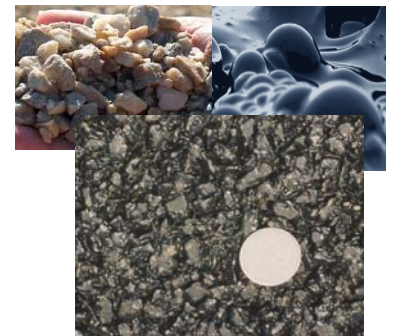


# The Portuguese Approach on Implementation of Harmonised European Asphalt Standards

Dr. Maria C. M. Azevedo, CAeMD,  
Chairperson of Portuguese Technical Committees on  
Bituminous Binders and Mixtures

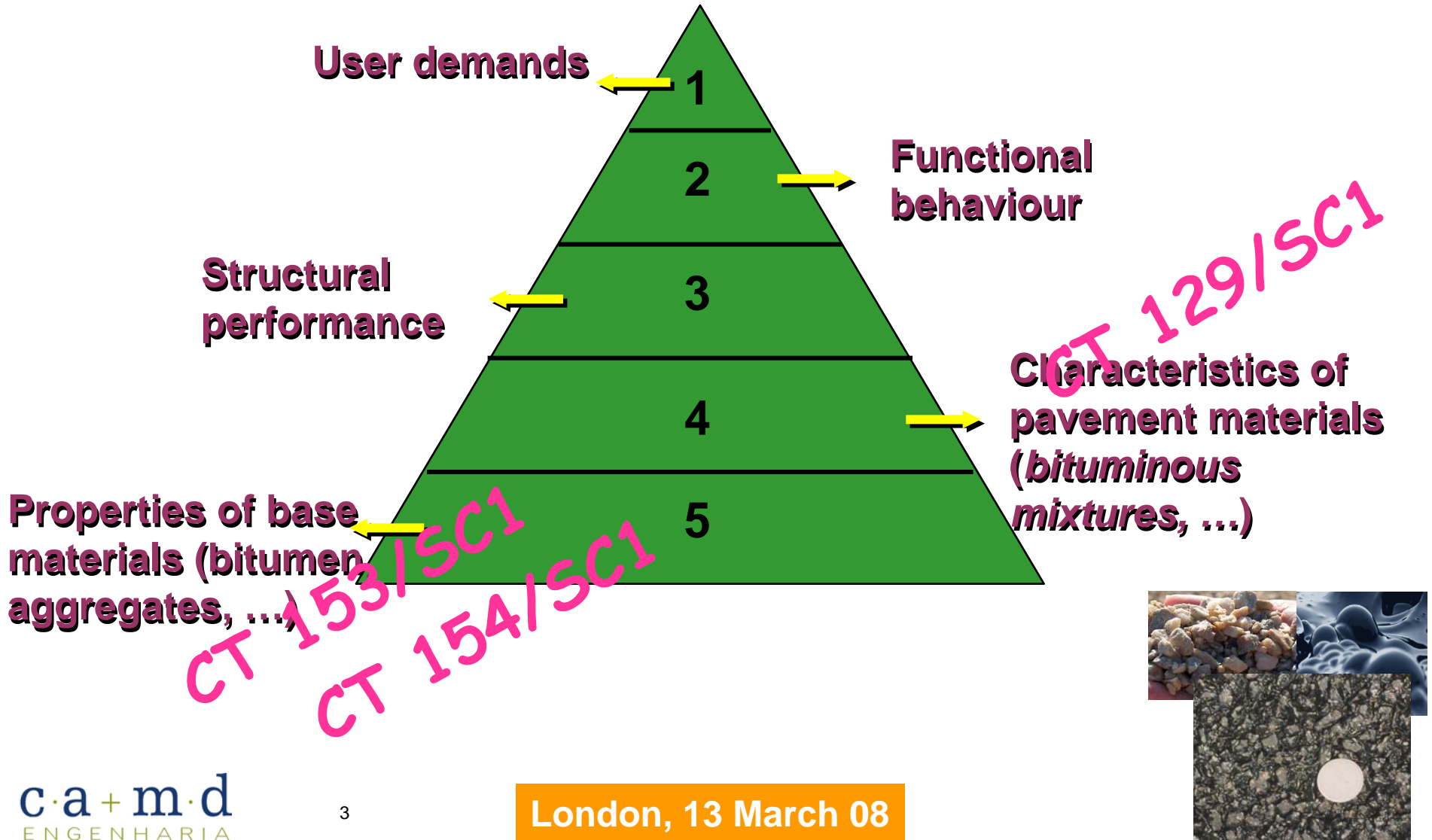


# SUMMARY

- Portuguese vs. European Standards
- What Changes?
- Portuguese Design Methodology
- Conclusions: Impacts

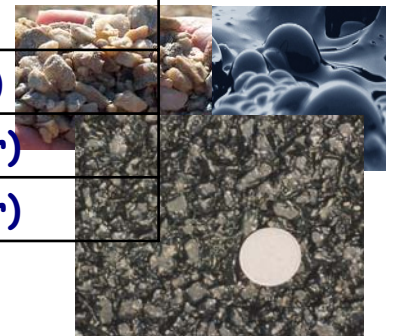


# Pyramid of demands



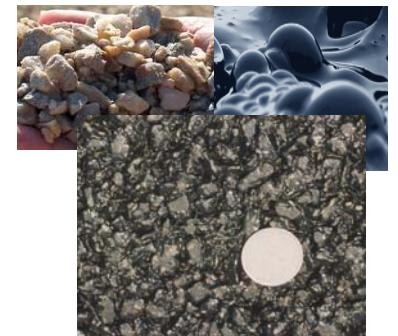
## ASPHALT CONCRETE - EN 13108-1

Pavement Course	Previous Designation	Current Designation (according EN 13108-1)
Base	Macadame Betuminoso Fuso B	AC 32 base ligante (MB)
	Macadame Betuminoso Fuso A	AC 20 base ligante (MB)
	Mistura Betuminosa de Alto Módulo	AC 20 base ligante (MBAM)
Binder	Macadame Betuminoso Fuso A	AC 20 bin ligante (MB)
	Mistura Betuminosa Densa	AC 20 bin ligante (MBD)
	Mistura Betuminosa de Alto Módulo	AC 16 bin ligante (MBAM)
	Betão Betuminoso Subjacente	AC 14 bin ligante (BBsb)
	Betão Betuminoso	AC 14 bin ligante (BB)
Regulating	Macadame Betuminoso Fuso A	AC 20 reg ligante (MB)
	Mistura Betuminosa Densa	AC 20 reg ligante (MBD)
	Mistura Betuminosa de Alto Módulo	AC 16 reg ligante (MBAM)
	Betão Betuminoso Subjacente	AC 14 reg ligante (BBsb)
	Betão Betuminoso	AC 14 reg ligante (BB)
Surface	Betão Betuminoso	AC 14 surf ligante (BB)
	Betão Betuminoso Rugoso	AC 14 surf ligante (BBr)
	(micro)Betão Betuminoso Rugoso	AC 10 surf ligante (BBr)



## OTHER EUROPEAN BITUMINOUS MIXTURES

- **EN 13108 - 2**
- Asphalt concrete for very thin layers
  - Betão betuminoso rugoso com granulometria descontínua ou betão betuminoso contínuo
- **EN 13108 - 3**
- Soft asphalt - **NOT USED**
- **EN 13108 - 4**
- Hot rolled asphalt - **NOT USED**
- **EN 13108 - 5**
- Stone mastic asphalt (SMA) - **STARTING**



## OTHER EUROPEAN BITUMINOUS MIXTURES

- EN 13108 - 6
  - Mastic Asphalt
    - Mástique betuminoso
- EN 13108 - 7
  - Porous asphalt - VERY USED, AT RAINY REGIONS OR FOR NOISE REDUCTION PURPOSES
- EN 13108 - 8
  - Reclaimed asphalt - USED AS A CONSTITUENT IN RECYCLING TECHNIQUES



## EVALUATION OF CONFORMITY

- EN 13108 - 20
- Type Testing - ITT
- EN 13108 - 21
- Factory Production Control - FPC

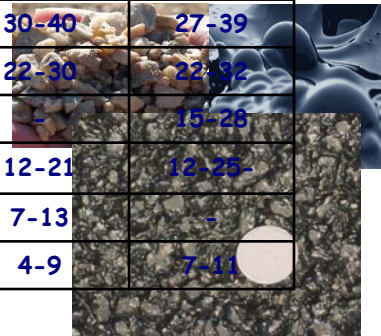




# WHAT'S CHANGING

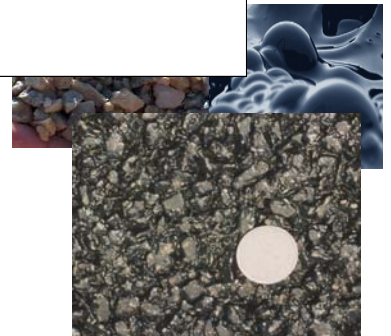
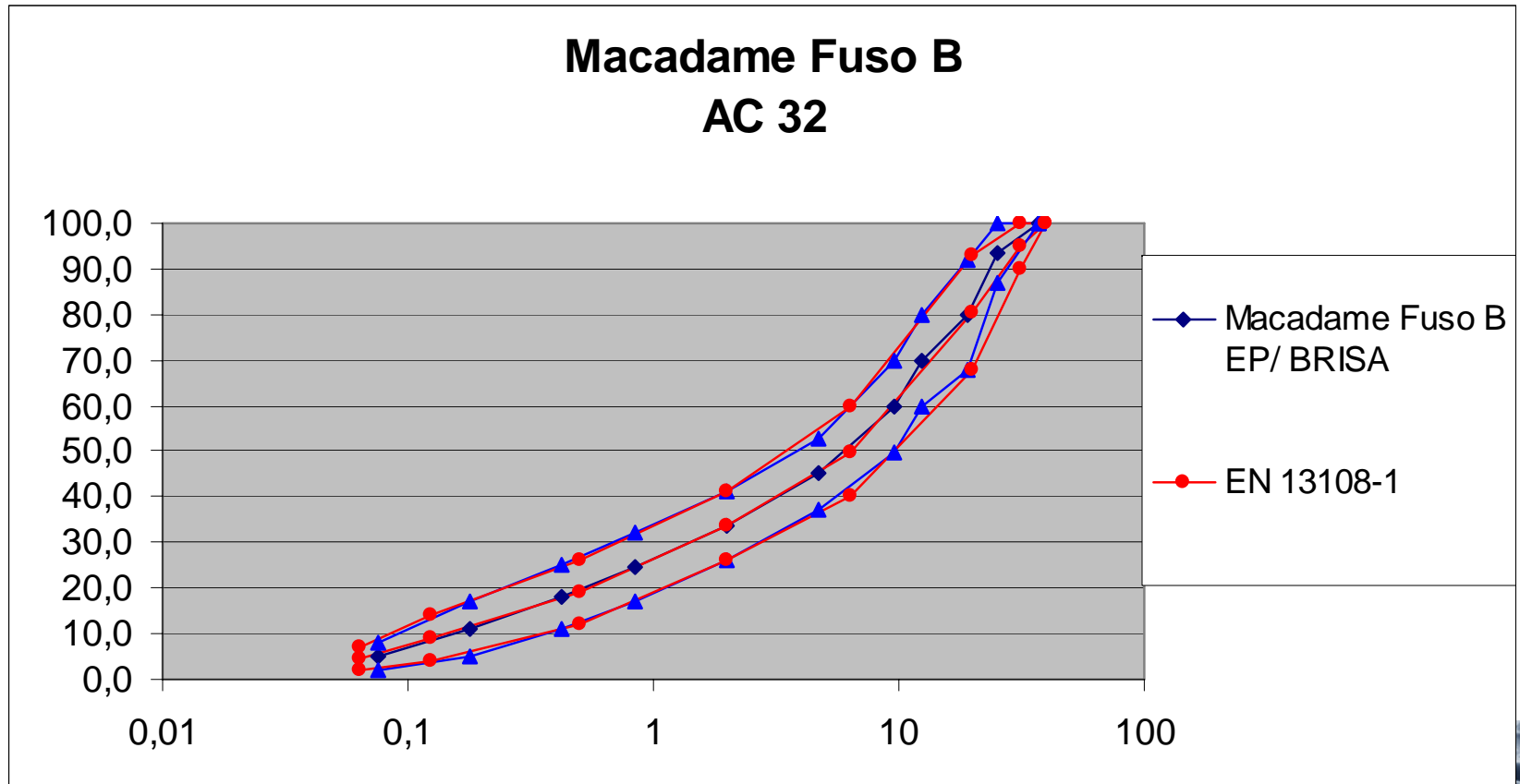
## GRADING

Basic Sieve Set + Set 2 (mm)	AC32	AC20 base binder (MB)	AC20 reg binder (MB)	AC20 base binder (MB)	AC16 reg binder (MBA M)	AC20 reg binder (MB D)	AC14 reg binder (BBs b)	AC14 reg binder (BB)	AC14 surf binder (BBr)	AC10 surf binder (BBr)
40	100	-	-	-	-	-	-	-	-	-
31,5	90-100	100	100	100	100	100	-	-	-	-
20	68-93	90-100	90-100	100	90-100	100	100	100	100	-
16	-	-	-	90-100	-	-	-	-	-	-
14	-	-	-	-	-	90-100	90-100	90-100	100	-
12,5	-	57-86	-	-	-	-	-	-	-	-
10	-	-	63-81	63-83	67-80	67-83	67-77	62-78	90-100	-
6,3	40-60	-	-	-	-	-	-	-	47-64	-
4	-	34-49	42-57	39-57	42-57	42-60	40-52	30-40	27-39	-
2	26-41	26-41	27-41	27-41	32-46	30-42	25-40	22-30	22-32	-
1	-	-	-	-	-	-	-	-	15-26	-
0,5	12-26	12-26	11-23	11-23	18-29	13-22	11-19	12-21	12-25	-
0,125	4-14	4-14	7-13	7-12	7-14	7-13	6-11	7-13	-	-
0,063	2-7	2-7	5-9	5-9	5-9	5-9	5-8	4-9	7-11	-

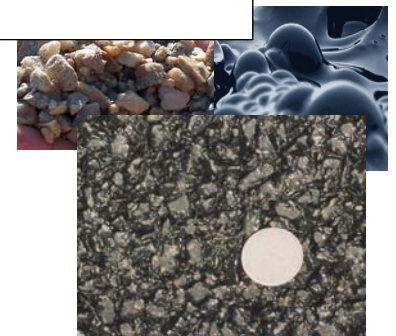
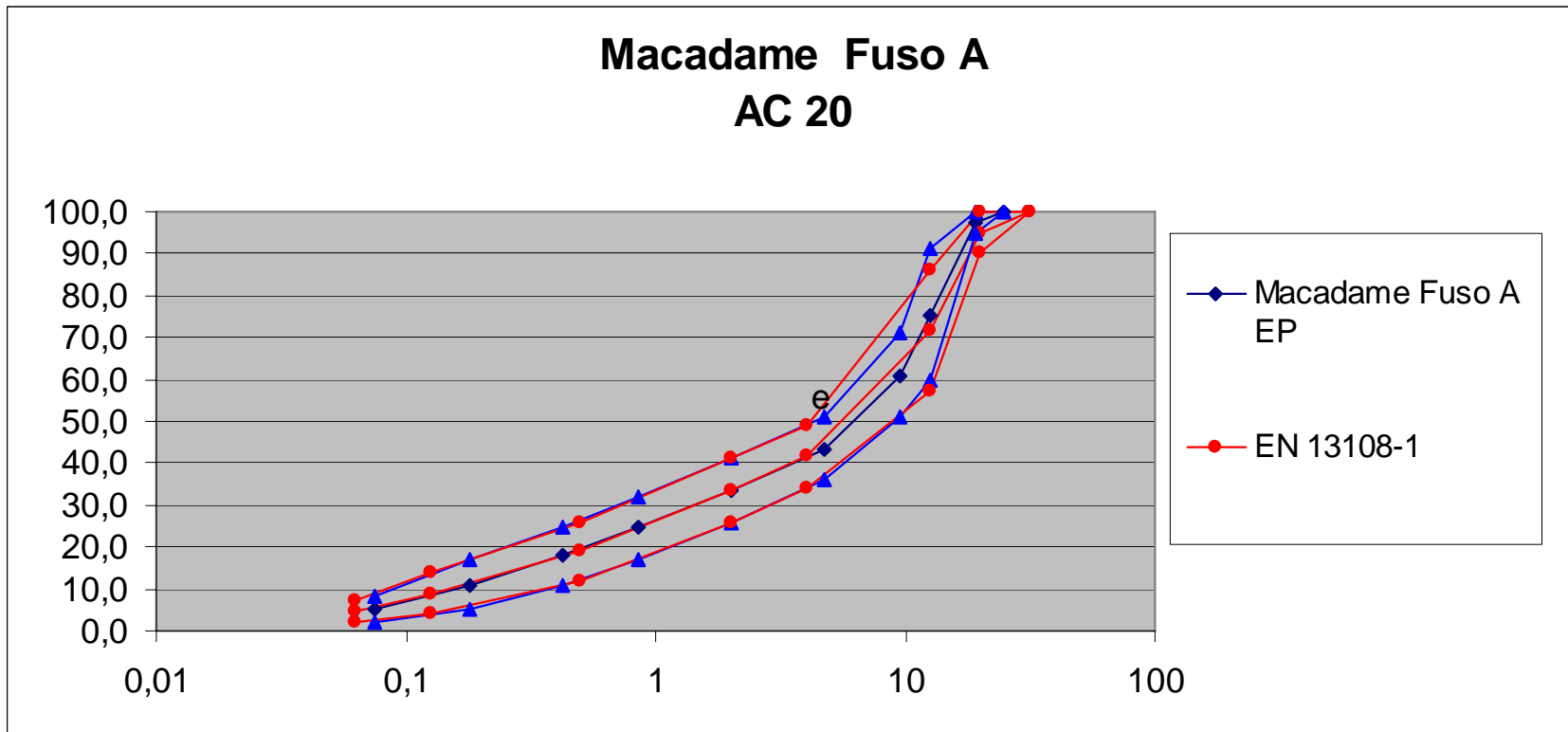




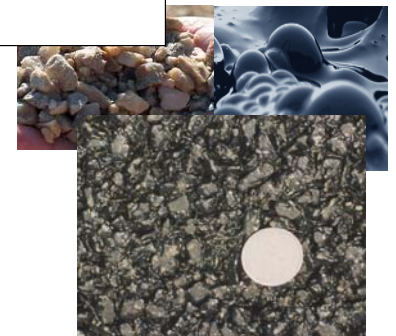
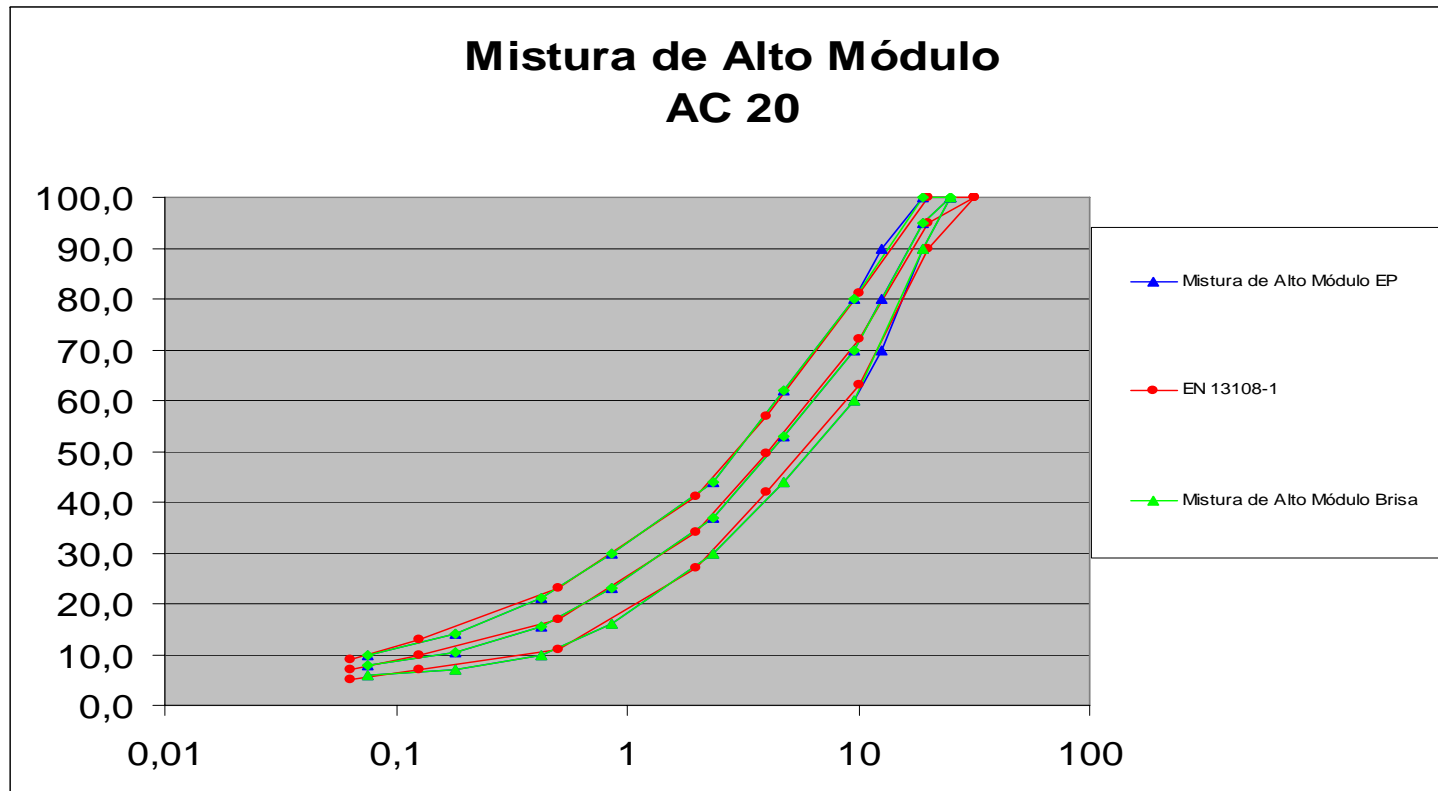
## AC 32 base binder (MB 0/37,5 Fuso B)



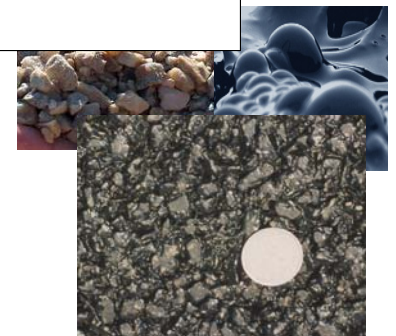
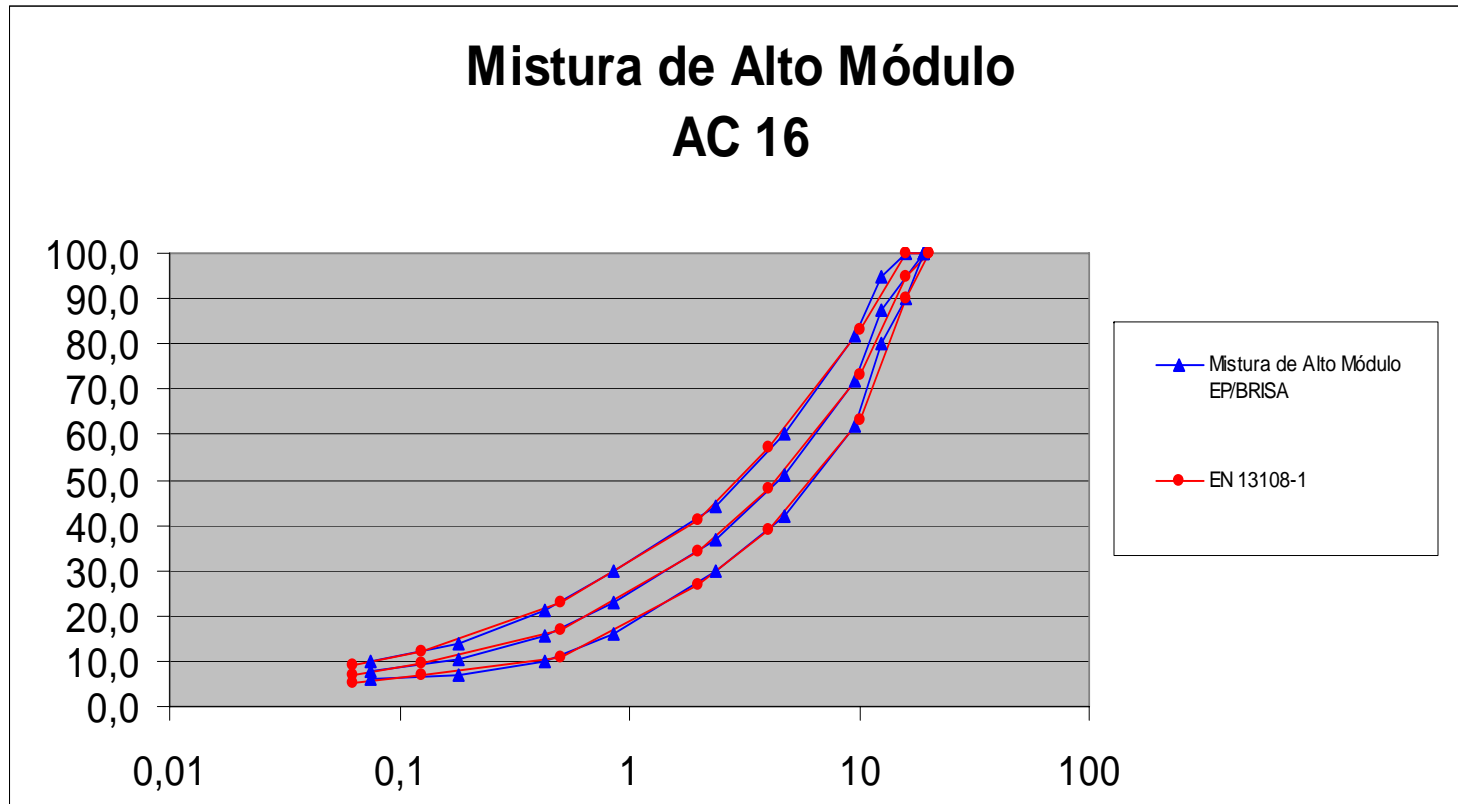
## AC 20 base binder (MB 0/37,5 Fuso A)



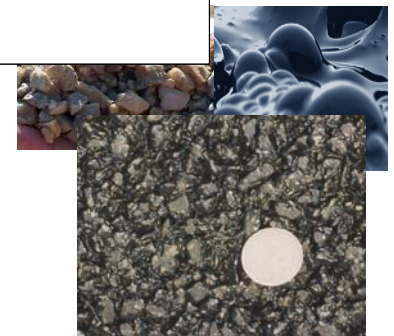
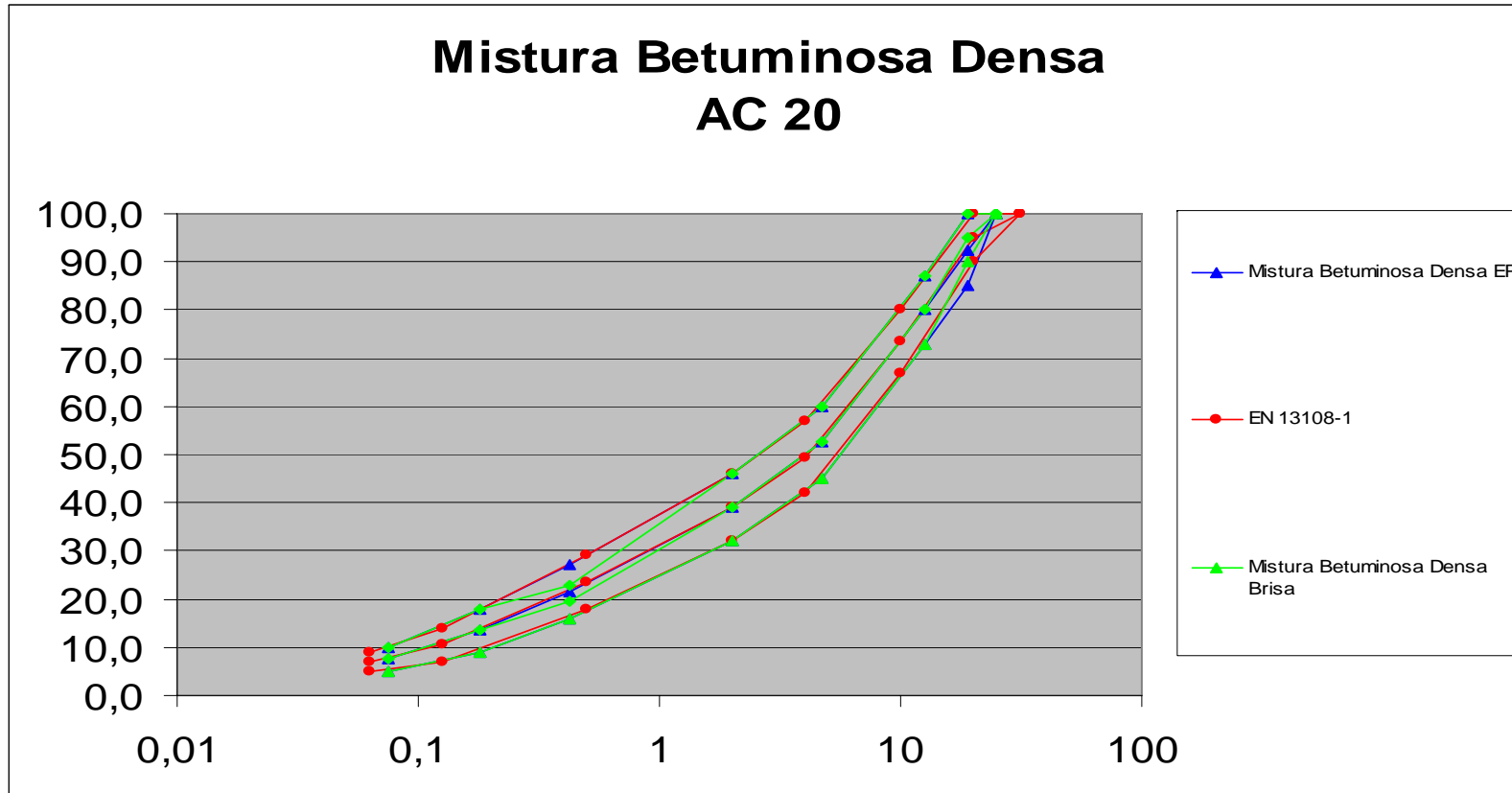
## AC 20 base binder (High Modulus)



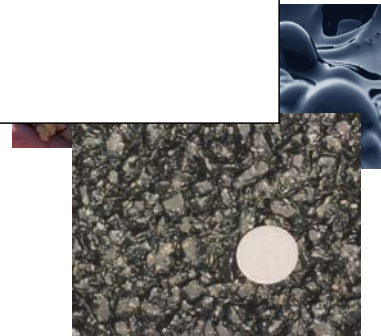
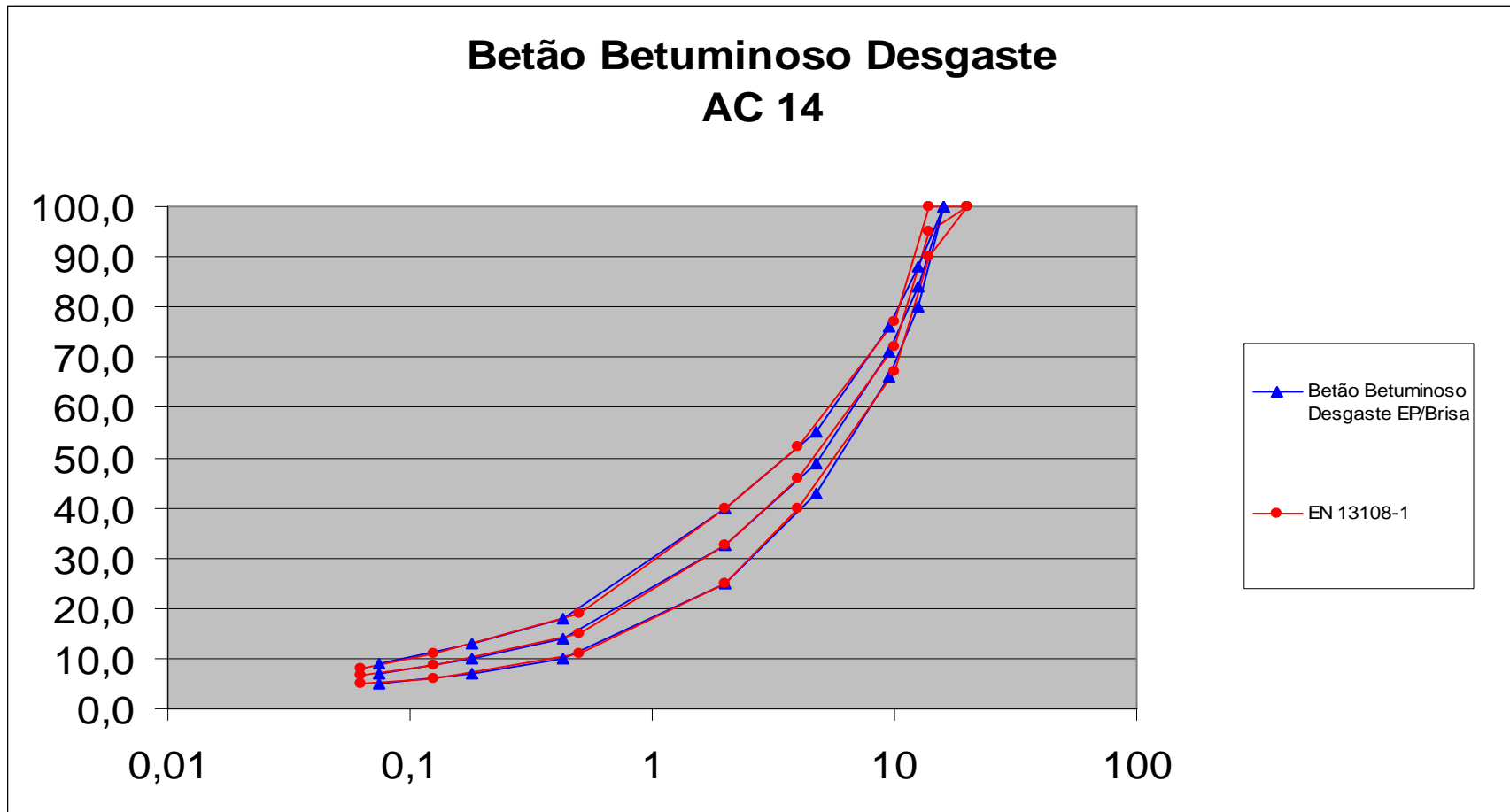
## AC 16 bin binder (High Modulus)



## AC 20 bin binder (MBD)



## AC 14 surf binder (BB)



## REQUIREMENTS AND APPROACHES FOR AC

- EVALUATION OF CONFORMITY AND CE MARKING
  - LEVEL 1 - EMPIRICAL APPROACH
    - EXPECTED TO CHANGE FOR LEVEL 2 WITHIN THE NEXT 3-5 YEARS
  - LEVEL 2 - FUNDAMENTAL APPROACH
    - TO START IN A NEAR FUTURE
  
- CONTRACT DOCUMENTS (SHW)
  - LEVEL 1 - EMPIRICAL REQUIREMENTS
    - FOR THE MAJORITY OF WORKS
  - LEVEL 2 - FUNDAMENTAL REQUIREMENTS
    - DEPENDING ON THE NETWORK IMPORTANCE;
    - JOB SIZE.



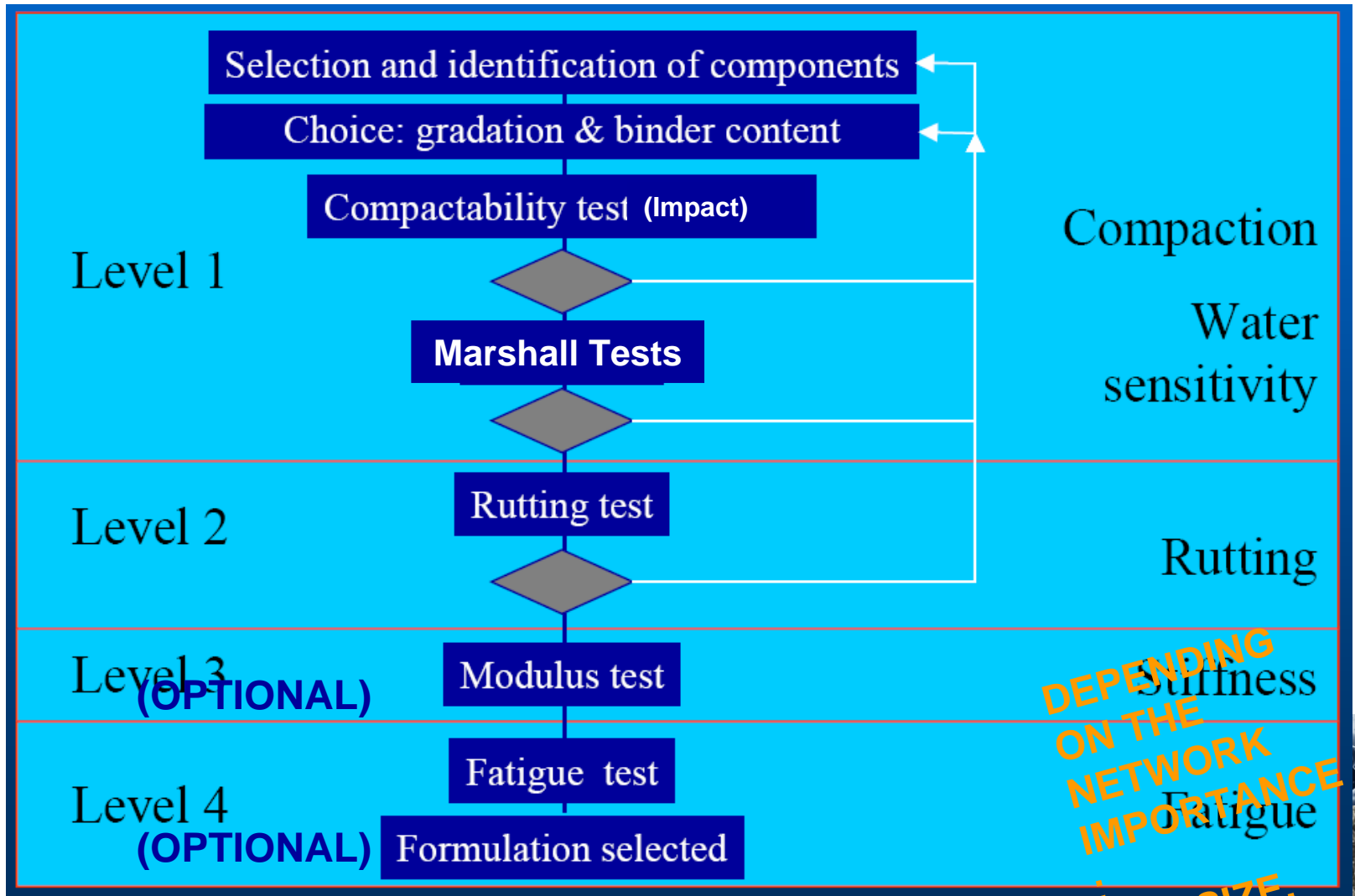
## SELECTIONS MADE

- EVALUATION OF CONFORMITY AND CE MARKING
  - LABORATORY COMPOSITION VALIDATION  
(INSTEAD OF PRODUCTION COMPOSITION)
  - SINGLE RESULT METHOD  
(INSTEAD OF THE MEAN OF FOUR RESULT METHOD)





# PORTUGUESE MIX DESIGN METHODOLOGY



## WHAT IS INTENDED

- **NO duplication** of work for CE Marking and for Specification for Highway Works Compliance purposes
- Specification for Highway Works may be **more demanding**:
  - Product Control Tests Frequency
  - Performance tests (stiffness and fatigue)
    - Work complexity
    - Work Importance



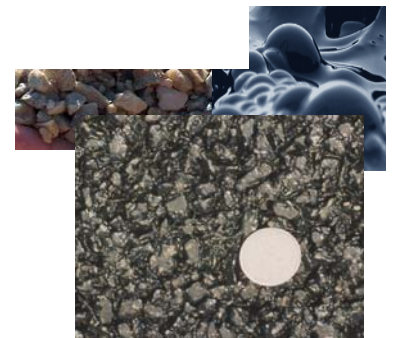
# QUESTIONS

- Necessary a new audit of a NB always a mobile plant is re-located?
- If a mobile plant has a serious malfunction, the producer must ask an extraordinary audit to a NB?



# CONCLUSIONS

- Need to review Contractual Documents
- Special work when defining requirements within fundamental approach



THANK YOU VERY MUCH FOR  
YOUR ATTENTION!

