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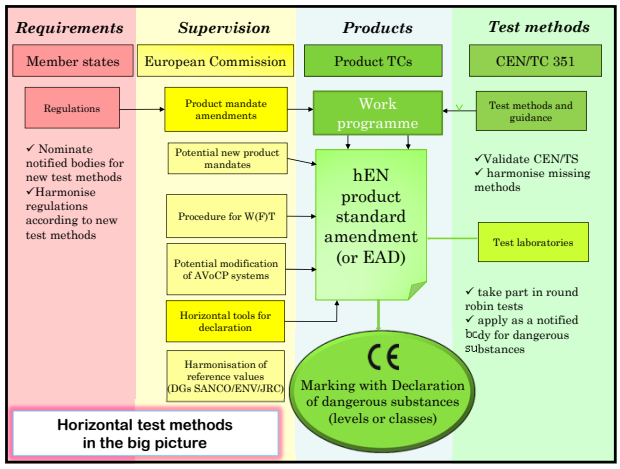
for our Environment

HORIZONTAL TESTING: THE CONCEPT AND GUIDANCE ON THE USE OF HORIZONTAL METHODS

CEN/TC 351 Workshop • 19th June 2012
CEN/CENELEC Meeting Centre



TECHNICAL REPORT CEN/TR 16098

- "Concept of horizontal testing procedures in support of requirements under the CPD" (November 2010)
- Task: To assess the feasibility of a common horizontal approach for testing emissions from construction products
  - the range of construction products covered by the CPD
  - their intended uses
  - the state of the art of the relevant test procedures
  - proposals for testing structure
  - release into soil, surface water and groundwater (excluding drinking water)
  - emissions into indoor air
- general overview of the results achieved by end of 2009 in CEN/TC 351 concerning horizontal testing for ER3 and the context of this work under M/366
- intended to a wider public

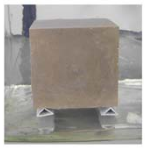
TECHNICAL REPORT 4 – INTRODUCTION

- Assignment from mandate M/366 to provide step-by-step guidance for product Technical Committees (TCs)
- The TR is intended as a "cook book" to be used by the product TCs when amending standards
- Intended to become available at the same as the first test TS of CEN/TC 351 (during 2013)
- Goal to make the guidance attractive and easy to use
- Technical Committee Approval in autumn 2012

EXAMPLES FROM VOLUNTARY PRODUCT TCS

- Model for an hEN with a reference to the TS emission into indoor air

- Model for an hEN with a reference to the TS leaching



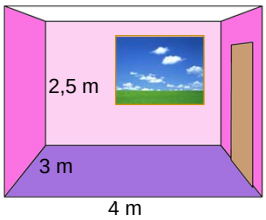
CURRENT DRAFT – POINTS FOR ATTENTION

- Intended use and product types
- Precisions required by the draft test TS
  - Choice of leaching test (TS-1 of WG1)
  - Choice of column type (TS-3 of WG 1)
  - Choice of loading factor (TS of WG2)
  - Selection of the analytical method (TS of WG2)
- Product specific aspects of taking product laboratory samples for testing
- Product specific aspects of making test specimens / portions from the laboratory sample

FROM PRODUCT LABORATORY SAMPLES TO TEST SPECIMENS

SELECTION OF THE LOADING FACTOR

Reference room



Surfaces
Floor: 12 m²
Ceiling: 12 m²
Walls: 31,4 m²
1 door – 1,6 m²
1 window – 2 m²

Air volume
30 m³

Choice of the loading factor

Floor, ceiling: each 0,4 m²/m³
Walls: 1,0 m²/m³
All large surfaces together: 1,8 m²/m³
Small surface (e.g. door): 0.05 m²/m³
Very small surface (e.g. sealants): 0.007 m²/m³

Draft TS for emissions into indoor air

Construction product

Emission test according to TS of CEN/TC 351 WG2

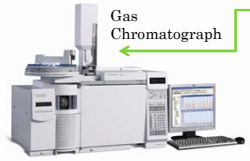
Selection of the analytical method:
Air sampling on TENAX and - if required - on DNPH with subsequent GC/MS and HPLC/UV analysis according to TS of CEN/TC 351 WG2

0 d | after 3 d | after 28 d | time (d)

DECLARATION OF EMISSION PERFORMANCE?

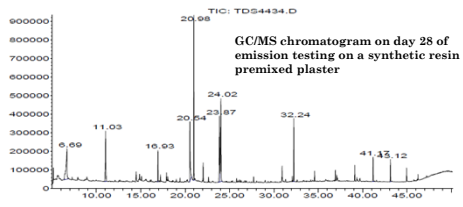
Synthetic resin premixed plaster placed double-sided on a glass plate

Test Chamber



Gas Chromatograph

DECLARATION OF EMISSION PERFORMANCE?



GC/MS chromatogram on day 28 of emission testing on a synthetic resin premixed plaster

DECLARATION OF EMISSION PERFORMANCE?

Concentrations of organic compounds analysed from a synthetic resin premixed plaster

Substances	CAS number	RT [min]	Day 1 [µg/m³]	Day 3 [µg/m³]	Day 10 [µg/m³]	Day 28 [µg/m³]
Acetic acid	64-19-7	6.87	34	510	210	61
Ethanediol	107-21-1	8.93	0	960	720	140
1,2-propanediol	57-55-6	9.55	54	1800	830	130
Toluene	108-88-3	8.87	3	4	4	n.d.
Acetamide	60-35-5	9.92	n.d.	6	5	n.d.
Acetamide, N,N-dimethyl-	127-19-5	11.65	0	12	2	n.d.
Ethylbenzene	100-41-4	11.74	13	34	1	n.d.
m,p-xylene	108-38-3 106-42-3	12.01	7	11	3	n.d.
o-xylene	95-47-6	12.74	3	7	1	n.d.
Cumene	98-82-8	13.84	4	10	n.d.	n.d.
Benzaldehyde	100-52-7	14.45	94	37	9	n.d.
Propylbenzene	103-65-1	14.82	5	13	0	n.d.
Phenol	108-38-3	15.7	7	5	3	n.d.
Butanoic acid butyl ester	109-21-7	16.06	4	5	n.d.	n.d.
2-(2-ethoxyethoxy)ethanol,	111-90-0	16.29	n.d.	35	15	1
2-ethyl-1-hexanol,	104-76-7	17.21	170	520	240	38
Dipropylene glycol mix*	25265-71-8	17.34	110	1300	1800	710
3(2H)-isothiazolone, 2-methyl- (MIT)	2682-20-4	20.94	n.d.	95	200	75
Acetic acid, 2-ethylhexyl ester	103-09-3	21.11	140	260	110	23
2-(2-butoxyethoxy)-ethanol,	112-34-5	22.03	190	460	350	76
Decamethylcyclopentasiloxane	541-02-6	22.08	2	6	3	1
Unknown VOC**		23.2	26	22	17	6
2-propenoic acid, 6-methylheptyl ester*	54774-91-3	23.6	26	34	22	5
Propanoic acid, 2,2-dimethyl-, 2-ethylhexyl ester*	016387-18-1	24	45	77	39	5
1-dodecanol	112-53-8	30.96	14	16	34	12
Formaldehyde DNPH	50-00-0	3.8	80	47	60	21
Acetaldehyde DNPH	75-07-0	6.1	93	66	10	5
TVOC ***			950	6300	4600	1300

DECLARATION OF EMISSION PERFORMANCE?

CE

AnyCo Ltd, P.O.-Box 21, B-1050

2013

EN 15824

Internal plaster based on organic binders

Water vapour permeability:	V_2
Water absorption:	W_2
Adhesive strength:	0.3 Mpa
Durability:	NPD
Thermal conductivity:	λ = 0.5 W / (m · K)
Reaction to fire:	B
VOC emission:	?

SOLUTION PROPOSAL: TECHNICAL CLASSES

Parameters	Details (unit: µg/m3, except for the R-value (without unit))	4	3	2	1	Declaration format
TVOC	TVOC measured 3d-28d one time	> 2000	< 2000	< 1500	< 1000	declare class 1 to 4
Qualification (Q)	R calculation with LCI list				< 1	declare Y / N (yes or no)
	Carcinogens day 3				< 10	
	Carcinogens day 28				< 1	
	Non assessable VOC				< 100	
	TVOC (3d)				< 10 000	
	Σ SVOC (C17-C22)				< 100	
HCHO	formaldehyde	> 120	< 120	< 60	< 10	declare class 1 to 4
Individual Substances List (ISL)	acetaldehyde	> 400	< 400	< 300	< 200	declare class 1 to 4 (highest class measuered)
	toluene	> 600	< 600	< 450	< 300	
	tetrachlorethylene	> 500	< 500	< 350	< 250	
	xylene	> 400	< 400	< 300	< 200	
	1,2,4-trimethylbenzene	> 2000	< 2000	< 1500	< 1000	
	1,4-dichlorobenzene	> 120	< 120	< 90	< 60	
	ethylbenzene	> 1500	< 1500	< 1000	< 750	
	2-butoxyethanol	> 2000	< 2000	< 1500	< 1000	
	styrene	> 500	< 500	< 350	< 250	

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Reaction to fire:	B
VOC emission:	TVOC 2 / Q N / HCHO 2 / ISL 1

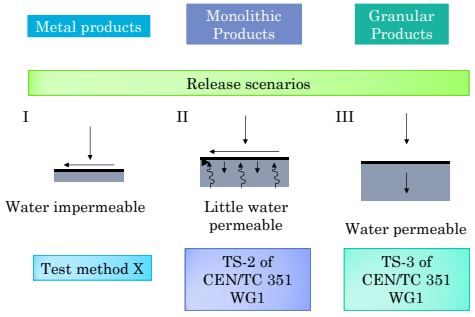
SOLUTION PROPOSAL: TECHNICAL CLASSES

Technical classes for declaration of VOC emissions determined according to the CEN/TC 351_N430 method.

Declaration	TVOC (C6 to C16) [µg/m³]	ISL class	CMR substances [µg/m³]	R-value (***)	VOC without LCI [µg/m³]	SVOC (C17 to C22) [µg/m³]
IAQ 1	≤ 1000	1	≤ 1 (*)	≤ 1	≤ 100	≤ 100
IAQ 2	≤ 1000	1	≤ 1 (**)	- -	- -	- -
IAQ 3	≤ 1500	2	≤ 1 (**)	- -	- -	- -
IAQ 4	≤ 2000	3	≤ 1 (**)	- -	- -	- -
IAQ 5	≥ 2000	4	≤ 1 (**)	- -	- -	- -
IAQ 6	≥ 2000	4	- -	- -	- -	- -

(*): Volatile cancerogenic substances of categories CARC 1A and CARC 1B of Annex VI to Regulation (EC) No 1272/2008 (Table 3.1)
(**): Trichloroethylene, benzene and dibutylphthalate
(***): For the calculation of the R value the latest notified LCI values are used (see http://www.umweltbundesamt.de/produkte-e/bauprodukte/agbb.htm). If harmonised EU-LCI values are available, these values have to be used.

SELECTION OF AN APPROPRIATE LEACHING TEST (TS-1 OF CEN/TC 351 WG1)

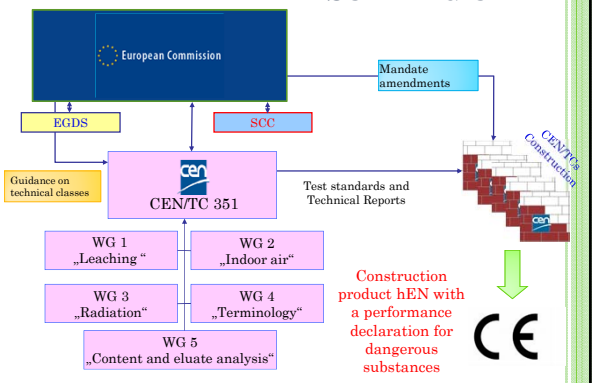


DRAFT TS FOR RELEASE INTO SOIL, GROUNDWATER AND SURFACE WATER

Monolithic construction product e.g. masonry units	Granular construction product e.g. aggregates
Tank leaching test TS-2 of CEN/TC 351 WG1	Percolation test TS-3 of CEN/TC 351 WG1
	Choice of column size according to particle size – voluntary or obligatory size reduction

Eluate analysis according to existing methods – in future with minimum necessary adaptations for construction products from WG5 – Guidance available in CEN/TR 16045

SUMMING-UP



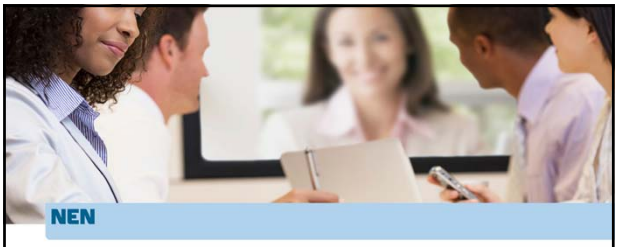
Next steps	
Task	**Competence**
•Adapt product description •Create / adapt product types •Participate in round robin tests of CEN/TC 351 •Integrate CEN/TC 351 methods as soon as available •Collect data for WFT dossiers	Product TCs with mandate amendments
•Validate and publish test methods and guidance on their use •Create a harmonised format for test reports and declaration of test results for the horizontal TS / EN •Draft harmonised criteria for competent laboratories	CENTC 351
•Participate in round robin tests of CEN/TC 351	Test laboratories
•Notify competent laboratories as notified bodies •Support the round robin tests financially	Member states
•Prepare further mandate amendments •Clarify AVoCP for dangerous substances where needed •Finalise guidance for W(F)T procedure •Prepare guidance for horizontal technical classes	European Commission

- Recommendations

Start preparation for integration of dangerous substances in hEN

Use guidance in TR4

When questions arise contact CEN/TC 351 or European Commission



NEN

Wish you a succesful implementation and thank you for your attention!