

# The CEN asphalt package of standards



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Is Europe in Harmony?  
SCI – UK - 13 March 2008

# Harmony and harmonised standards



**The Comedian Harmonists**



**The Andrews Sisters**

# Introduction

- Why European Standards
- How were they produced (TC227 WG1)
- What did they produce  
(overview of 13108 and 12697 standards)
- Attestation of Conformity
- What is CE marking



# European

- Europe an enormous economy
- Together we are strong
- One European currency
- European market
- Free travel of goods and services



# European Market

Main goal European Commission:

- Free travel of goods and services - with no barriers of trade
- For free travel of goods (and services) in construction market the 'Construction Product Directive' (CPD) was issued in 1988
- Road building activities part of the construction market



# Construction Product Directive

- Objective CPD (1988) : to allow the free travel of construction products
- CPD requests to harmonise the standards for several construction products including asphalt because different national standards can be barrier to trade.
- Mandate/124 (1998) for road construction product standards



# Why European standards

Important for the European Commission

- Creating Single and open market with fair competition
- Enhancing competitiveness of enterprises in EU
- Helping to protect the health, safety and environment of Europe's citizens
- Translate the European 'essential' requirements into technical solutions
- Facilitate trade and cooperation across the EU

# European Standards

- EC asked CEN to produce European Standards to have no barriers of trade
- CPD is general
- Technical Committees of CEN draft technical details of standards
- Other advantages
  - we all speak one language and
  - easier to exchange knowledge and experience.



# Essential Requirements

are related to

1. Mechanical resistance and stability
2. Safety in case of fire
3. Hygiene, health and the environment
4. Safety in use
5. Protection against noise
6. Energy economy and heat retention



# CEN TC227 Road Materials

## Organization of the work

- WG 1: Bituminous mixtures
- WG 2: Surface dressing and slurry surfacing
- WG 3: Materials for concrete roads incl. joint fillers and sealants
- WG 4: Hydraulic bound and unbound mixtures
- WG 5: Surface characteristics
- WG 6: Liaison



# CEN TC227 WG1

Started in 1990 ..... to ...

- do a lot of work
- speak one languages
- understand different materials and mixes
- and different test methods
- learn to work together
- to understand the system
- to harmonise





# CEN TC227 WG1

## ‘Bituminous mixtures’

- TG 1 Definitions
- TG 2 Test methods
- TG 3 Product Standards
- TG 4 Quality Standards

# Product Standards

## Bituminous mixtures - Material specifications

- 13108- Part 1: Asphalt concrete
- 13108- Part 2: Asphalt concrete for very thin layers
- 13108- Part 3: Soft asphalt
- 13108- Part 4: Hot rolled asphalt
- 13108- Part 5: Stone mastic asphalt
- 13108- Part 6: Mastic asphalt
- 13108- Part 7: Porous asphalt
- 13108- Part 8: Recycled asphalt

# Asphalt standards EN 13108

- Initial Type Testing (EN 13108-20)
- Factory Production Control (13108 -21)
- Both part of system for the Evaluation of Conformity
- 13108-21 provides the basis for quality and conformity control
- Manufacturers test and declare that their product meets the requirements and they declare the properties of their product

# Test methods

## 12697 series

- -1 Soluble Binder Content
- -2 Particle Size Distribution
- -3 Bitumen recovery
- -12 Water sensitivity of bituminous specimens
- -16 Resistance against studded tyres
- -22 Wheel tracking test
- -24 Resistance to fatigue
- -43 Resistance to fuel





# European Asphalt Standards

- Product standards (hEN 13108–1 till 13108-7)
- Recycled asphalt (EN13108-8)
- Conformity Assessment Standards (EN 13108–20 and 13108-21)
- Test standards (EN 12697–1 till 12697-43)

Date of Applicability 1 March 2007

Date of Withdrawal 1 March 2008

Standards are for asphalt in back of the truck  
leaving the asphalt plant

# Harmonisation

- one characteristic one test method
- all existing national requirements will be incorporated in new hENs
- national guidance documents



# Empirical and fundamental approach

- Ultimate aim to specify fundamental properties required
- Now too early for fundamental approach only
- Standard of Asphalt Concrete provides two ways
- Empirical
- Fundamental



# Empirical - Fundamental

## Empirical specification

- *combination of requirements for composition and constituent materials together with performance-related requirements (e.g. Wheel-tracking properties)*

## Fundamental specification

- *combination of performance-based requirements (e.g. Stiffness, Fatigue properties, Triaxial Cyclic Compression Test) together with limited requirements for composition, and constituent materials, with more degrees of freedom than for an empirical specification*



# First generation standards

Empirical specification

Only for AC possibility to use fundamental specs:

- Stiffness,
- Fatigue,
- Resistance to permanent deformation using tri-axial compression test instead of Voids requirements

# At this moment

- The asphalt standards can be applied since 1st March 2007 and shall 1st March 2008
- First priority: implementation of the first generation of the asphalt standards
- Second priority: Vision for the second generation asphalt standards



# Second generation standards

## Performance standards ..... Why ????

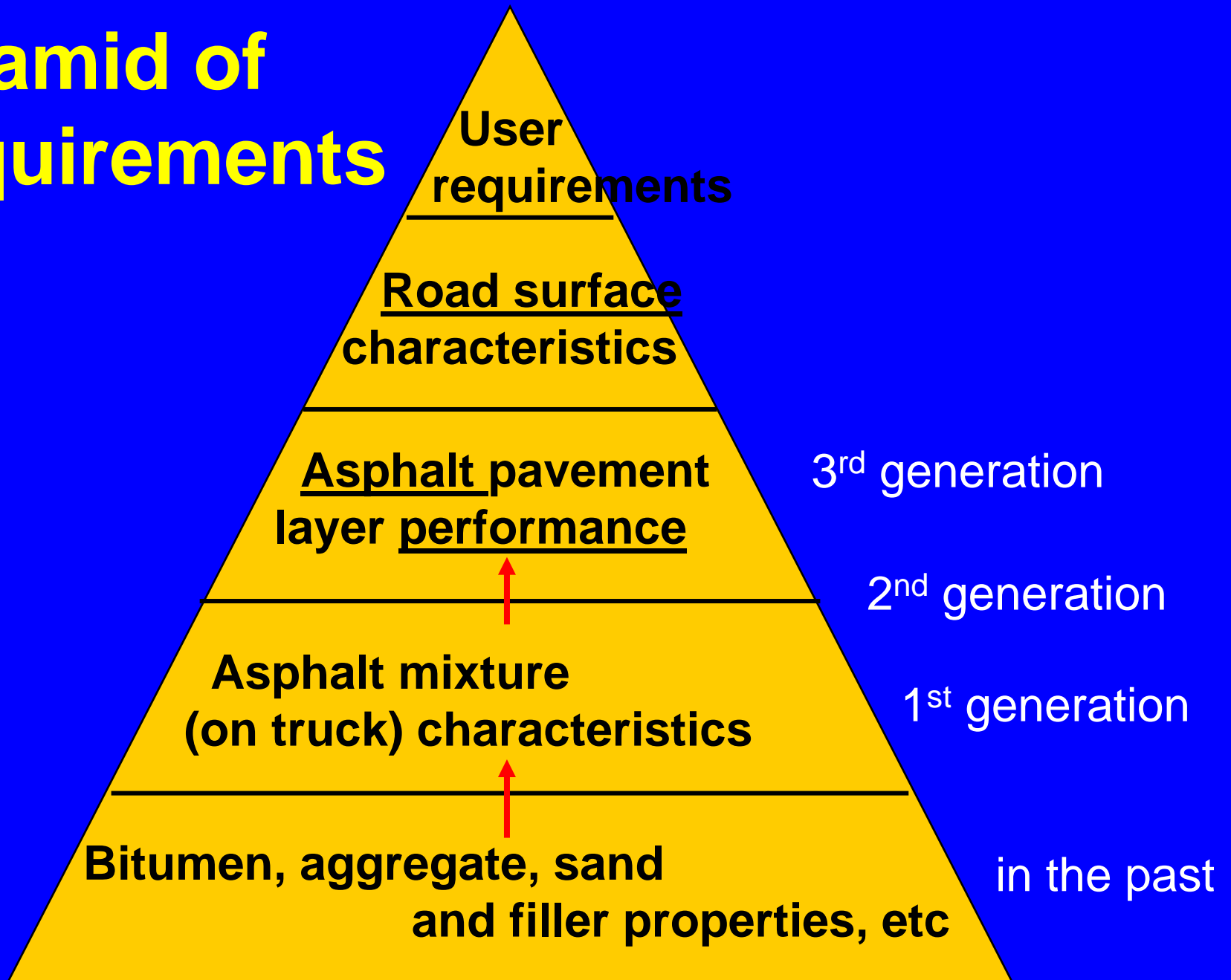
- To avoid barriers of trade
- EC requested CEN in Mandate M/124
- Empirical standards based the past
- Performance standards can cover a broader area
- To stimulate new developments

# Performance standards

- Standards describing the performance required without requirements for composition and constituent materials.
- All relevant characteristics have to be described using performance characteristics.
- Goal (could in theory be) one standard for bituminous mixtures
- Mix could be: hot, warm, half warm or cold



# Pyramid of Requirements



# Attestation of Conformity

- Initial Type Testing
- Factory Production Control
- Evaluation of Conformity
- CE-marking

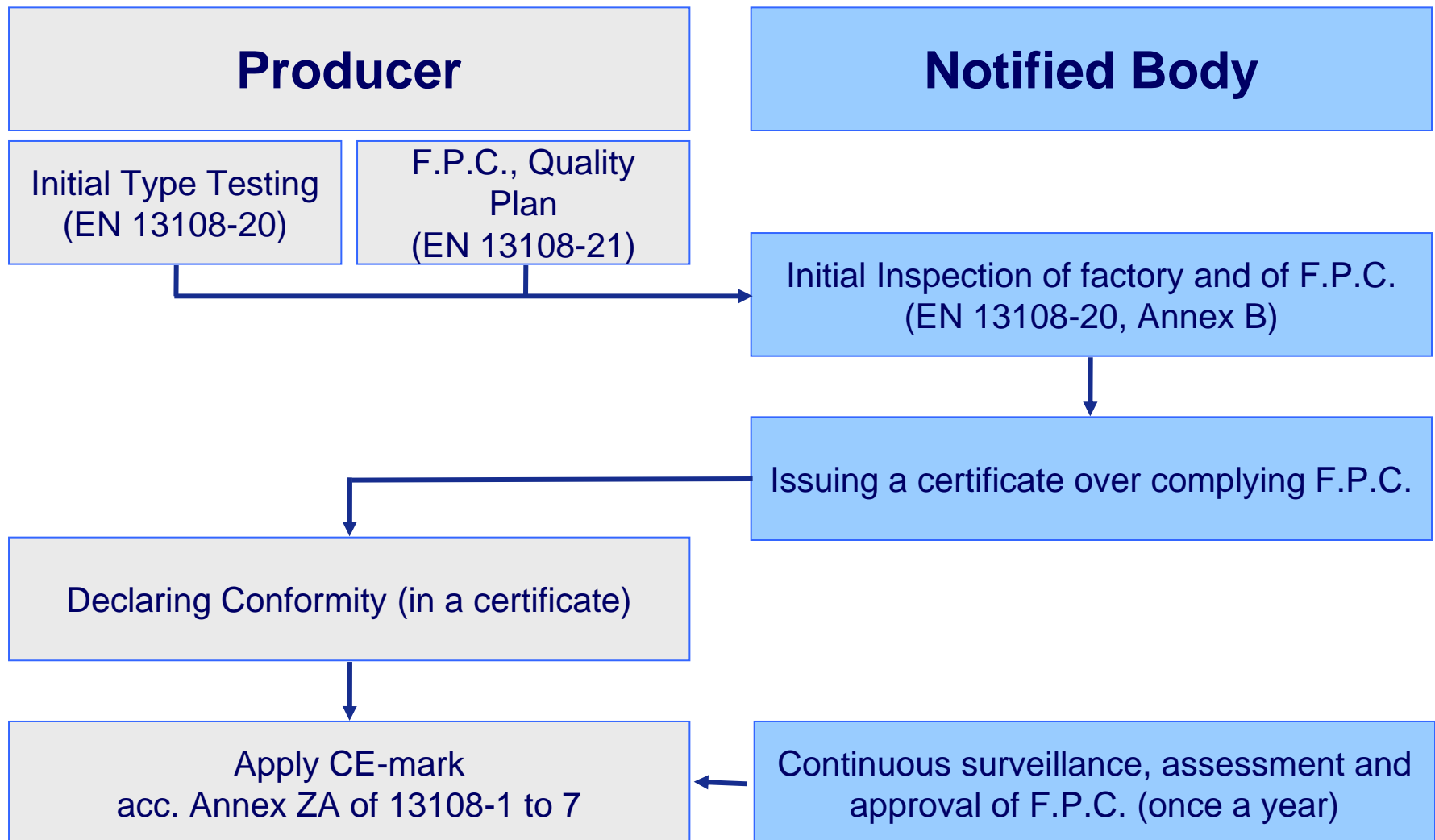


# Attestation of Conformity

To obtain CE mark there is a  
Procedure of Attestation of Conformity  
For asphalt

1. (initial) type testing – by the manufacturer.
2. factory production control - by the manufacturer.
3. initial inspection plus a continuous surveillance of the FPC by a notified body (a neutral third party).

# Evaluating Conformity in European System 2+



# Initial Type Testing

A series of tests to determine

- - the values and
- - the categories

of that specific asphalt mixture.

Details are in EN 13108-20 ITT

# Initial Type Testing

Demands from the market



The producer / manufacturer decides to produce a certain asphalt mixture (to it bring on the market): Selecting (EN13108-1 to -7)



Asphalt producer starts an Initial Type Testing (EN13108-20)

- makes a mix design: mix formulation
- chooses the constituent materials
- produces specimen (EN12697-35)
- tests specimen with complete set of tests (see 13108-20)

The asphalt producer is responsible for the Initial Type Testing.

He can do it himself or other lab. but he will remain responsible.



The results of Type Testing presented in Type Test Report containing all of the information required by EN13108-20.

The Notified Body may wish to see the Type Testing Report.



If results of TT comply with requirements of selected mix, with which conformity is to be demonstrated, the TT is completed.  
Not good: change mix formulation or constituent materials and start TT again.



Production step can start

# Factory Production Control

FPC is the permanent internal system of control of production done by the producer

It includes the inspections and tests used to monitor the

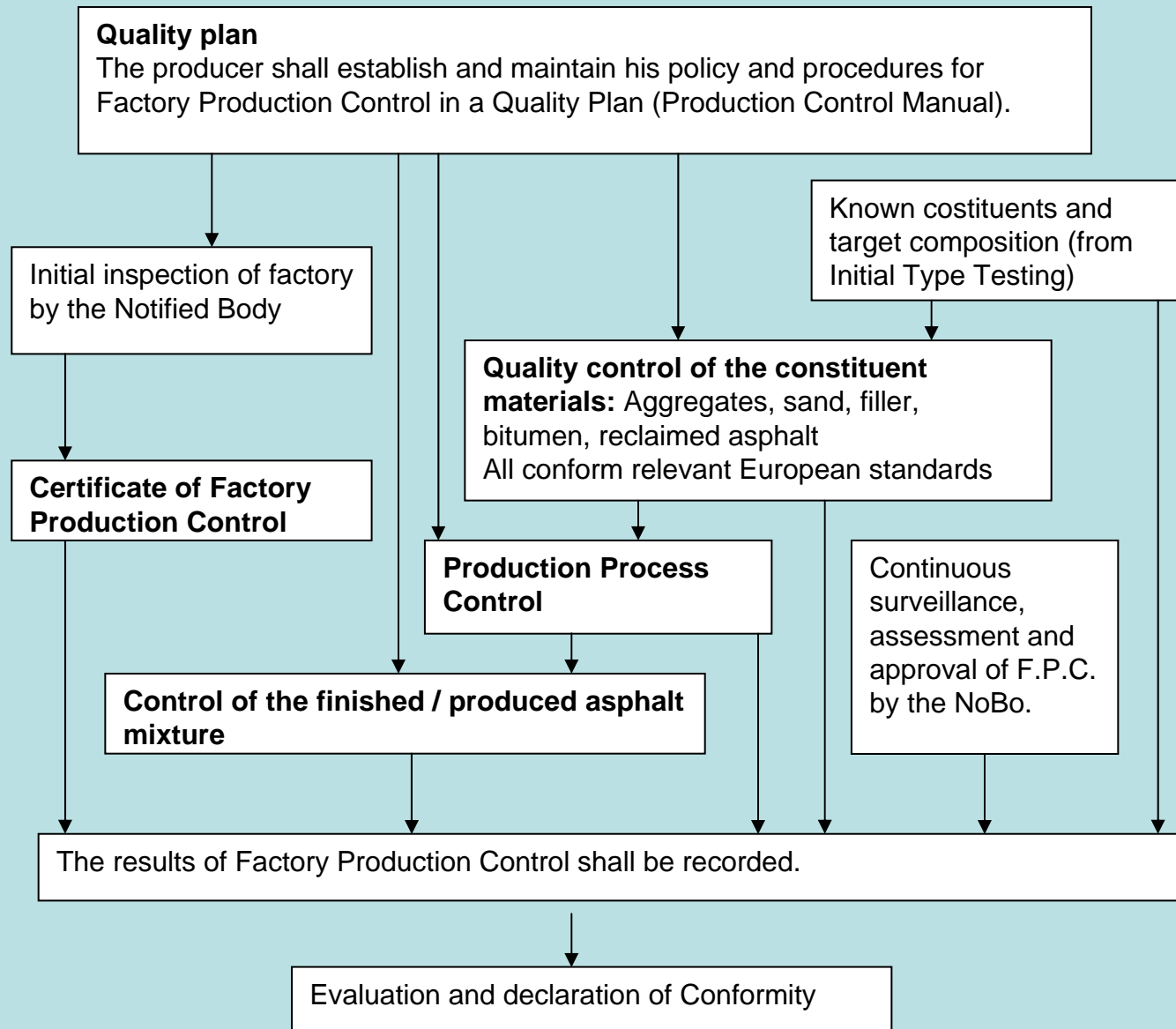
- equipment
- constituent materials
- manufacturing process
- and the finished product

Details are in EN13108-21 FPC

FPC is production control, not product control.

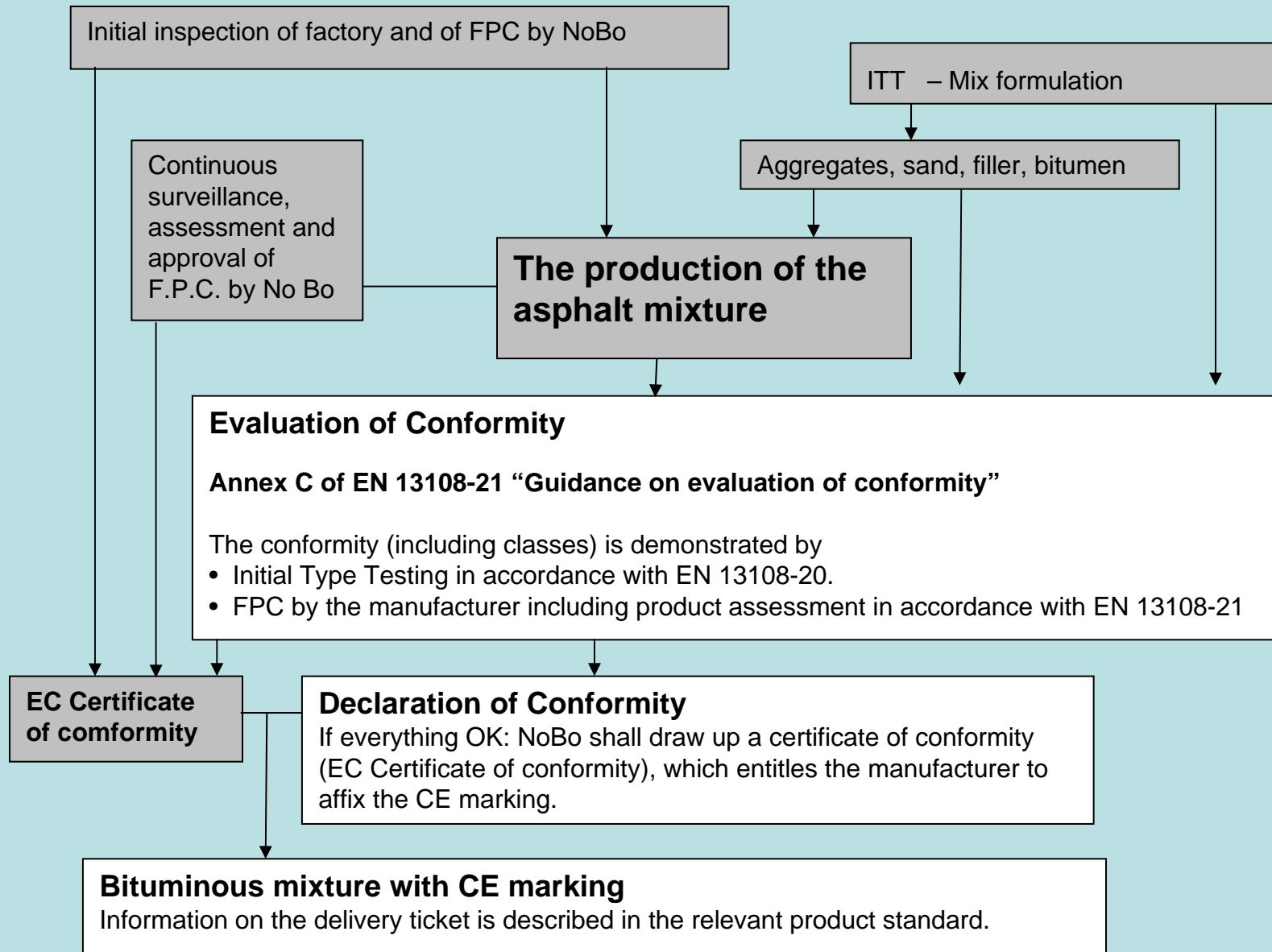


# Factory Production Control





# Evaluation and Declaration of Conformity



# CE-marking



- In CPD the use of CE marking is described
- A product for construction works and placed on the European internal market must have a CE marking.
- CE marking on a product indicates that the product satisfies all the provisions of the CPD, including the conformity assessment procedures.
- Asphalt mix produced according to the harmonised European standards, must carry the so called CE marking.

# CE marking and labelling

Some examples

# Identification

On delivery ticket

- the manufacturer and mixing plant
- mix identification code
- designation of the mixture
- description of product

AC 16 surf 70/100

BBTM 11A 40/60

SA 16-d-500/650 Type B

HRA 30/14 F surf 40/60

SMA 11 70/100

MA 11 30/45

PA 11 70/100



01234

*CE conformity marking,  
consisting of the  
“CE”-symbol given in directive  
93/68/EEC.  
Identification number of the  
certification body (where  
relevant)*

AnyCo Ltd, PO Box 21, B-1050  
**06**  
01234-CPD-00234

*Name or identifying mark and  
registered address of the  
producer  
Last two digits of the year in  
which the marking was affixed  
Certificate number (where  
relevant)*

**EN 13108-7**  
**Porous Asphalt for roads  
and trafficked areas**  
**PA 11 70/100**  
**Euro asphalt plant**  
**P 08**

*No. of European standard  
Description of product  
Standard designation  
Name of the plant  
Mix Identification code*

**Shortened CE marking for delivery note**



01234

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<p><b>EN 13108-5</b>  <b>Stone mastic asphalt for roads  and trafficked areas</b>  <b>SMA 11 70/100</b>  <b>Euro asphalt plant</b>  <b>S12</b></p> <p><b>Grading</b></p> <table> <tr><td>Passing sieve 1,4 C11</td><td>100 %</td></tr> <tr><td>Passing sieve C11</td><td>94,0 %</td></tr> <tr><td>passing sieve C8</td><td>50,0 %</td></tr> <tr><td>passing sieve C5,6</td><td>40,0 %</td></tr> <tr><td>passing sieve 2 mm</td><td>25,0 %</td></tr> <tr><td>passing sieve 63 µm</td><td>10,5 %</td></tr> <tr><td>Binder content</td><td>6,8 %</td></tr> <tr><td>Void content</td><td>3,0 %</td></tr> <tr><td>Voids filled with bitumen</td><td>NPD</td></tr> <tr><td>Water sensitivity</td><td>NPD</td></tr> <tr><td>Resistance to abrasion by studded tyres</td><td>44 %</td></tr> <tr><td>Binder drainage</td><td>0 %</td></tr> <tr><td>Maximum deformation strain</td><td>NPD</td></tr> <tr><td>Maximum rut depth</td><td>3,0 mm</td></tr> <tr><td>Reaction to fire</td><td>Euroclasse Cfl</td></tr> <tr><td>Temperature of the mixture</td><td>140 – 170 °C</td></tr> <tr><td>Dangerous substance X:</td><td>&lt; 0,2 ppm</td></tr> </table>	Passing sieve 1,4 C11	100 %	Passing sieve C11	94,0 %	passing sieve C8	50,0 %	passing sieve C5,6	40,0 %	passing sieve 2 mm	25,0 %	passing sieve 63 µm	10,5 %	Binder content	6,8 %	Void content	3,0 %	Voids filled with bitumen	NPD	Water sensitivity	NPD	Resistance to abrasion by studded tyres	44 %	Binder drainage	0 %	Maximum deformation strain	NPD	Maximum rut depth	3,0 mm	Reaction to fire	Euroclasse Cfl	Temperature of the mixture	140 – 170 °C	Dangerous substance X:	< 0,2 ppm	<p><i>No. of European standard</i></p> <p><i>Description of product</i></p> <p><i>Standard designation</i></p> <p><i>Name of the plant</i></p> <p><i>Mix Identification code</i></p> <p><i>And</i></p> <p><i>information on regulated  characteristics</i></p>
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## Example CE marking information

# Conclusions

- European Standards are a great step forward
- A lot of work had to be done
- National implementation
- National guidance documents
- Influence on the contractual situations in the countries
- Training is needed and possibly test equipment
- It will never be finished.



Thank you  
and success





**See you in Copenhagen  
in May 2008**

[www.eecongress.org](http://www.eecongress.org)



