A first look at the New SR 28

"Guidance on the use and specification of bituminous materials in Ireland"

Presented

by

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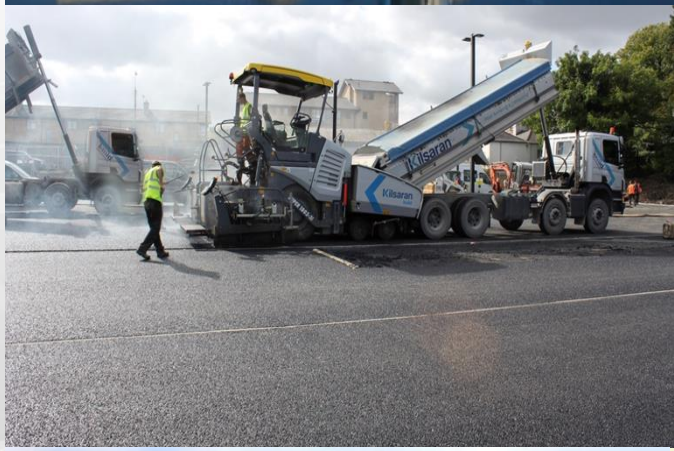
Kilsaran INTERNATIONAL

Overview.

- What is SR28 and Why is it needed.
- NSAI - TC227 Asphalt WG
- SR28
- Example specification

What is SR 28?

Recommendation for the use and implementation of the I.S. EN 13108 series bituminous mixtures – material specifications



EN 13108

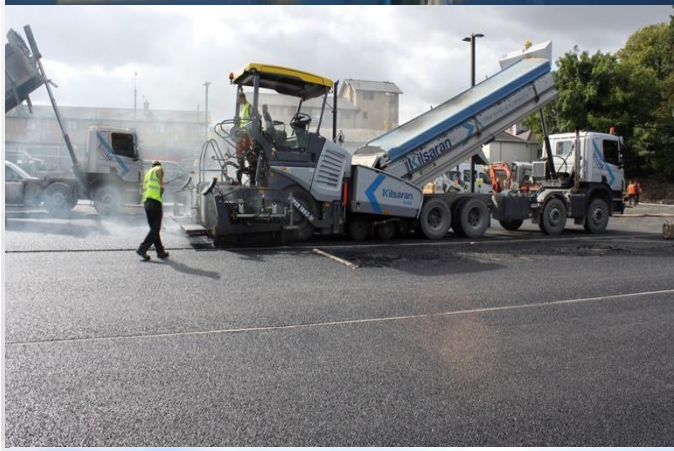
Contract Specifications

S.R 28

NSAI Standards

Standard Recommendation
S.R. 28:2009

Recommendation for the use and implementation of the I.S. EN 13108 series bituminous mixtures – material specifications



Why update SR 28?

- EN13108 - 5 year review
- Which properties are relevant?
- What levels to choose?
- Existing SR28 was an introduction to EN standards
- Existing SR28 more aimed towards producers and FPC.
- Not being used by the wider industry

NSAI - Working Group TC227 Asphalt WG

- Who's involved:
  - NSAI Secretary
  - Industry Representation
- Work commenced in 2015
  - Completed Late 2017
- SR28 published early 2018

SR28 – Before work Started

- Start from scratch rather than update existing SR28
- Knowledge gaps
- Over specification -Tii 900 series
- One stop shop!

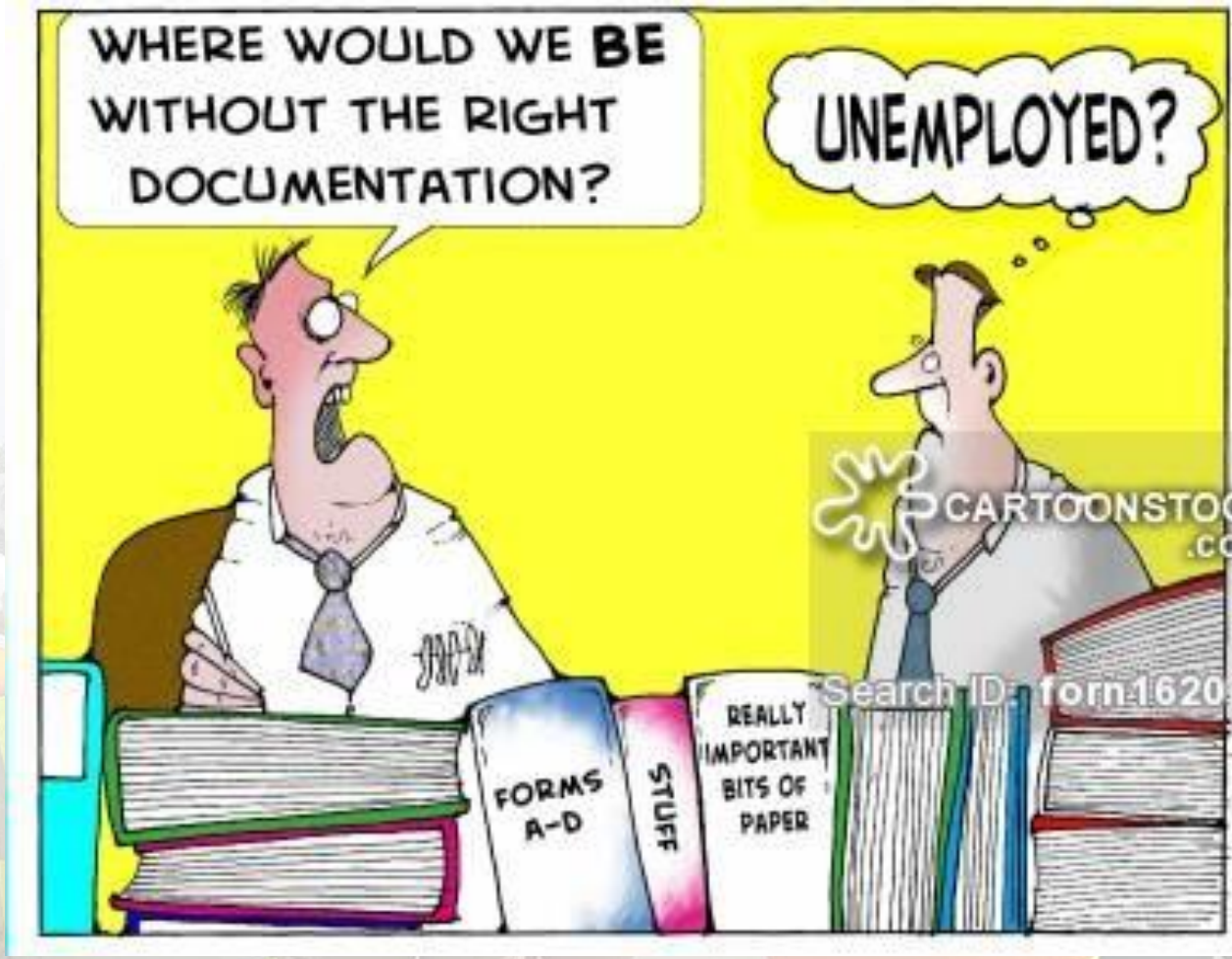
- SR28 highlights end use applications and material selection

- Transport, Laying, Compaction outside scope to be covered in I.S.844

Why is it not here now? 2016

- Cen
- European Commission
- OJEU
- CE Marking (2006)

- Red tape!!!!



Overview of layout of SR28

- Introduction
- Requirements
- Constituents
- Requirements for the mixture
  - Bmin
- Identification
  - delivery ticket
- Evaluation of conformity
  - Type Testing
  - Factory Production Control

Overview of layout of SR28

- **Annex A -** End use applications for mixture
- **Annex B -** Mix Design Parameters
- **Annex C** - Composition , grading, binder content etc.
- **Annex D** - Over Specification-Conflicting Requirements
- **Annex E** – Guidance for determining mixtures for particular end uses
- **Annex F** - Coated chippings for application to hot rolled asphalt surface courses
- **Annex G** - Protocol for determining the design binder content of designed HRA surface course mixtures to I.S. EN 13108-4
- **Annex H -** Protocol for determining the design content of designed Marshall mixtures
- **Annex I -** Examples of Declaration of Performance and CE Marking
- **Annex J -** Test Methods

Annex A - End use applications for mixture

Mixture type	Application												
	Public Roads	Bus lanes and Stops	Housing Estate Roads	Industrial Estate Roads	Industrial Areas	Car Parks	Private Driveways	Sustainable Urban Drainage (SUDs)	Ports & Heavy Duty Storage Areas	Airfield Movement Areas	Airfield Aprons	Ironwork Surrounds / Car park decks / Bridgedecks	Footpaths / Cycleways / Recreational Areas
	BASE												
AC 32 dense base	B1/1-1	B2/ 1-1	B3/1-1	B4/1-1	B5/1-1				B9/1-1	B10/1-1	B11/1-1		
	BINDER COURSE												
AC 32 dense bin	B1/2-1	B2/2-1	B3/2-1	B4/2-1	B5/2-1				B9/2-1	B10/2-1	B11/2-1		
AC 20 dense bin	B1/2-2	B2/2-2	B3/2-2	B4/2-2	B5/2-2	B6/2-1	B7/2-1		B9/2-2	B10/2-2	B11/2-2		B13/2-1
AC 20 open bin								B8/2-1					B13/2-2
AC 20 EME 2 bin		B2/2-3			B5/2-3				B9/2-3	B10/2-3	B11/2-3		
AC 14 EME 2 bin		B2/2-4			B5/2-4				B9/2-4	B10/2-4	B11/2-4		
AC 10 EME 2 bin		B2/2-5			B5/2-5				B9/2-5	B10/2-5	B11/2-5		
AC 32 Marshall bin					B5/2-6				B9/2-6	B10/2-6	B11/2-6		
AC 20 Marshall bin					B5/2-7				B9/2-7	B10/2-7	B11/2-7		
SMA 14 bin	B1/2-3	B2/2-6	B3/2-3		B5/2-8				B9/2-8	B10/2-8	B11/2-8		
SMA 10 bin	B1/2-4	B2/2-7	B3/2-4		B5/2-9				B9/2-9	B10/2-9	B11/2-9		
SMA 6 bin	B1/2-5	B2/2-8	B3/2-5		B5/2-10				B9/2-10	B10/2-10	B11/2-10		
PA 20 bin								B8/2-2					B13/2-3
	SURFACE COURSE												
AC 14 close surf	B1/3-1		B3/3-1										B13/3-1
AC 14 open surf									B9/3-1		B11/3-1		B13/3-2
AC 10 close surf	B1/3-2		B3/3-2				B7/3-1						B13/3-3
AC 10 open surf								B8/3-1	B9/3-2		B11/3-2		B13/3-4
AC 6 close surf							B7/3-2						B13/3-5
AC 6 medium surf													B13/3-6

Annex B - Mix Design Parameters

Application: Airfield Movement Areas	Table reference	Binder content & Grading– See table	Void content	Water sensitivity	Voids filled with binder	Marshall flow	Marshall stability	Resistance to permanent deformation	Stiffness	Fatigue [1]	Binder drainage	Strain for fracture toughness	Resistance to fuel	Resistance to de-icing fluid
Mixture type		**BASE**												
AC 32 dense base	B10/1-1	C10b / 1-1	$V_{min\ 2,0}$, $V_{max\ 10,0}$	$ITSR_{min70}$	-	-	-	-	-	-	-			
		BINDER COURSE												
AC 32 dense bin	B10/2-1	C10b / 2-1	$V_{min\ 2,0}$, $V_{max\ 10,0}$	$ITSR_{min70}$	-	-	-	-	-	-	-			
AC 20 dense bin	B10/2-2	C10b / 2-2	$V_{min\ 2,0}$, $V_{max\ 8,0}$	$ITSR_{min80}$	-	-	-	-	-	-	-			
AC 20 EME 2 bin	B10/2-3	C10b / 2-3	$V_{max\ 6,0}$ (120 gyrations)	$ITSR_{min75}$	-	-	-	$P_{max7,5}$ ($V_{min3,0}$ to $V_{max6,0}$)	S_{min} 5 500	$\varepsilon_{6\text{-min }130}$ ($V_{min3,0}$ to $V_{max5,0}$)	-			
AC 14 EME 2 bin	B10/2-4	C10b / 2-4	$V_{max\ 6,0}$ (100 gyrations)	$ITSR_{min75}$	-	-	-	$P_{max7,5}$ ($V_{min3,0}$ to $V_{max6,0}$)	S_{min} 5 500	$\varepsilon_{6\text{-min }130}$ ($V_{min3,0}$ to $V_{max5,0}$)	-			
AC 10 EME 2 bin	B10/2-5	C10b / 2-5	$V_{max\ 6,0}$ (80 gyrations)	$ITSR_{min75}$	-	-	-	$P_{max7,5}$ ($V_{min3,0}$ to $V_{max6,0}$)	S_{min} 5 500	$\varepsilon_{6\text{-min }130}$ ($V_{min3,0}$ to $V_{max5,0}$)	-			
AC 32 Marshall bin	B10/2-6	C10b / 2-6	$V_{min\ 3,0}$, $V_{max\ 5,0}$	$ITSR_{min70}$	VFB_{min65}, VFB_{max77}	$F_{4,0}$	$MS_{min\ 10,0}$	-	-	-	-	$\varepsilon_{max,\ i} \geq 2.0\%$		
AC 20 Marshall bin	B10/2-7	C10b / 2-7	$V_{min\ 3,0}$, $V_{max\ 5,0}$	$ITSR_{min70}$	VFB_{min65}, VFB_{max77}	$F_{4,0}$	$MS_{min\ 10,0}$	-	-	-	-	$\varepsilon_{max,\ i} \geq 2.0\%$		
SMA 14 bin	B10/2-8	C10b / 2-8	$V_{min\ 2,0}$, $V_{max\ 4,0}$	$ITSR_{min80}$	-	-	-	-	-	-	$BD_{max\ 0,3}$			
SMA 10 bin	B10/2-9	C10b / 2-9	$V_{min\ 2,0}$, $V_{max\ 4,0}$	$ITSR_{min80}$	-	-	-	-	-	-	$BD_{max\ 0,3}$			
SMA 6 bin	B10/2-10	C10b / 2-10	$V_{min\ 2,0}$, $V_{max\ 4,0}$	$ITSR_{min80}$	-	-	-	-	-	-	$BD_{max\ 0,3}$			

Annex C - Composition , gradings, binder content etc.

EN 13108 reference	1	1	1	4	5	5	5	1	5	5	5
Table column reference	C3/1-1	C3/2-1	C3/2-2	C3/2-3	C3/2-4	C3/2-5	C3/3-1	C3/3-2	C3/3-3	C3/3-4	C3/3-5
Layer	Base	Binder	Binder	Binder	Binder	Binder	Surface	Surface	Surface	Surface	Surface
Mixture designation	AC 32 dense base	AC 32 dense bin	AC 20 dense bin	SMA 14 bin	SMA 10 bin	SMA 6 bin	AC 14 close surf	AC 10 close surf	SMA 14 surf	SMA 10 surf	SMA 6 surf
Sieve Size	% by mass passing										
40	100	100									
31,5	90 to 100	90 to 100	100								
20	71 to 95	71 to 95	90 to 100	100			100		100		
14				90 to 100	100		90 to 100	100	90 to 100	100	
10			52 to 72	35 to 60	90 to 100	100	70 to 90	90 to 100	35 to 60	90 to 100	100
6,3	44 to 60	44 to 60	38 to 56	20 to 45	30 to 55	90 to 100	45 to 65	55 to 75	20 to 45	30 to 55	90 to 100
4						25 to 45					25 to 45
2	20 to 40	20 to 40	20 to 40	15 to 30	20 to 35	25 to 40	19 to 33	19 to 33	15 to 30	20 to 35	25 to 40
1							15 to 30	15 to 30			
0,500											
0,250	6 to 20	6 to 20	6 to 20								
0,125											
0,063	2 to 9	2 to 9	2 to 9	6 to 12	6 to 12	8 to 14	3 to 8	3 to 8	6 to 12	6 to 12	8 to 14
Minimum B_{MIN}											
10/20; 15/25											
40/60	3,9	4,3	4,4	5,3[1]	5,5[1]	5,8[1]			5,5[1]	5,7[1]	6,0[1]
70/100	3,9	4,3	4,4	5,3[1]	5,5[1]	5,8[1]	5,0	5,2			
Polymer Modified				5,1	5,3	5,6			5,3	5,5	5,8

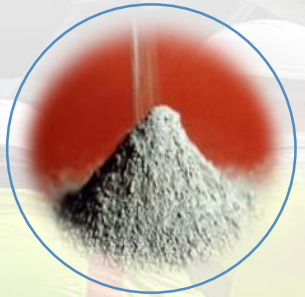
[1] When Paving grade binder is used in SMA the mixture shall include a minimum of 0,3% by mass of Fibres

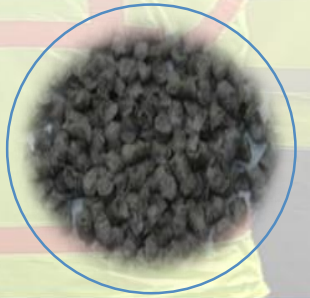
Appendix D - Over Specification

- Conflicting requirements
- All in the SR is not conflicting and conforms to Annex D
- Ensures users don’t over-specify

Annex E - Guidance for determining mixtures for particular end uses

- Information on Pavement Layers – surf, bin, base
- Explaining Mix Types – HRA, SMA, AC
- Additives & Special Mixtures – Warm Mix, Fuel Resisting
- Specific Considerations – binder grade, filler, reclaim asphalt
- Particular End Uses





Annex F - Coated chippings for application to hot rolled asphalt surface courses

- Pre Coated Chippings for HRA
- 2 options
- Information on identification

Annex G - Protocol for determining the design binder content of designed HRA surface course mixtures to I.S. EN 13108-4

- Lab Design
- Marshall values

Annex H - Protocol for determining the design content of designed Marshall mixtures

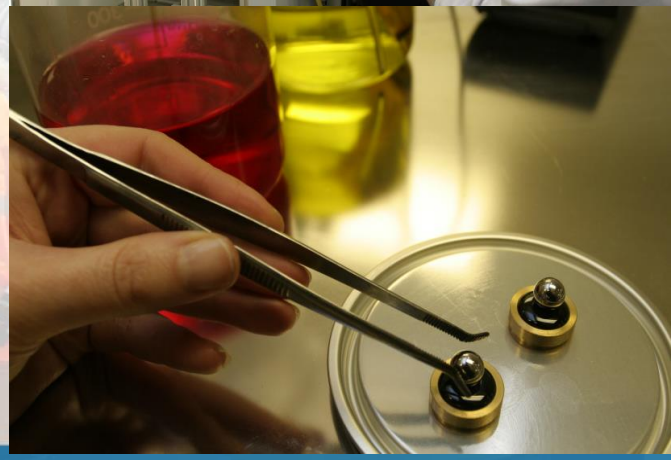
- Marshall Design for Airfields
- Marshall values, different to HRA design

Annex I - Examples of Declaration of Performance and CE Marking

- Required Documentation
- DOP (Declaration Of Performance)
- Type Test Report – Requirements
- CE Mark

Annex J - Test Methods

- Test Methods
- Tests required for performance characteristics
  - Eg. Water Sensitivity – Value min 80 – Test Method IS EN 12697-12
- Short description of test for those unfamiliar



Taking one Application

- Annex A

- Housing estate road

- Definition

  "A road provided primarily for the use of vehicles associated with housing over which public access may or may not exist and the responsibility for the maintenance of which may or may not lie with a public authority"

Annex A	*Annex B*	*Annex C*	*Annex D*	*Annex E*	*Annex F*
Application End Use	**Properties**	**Composition**	**Conflicting Requirements**	**Guidance on uses, particular end uses and maintenance considerations**	**Guidance on bituminous mixtures test methods**
Table A1	*Table No.*	*Table No.*	*Table No.*	*Annex*	*Table No.*
Public Roads	B1	C1	D1	Annex E	F1
Bus lanes and Stops	B2	C2			
Housing Estate roads	B3	C3			
Industrial Estate roads	B4	C4			
Industrial Areas	B5	C5			
Car Parks	B6	C6			
Private Driveways	B7	C7			
Sustainable Urban Drainage (SUDs)	B8	C8			
Ports & Heavy Duty Storage Areas	B9	C9a, C9b			
Airfield Movement Areas	B10	C10a, C10b			
Airfield Aprons	B11	C11a, C11b			
Ironwork Surrounds / Cark park decks / Bridgedecks	B12	C12			
Footpaths / Cycle ways / Recreational areas	B13	C13			

Table B.3

Application: Housing Estate Roads	**Table reference**	Binder content & Grading– See table	Void content	Water sensitivity	Binder drainage
Mixture type		**BASE**			
AC 32 dense base	B3/1-1	C3 / 1-1	$V_{min\ 2,0}$, $V_{max\ 10,0}$	$ITSR_{min70}$	-
		BINDER COURSE			
AC 32 dense bin	B3/2-1	C3 / 2-1	$V_{min\ 2,0}$, $V_{max\ 10,0}$	$ITSR_{min70}$	-
AC 20 dense bin	B3/2-2	C3 / 2-2	$V_{min\ 2,0}$, $V_{max\ 8,0}$	$ITSR_{min70}$	-
SMA 14 bin	B3/2-3	C3 / 2-3	$V_{min\ 2,0}$, $V_{max\ 8,0}$	$ITSR_{min80}$	$BD_{max0,3}$
SMA 10 bin	B3/2-4	C3 / 2-4	$V_{min\ 2,0}$, $V_{max\ 8,0}$	$ITSR_{min80}$	$BD_{max0,3}$
SMA 6 bin	B3/2-5	C3 / 2-5	$V_{min\ 2,0}$, $V_{max\ 8,0}$	$ITSR_{min80}$	$BD_{max0,3}$
		SURFACE COURSE			
AC 14 close	B3/3-1	C3 / 3-1	$V_{min\ 3,0}$, $V_{max\ 11,0}$	$ITSR_{min80}$	-
AC 10 close	B3/3-2	C3 / 3-2	$V_{min\ 3,0}$, $V_{max\ 11,0}$	$ITSR_{min80}$	-
SMA 14 surf	B3/3-3	C3 / 3-3	$V_{min\ 2,0}$, $V_{max\ 5,0}$	$ITSR_{min80}$	$BD_{max0,3}$
SMA 10 surf	B3/3-4	C3 / 3-4	$V_{min\ 2,0}$, $V_{max\ 5,0}$	$ITSR_{min80}$	$BD_{max0,3}$
SMA 6 surf	B3/3-5	C3 / 3-5	$V_{min\ 2,0}$, $V_{max\ 5,0}$	$ITSR_{min80}$	$BD_{max0,3}$

Annex A	*Annex B*	*Annex C*	*Annex D*	*Annex E*	*Annex F*
Application **End Use**	**Properties**	**Composition**	**Conflicting Requirements**	**Guidance on uses, particular end uses and maintenance considerations**	**Guidance on bituminous mixtures test methods**
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Housing Estate roads	B3	C3			
Industrial Estate roads	B4	C4			
Industrial Areas	B5	C5			
Car Parks	B6	C6			
Private Driveways	B7	C7			
Sustainable Urban Drainage (SUDs)	B8	C8			
Ports & Heavy Duty Storage Areas	B9	C9a, C9b			
Airfield Movement Areas	B10	C10a, C10b			
Airfield Aprons	B11	C11a, C11b			
Ironwork Surrounds / Cark park decks / Bridgedecks	B12	C12			
Footpaths / Cycle ways / Recreational areas	B13	C13			

Table C.3

EN 13108 reference	1	1	1	4	5	5	5	1	5	5	5
Table column reference	C3/1-1	C3/2-1	C3/2-2	C3/2-3	C3/2-4	C3/2-5	C3/3-1	C3/3-2	C3/3-3	C3/3-4	C3/3-5
Layer	Base	Binder	Binder	Binder	Binder	Binder	Surface	Surface	Surface	Surface	Surface
Mixture designation	AC 32 dense base	AC 32 dense bin	AC 20 dense bin	SMA 14 bin	SMA 10 bin	SMA 6 bin	AC 14 close surf	AC 10 close surf	SMA 14 surf	SMA 10 surf	SMA 6 surf
Sieve Size	% by mass passing										
40	100	100									
31,5	90 to 100	90 to 100	100								
20	71 to 95	71 to 95	90 to 100	100			100		100		
14				90 to 100	100		90 to 100	100	90 to 100	100	
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0,250	6 to 20	6 to 20	6 to 20								
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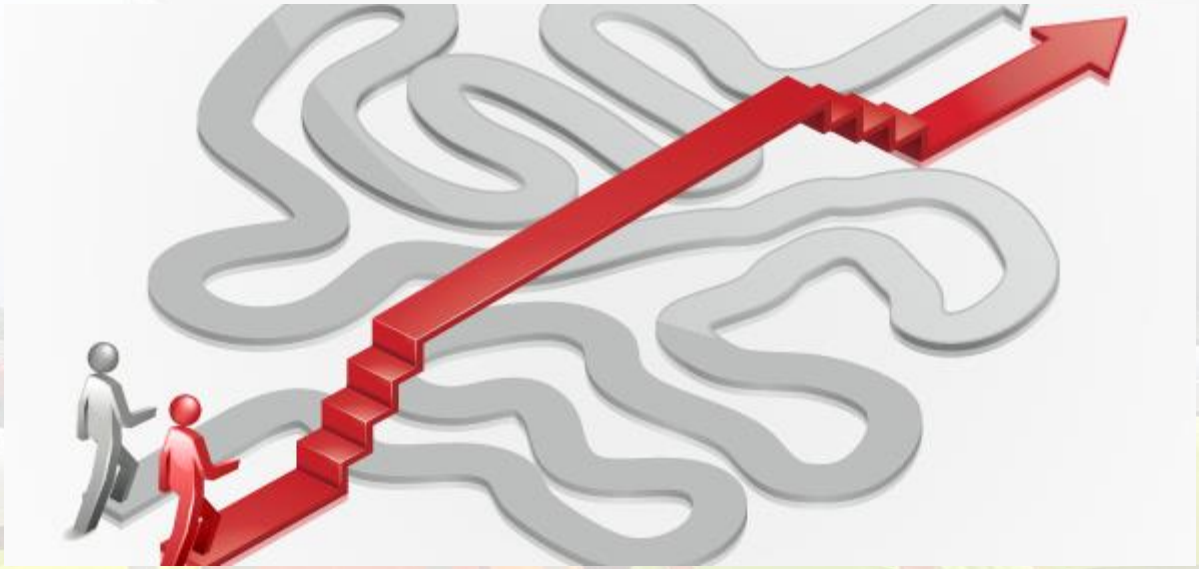
Minimum B_{MIN}											
10/20; 15/25											
40/60	3,9	4,3	4,4	5,3[1]	5,5[1]	5,8[1]			5,5[1]	5,7[1]	6,0[1]
70/100	3,9	4,3	4,4	5,3[1]	5,5[1]	5,8[1]	5,0	5,2			
Polymer Modified				5,1	5,3	5,6			5,3	5,5	5,8

[1] When Paving grade binder is used in SMA the mixture shall include a minimum of 0,3% by mass of Fibres

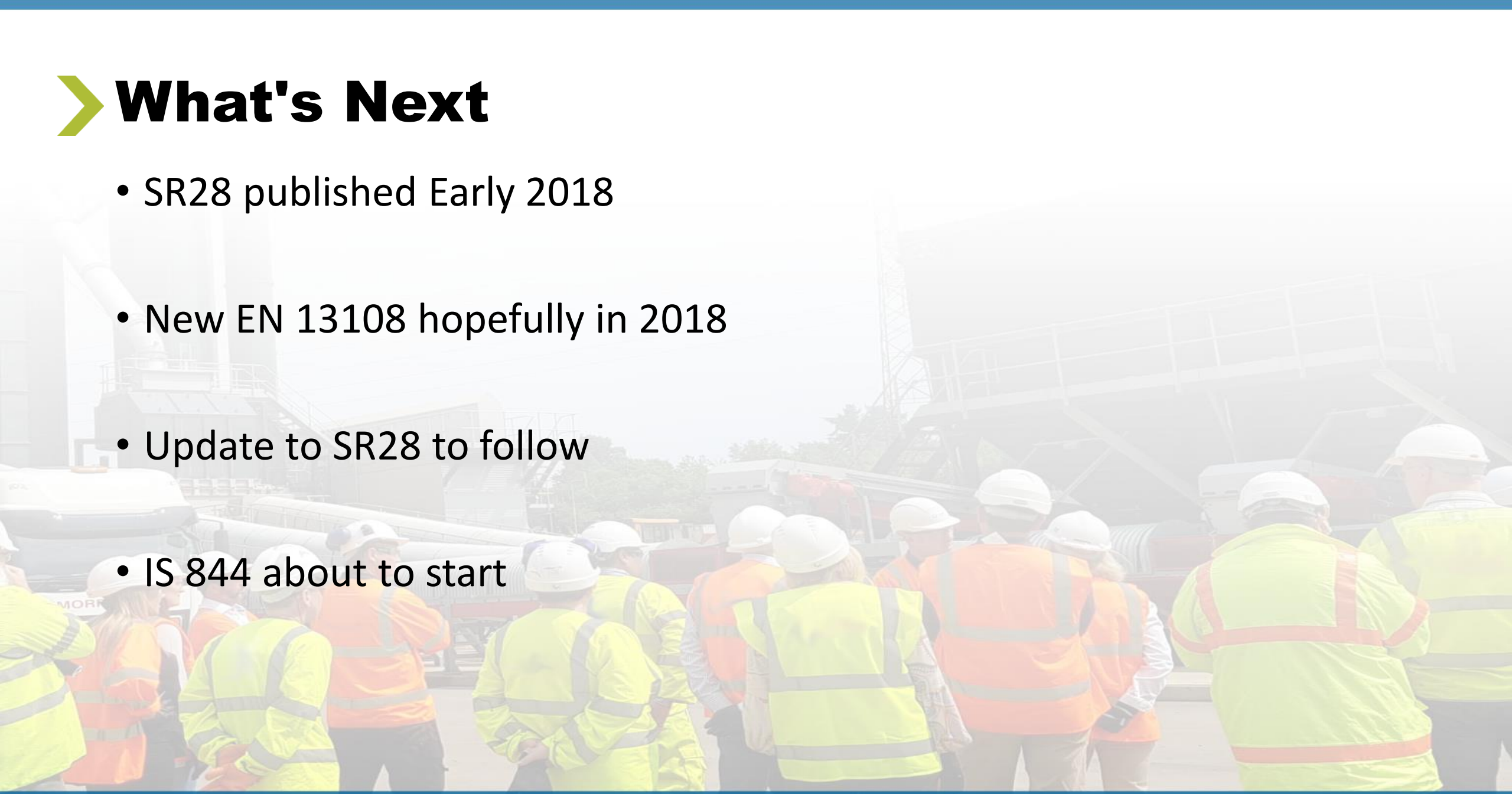
SR28 –Conclusions

- Easy to use tables
- End Use
- Properties
- Performance Categories
- Composition
- Advice on material use
- Example CE/DoP/Type test report
- Advice on testing



What's Next

- SR28 published Early 2018
- New EN 13108 hopefully in 2018
- Update to SR28 to follow
- IS 844 about to start



Thanks for your attention!