

New Snow Test Method for Tyre Class C3 Agenda

1. Scope
2. Requirements for test method
3. Boundary Conditions
4. Test Method Approach
5. Results
6. Conclusions

New Snow Test Method for Tyre Class C3

1. Scope

As allowances for Noise and Rolling Resistance minimum performance are granted to “Snow tyre”, a proper test method based on snow performance should be introduced taking into account the existing industrial testing practice in Europe. Hence there is a need to develop an objective test method on snow covered surfaces which is able to segregate class C3 “Snow tyres” from “Normal tyres”

	C1	C2	C3
Spin Traction method	Existing	Existing	No
Brake on Snow method	Existing		No
Acceleration method	No	No	Proposal



New Snow Test Method for Tyre Class C3

2. Requirements for Test Method

- Having a high sensitivity to performance variations on snow.
- Acceptable accuracy and repeatability.
- Using two reference tyres depending on the tyre section width:
 - **ASTM F 2871 SRTT 19.5**
 - **ASTM F 2870 SRTT 22.5**
- Capable to test steer, drive and trailer tyres on snow with properly defined test conditions to cover the regular use of snow tyres
- Robust / stable test method within the defined range of test condition
- Easy to perform by technical services and tyre manufacturers.

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3. Boundary Conditions

- Use of two-axle vehicles to reduce the number of test tyres
- Efficient and effective method covering all C3 category tyre sizes
- Low tyre load to cover worst case of application (empty truck conditions)
- Can be conducted in a feasible time frame



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4. Test Method Approach

Snow Acceleration with traction control system on hard packed snow surface

Acceleration test shows the following advantages:

- Easy preparation and maintenance of the track → time and cost efficiency
- Low damaging of the tracks during the test runs → high test quality
- High sensitivity of the test method and therefore clear discrimination between normal and snow tyres
- Testing of all kind of tyre fitment (steer, drive, trailer, coach)

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4. Test Method Approach - Description

Test Method Description:

Vehicle available on the market

Reference tyres:

- **ASTM F 2870** - 315/70 R 22.5 SRTT
- **ASTM F 2871** - 245/70 R 19.5 SRTT

Tyre Configuration: drive axle only

Snow surface: Hard packed snow with CTI 80-90

Ambient Temperature: -2°C to -15°C

Surface Temperature: -4°C to -15°C

Recommended Gear: 3rd or 4th (giving minimum 13% average slip ratio)
(constant gear - no gear change in the measurement range)

Initial Speed: between 4 -11 km/h

Final speed: 15 km/h above initial speed (19 to 26 km/h)

Recorded Measurement: Distance to reach final speed



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4. Test Method Approach - Description

Test Method Description:

Test sequence R – T1 – R, max. R – T1 – T2 – T3 – R

Test variation max. CV = 6% (CV = Coefficient of Variation)

Test runs min. of 6



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4. Test Method Approach - Vehicle

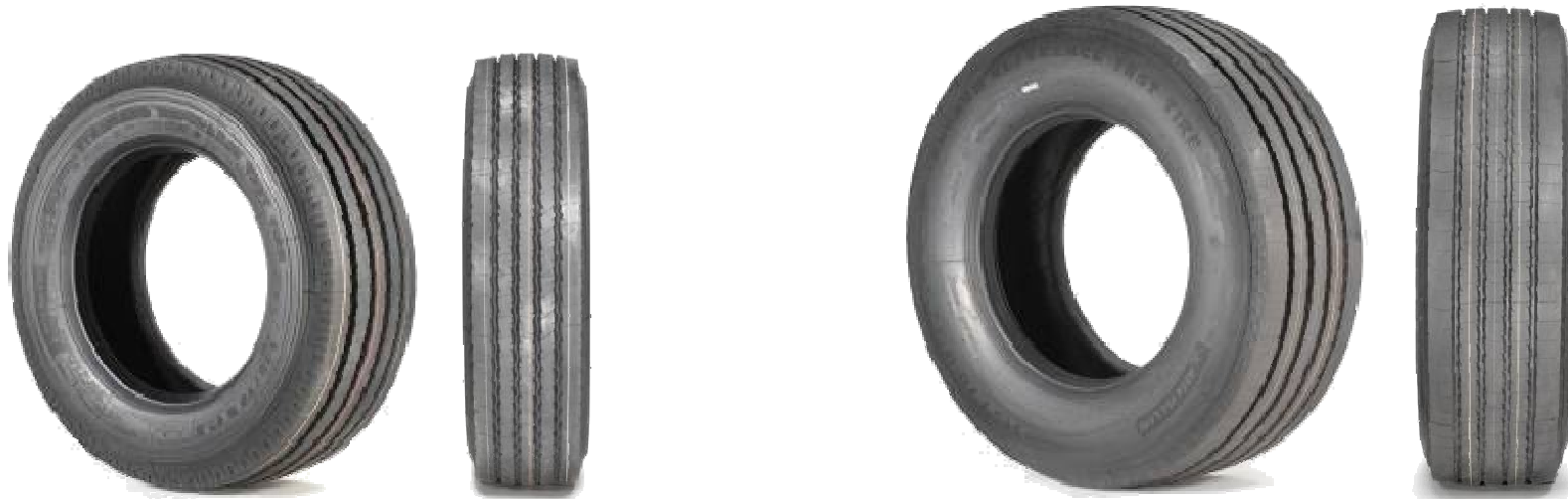


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4. Test Method Approach – Reference Tyres

C3 SRTT's:

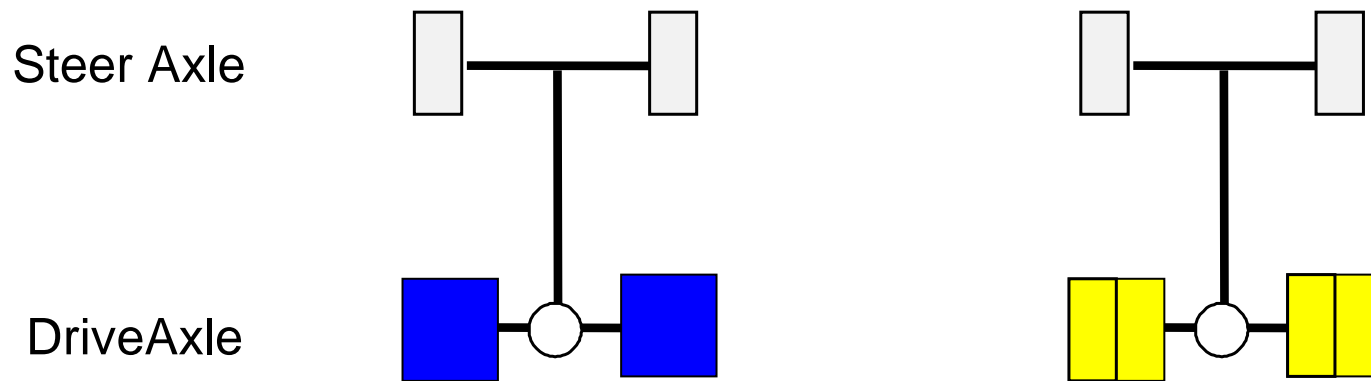
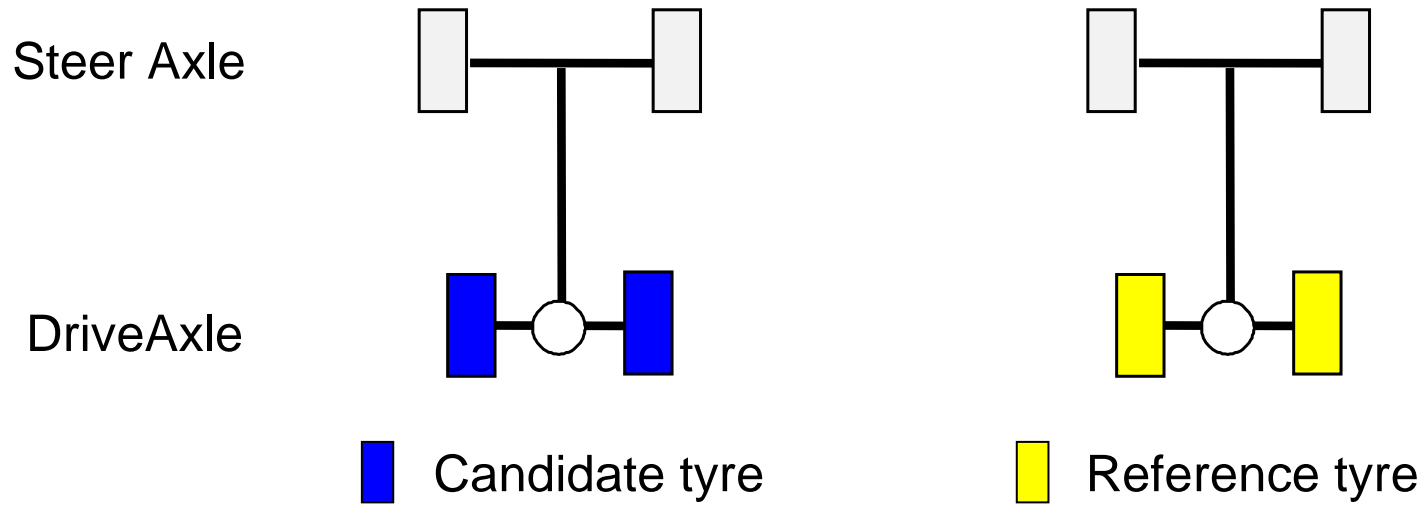
SRTT for C3 tyres → 2 Families	
C3 NARROW FAMILY $S_{Nominal} < 285 \text{ mm}$	C3 WIDE FAMILY $S_{Nominal} \geq 285 \text{ mm}$
ASTM F 2871 SRTT 245/70R19.5	ASTM F 2870 SRTT 315/70R22.5
$S_{Nominal} = \text{Tyre Nominal Section width}$	



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4. Test Method Approach – Tyre Configuration

Possible Tyre Configuration for Snow Acceleration:



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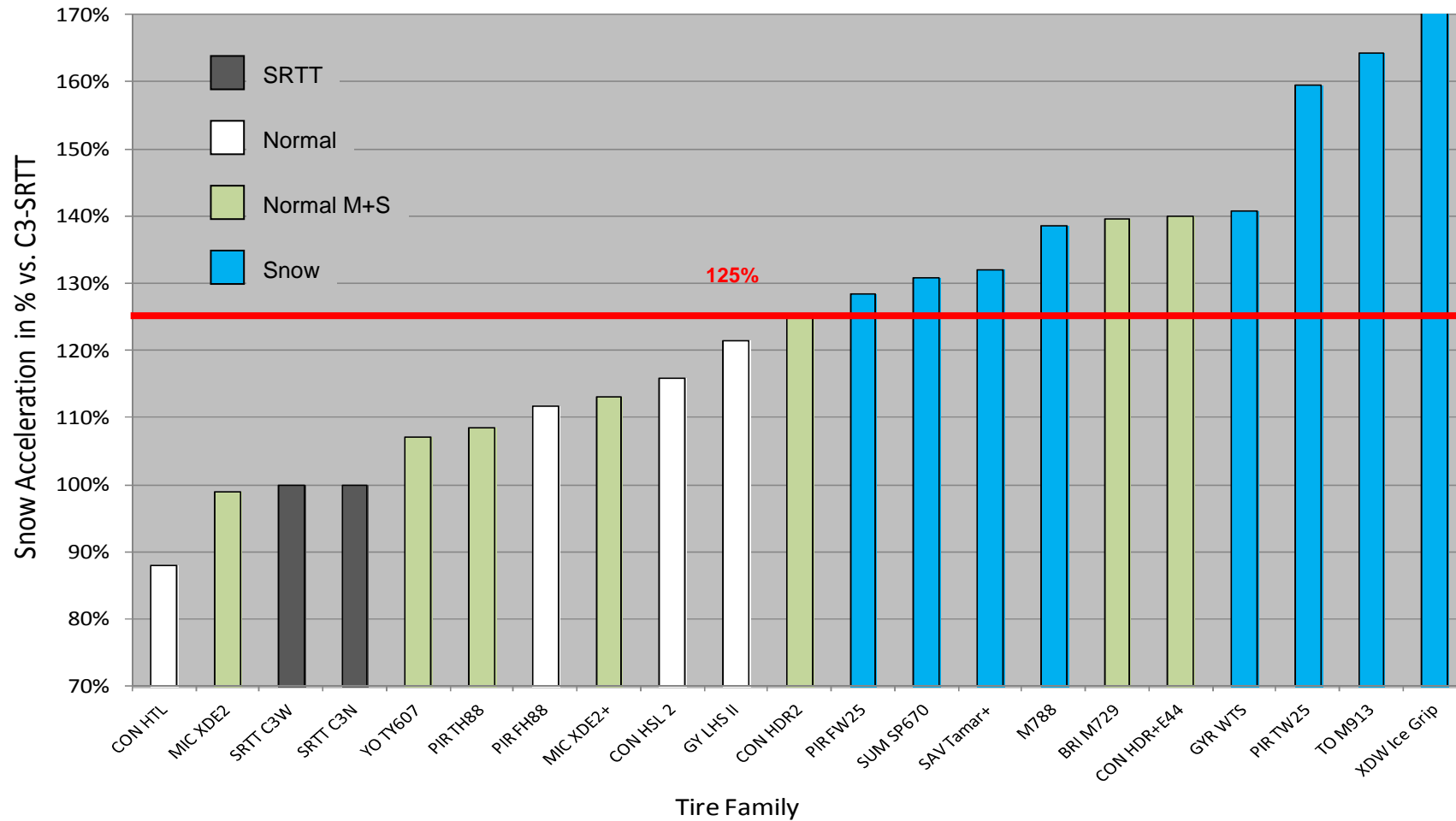
5. Manufacturers and Tested Tyres

Testing Manufacturers	Tested Tyres	
	Size	Pattern
BRIDGESTONE	315/70R22.5	SRTT C3L (wide)
	245/70R19.5	SRTT C3N (narrow)
CONTINENTAL	315/70R22.5	Old used XZE2+
	215/75R17.5	GDY LHT
GOODYEAR	315/70R22.5	MIC XD/XDA2 E.
	245/70R19.5	YOK TY287
MICHELIN	245/70R19.5	MIC XDE2+
	215/75R17.5	BRI M729
JATMA A	245/70R19.5	CON HDR+E44
	215/75R17.5	CON LDR1
JATMA B	9.5R17.5	SAV Tamar+
	245/70R19.5	SUM SP670
JATMA C	315/70R22.5	GDY WTS
	215/75R17.5	BRI M788
JATMA D	215/75R17.5	GDY RHD2
	315/70R22.5	GDY WTD
	245/70R19.5	Mi XDS
	245/70R19.5	TOY M919



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6. Test Results – Order of Ranking



Threshold proposal: 125% vs. C3-SRTT



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7. Conclusions - Summary

1) The snow acceleration test method for C3 is capable to segregate snow tyres from normal tyres for a proper definition of snow tyres based on performance.

2) A single threshold of **125%** vs. the wide and narrow C3-SRTT is possible.

Reasons are the followings:

- a. The snow performance of **all NORMAL** and **Normal M+S** tyres which are not designed for snow is **below** this threshold
- b. The snow performance of **only a few of the Normal M+S** tyres are **above** this threshold, since they are designed for good snow performance.
- c. The snow performance of **all SNOW** tyres is **above** this threshold

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Thank you!



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ANNEX



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Test Results

Round Robin Test Results 2009/10 and 2010/11

Family	Size	Pattern	Jatma A	Jatma C	Conti	Michelin	Goodyear	Ave
Normal	385/65R22.5	CON HTL			84%	85%	95%	88%
Normal M+S	295/80R22.5	MIC XDE2			99%	108%	90%	99%
SRTT	315/70R22.5	SRTT C3W	100%	100%	100%	100%	100%	100%
SRTT	245/70R19.5	SRTT C3N		100%	100%	100%	100%	100%
Normal M+S	315/80R22.5	YO TY607	109%	123%	101%	113%	90%	107%
Normal M+S	315/70R22.5	PIR TH88			112%	106%	108%	109%
Normal	315/70R22.5	PIR FH88			109%	110%	116%	112%
Normal M+S	245/70R19.5	MIC XDE2+	118%	104%	119%	111%		113%
Normal	295/80R22.5	CON HSL 2			115%	123%	110%	116%
Normal	385/55R22.5	GY LHS II			118%	119%	127%	121%
Normal M+S	315/70R22.5	CON HDR2	132%	143%	123%	113%	114%	125%
Snow	315/70R22.5	PIR FW25			122%	131%	131%	128%
Snow	245/70R19.5	SUM SP670	124%	145%	125%	124%	136%	131%
Snow	9.5R17.5	SAV Tamar+			141%	133%	122%	132%
Snow	315/70R22.5	M788	137%	147%	141%	143%	125%	139%
Normal M+S	215/75R17.5	BRI M729			127%	150%	142%	140%
Normal M+S	245/70R19.5	CON HDR+E44	154%	115%	139%	148%	144%	140%
Snow	295/80R22.5	GYR WTS			136%	142%	144%	141%
Snow	315/70R22.5	PIR TW25	172%	182%	141%	141%	161%	159%
Snow	315/80R22.5	TO M913	201%	185%	139%	161%	136%	164%
Snow	245/70R19.5	XDW Ice Grip	180%	187%	153%	192%		178%

Threshold proposal: 125% vs. C3-SRTT

