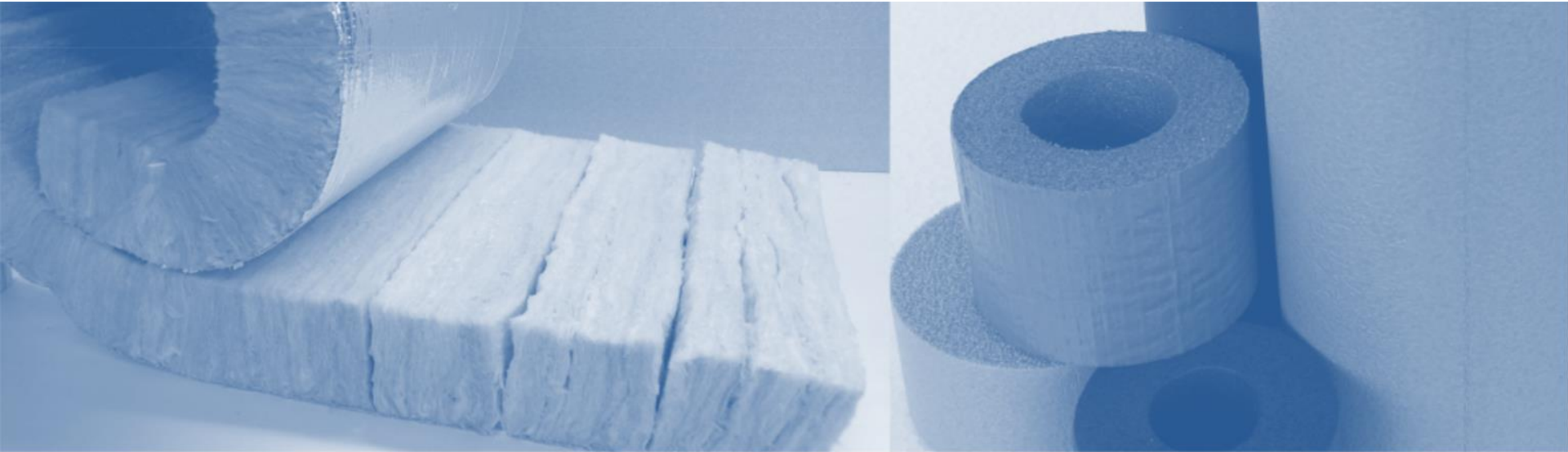




# Harmonised EU standards for Thermal insulation products

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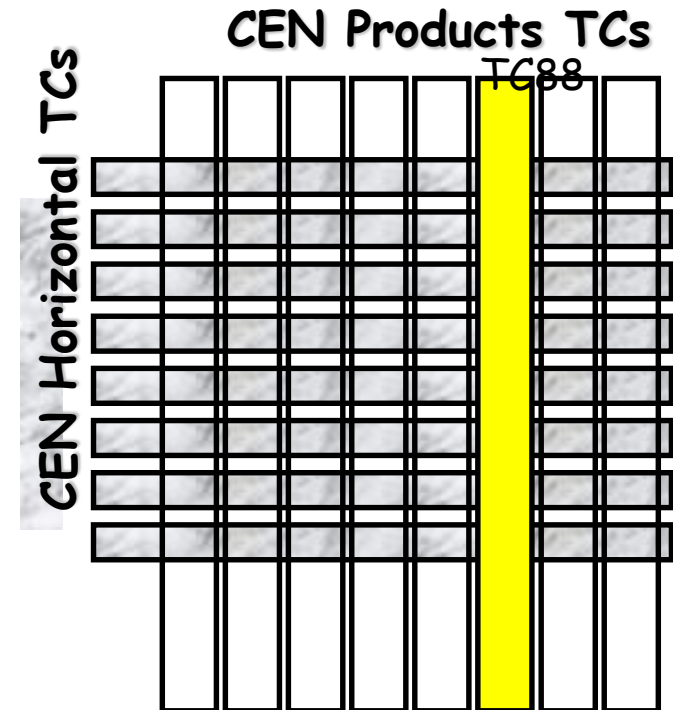
## Before CPD / CPR

- National standards and/or national guidelines on Thermal insulation products were available in many countries connected to national test methods and rules → very difficult to compare results between countries
  - On thermal values, no agreement on test rules and on T°C
  - On fire, many differences on tests and classifications
  - No agreement on other properties
- National certifications systems were used in many countries, based on real audits of plants and external check of products
  - Belgium, France, Denmark, Germany, Netherlands, Spain...



Work started end 1988 with as objective harmonised standards for Thermal insulation products with common and uniform test methods

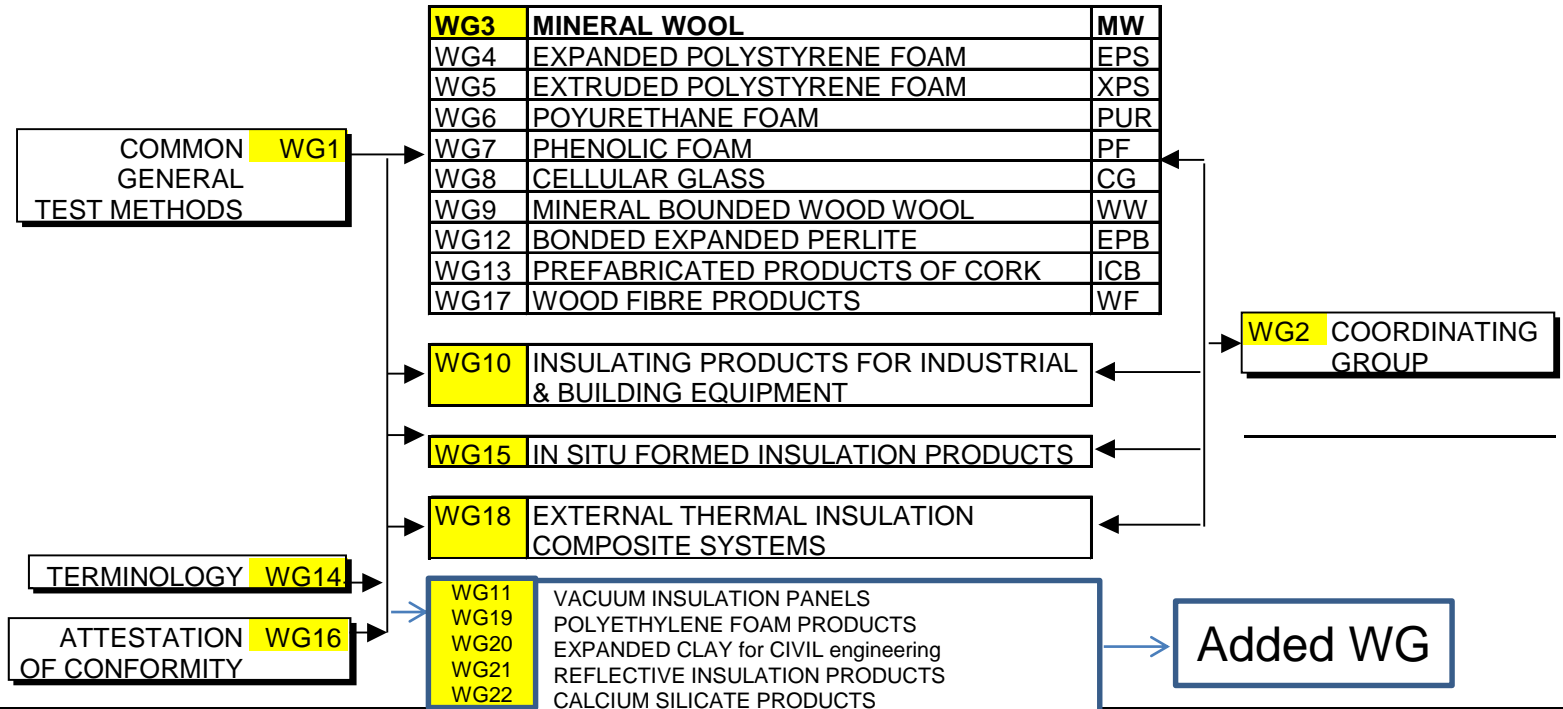
- Use as maximum test methods prepared by horizontal specific technical committees Objective is to use
- In the beginning CEN/TC88 and CEN/TC89 were linked in meetings with a 1 day common meeting to define how to measure and declare the thermal performance





CEN/TC89 Thermal Performance of Buildings and building components  
CEN/TC126 Building Acoustics  
CEN/TC127 Fire Safety  
CEN/TC350 Integrated environmental performance of buildings  
CEN/TC351 Construction products: Assessment of release of dangerous substances

## CEN / TC 88 : Thermal insulation materials and products



# Choices made by CEN/TC88



- Everything was new and all rules had to be create: during 4-5 years all rules were defined in a dynamic process with many fruitful discussions
  - Choice not to enter in the application world due to the total number and the many little differences between countries on the same application
  - Choice to prepare for each type of product and each application a specific standard with a split between factory made and in-situ products
  - Only 3 applications were chosen:
    - Buildings,
    - Building equipment's and Industry
    - Civil engineering



### **BUILDING Factory made PACKAGE :**

- EN 13162 : MINERAL WOOL (MW)
- EN 13163 : EXPANDED POLYSTYRENE (EPS)
- EN 13164 : EXTRUDED POLYSTYRENE (XPS)
- EN 13165 : POLYURETHANE (PUR)
- EN 13166 : PHENOLIC FOAM (PF)
- EN 13167 : CELLULAR GLASS (CG)
- EN 13168 : WOOD WOOL (WW)
- EN 13169 : EXPANDED PERLITE (EPB)
- EN 13170 : EXPANDED CORK (ECB)
- EN 13171 : WOOD FIBRE (WF)
- ....

### **BUILDING equipment and Industry Products :**

- EN 14303 : MINERAL WOOL (MW)
- EN 14304 : ELASTOMERIC FOAM (FEF)
- EN 14305 : CELLULAR GLASS (CG)
- EN 14306 : CALCIUM SILICATE (CS)
- EN 14307 : EXTRUDED POLYSTYRENE (XPS)
- EN 14308 : POLYURETHANE (PUR)
- EN 14309 : EXPANDED POLYSTYRENE (EPS)
- EN 14313 : POLYETHYLENE FOAM (PEF)
- EN 14314 : PHENOLIC FOAM (PF)
- ....

## **- EN 13172 : EVALUATION OF CONFORMITY**

### **In-situ products:**

- EN 14063-1-2 : EXPANDED CLAY (LWA)
- EN 14064-1-2 : MINERAL WOOL (MW)
- EN 14315-1-2 : POLYURETHANE (PUR)
- EN 14316-1-2 : EXPANDED PERLITE (EP)
- EN 14317-1-2 : EXFOLIATE VERMICULITE (EV)
- EN 14318-1-2 : POLYURETHANE (PUR)
- EN 14319-1-2 : POLYURETHANE (PUR)
- EN 14320-1-2 : POLYURETHANE (PUR)
- EN 15101-1-2 : CELLULOSE (LFCI)
- ....

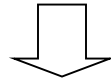
### **Civil Engineering products:**

- EN 14933 : EXPANDED POLYSTYRENE (EPS)
- EN 14934 : EXTRUDED POLYSTYRENE (XPS)
- EN 15732 : EXPANDED CLAY (LWA)



# Choices made by CEN/TC88

- Everything was new and all rules had to be create: during 4-5 years all rules were defined in a dynamic process with many fruitful discussions
  - Choice for standards based on performances: for each characteristic a test method, levels or limits and rules for FPC



Characteristic	Test method	Requirement	Factory Production Control (FPC)	
			Method	Frequency
25 or more	EN xxxx EN ISO xxxx ISO xxxx	Limit value Levels Classes	EN xxxx Manufacturer 's method	





# Choices made by CEN/TC88

- Everything was new and test methods had to be create.
- Test methods for thermal performances were taken over from CEN/TC89, For acoustical performances from CEN/TC126 and reaction to fire from CEN/TC127.
- All other test methods were prepared by CEN/TC88 WG1:
  - Dimensions (Length, Width, Thickness),
  - Squareness,
  - Flatness,
  - Dimensional stability,
  - Compressive stress or strength 10%
  - Tensile strength
  - Point load
  - Compressive creep
  - Water absorption
  - Water vapour transmission
  - Compressibility...



# Joint choices CEN/TC88 and CEN/TC89

- Important item to define was the thermal performance of products
- Choice for a test temperature for Europe: 10°C and a temperature curve for building equipments and industry
- Large discussion and final choice for statistical based sure limit values representing at least 90% of the production with a confidence level of 90 % for R and  $\lambda$

$$\lambda_D \leftarrow \lambda_{90/90} = \lambda_{mean} + k \cdot \sigma$$

- Excluding proposals on:
  - Mean value,
  - 100 % limit value
  - Statistical 50/50 value with standard deviation

# Joint choices CEN/TC88 and CEN/TC89



- $R_D$  shall always be declared, except where appropriate, for products of non-uniform thickness.  $\lambda_D$ , shall be declared where possible.
- Rounding is defined for R and  $\lambda$ .
- Follow-up of factory production control and (third party control) was defined:
  - At least ten test results, obtained from internal or external direct measurements in order to calculate the declared values.
  - Measurements shall be carried out at regular intervals spread over a time period of the last twelve months. (extension possible if less results are available)
  - The declared values shall be recalculated at intervals not exceeding three months of production.

# Mandate and Evaluation of conformity



- Only in September 1994 mandate M103 was given by the commission for CEN/TC88 work
  - System 3 level of evaluation for all properties except for reaction to fire with system 1 for A1, A2, B and C thermal insulation products
- Since begin nineties large discussions in CEN/TC88 plenary meetings on level of the evaluation with as conclusion a resolution on a wish to have for CE marking thermal insulation products a system 1+ level
- It was never possible to convince the commission to improve the level of evaluation and we have still to-day a level system 3 + system 1 for reaction to fire
- This is probably the origin of the voluntary Keymark certification system

# Conclusions



- CE-marking exists but still open issues and nearly no enforcement
- CE-marking too weak for consumers & contractors
- Thermal insulation products are not satisfied with a CE marking with only system 1 for reaction to fire. It is not necessary to have all characteristics at that level but some other properties should also be certified by third party, certainly our thermal values.
- A uniform choice should be decided valid for Europe.
- The weakness of CE-marking is the origin of the voluntary Keymark certification system



# Thanks



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