



**International Conference**

**Lublin, Poland 18-19.05.2021**

**Issues for sustainable roads and ecoinfrastructures: *new challenges in the context of Energy and Climate***

# **Project ELANORE – Improvement of the EU tyre labelling system for noise and rolling resistance**

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**GDAŃSK UNIVERSITY  
OF TECHNOLOGY**

# Project ELANORE

## Improvement of the EU tyre labelling system for noise and rolling resistance

Financing program:

NCBiR under Norwegian Financial Mechanism 2014-2021, POLNOR / 2019, *Energy, transport and climate*

Project start date: 2020.05.01 and finish date: 2023.04.30



### Partners:

- **Gdansk University of Technology (GUT)**  
ul. G. Narutowicza 11/12, 80-233 Gdańsk, Poland
- **SINTEF AS, by its institute SINTEF Digital**  
Strindvegen 4, NO-7465 Trondheim, Norway
- **EKKOM Sp. z o.o.**  
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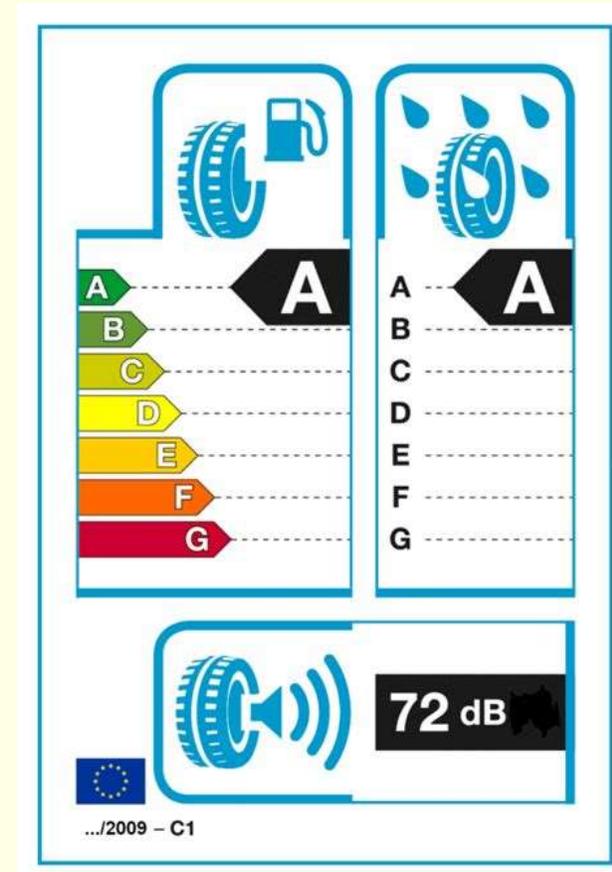
WP no	WP Leader		Involved partners	WP Title	Tasks	Start Month	End Month
1	GUT	Dr hab. inż. Grzegorz Ronowski	GUT	Representativeness verification of the rolling resistance test methods proscribed in the Tyre Labelling Directive.	1.1. Organization of kick-off seminar for consortium members and invited guests. 1.2. Launching of the project webpage. 1.3. Selection of tyres covering broad range of fuel efficiency grades (from A to G). 1.4. Smooth drum tests of tyres selected in Task 3. 1.5. Selection of 6 or more road surfaces representative for Europe with particular emphasis on the Nordic countries and Poland. 1.6. Road measurements of rolling resistance (with R2 Mk.2 trailer) on selected road surfaces. 1.7. Making replica road surfaces based on pavements selected in Task 5. 1.8. Laboratory (drum) rolling resistance measurements on replica road surfaces. 1.9. Data analysis.	1	18
2	SINTEF	Truls Berge, Research Scientist	GUT SINTEF EKKOM	Representativeness verification of the tyre/road noise test method proscribed in the Tyre Labelling Directive	2.1 Selection of test tyres 2.2 Selection of test vehicle 2.3 Selection of ISO test tracks 2.4 Selection of conventional pavements 2.5 Round Robin Test program on ISO test tracks 2.6 Measurement program on conventional pavements 2.7 Calibration procedure for the influence of the test track	1	16
3	GUT	Dr hab. inż. Beata Świeczko-Żurek	GUT	Development and evaluation of improved method of tyre rolling resistance measurements	3.1. Modernization of roadwheel facilities (1.7 m and 2.0 m drums). 3.2. Development of optimal replica road surface (on the base of results obtained in WP1). 3.3. Development of replica manufacturing technology. 3.4. Investigation of inflation pressure influence on RR (on drums and on the road). 3.5. Investigation of load influence on RR (on drums). 3.6. Investigation of temperature influence on results of RR measurements. 3.7. Development of parameters for enhanced laboratory method. 3.8. Dissemination of WP3 results	6	29
4	GUT	Dr hab. inż. Piotr Mioduszeński	GUT SINTEF	Development and evaluation of improved method of tyre/road noise measurements	4.1 Modernization of the GUT CPX trailer 4.2 Tyre/road noise measurements performed using the CPX method 4.3 Modernization of the roadwheel facility in GUT 4.4 Laboratory measurements of tyre/road noise 4.5 Proposal of an improved Tyre labelling procedure for noise performance of passenger car tyres	6	29
5	EKKOM	Dr hab. inż. Janusz Bohatkiewicz	GUT SINTEF EKKOM	Cost benefits analyses of improved methods and evaluation of their impact on environment	5.1 An impact and cost-benefit analysis for improved fuel efficiency measuring procedures 5.2. Tyre/road noise cost-benefit analysis of improved noise measuring method 5.3 An impact analysis of improved noise measuring method	25	36

## Examples of passenger car's tires selected for testing:

Designation	Size	Manufacturer	Tread	DOT	LI	SI	LABELS			Remarks
							Energy efficiency class	Wet grip class	External rolling noise class	
T1218	225/55R18	Michelin	CrossClimate SUV	0520	98	V	C	B	69	All Seasons
T1222	205/55R16	Bridgestone	LM32	1020	91	H	F	E	72	Winter
T1223	205/55R16	Michelin	Primacy 3	1620	91	H	E	A	71	Summer - Run On Flat
T1224	205/55R16	Goodyear	Vector 4 Seasons G2	1020	91	V	C	C	71	All Seasons
T1225	205/55R16	Goodyear	Efficientgrip Performance	2920	91	V	A	C	69	Summer
T1226	205/55R16	Michelin	CrossClimate+	1220	91	H	C	B	69	All Seasons
T1227	205/55R16	Michelin	Primacy 4	1720	91	W	C	A	68	Summer
T1228	205/55R16	Bridgestone	Turanza T001	3020	91	Q	A	B	69	Summer
T1230	205/55R16	Hankook	Ventus Prime 3 K125	2820	94	H	A	B	71	Summer - XL
T1231	205/55R16	Michelin	Primacy 4	2420	94	H	A	A	68	Summer - XL
T1232	205/55R16	Continental	EcoContact 6	2320	91	W	A	A	71	Summer
T1234	205/55R16	Michelin	CrossClimate+	3120	94	V	B	B	69	All Seasons, XL
T1235	205/60RF16	Falken	HS 449	2819	92	H	F	C	70	Winter - Run On Flat
T1236	205/55R16	Nankang	SV-3	4819	94	V	C	C	71	Winter - XL
T1237	205/55R16	Nankang	SV-3	2020	94	V	C	C	71	Winter - XL
T1238	175/60R19	Continental	EcoContact 6	2320	86	Q	A	A	70	Summer
T1239	175/60R19	Michelin	e primacy	2320	86	Q	no data	no data	no data	no data
T1240	175/60R19	Bridgestone	Ecopia EP 500	0519	86	Q	C	B	69	Summer

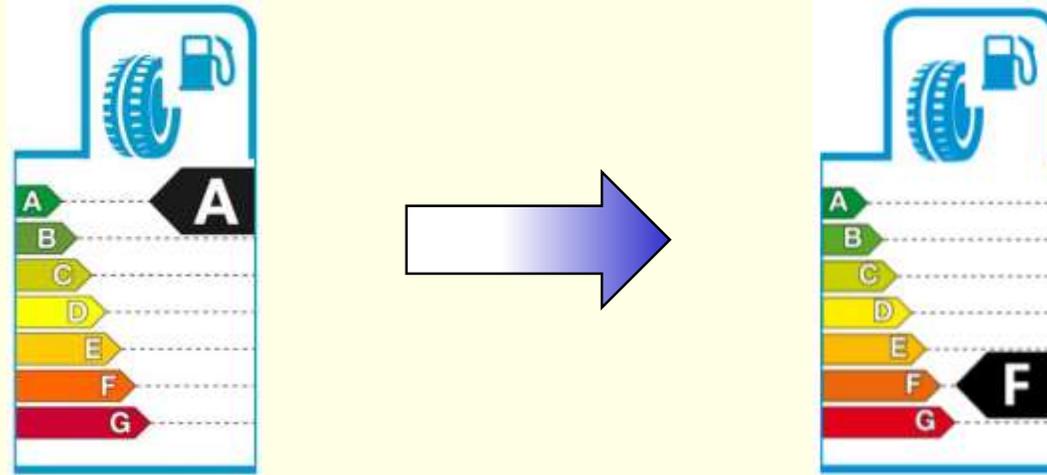
# Each tire is marked with three different labels

REGULATION (EC) No 1222/2009 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL  
of 25 November 2009  
on the labelling of tires with respect to fuel efficiency and other essential parameters

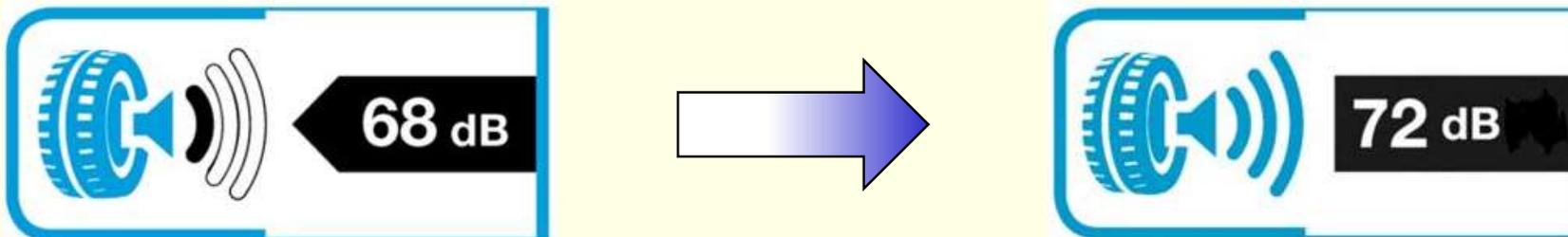


# The range of labels for selected tires

Energy efficiency class:



External rolling noise class:



# Each tire is marked with three different labels

REGULATION (EC) No 1222/2009 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL  
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The energy efficiency class is determined by a **steel drum**.



The external rolling noise class is determined by the **ISO pavement**.

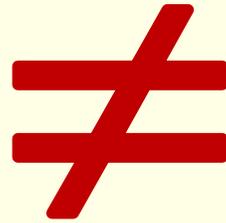


# The energy efficiency class is determined by a steel drum

Ranking according to increasing rolling resistance coefficient



Steel drum

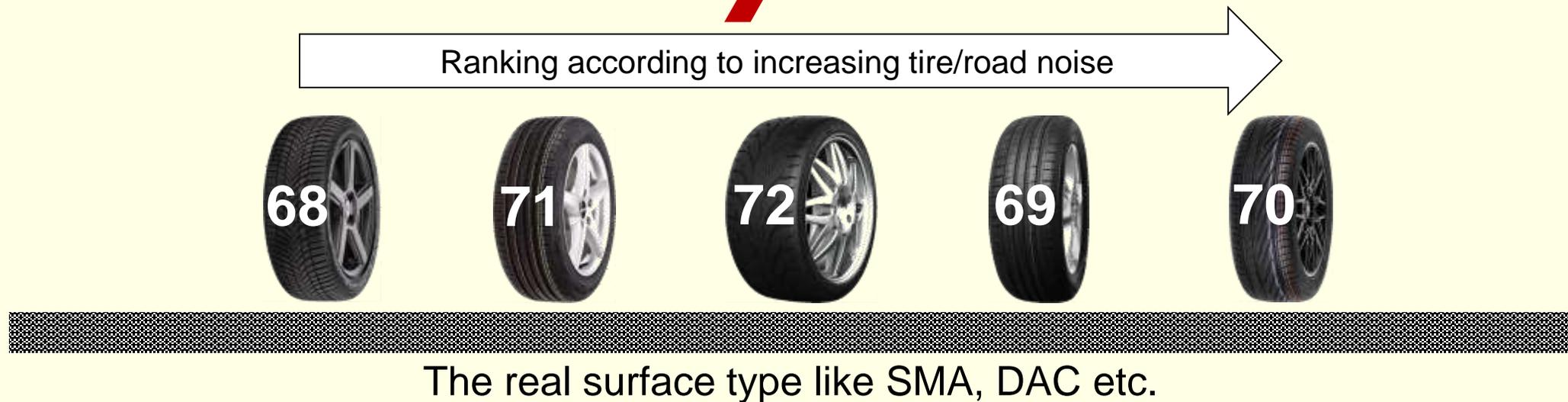
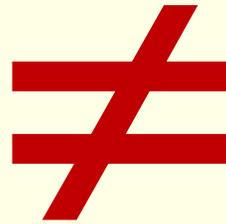
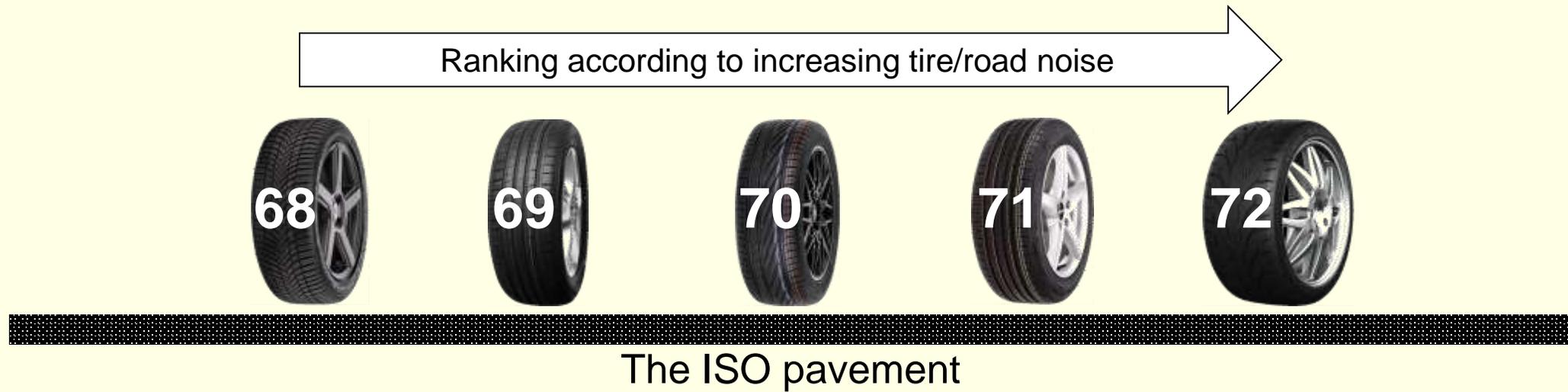


Ranking according to increasing rolling resistance coefficient



The real surface type like SMA, DAC etc.

# The external rolling noise class is determined by the ISO pavement



## Development of a reference pavement



- The developed surface should give the same ranking of tires with respect to energy consumption and noise generation as typical road surfaces.
- The reference pavement should be easy to make and to install on a steel drum.

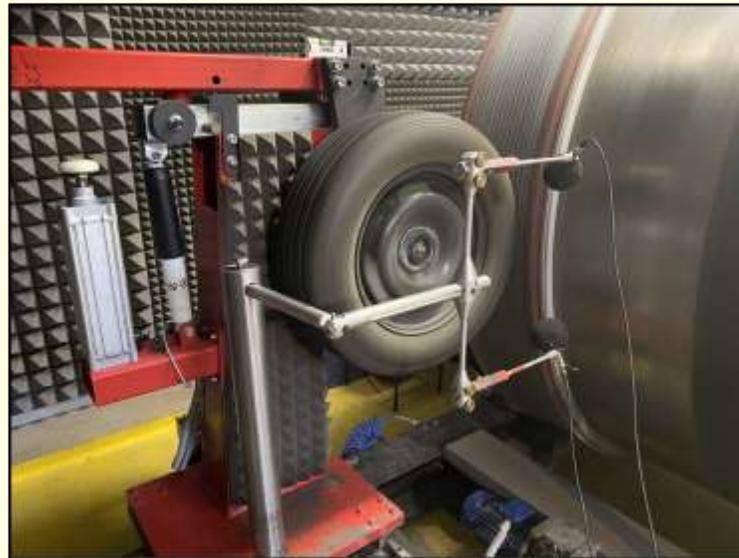
# Measurements will be performed on the roads and on a roadwheel facility



The rolling resistance trailer R2Mk.2



The Tiresonic Mk.3 trailer for tyre/road noise measurement



Roadwheel facility with drum 2 m diameter



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# Thank you for your attention

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