EAS – EUROPEAN ACCEPTANCE SCHEME FOR CONSTRUCTION PRODUCTS IN CONTACT WITH DRINKING WATER

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EAS - European Acceptance Scheme for Construction Products in contact with Drinking Water

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1. Reasons for EAS

In Europe there doesn't exist a coherent normative legislation for construction of products in contact with drinking water. For the time being each Member State has its own regulatory arrangements together with either Standards or Voluntary Norms. The different regulations and local standards are creating barriers to free trade.

2. Scope of EAS

The EAS will be a coherent and harmonized system in the EC market for regulating and accepting all the materials/products coming in contact with water for human consumption.

The EAS will cover construction products of the drinking water supply system from the last downstream point of the water treatment station to the consumer's tap (including hot water systems).

3. Major milestones in the development of EAS

- 1998 Report of the 4 MS feasibility study recommending a harmonized European Acceptance Scheme.
- 1999 European Community SCC and SCDW accepting recommendations of MS.
- 2001 DG enterprise issuing the Mandate M 136 to CEN for preparation of Test Methods and harmonized Product Standards.
  RG-CPDW Interim Report (EAS on paper) issued for consultation.
- 2003 Research Reports on Test Methods published.
- 2004 An EAS proposal discussed at Level of RG-CPDW.
  The draft of EAS setting out all principles of the scheme and covering all operational and management aspects of the directive, submitted to SCC and SCDW for approval and endorsement.
  Further research on test methods for GCMC and EMG commissioned.
- 2005 RG-CPDW replaced by EG-CPDW under direct reporting line of SCC and DG Enterprise.

4. EAS - High Level Principles

EAS based on following main principles:

- High level of consumer protection and sound scientific base for public Health protection.
- Equal opportunities for all materials/products in contact with drinking water on the European market.
- Transparency of the EAS process.

5. EAS - A risk based approach to Product Assessment

❖ ***Risk in Material Behaviour***

The potential risk for the materials in Products to leach harmful substances affecting Drinking water quality in term of:

- Cytotoxicity
- Colour
- Odour
- Turbidity
- General Hygienic Aspects
- Enhancement of microbial growth

The control strategies to be implemented against risks in Material behaviour are:

- full information in composition
- compliance of these Materials with PL (Organic Materials), CL (Metallic Materials), ACL (Cementitious Materials) and OCL (Glassy Materials/ Vitreous Enamels)

❖ ***Risk in Products Performance***

The impact of products on drinking water quality will depend also on their form and function.

The control strategies are implementing the evaluation of products parameters and related functionality such as:

- Surface to Volume ratios (S/V)
- Residence Time
- Lab Test Results vs. product operating conditions by means of Conversion Factors.

6. EAS – The framework for Materials Testing

The EAS structure of materials testing is built on following 5 pillars:

❖ Compliance with PL, CL, ACL, OCL, as first line of defence for drinking water quality.

❖ Organoleptic Assessments consisting of:
- Odour and Flavour
- Colour and turbidity

❖ General Hygiene Assessments consisting of:
- Total Organic Carbon
- Chlorine Demand
- Surface Organic Residues (metallic products)

❖ Toxic Substances
- DW Parameters according to DWD 98/83/CE.
- Drinking Water Positive List Limits (DWPLL)
- Unsuspected Organic substances (by GCMS)

❖ Enhancement of Microbial Growth (EMG)

The behaviour of the material to provide Bio-film for Microbial Growth (table 1).

Table 1 EAS Matrix

Proposal for a matrix for EAS compliance criteria and testing related to material

EAS compliance criteria	Organic Materials	Metallic Materials	Cementitious Materials	Glassy Materials Vitreous Enamels
Positive lists	Yes	-	Yes	-
Composition lists	-	Yes	-	-
Oxide Composition List				Yes
Approved Constituent list	-	-	Yes	-
Organoleptic tests				
Odour and flavour	Yes	-	Yes	-
Colour and Turbidity	Yes	-	Yes	-
General hygiene assessments				
TOC	Yes	-	Yes	-
Chlorine demand	Yes	-	To be decided	-
Surface residues (metals)	-	Yes	-	-
Substances posing a risk to health				
DWD parameters	Yes	Yes	Yes	Yes
PL substances	Yes	-	Yes	-
Unsuspected substances (GCMS)	Yes	-	Yes	-
CL Compliance	-	Yes	-	-
OCL Compliance				Yes
Enhancement of Microbial Growth	Yes	-	Yes	-

7. EAS and issues in product testing

The test programmes recognize the different risks and performance characteristics of the different materials, but the approval and certification process applies to the products and not to materials.

This is not a problem for single material products (e.g. plastic pipes), while different issues arise for more complex products such as:

- Assembled products, which may require independent components testing.
- Multi-layer products, which may require independent layer testing, if the layer in contact with drinking water is not acting as a perfect barrier to water and insulating deeper layers.
- Site applied products, require representative samples for testing purposes. (ACL approach trying to simplify the assessment by means of an approved constituents list process).

The assessment of complex products may no require full testing in all circumstances.

When their impact on DW quality is insignificant due to:

- the very low contact surface
- the very high water volume
- very low residence time
- very suitable material type

a Reduced Assessment Procedure (RAP) may be applied.

8. EAS – The legal base

The legal base of the new EAS of products suitable for contact with water for human consumption was found primarily in the CPD 89/106/EEC and for drinking water parameters in DWD 98/83/CE.

CPD 89/106/EEC is under DG Enterprise responsibility, while DWD 98/83/CE is under DG-Environment responsibility.

EAS requested to comply with CPD 89/106/EEC that imply the use of:

- CE marking
- Provision of product information
- Harmonized Product Standards (hENs)
- Harmonized Test Method
- The highest level of Attestation of Conformity (AoC) system (1+) which involves (table 2):
  - Third party testing, inspection and certification by Notified Bodies nominated by Member States.
  - Factory Production Control (FPC) system
  - Initial Type Testing (ITT)
  - Audit Surveillance

Table 2 AoC

Attestation of Conformity (AoC) SYSTEMS

System	Task for Manufacturer	Task for Notified Body	Basis for CE marking
4	• ITT of product • FPC		Declaration of conformity of the Manufacturer
3	• FPC	• ITT of product	
2	• ITT of product • FPC • (testing of samples according prescribed test plan)	• certification of FPC on basis of initial inspection	
2 +	• ITT of product • FPC • (testing of samples according prescribed test plan)	• certification FPC on basis of initial inspection and continuous surveillance, assessment and approval of FPC	Declaration of conformity of the Manufacturer based on certificate of conformity of FPC
1	• FPC • testing of samples according prescribed test plan	Product certification on basis of: • ITT of product • initial inspection of FPC • continuous surveillance, assessment and approval of FPC	Declaration of conformity of the Manufacturer based on certificate of conformity of product
1 +	• FPC • testing of samples according prescribed test plan	Product certification on basis of: • ITT of product • initial inspection of FPC • continuous surveillance, assessment and approval of FPC • audit testing of samples	

9. Special feature of EAS

The EAS has special features that are not normally found in CPD 89/106/EEC:

- Requirements to comply with PL, CL, ACL, OCL
- Use of common test programmes which lead to a single pass/fail outcome
- Use of common Acceptance Levels

This conflicting area has to be cleared up by EG-CPDW/ SCC/SCDW in the near future.

10. Management of EAS development and operation

The EAS project management is carried out by means of following Work Break down Structure (WBS):

❖ European Commission **(table 3)**	Technical and Administrative Lead under the responsibility of DG-Enterprise DG-Environment with DW function only giving Advisory positions.
❖ Supervisory Committees **(table 3)**	Standing Committee on Construction (SCC) Standing Committee on Drinking Water (Advisory Role)
❖ Advisory Committee **(table 3)**	Regulators Group for Construction Products in contact with Drinking Water (RG-CPDW), recently replaced by Experts Group for Construction Products in contact with Drinking Water (EG-CPDW).
❖ Working Subgroups **(table 4)**	Subgroup 1 for Organic Material (SG1-OM) Subgroup 2 for Metallic Materials (SG2-MM) Subgroup 3 for Non Metallic Inorganic Material (SG3-NMIM) (Cementitious and Glassy Materials). Subgroup 4 for Assembled an Multi-Layer Products (SG4 -AMLP) (including Water Heater).
❖ CEN **(table 5)**	Preparation of test method standards and harmonized products Standards under formal Mandate M 136 rev. of EC DG-Enterprise. CEN working with Its on work breakdown structure with a coordination Technical Committee CEN/TC 164-CPDW and Working Groups (WG_i)and Sub-Groups (AHG_j).
❖ Notified Bodies	For Testing and Certification. MS requested to nominate NB in their own area of competence and responsibility. Representatives, of already nominated NBs, participate in developing EAS at EG-CPDW and SGs levels.
❖ Industry	Present as Observers/Experts in EG-CPDW and contributing to Sub-Groups activity. Participation in CEN Sub-groups.

Table 3

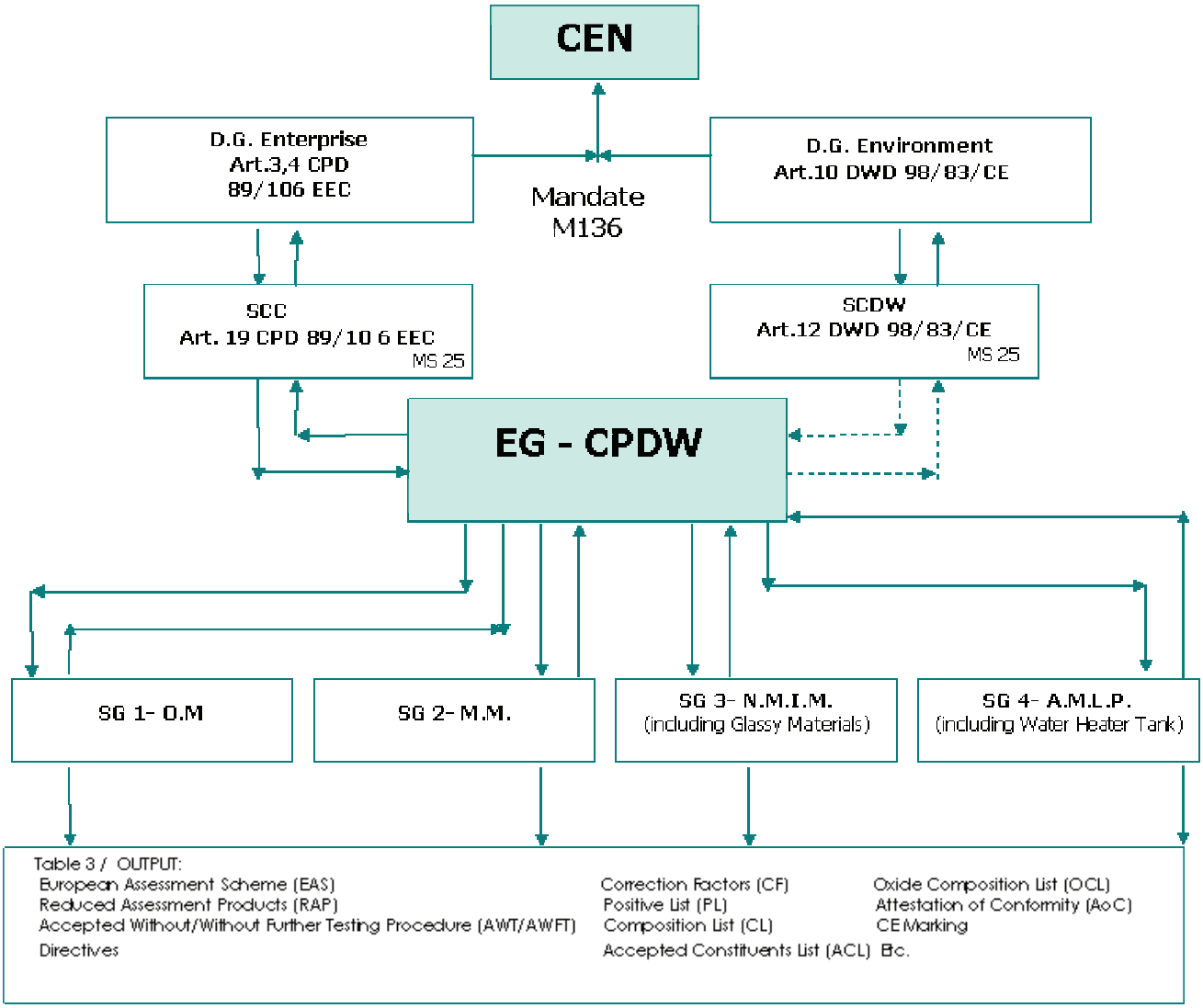

CEN
D.G. Enterprise
Art.3,4 CPD
89/106 EEC
Mandate
M136
D.G. Environment
Art.10 DWD 98/83/CE
SCC
Art. 19 CPD 89/10 6 EEC
MS 25
SCDW
Art.12 DWD 98/83/CE
MS 25
EG - CPDW
SG 1- O.M
SG 2- M.M.
SG 3- N.M.I.M.
(including Glassy Materials)
SG 4- A.M.L.P.
(including Water Heater Tank)
Table 3 / OUTPUT:
European Assessment Scheme (EAS)
Reduced Assessment Products (RAP)
Accepted Without/Without Further Testing Procedure (AWT/AWFT)
Directives
Correction Factors (CF)
Positive List (PL)
Composition List (CL)
Accepted Constituents List (ACL) Etc.
Oxide Composition List (OCL)
Attestation of Conformity (AoC)
CE Marking

Table 4

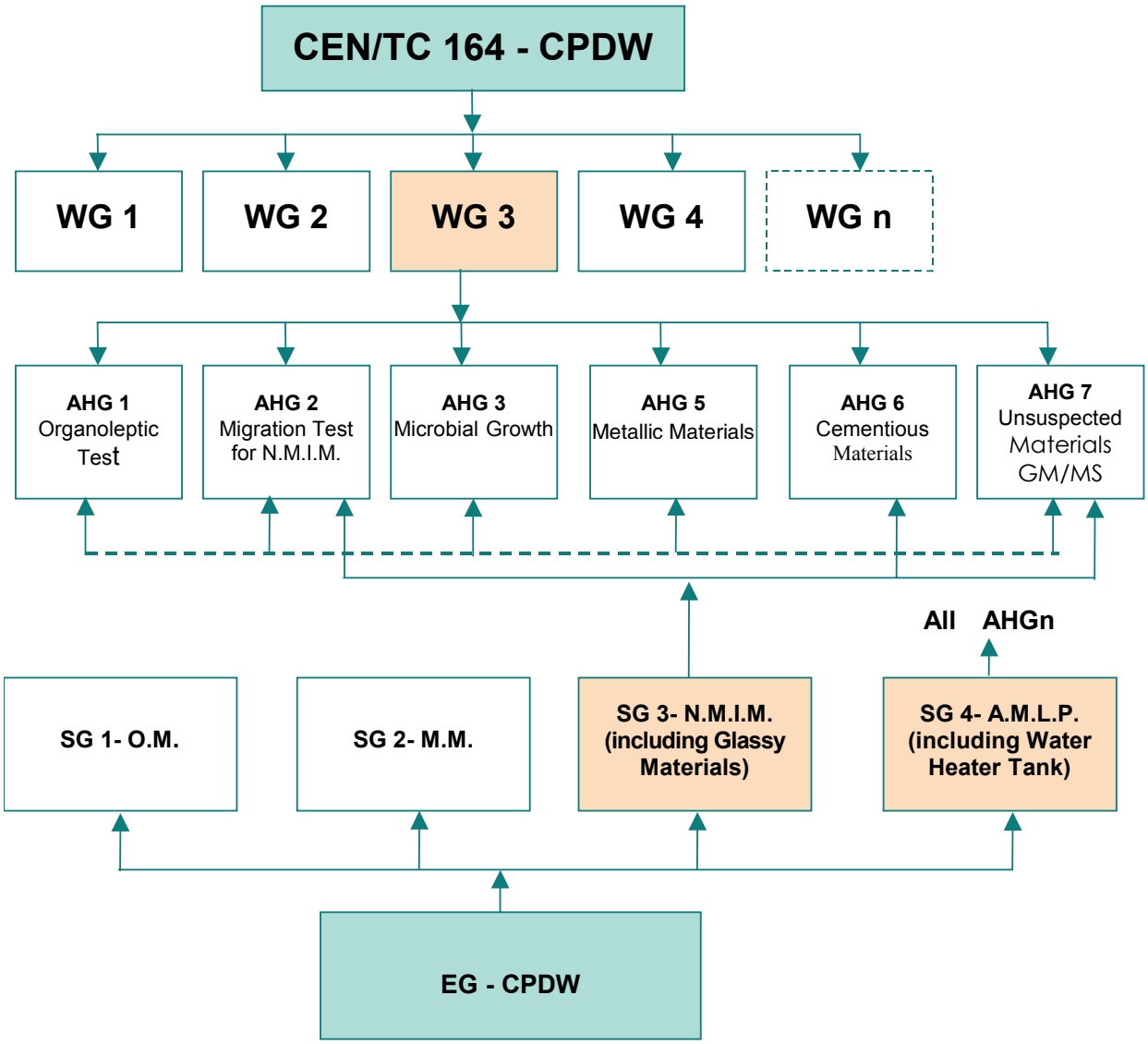
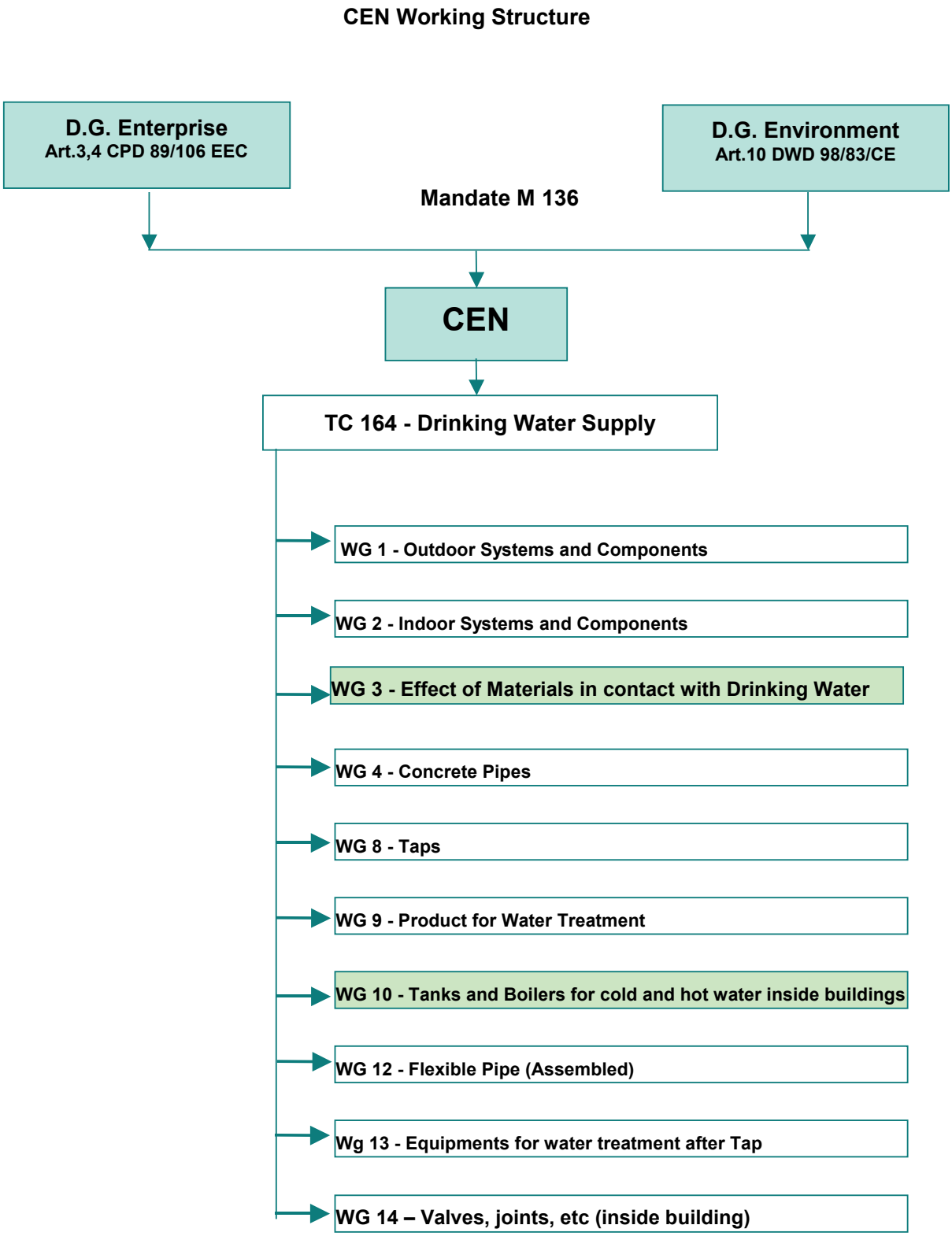

CEN/TC 164 - CPDW
WG 1
WG 2
WG 3
WG 4
WG n
AHG 1 Organoleptic Test
AHG 2 Migration Test for N.M.I.M.
AHG 3 Microbial Growth
AHG 5 Metallic Materials
AHG 6 Cementious Materials
AHG 7 Unsuspected Materials GM/MS
All AHGn
SG 1- O.M.
SG 2- M.M.
SG 3- N.M.I.M. (including Glassy Materials)
SG 4- A.M.L.P. (including Water Heater Tank)
EG - CPDW

Table 5


CEN Working Structure
D.G. Enterprise
Art.3,4 CPD 89/106 EEC
D.G. Environment
Art.10 DWD 98/83/CE
Mandate M 136
CEN
TC 164 - Drinking Water Supply
WG 1 - Outdoor Systems and Components
WG 2 - Indoor Systems and Components
WG 3 - Effect of Materials in contact with Drinking Water
WG 4 - Concrete Pipes
WG 8 - Taps
WG 9 - Product for Water Treatment
WG 10 - Tanks and Boilers for cold and hot water inside buildings
WG 12 - Flexible Pipe (Assembled)
Wg 13 - Equipments for water treatment after Tap
WG 14 – Valves, joints, etc (inside building)

11. EAS and Mandate M136 to CEN

DG Enterprise commissioned the Mandate M136 to CEN/CENELEC in 2001.
The Mandate deals with two areas of work:

- Supporting Standards (EAS Supporting test methods)
- Harmonized product standards (hEN)

The test methods are being developed by CEN/TC 164 WG3 dealing with Drinking Water Materials Behaviour and in liaison with EG-CPDW subgroups (1, 2, 3, 4).

The work structure of CEN/TC 164 WG3 breaking down in:

- AHG1-subgroup, developing Organoleptic Tests
- AHG2-subgroup, developing test for NMIM
- AHG3-subgroup, developing Microbial Growth Test
- AHG5-subgroup, developing MM tests
- AHG6-subgroup, developing Cementitious tests
- AHG7-subgroup, developing GC/MS analyses methods for unsuspected substances.

Among other CEN/CT 164 WG_n , WG_{10} has to be also quoted because dealing with product standards of Tanks and Boilers for cold and hot water inside buildings.

For the harmonized product standards the Mandate indicated:

- The products/materials to be covered (Annex1)
- The product performance characteristics (Essential Requirements)
- The System of Attestation of Conformity

The harmonized product standards will have a ZA annex for Essential Requirements (CPD 89/106/EC), also giving details of Attestation of Conformity (1+) and Product marking Requirements. It is not clear at present how the detailed and complex testing and approval procedures are to be incorporated into product standards.

The ZA/EAS annex will give details of attestation of conformity “1+” (see table 2) and will introduce the **EAS** Logo that will be reported in the CE marking.

Table 6 Annex 1 of M136 rev. Mandate

FORMS	MATERIALS	PRODUCTS FOR CONSIDERATION
Kits Piping system Storage system	As indicated below for components	**Kits,** composed of pipes and/or tanks, fittings, adhesives and joints, including their supports, to be used for the transport, storage and/or distribution of the water intended for human consumption.
Rigid components Flexible components	**Cementitious materials**: (e.g. reinforced/fibred/ unreinforced/prestressed precast concrete, cement mortar lining with or without seal coat, polymer modified, fibre cement, …) **Metallic materials**: (e.g. steel, aluminium, copper, alloys, cast/ductile/grey/ malleable cast iron, …) **Organic materials**: (e.g. plastics, polymers, rubbers, elastomers, PVC, PE,…) **Glassy, glass-like and ceramic materials** : (e.g. glass, vitrified clay, enamel, …) **Composite:** (e.g. glass fibre reinforced polyester, carbon fibre reinforced epoxy resins,…)	**Pipes** (coated or uncoated).

ANNEX 1 - FIELD OF APPLICATION *

Construction products in contact with water intended for human consumption

LIST OF PRODUCTS INCLUDED IN THE MANDATE TO BE USED IN:
- 19/33 SUPPLY OF HOT AND COLD WATER
- 33/33 STORAGE FIXTURES

* Under the provisions of both Council Directives 89/106 (CPD) and 98/83 (DWD), it is of the competence of the Member States to fix from which place the networks carry Drinking Water (e.g. from the last treatment plant). It is understood that the DW distribution goes up to, and includes the consumer taps. Products specifically placed on the market for the purpose of being used in drinking water extraction, production and/or treatment by the water supplier, in installations for putting drinking water into tankers, bottles, or containers, or in any food-production undertaking for the manufacture, processing, preservation or marketing of products or substances intended for human consumption, are excluded from the field of application.

FORMS	MATERIALS	PRODUCTS FOR CONSIDERATION
Components	**Cementitious materials**: (e.g. reinforced/fibred/ unreinforced/prestressed precast concrete, in situ concrete with or without organics, polymer modified, fibre cement, …) **Metallic materials**: (e.g. coated/mild/lined/stainless steel, aluminium, copper, alloys, ductile iron, cast iron, …) **Organic materials**: (e.g. plastics, rubber, …) **Glassy, glass-like and ceramic materials**: (e.g. glass, vitrified clay, enamel …) **Composite:** (e.g. glass fibre reinforced polyester, admixtures,…)	**Tanks** (including closed and vented hot water storage units) used in fixed installation for supply or storage of water intended for human consumption
Components	Metals Rubber Plastics Glass, ceramics, enamels Composite Cast iron	**Valves, taps, pumps, watermeters, protection and safety devicess** *Coated or uncoated*
Components	Metals Rubber Plastics Chemical compounds	**Fittings, adhesives, joints, joint sealings and gaskets**
Malleable Flexible	Composite	**Membranes, resins**
Malleable	Composite	**Coatings,** including linings
Malleable	Composite	**Lubricants, greases**

The following Directives must be taken into consideration:

89/106/EEC of 12 December 1988, known as the “CPD” as amended.
98/83/EC of 3 November 1998, known as the “DWD”.

12. EAS and IEI contribution and strategy

IEI has been participating at the works of EAS as Observer on behalf of the European Enamelling Industry at RG-CPDW from the very beginning.

Several working documents were developed aiming at showing Vitreous Enamel fitness for contact with water for human consumption (see: www.iei-world.org).

When EG-CPDW replaced RG-CPDW, I.E.I. sitting in

- SG3-NMIM as Expert of Glassy Material/Vitreous enamel
- SG4-AMLP as liaison for SG3 and expert for Hot Waters Heaters.

IEI strategy has been to develop working documents to support:

- a Vitreous Enamel Oxide Composition List
- an Accepted Without Testing Procedure (AWT)
- a Reduced Assessment Product approach for water heaters

13. Vitreous Enamel Migration Test Study

Recently, I.E.I. presented at the EG-CPDW plenary meeting a **Vitreous Enamel Migration Test Study** with following objectives:

- To prove that the Vitreous Enamel is a very insoluble and inert material, also in hot water (85°C)
- To issue an Oxide Composition List for Water Heater acting as a Positve List in the CPDW European Directive.
- To demonstrate by means of Migration Test, according to **EN 12873-1** test method, that Vitreous Enamel heavy metal in the leacheates are far below the Maximum Allowed Concentration (M.A.C.) of **DWD 98/83/EC**.
- To ask for an Accepted Without Testing (AWT) Procedure for Vitreous Enamel.

14. Water Heaters Vitreous Enamel Oxide Composition List (OCL)

Following Oxide Composition List was proposed to the European Commission the base of a very long and reliable " Prior Knowledge" of the Water Heater Market.

Table 7 Vitreous Enamel Oxide Composition List (OCL).

Substance	Min	Max	Substance	Min	Max	Substance	Min	Max
SiO_2	40	80	MgO	0	2	Fe_2O_3	0	5
B_2O_3	5	15	CeO_2	0	15	MoO_3	0	3
Na_2O	5	20	ZnO	0	10	P_2O_5	0	5
K_2O	0	5	Al_2O_3	0	5	SnO_2	0	5
Li_2O	0	10	CoO	0	3	TiO_2	0	10
CaO	0	10	NiO	0	3	ZrO_2	0	20
BaO	0	5	CuO	0	2	F	0	5
SrO	0	5	MnO_2	0	3			

For following type of products:

- Water heaters/hot water tanks/boilers (working at 60-85°C);
  As first objective and secondly
- Storage Systems;
- Pipes;
- Valves;
- Joints.

15. Potential Risk

Vitreous enamel is an inorganic glassy material with a very low solubility in water and, due to its chemical composition and physical structure, and on the basis of scientific studies and a very long prior knowledge, it can be stated that:

- T.O.C.: not applicable (n.a.), Vitreous Enamel is a pure Inorganic Material and is free from any organic product contamination, also due to the high temperature firing process (830 – 860°C)
- Odour & flavour: not applicable (n.a.), the product is free from any organic product which could affect these drinking water characteristics;
- Colour & turbidity: not applicable (n.a.), the material has a so low solubility that could not affect these drinking water characteristics;
- Enhancement of microbial growth: not applicable (n.a.) for absence of Bio-film, the product has a very smooth, clean and hard surface and the normal boiler working temperature is over 60°C.

A specific study demonstrates that vitreous enamel inhibits microbial growth (see document RG-CPDW 123 “Comparative Bacteriological Studies”)[2];

- Migration test: an assessment of the migration of some elements according to DWD 98/83 CE could be necessary to prove the low leaching level of Vitreous Enamels for water heater.

These statements are fully in line with the test methods reported for glassy materials in the matrix for EAS compliance criteria and testing related to material types (Table 1).

16. A few examples

Table 8 Boron

	Element	B				
	M.A.C.	1000	µg/l	DWD 98/83/CE		
Migration Test Cycles According to EN12873-1						
	Element Oxide	Cycle(24h)	Cycle(24h)	Cycle(24h)	Cycle(24h)	Cycle(24h)
Product	Composition	I°	II°	III°	X°	XI°
	%	µg/l	µg/l	µg/l	µg/l	µg/l
F1	10,12	65	63	50	n.a.	n.a.
F2	10,39	63	61	60	63	63
F3	12,33	112	133	123	119	127
P1	7,80	115	90	95	55	60
P2w	8,70	20	0	5	10	10
P3	11,20	164	150	138	n.a.	n.a.
P4	9,77	124	100	93	n.a.	n.a.
C1	10,00	304	287	305	n.a.	n.a.
C2w	9,00	164	175	171	n.a.	n.a.
C3	12,00	311	288	310	n.a.	n.a.

Graph 1 Boron

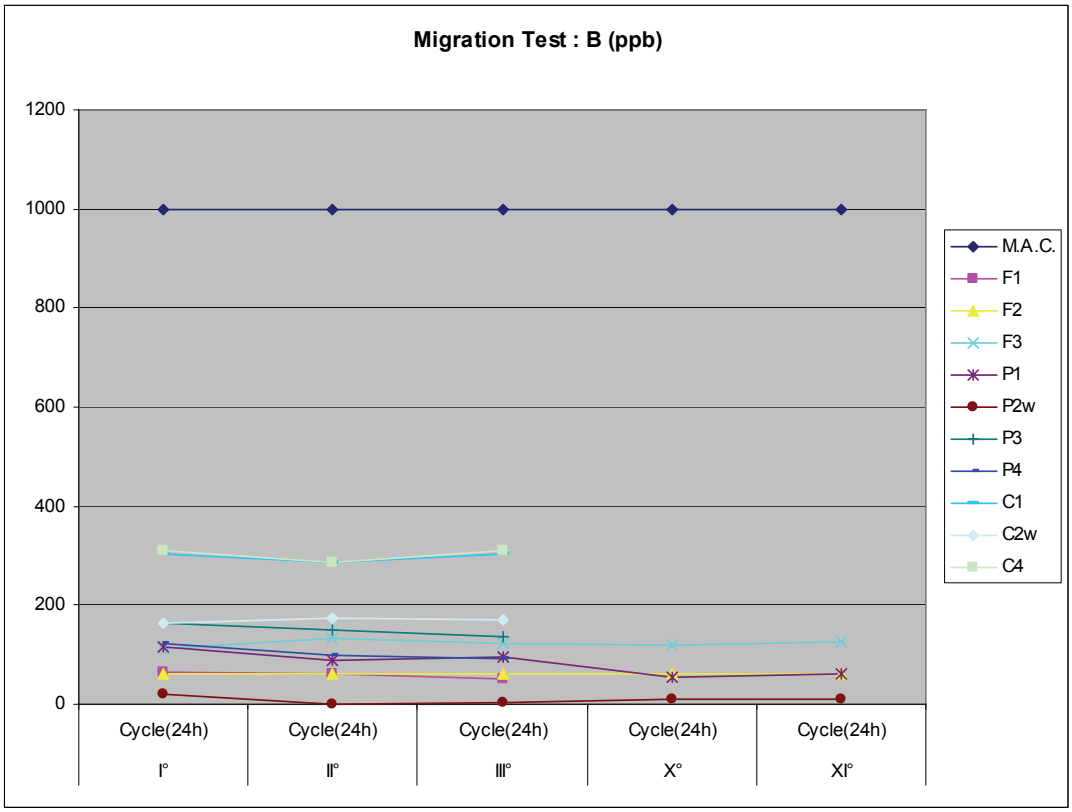
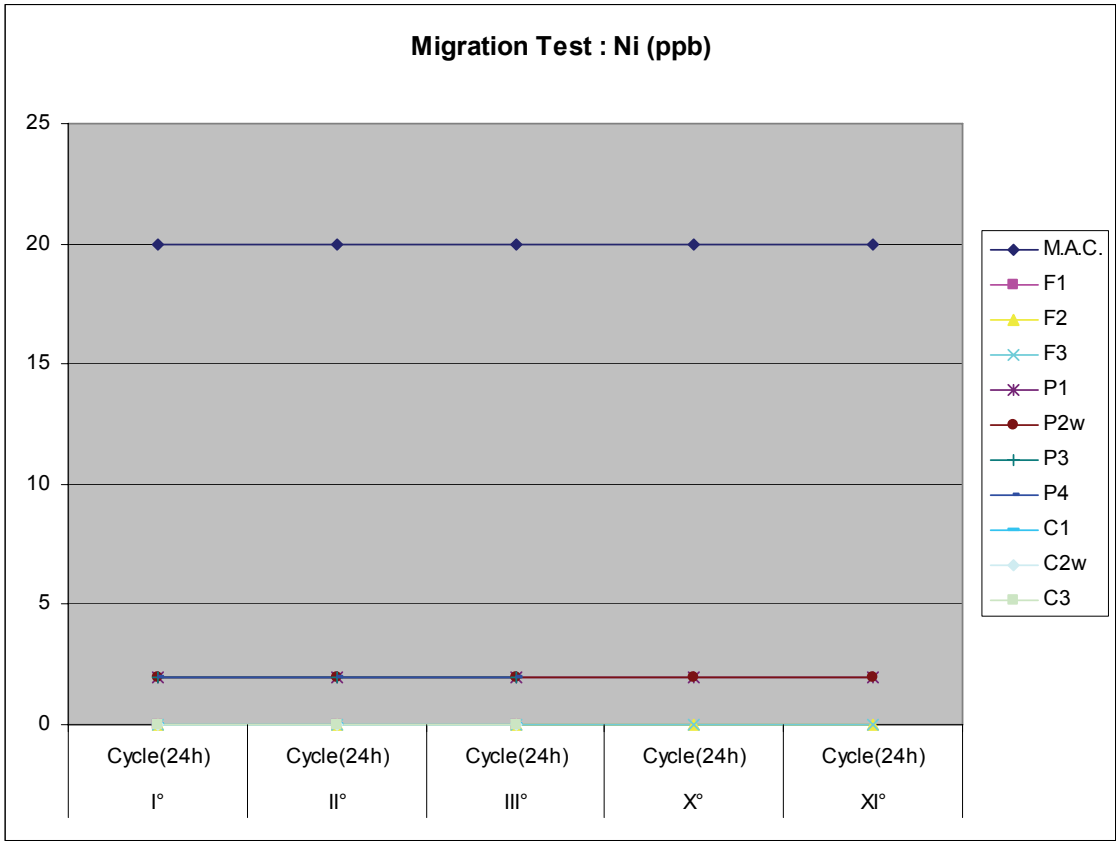


Table 9 Nickel

	Element	Ni				
	M.A.C.	20	µg/l	DWD 98/83/CE		
Migration Test Cycles According to EN12873-1						
	Element Oxide	Cycle (24h)	Cycle (24h)	Cycle (24h)	Cycle (24h)	Cycle (24h)
	Composition	I°	II°	III°	X°	XI°
Product	%	µg/l	µg/l	µg/l	µg/l	µg/l
F1	0,50	0	0	0	n.a.	n.a.
F2	0,98	0	0	0	0	0
F3	0,36	0	0	0	0	0
P1	0	2	2	2	2	2
P2w	0,40	2	2	2	2	2
P3	1,95	2	2	2	n.a.	n.a.
P4	0,95	2	2	2	n.a.	n.a.
C1	0,00	0	0	0	n.a.	n.a.
C2w	0,00	0	0	0	n.a.	n.a.
C3	0,00	0	0	0	n.a.	n.a.

Graph 2 Nickel



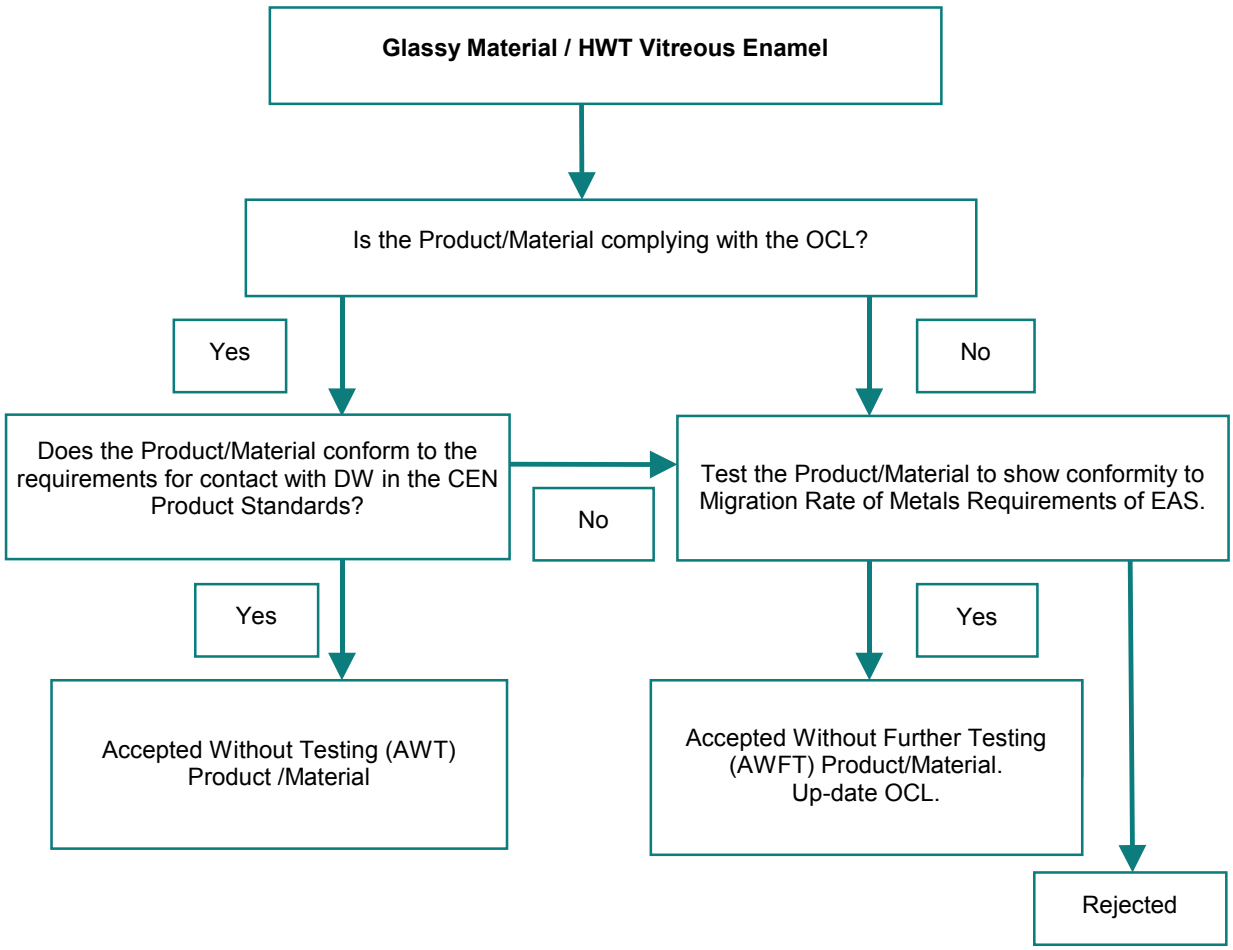
17. Glassy Material / Vitreous Enamels Acceptance Procedure Flowchart

HWT Vitreous Enamels, according to the EAS matrix, requested to comply only with:

1. **OCL**
2. **DW parameters**

European Acceptance Scheme procedure for contact with drinking water for these type of materials could be reported in the flowchart of Table D:

Table D EAS flowchart for HWT Vitreous Enamels



18. Conclusions

IEI migration study report stating following outcomes:

- HWT Vitreous Enamels containing following Elements: B, Ni, Cu, F, Mn, Ba, Co according to the proposed OCL, are proved to be very insoluble materials, both in distilled and spring crystalline water.

- Migration Rates at 85°C of above elements analyzed with testing method EN 12873-1 are far below the according MAC of DWD 98/83/CE.

- Also registered a very low leaching trend of other elements such as Ba, Co present in the OCL of HWT Vitreous Enamels but of no interest of DWD 98/83/CE.

- Residence time considered in " M_n^{85} " calculation being 24h (1day).

- Migration rates at low temperature (25°C) are expected to be much lower than those at high temperature (85°C) according with Arrhenius' equation:

  $M_n^T \approx e^{-Ea/RT}$

  M_n^T = Migration rate at Absolute Temperature T

E_a = Activation Energy (70 kj/mol)[13]
R = General Gas Constant

and in line with the prior knowledge of the enamels and enamelling technology;
hence, no need of further Migration Tests at lower temperatures (25°C and 65°C).

- Vitreous Enamels complying with OCL are suitable for contact drinking water and can be accepted for contact with water for human consumption with an AWT procedure, according to the proposed Approval Procedure Flowchart.

EG-CPDW commission has to bring the I.E.I. working document along with all the eventual Expert Comments at the Steering Construction Committee (SCC) for final decision.

Bibliography and previous CPDW Documentation on Vitreous Enamels:

1. RG-CPDW 115: Comments concerning Enamelled Products
2. RG-CPDW 123: "Comparative Bacteriological Studies";
3. RG-CPDW 165: "Detailed Boiler Presentation"
4. CEN/TC164/WG3, - document N 617: "WG3 Matrix".
5. EG-CPDW 200 - 'RG-CPDW186 Final EAS
6. EG-CPDWD 223 -"Glassy Material - EAS Approach Proposal I.E.I. Working Document".
7. Revised Mandate M 136 to CEN/CENELEC - Brussel, March, 2006 - G3 RK D(2005)
8. TG-CPDW 06-007 (RS 036 rev.5) "Accepted Without Testing / Without further Testing (draft) Procedural Aspects."
9. EG-CPDW 238 rev.1: Glassy Materials – Porcelain - Vitreous Enamel migration test study to validate vitreous enamel Oxide Composition List (OCL) and Accepted without testing (AWT) Approach in the framework of the EAS of CPDW Directive
(International Enamellers Institute (I.E.I.) Working Document).
10. TG-CPDW 06 065A = TG DS 042A, Construct 06/763 "Construction Products in contact with water intended for human consumption"
11. RG-CPDW 14 Rev.1 Coordinated DWD/CPD Glossary of Concepts & Tools for the EAS
12. Andrew I. Andrews – Porcelain Enamels – The Garrard Press, Publisher Champaign, Illinois, USA .
13. Lorenz R. – Mitt. des V.D.Efa,1986,34,5,65- Enamels for chemical Industry, corrosion by neutral water solutions.

List of Abbreviations

Acronym	Full Name
ACL	Approved Constituent List for the European Acceptance Scheme
ATP	Adenosine Tri-Phosphate
AoC	Attestation of Conformity; refers to the CPD system for attesting the conformity of construction products to European Technical Specifications
AWT-AWFT	Accepted Without Testing-Accepted Without Further Testing
CEN	Comité Européen de Normalisation (European Committee for Standardisation)
CL	Composition Lists for the European Acceptance Scheme

continue

Acronym	Full Name
CPD	Construction Product Directive (Directive 89/106/EC)
CPDW	Construction Products in contact with Drinking Water
DG	Directorate General of European Commission
DWD	Drinking Water Directive (Directive 98/83/EC)
EAS	European Acceptance Scheme for CPDW
EC	European Commission
EFSA	European Food Safety Authority
EN	European Standard
EG-CPDW	Experts Group on CPDW
EOTA	European Organisation for Technical Approvals
EMG	Enhanced Microbial Growth
ETA	European Technical Approval
EU	European Union
FPC	Factory Production Control
GCMS	Gas Chromatography Mass Spectrometry – (analytical technique for identifying chemicals in leachates)
GNB	Group of Notified Bodies
hEN	harmonised European Standard
ITT	Initial Type Testing
MS	Member State of the EU
MTC	Maximum Tolerable Concentration
NAS	National Acceptance Scheme for construction products in contact with drinking water
NB	Notified Body (i.e. certification, inspection or testing bodies)
NCB	Notified Certification Body
NOAEL	No Observed Adverse Effect Level
NPD	No Performance Determined
NTL	Notified Testing Laboratory
OCL	Oxide Composition List of Vitreous Enamels for European Acceptance Scheme
PL	Positive List for the European Acceptance Scheme
RG-CPDW	Regulators Group on CPDW
RT	Residential Time
SCC	Standing Committee on Construction (CPD Article 19)
SCDW	Standing Committee on Drinking Water (DWD Article 12)
SCHER	Scientific Committee on Health and Environment Risks
SG1-OM	Experts Subgroup 1 - Organic Materials
SG2-MM	Experts Subgroup 2 - Metallic Materials

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Acronym	Full Name
SG3-NMIM	Experts Subgroup 3 - Non-Metallic Inorganic Materials (including Glassy Materials)
SG4-AMLP	Experts Subgroup 4 - Assembled Multi-Layers Products
S/V	Surface vs. Volume Rate
TC	Technical Committees of CEN
TDI	Tolerable Daily Intake
TOC	Total Organic Carbon
UAP	Unique Acceptance Procedure
WHO	World Health Organisation
CAS	Chemical Abstracts Service
EINECS	European Inventory of Existing Commercial Chemical Substances
p.p.b.	Parts per billion equivalent to µg/l
HWT	Hot Water Tank (= Water Heater = Boiler)
MAC	Maximum Allowed Concentration
M_n^T	Migration Rate at T°C for n^{th} period
HSM	Hot Stage Microscope
n.a.	not available
n.r.	not reported

A few Useful Definitions

Term	Definition
Vitreous Enamel /Porcelain Enamel	Borosilicate glassy structured material, whose chemical composition can be expressed only in term of oxide com-position and is almost insoluble in water because all elements are linked mainly with covalent chemical bonds V.E./P.E. defined by: • EINECS N. 266-047- 6; • CAS N. 65997-18- 4.
Oxide Composition List	List of components/oxides that have been accepted for use in glassy or metallic products (Vitreous Enamels) with respect to toxicological, organoleptic, migration of metals and hygienic characteristics.
Accepted Without Testing (AWT)	Product or material that is accepted as being fit for use in contact with drinking water due to its composition and other requirements placed on the product/ material; obviating the need for testing of the finished product/material NOTE This concept is applied to cementitious, glassy and metallic materials.
Accepted Without Further Testing (AWFT)	Product, material or constituent that has been tested and has been shown to be sufficiently below the limits in this EAS to be accepted without further testing. NOTE See text of EAS for criteria.
Single Material Product	Product made with one single homogeneous material. Such products are relatively straightforward to test, using either the product itself, or a representative sample in the case of a large item.

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Term	**Definition**
Assembled Product	These products comprise two or more components, possibly of different materials. Where the components are of different materials, it may be necessary to separately measure their impacts on water quality. This may require the product to be dismantled, but in some situations it will be proper to test the complete unit in its intended conditions of use.
Multi-Layers Product (including Coatings)	Product made with more than one layer. Where there is a foreseeable possibility that the layers not initially intended to be in contact with water may - within the expected life of the product ,eventually have an impact on water quality, each layer should be independently tested. (This situation might arise from migration through layers, or by the long-term deterioration of the layer intended to be in contact). Where such an indirect action is not possible, e.g. because of the existence of a functional barrier (es. V.E.), the layers that will not be in contact need not be tested.
Water Heater / Boiler/Hot Water Tank	Factory made product intended to produce and store hot water in buildings merging the indoor drinking water distribution system. The hot water is produced by means of electricity, gas or fuels and/or indirect exchange hot fluids.
Substance	Chemical or mixture of related chemicals used to make a material
Constituent	Ingredient used to make a material or product.
Material	Prepared form of a substance, or of a combination of substances, suitable for use in a manufacturing process.
Material type	Category of materials of similar physical/chemical characteristics (e.g. organic, metallic, vitreous enamels).
Product	Item made from a material or combination of materials or material types, in the form in which it is placed on the market.