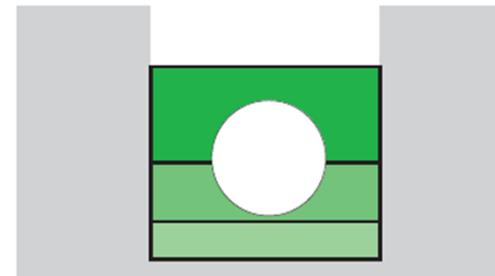


RMH

Recycled mineral demolition waste from above-ground structures



Quality building materials for backfilling for trenches, embankments, drainage construction of sport fields



Quality of Use

RS – Recycled sand

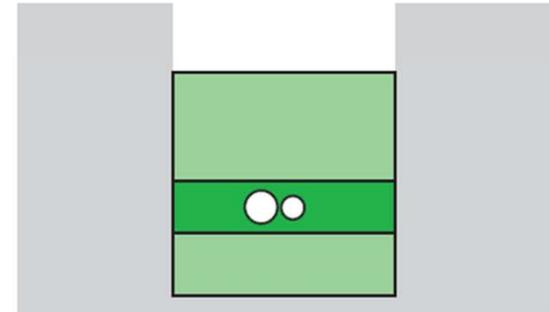


RS

Recycled sand



Quality building materials for
the ballast of energy and telecommunications
cables (cable sand), duct, e.g. by channel,
gas and water pipes, and for other
infrastructure



Recycling construction examples



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Recycling construction examples



Recycling construction examples



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Recycling construction examples



Recycling construction examples



Recycling construction examples



Recycling construction examples



Classifications – Quality guarantee

(see guidelines)

1. Grade Classes – Civil Engineering
Grades S, I, II, III, IV
- different specifications for road constructions
2. Quality Classes – Environmental Compatibility
Quality A+, A, B
- according to their composition (limits of different parameters)
- and form of application

Form of application	Hydro-geolocial delicate area	Hydro-geological less delicate area
Unbound without cover layer	Quality class A+	Quality classes A+, A
Unbound with cover layer or in bound form with or without cover layer	Quality classes A+, A	Quality classes A+, A, B
Aggregate	Quality classes A+, A, B	Quality classes A+, A, B

Definition of hydro-geological less delicate area:

An area is to be considered less delicate in respect of hydro-geological conditions if it shows the following criteria:

- ❖ existence and sufficient efficiency of layers with low permeability
- ❖ sufficient distance from ground water supplies

The application of recycled construction materials is not permitted in

- ❖ water-source protection areas
- ❖ areas with changing groundwater levels

Classifications – Quality guarantee

(see guidelines)

3. Quality Management

External Control

Charge of an independent laboratory

Examination report

Result report

Operating and result report of the internal control

Internal Control

Regular operating reports

Regular result reports

must be presented to the ÖGSV

Quality Management

Quality Seal on Recycled Construction Materials:

Its award is subject to periodic external and internal quality assurance reviews as specified.

CE:

Declaration by the manufacturer that the product meets all the appropriate provisions of the relevant legislation implementing certain European Directives



Propositions for new User

- 1.) Political intention
Change of the topical bad habits by new regulations, deliveries and controls
- 2.) Execution of EU-law (waste framework directive, landfill)
Application of the technical standards
Ban and control of wild depositions / dumps
- 3.) Taxation of depositing waste or on new minerals
Promotion of Recycling Products by improved competition ability
- 4.) Adaption the technical standards of EN 13242
Aggregate of raw materials or recycling granulats used for civil engineering work and road constructions
- 5.) Croatian Guidelines for Recycled Construction Materials
→ see the Austrian Guidelines

Propositions for new User

- 6.) Regulations for recycling plant-installations
Regulations for noise- and dust-emissions
- 7.) Establishing of a market under ecological conditions
- 8.) Educational measurements
applicative of efficient resources
- 9.) Promotion, Control
Promotion for - installation of sorting and recycling plants
- applications
Control of legal utilisation
- 10.) The image of recycling products should be better than of primary materials

European Quality Association for Recycling e.V. (EQAR)

Founded in 2005

Members: Austria, Bosnia-Herzegovina, Germany,
Netherlands, South Tyrol/Italy, Switzerland,
Czech Republic, Netherlands, Ireland, Slovakia,

activities concentrate on:

- Promoting international cooperation and experience sharing between national quality protection organisations and their members,
- Transfer of know-how
- Supporting the dissemination of thinking on quality protection and quality assurance for recycled building materials at European level.

President: Wierichs, Germany;

Vicepresident: Günter GRETZMACHER, Austria

**THANK YOU
for your attention**

Ing. Günter Gretzmacher

ÖKOTECHNA

Entsorgungs- und Umwelttechnik Ges.m.b.H.

Waldmühlgasse 31

A – 2380 Perchtoldsdorf

Tel.: 0043 1 876 82 74 – 0

Fax: 0043 1 876 82 74 – 707

E-Mail: kontakt@oekotechna.at

www.eqar.info

www.br.v.at



www.oekotechna.at

