THE NETHERLANDS
(N E D E R L A N D)

E4

COMMUNICATION

Digitally signed by Țaran Igor
Date: 2024.11.15 15:16:55 EET
Reason: MoldSign Signature
Location: Moldova
MOLDOVA EUROPEANĂ

Concerning (1):

- approval granted
- ~~approval extended~~
- ~~approval refused~~
- ~~approval withdrawn~~
- ~~production definitely discontinued~~

of a type of tyre with regard to 'rolling sound emission level' and/or 'adhesion performance on wet surfaces' and/or 'rolling resistance' pursuant to UN Regulation number 117.

Approval number (2): E4*117R02/12*11945*00

Suffix(es) (3): 02S2WR2

1.	Manufacturer's name and address	:	ZODO TIRE Co., LIMITED The South of Yalujiang Road, Wenzhuang Village Qinghe Agency of Cao County Heze City, Shandong Province 274400 China(PRC)
2.	If applicable, name and address of manufacturer's representative	:	N/A
3.	"Tyre class" of the type of tyre	:	Class C1 / ~~Class C2~~ / ~~Class C3~~ (1)
4.	"Category of use" of the type of tyre	:	~~normal~~ / snow / ~~special~~ (1)
4.1.	Snow tyre for use in severe snow conditions	:	yes/~~no~~ (1)
4.2.	Traction tyre	:	~~yes~~/no (1)
5.	Tyre structure	:	~~Diagonal~~ / ~~Bias-belted~~ / Radial / ~~Run-flat tyre~~ (1)
6.	Tyre type designation	:	

P.O. Box 777
2700 AT Zoetermeer
The Netherlands

Tel. + 31 79 345 83 02
E-mail typeapproval@rdw.nl
www.rdw.nl

Type-approval Department

RDW

6.1.	Brand name(s)/trademark(s) of the type of tyre	:	GRENLANDER; CONSTANCY; ILINK; FRONWAY; SAILWIN; ARIVO; XBRI; LUXXAN; RHINO; TTYRE; CRYSTAL; ROCKBLADE; ROADMARCH; KANGS; ZMAX; XCENTWAY; ADERENZA; CONCEPTA
6.2.	Trade description(s)/Commercial name(s) of the type of tyre	:	ICEHAWKE I; SNOWGRIPPER I; ICEMASTER I; SNOWHAWKE I; Winmaster ProX ARW3; SNOWPLORER I; ICECRUISER I; Winter Xpro 888; WINTERHAWKE I; POLARSNOW
7.	Technical service and, where applicable, test laboratory approved for purposes of approval or of verification of conformity tests	:	IDIADA Automotive Technology, S.A. L'Albornar, P.O. Box 20 43710 Santa Oliva (Tarragona), SPAIN
8.	Performance(s) approved	:	sound level at (~~stage 1~~/stage 2) (1), wet adhesion level, rolling resistance level (~~stage 1~~/stage 2) (1)

8.1. Sound level of the representative tyre size, see paragraph 2.7. of this Regulation, as per item 7. of the test report in Appendix 1 to Annex 3: 69 dB(A) at reference speed of ~~70~~/80 km/h (1).

8.2. Wet adhesion level of the representative tyre size, see paragraph 2.7. of this Regulation, as per item 7. of the test report in the appendix to Annex 5: 1.11 (G) using the vehicle ~~or trailer~~ method (1).

8.3. Rolling resistance level of the representative tyre size, see paragraph 2.7. of this Regulation, as per item 7. of the test report in Appendix 1 to Annex 6 9.73 N/kN

8.4. Snow grip level of the representative tyre size, see paragraph 2.7. of Regulation No. 117, as per item 7. of the test report in the appendix (4) to Annex 7: 1.24 (Snow grip index) using the brake on snow method (1), ~~spin traction method~~ (1) or ~~acceleration method~~ (1).

9.	Number of report issued by that service	:	CN21040504
10.	Date of report issued by that service	:	15/04/2021
11.	Reason(s) of extension (if applicable)	:	N/A
12.	Any remarks	:	

JE MAINTIENDRAI
RDW

13.	Place	: Zoetermeer
14.	Date	: 28 April 2021
15.	Signature	:

Uwe Löbig

16. Annexed to this communication are:

16.1. A list of documents in the approval file deposited at the Type Approval Authorities having delivered the approval and which can be obtained upon request [5].

16.2. A list of tyre size designations: Specify for each brand name/trademark and/or each trade description/Commercial name the list of tyre size designations and service descriptions, adding in case of Class C1 tyres whether "reinforced" (or "extra load") or not.

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[1] Strike out what does not apply.
[2] According to Schedule 4 to Revision 3 of the 1958 Agreement.
[3] According to paragraphs 5.2.2. and 5.3.1.2. of this Regulation.
[4] Appendix 2 for C1 and C2 tyres.
Appendix 3 for C3 tyres.
[5] In the case of 'snow tyre for use in severe snow conditions' a test report according to Appendix 2 of Annex 7 shall be submitted.

Statement manufacturer and authorization regarding application

This statement must only be sent with new "00" applications. This applies to both the statements that the application has not been submitted to another authority and the authorization of the applicant. If the authorized party is changed in the meantime (i.e. in case of an extension or correction request), this declaration must be filled in again.

EC & UNECE type-approval number : E4*117R02/12*11945*00

☒ Manufacturer/ ☐ Manufacturer's representative [1]

Company name	: ZODO TIRE CO., LIMITED
Name authorized person	: Hailong Ren
Job title	: Supervision
E-mail address	: 295512660@qq.com
Address manufacturer	: The South of Yalujiang Road, Wenzhuang Village, Qinghe Agency of Cao County Heze City, Shandong Province 274400, China (PRC)
Country	: China(PRC)

Statement

Hereby : Hailong Ren ,
declares on behalf of
the manufacturer : ZODO TIRE CO., LIMITED ,
for the application with
type-approval number : E4*117R02/12*11945*00 ,
the following:

a) the manufacturer has not applied for an EC & UNECE type-approval for the same type to any other approval authority, and no other approval authority granted the manufacturer such an approval;
b) no approval authority has refused to grant type-approval of that type;
c) no approval authority has withdrawn type-approval of that type;
d) the manufacturer has not revoked an application for a type-approval of that type.

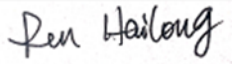
Authorization regarding handling of this application (if applicable) [2]

Company name	: IDIADA Automotive Technology, S.A.
E-mail address	: QualityHomologations@idiada.com
Address	: PO Box 20 Santa Oliva, l'Albornar 43710, Tarragona
Country	: Spain

Authorization

By means of this
declaration, I : Hailong Ren ,
on behalf of : ZODO TIRE CO., LIMITED ,
authorizes : IDIADA Automotive Technology, S.A. ,
to respectively apply for a type-approval with type-approval number:
E4*117R02/12*11945*00 ,
handle all communication concerning this application and receive the type-approval certificate.

Date	Place	Name:
15/04/2021	Heze, China	ZODO TIRE CO., LIMITED

On their behalf, signature : 

Name : Hailong Ren

CN21040504

[1] Mark the specific checkbox.
[2] This authorization only concerns the application procedure and all activities that are directly or indirectly related to this procedure. If and insofar as other procedures, including the lodging of objections, are deemed necessary, a new authorization must be submitted in respect of that specific procedure.

TECHNICAL DOCUMENTATION

RELATING TO ECE TYPE-APPROVAL FOR A TYPE OF TYRE WITH REGARD TO ROLLING SOUND EMISSIONSAND TO ADHESION PERFORMANCE ON WET SURFACES AND/OR TO ROLLING RESISTANCE (ECE Regulation No. 117. 02, Supplement 12)

1.	GENERAL		
1.1.	The performance characteristics to be assed for the tyre type	:	rolling sound emission level and adhesion performance level on wet surfaces and rolling resistance and snow performance level of snow tyre for use in severe snow conditions
1.2.	Manufacturer's name	:	ZODO TIRE CO., LIMITED
1.3.	Name and address of applicant	:	ZODO TIRE CO., LIMITED The South of Yalujiang Road, Wenzhuang Village, Qinghe Agency of Cao County, Heze City, Shandong Province, 274400, China(PRC)
1.4.	Address(es) of manufacturing plant(s)	:	same with the applicant
1.5.	Brand name(s), Trade description(s) or Trade mark(s) to be used for particular tyre type-approval requested	:	Brand name :GRENLANDER; CONSTANCY; ILINK; FRONWAY; SAILWIN; ARIVO; XBRI; LUXXAN; RHINO; TTYRE; CRYSTAL; ROCKBLADE; ROADMARCH; KANGS; ZMAX; XCENTWAY；ADERENZA；CONCEPTA； Tread pattern : ICEHAWKE I; SNOWGRIPPER I; ICEMASTER I; SNOWHAWKE I; Winmaster ProX ARW3; SNOWPLORER I; ICECRUISER I; Winter Xpro 888; WINTERHAWKE I; POLARSNOW;
2.	Tyre		
2.1.	Tyre classification (class C1, C2, C3)	:	Class C1 /~~ Class C2 / Class C3~~
2.2.	Section width range for class C1 tyres	:	see attached “list of tyre size"
2.3.	Tyre structure	:	~~diagonal / bias-belted /~~ radial
2.4.	For Class C1 tyres, state weather	:	
2.4.1.	Reinforced (or extra load) in case of approval with regarding to rolling sound emission level	:	see attached “list of tyre size”
2.4.2.	Speed category symbol “Q” or below (not inc-luding “H”) or “R” and above (including “H”) in case of snow tyres for approval with regarding to adhesion on wet surfaces	:	not applicable
2.5.	For Class C2 or C3 tyres, state weather “Traction tyre”	:	~~Yes / No~~
2.6.	Category of use (normal, snow, special)	:	~~normal~~ / snow (snow tyre for use in severe snow conditions) / ~~special~~
2.7.	A list of tyre designations covered by this application	:	see attached “list of tyre size”
2.8.	Details of major features, with respect to the effects on tyre performance (i.e. rolling emission level or adhesion on wet surfaces, respectively) of the tread pattern(s) to be used on the designated range of tyre sizes.	:	see attached “drawing of tread pattern”
2.9.	In the case of“special use tyre”, drawing of the tread pattern supplied in order to verify the void-to-fill ratio.		not applicable

MANUFACTURER'S STAMP

Signature : Ren Hailong

……

Name: Ren Hailong

THIS APPLICATION IS ACCOMPANIED BY:

- List of tyre size
- Drawing of tread pattern
- The test report

List of tyre size

Brand name(s) or Trade mark(s) : GRENLANDER; CONSTANCY; ILINK; FRONWAY; SAILWIN; ARIVO; XBRI; LUXXAN; RHINO; TTYRE; CRYSTAL; ROCKBLADE; ROADMARCH; KANGS; ZMAX; XCENTWAY;ADERENZA;CONCEPTA;

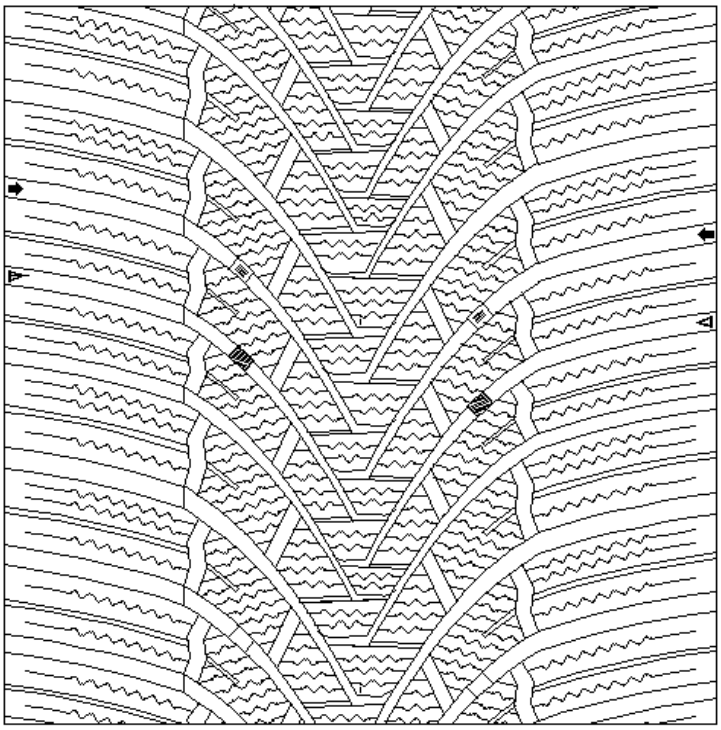
Tread pattern : ICEHAWKE I; SNOWGRIPPER I; ICEMASTER I; SNOWHAWKE I; Winmaster ProX ARW3; SNOWPLORER I; ICECRUISER I; Winter Xpro 888; WINTERHAWKE I; POLARSNOW;

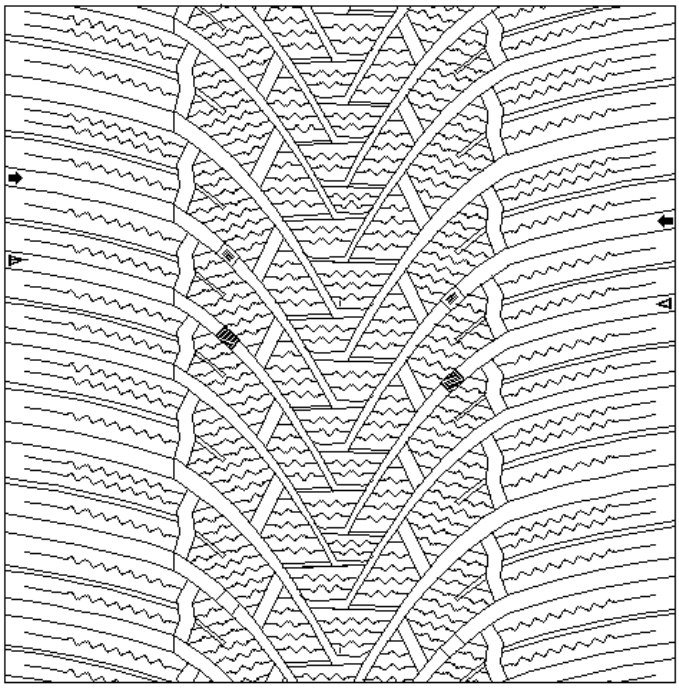
No.	Tyre size	Standard/ Extra load	load	Speed	Approval No.	Limit value for Sound level ~~stage 1~~/ stage 2	limit for wet grip index	Rolling resistance maximum values for ~~stage 1/~~ stage 2 （N/kN）
1	145/70R13	Standard	71	T	E4-02114294	71	1.0	11.5
2	145/80R13	Standard	75	T	E4-02114296	71	1.0	11.5
3	155/65R13	Standard	73	T	E4-02114167	71	1.0	11.5
4	155/70R13	Standard	75	T	E4-02114330	71	1.0	11.5
5	155/80R13	Standard	79	T	E4-02114168	71	1.0	11.5
6	165/70R13	Standard	79	T	E4-02114169	71	1.0	11.5
7	165/80R13	Standard	83	T	E4-02114331	71	1.0	11.5
8	175/65R13	Standard	80	T	E4-02114332	71	1.0	11.5
9	175/70R13	Standard	82	T	E4-02114170	71	1.0	11.5
10	155/65R14	Standard	75	T	E4-02114333	71	1.0	11.5
11	165/60R14	Standard	75	H	E4-02114021	71	1.0	11.5
12	165/65R14	Standard	79	T	E4-02114022	71	1.0	11.5
13	165/70R14	Standard	81	T	E4-02114334	71	1.0	11.5
14	175/65R14	Standard	82	T	E4-0298343	71	1.0	11.5
15	175/70R14	Standard	84	T	E4-02114171	71	1.0	11.5
16	185/55R14	Standard	80	H	E4-02114284	71	1.0	11.5
17	185/60R14	Standard	82	T	E4-02115886	71	1.0	11.5
18	185/65R14	Standard	86	T	E4-0298324	71	1.0	11.5
19	185/70R14	Standard	88	T	E4-02121690	71	1.0	11.5
20	195/60R14	Standard	86	H	E4-0297219	72	1.0	11.5
21	195/65R14	Standard	89	H	E4-0298331	72	1.0	11.5
22	195/70R14	Standard	91	T	E4-02126892	72	1.0	11.5
23	165/60R15	Extra load	81	H	E4-02114287	71	1.0	11.5
24	165/65R15	Standard	81	T	E4-02114290	71	1.0	11.5
25	175/55R15	Standard	77	H	E4-02121693	71	1.0	11.5
26	175/60R15	Standard	81	H	E4-02114288	71	1.0	11.5
27	175/65R15	Standard	84	T	E4-02115894	71	1.0	11.5
28	185/55R15	Standard	82	H	E4-0298323	71	1.0	11.5
29	185/60R15	Standard	84	H	E4-02115915	71	1.0	11.5
30	185/65R15	Standard	88	T	E4-0297203	71	1.0	11.5
31	195/50R15	Standard	82	V	E4-0297205	72	1.0	11.5

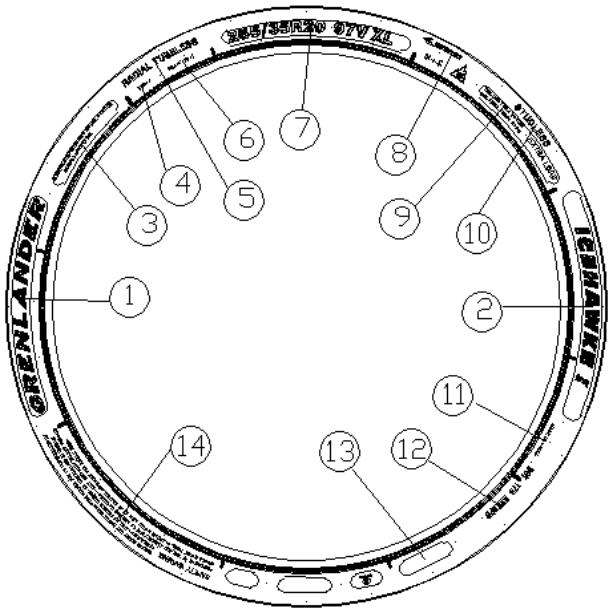
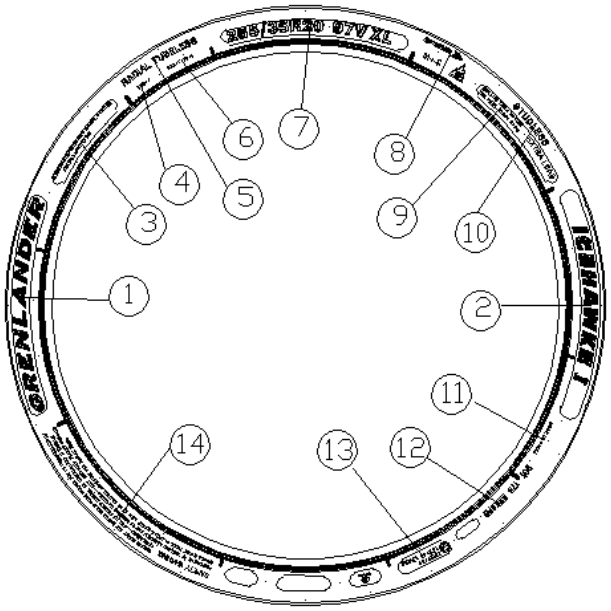
32	195/55R15	Standard	85	H	E4-0298326	72	1.0	11.5
33	195/60R15	Standard	88	H	E4-0297207	72	1.0	11.5
34	195/65R15	Extra load	95	T	E4-02115890	72	1.0	11.5
35	205/60R15	Standard	91	H	E4-02126893	72	1.0	11.5
36	205/65R15	Standard	94	H	E4-0297211	72	1.0	11.5
37	205/70R15	Standard	96	T	E4-02126894	72	1.0	11.5
38	215/65R15	Standard	96	H	E4-0298352	72	1.0	11.5
39	185/50R16	Standard	81	V	E4-02114282	71	1.0	11.5
40	185/55R16	Standard	83	H	E4-02121695	71	1.0	11.5
41	185/60R16	Standard	86	H	E4-02126855	71	1.0	11.5
42	195/45R16	Extra load	84	V	E4-0290152	72	1.0	11.5
43	195/50R16	Standard	84	V	E4-0290154	72	1.0	11.5
44	195/55R16	Extra load	91	H	E4-02115895	72	1.0	11.5
45	205/45R16	Extra load	87	V	E4-02126896	72	1.0	11.5
46	205/50R16	Extra load	91	V	E4-02126897	72	1.0	11.5
47	205/55R16	Standard	91	H	E4-0297210	72	1.0	11.5
48	205/60R16	Standard	92	H	E4-0298329	72	1.0	11.5
49	205/65R16	Standard	95	H	E4-0298347	72	1.0	11.5
50	215/45R16	Extra load	90	V	E4-02114307	72	1.0	11.5
51	215/55R16	Extra load	97	H	E4-02115898	72	1.0	11.5
52	215/60R16	Extra load	99	H	E4-0297212	72	1.0	11.5
53	215/65R16	Standard	98	T	E4-02109482	72	1.0	11.5
54	225/55R16	Standard	95	H	E4-02126898	72	1.0	11.5
55	225/60R16	Standard	98	H	E4-0297216	72	1.0	11.5
56	225/65R16	Standard	100	T	E4-02114291	72	1.0	11.5
57	205/40R17	Extra load	84	V	E4-02126899	72	1.0	11.5
58	205/45R17	Extra load	88	V	E4-02126900	72	1.0	11.5
59	205/50R17	Extra load	93	H	E4-02115896	72	1.0	11.5
60	205/55R17	Extra load	95	H	E4-02126901	72	1.0	11.5
61	215/40R17	Extra load	87	V	E4-02126902	72	1.0	11.5
62	215/45R17	Extra load	91	V	E4-02126903	72	1.0	11.5
63	215/50R17	Extra load	95	H	E4-02115897	72	1.0	11.5
64	215/55R17	Extra load	98	V	E4-02115891	72	1.0	11.5
65	225/45R17	Extra load	94	V	E4-02126904	72	1.0	11.5
66	225/50R17	Extra load	98	H	E4-02115903	72	1.0	11.5
67	225/55R17	Extra load	101	H	E4-0298355	72	1.0	11.5
68	235/45R17	Extra load	97	H	E4-02115905	72	1.0	11.5
69	235/55R17	Extra load	103	H	E4-02115907	72	1.0	11.5
70	245/40R17	Extra load	95	V	E4-02126905	72	1.0	11.5
71	245/45R17	Extra load	99	V	E4-02126906	72	1.0	11.5
72	215/45R18	Extra load	93	V	E4-02126907	72	1.0	11.5
73	215/55R18	Extra load	99	H	E4-02126908	72	1.0	11.5
74	225/40R18	Extra load	92	H	E4-02115901	72	1.0	11.5
75	225/45R18	Extra load	95	H	E4-02115902	72	1.0	11.5
76	225/50R18	Extra load	99	H	E4-02126909	72	1.0	11.5
77	225/55R18	Standard	98	H	E4-02122439	72	1.0	11.5
78	235/40R18	Extra load	95	V	E4-02126910	72	1.0	11.5
79	235/45R18	Extra load	98	H	E4-02115906	72	1.0	11.5
80	235/50R18	Standard	97V	V	E4-0289816	72	1.0	11.5
81	235/55R18	Extra load	104	H	E4-02122440	72	1.0	11.5

82	245/40R18	Extra load	97	V	E4-02125224	72	1.0	11.5
83	245/45R18	Extra load	100	H	E4-02115909	72	1.0	11.5
84	245/50R18	Extra load	104	H	E4-02126911	72	1.0	11.5
85	255/40R18	Extra load	99	H	E4-02126912	73	1.0	11.5
86	255/45R18	Standard	99	V	E4-02126913	73	1.0	11.5
87	225/40R19	Extra load	93	V	E4-02126914	72	1.0	11.5
88	225/45R19	Extra load	96	V	E4-02126915	72	1.0	11.5
89	225/55R19	Standard	99	H	E4-02126916	72	1.0	11.5
90	235/35R19	Extra load	91	V	E4-02126917	72	1.0	11.5
91	235/45R19	Extra load	99	V	E4-02126918	72	1.0	11.5
92	235/50R19	Extra load	103	V	E4-02114017	72	1.0	11.5
93	235/55R19	Extra load	105	H	E4-02125225	72	1.0	11.5
94	245/40R19	Extra load	98	V	E4-02126919	72	1.0	11.5
95	245/45R19	Extra load	102	H	E4-02125227	72	1.0	11.5
96	245/50R19	Extra load	105	H	E4-02126920	72	1.0	11.5
97	255/35R19	Extra load	96	V	E4-02126921	73	1.0	11.5
98	255/40R19	Extra load	100	H	E4-02126922	73	1.0	11.5
99	255/45R19	Extra load	104	H	E4-02126923	73	1.0	11.5
100	235/55R20	Extra load	105	H	E4-02126924	72	1.0	11.5
101	245/35R20	Extra load	95	V	E4-02126925	72	1.0	11.5
102	245/40R20	Extra load	99	V	E4-02126926	72	1.0	11.5
103	245/45R20	Extra load	103	V	E4-02126927	72	1.0	11.5
104	245/50R20	Extra load	105	H	E4-02126928	72	1.0	11.5
105	255/35R20	Extra load	97	V	E4-02126929	73	1.0	11.5
106	255/40R20	Extra load	101	V	E4-02126930	73	1.0	11.5
107	255/45R20	Extra load	105	V	E4-02125230	73	1.0	11.5
108	255/55R18	Extra load	109	H	E4-02115911	73	1.0	11.5
109	245/55R19	Extra load	107	H	E4-02125226	72	1.0	11.5
110	255/50R19	Extra load	107	H	E4-02125228	73	1.0	11.5
111	255/55R19	Extra load	111	H	E4-02125229	73	1.0	11.5
112	255/50R20	Extra load	109	H	E4-02126935	73	1.0	11.5
113	255/55R20	Extra load	110	H	E4-02126936	73	1.0	11.5

Worst Case Selection	
Representative tyre size for rolling sound emission	255/35R20 97V XL
Worst Case Criteria for rolling sound emission	Largest section width (if the same section width: lowest aspect ratio; largest rim size)t
Representative tyre size for wet grip	255/35R20 97V XL
Worst Case Criteria for wet grip	The wet grip test result of 255/35R20 97V XL is G=1.11,which is 110% above the limit value of ECE-R117(for snow tyre for us,the110% limit value is G=1.1)
Representative tyre size for snow grip	255/35R20 97V XL
Worst Case Criteria for snow grip	widest nominal section width
Representative tyre size for rolling resistance	145/70R13 71T
Worst Case Criteria for rolling resistance	Lowest load capacity index

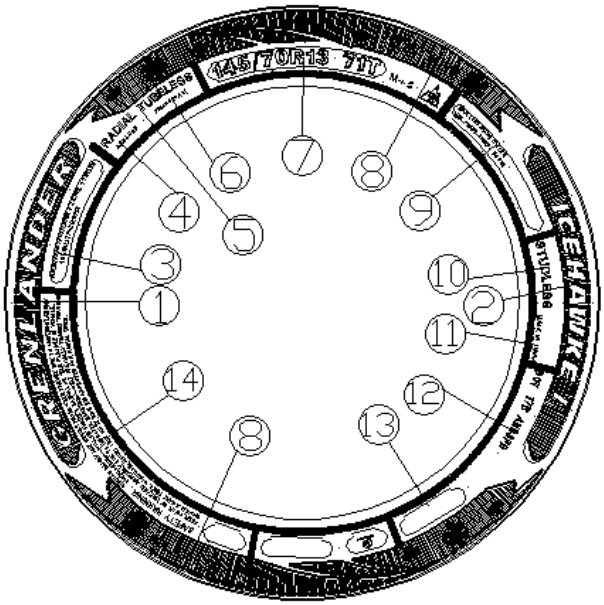
Drawing of the tread pattern (for measured tyre using for tyre snow and noise and wet grip)		
Manufacturer name	:	ZODO TIRE CO., LIMITED
Pattern name	:	ICEHAWKE I; SNOWGRIPPER I; ICEMASTER I; SNOWHAWKE I; Winmaster ProX ARW3; SNOWPLORER I; ICECRUISER I; Winter Xpro 888; WINTERHAWKE I; POLARSNOW;
Tyre Size	:	255/35R20 97V XL
Market	:	EU/US
Marking	:	M+S
Pitch number	:	61
Pitch ratio	:	0.9/1.0/1.1/1.2
Void volume [%]	:	64
Width: main grooves [mm]	:	6/5.5/5.5/6
Depth: center groove [mm]	:	8.5
Depth: shoulder groove [mm]	:	5.9
Tyre tread pattern	:	

Drawing of the tread pattern (for measured tyre using for tyre rolling resistance test)			
Manufacturer name		:	ZODO TIRE CO., LIMITED
Pattern name		:	ICEHAWKE I; SNOWGRIPPER I; ICEMASTER I; SNOWHAWKE I; Winmaster ProX ARW3; SNOWPLORER I; ICECRUISER I; Winter Xpro 888; WINTERHAWKE I; POLARSNOW;
Tyre Size		:	145/70R13 71T
Market		:	EU/US
Marking		:	M+S
Pitch number		:	56
Pitch ratio		:	0.9/1.0/1.1/1.2
Void volume	[%]	:	65
Width: main grooves	[mm]	:	2.8/2.5/2.5/2.8
Depth: center groove	[mm]	:	7.8
Depth: shoulder groove	[mm]	:	5.5
Tyre mass	[kg]	:	5.477
Tread depth	[mm]	:	7.8
Tread width	[mm]	:	104
Curvature radius of tread crown	[mm]	:	560
Tyre outer diameter	[mm]	:	534
Tread plies		:	1POLYESTER + 2 STEEL + 1NYLON
Tyre tread pattern		:	

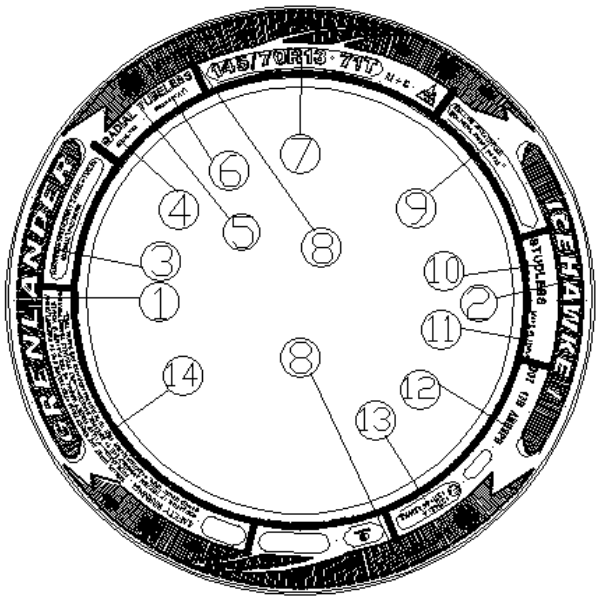
Drawing of the tyre sidewall Tyre Size : 255/35R20 97V XL	
	
Upper mold	Lower mold
1. GRENLANDER	1. GRENLANDER
2. ICEHAWKE I	2. ICEHAWKE I
3. PLIES:TREAD 2POLYESTER+2STEEL+1NYLON SIDEWALL 2POLYESTER	3. PLIES:TREAD 2POLYESTER+2STEEL+1NYLON SIDEWALL 2POLYESTER
4. RIM:9J	4. RIM:9J
5. RADIAL TUBELESS	5. RADIAL TUBELESS
6. MOLD NO.	6. MOLD NO.
7. 255/35R20 97V XL M+S	7. 255/35R20 97V XL M+S
8.ROTATION	8. ROTATION
9. MAX. LOAD 730kg (1609LBS) MAX. PRESS. 340 kPa (50 PSI) EXTRA LOAD	9. MAX. LOAD 730kg (1609LBS) MAX. PRESS. 340 kPa (50 PSI) EXTRA LOAD
10. STUDLESS	10. STUDLESS
11. MADE IN CHINA	11. MADE IN CHINA
12. DOT 17B NWK3PD	12. DOT 17B NWK3PD XXXX(DATE CODE)
13. E4 XXXXXXX	13. E4 XXXXXXX
14. SAFETY WARNING	14. SAFETY WARNING

Drawing of the tyre sidewall

Tyre Size : 145/70R13 71T



Upper mold



Lower mold

1. GRENLANDER	1. GRENLANDER
2. ICEHAWKE I	2. ICEHAWKE I
3. PLIES:TREAD 1POLYESTER+2STEEL+1NYLON SIDEWALL 1POLYESTER	3. PLIES:TREAD 1POLYESTER+2STEEL+1NYLON SIDEWALL 1POLYESTER
4. RIM:4.50B	4. RIM: 4.50B
5. RADIAL TUBELESS	5. RADIAL TUBELESS
6. MOLD NO.	6. MOLD NO.
7. 145/70R13 71T M+S	7. 145/70R13 71T M+S
8.ROTATION	8. ROTATION
9. MAX. LOAD 345kg (761LBS) MAX. PRESS. 300 kPa (44 PSI)	9. MAX. LOAD 345kg (761LBS) MAX. PRESS. 300 kPa (44 PSI)
10. STUDLESS	10. STUDLESS
11. MADE IN CHINA	11. MADE IN CHINA
12. DOT 17B AMB3PD	12. DOT 17B AMB3PD XXXX(DATE CODE)
13. E4 XXXXXXX	13 E4 XXXXXXX
14. SAFETY WARNING	14. SAFETY WARNING

China Office:

Jucheng Pioneer Park, Building 23
3999 Xiu Pu Rd, Nan Hui Pudong District
201315 Shanghai - China

Tel. +86 (21) 6210 0894
Fax +86 (21) 5208 0556
e-mail: idiada_china@idiada.com

Headquarters:

L'Albornar – P.O.Box 20
E - 43710 Santa Oliva (Tarragona)
Spain

Tel. +34 977 166000
Fax +34 977 166007
e-mail: idiada@idiada.com

REPORT Nº CN21040504

UN/ECE REGULATION 117R02 RELATED TO ROLLING SOUND EMISSIONS, ADHESION ON WET SURFACES AND ROLLING RESISTANCE

Approval number	: E4*117R02/12*11945*00
Approved performances	: 02S2WR2
Applicant	: ZODO TIRE CO., LIMITED The South of Yalujiang Road, Wenzhuang Village Qinghe Agency of Cao County Heze City, Shandong Province 274400 China (PRC).
Manufacturer	: ZODO TIRE CO., LIMITED The South of Yalujiang Road, Wenzhuang Village Qinghe Agency of Cao County Heze City, Shandong Province 274400 China (PRC).
Tyre class	: C1
Category of use	: Snow (for use in severe snow conditions)
Traction tyre	: N/A
Brand name / Trade mark	: GRENLANDER; CONSTANCY; ILINK; FRONWAY; SAILWIN; ARIVO; XBRI; LUXXAN; RHINO; TTYRE; CRYSTAL; ROCKBLADE; ROADMARCH; KANGS; ZMAX; XCENTWAY; ADERENZA; CONCEPTA
Trade description/ Commercial name	: ICEHAWKE I; SNOWGRIPPER I; ICEMASTER I; SNOWHAWKE I; Winmaster ProX ARW3; SNOWPLORER I; ICECRUISER I; Winter Xpro 888; WINTERHAWKE I; POLARSNOW
Place and date of issue	: L'Albornar, Santa Oliva (Tarragona), 15/04/2021

CONCLUSIONS: The tested samples of the family FULFIL the technical prescriptions with regard to "rolling sound emissions level" and/or "adhesion performance on wet surfaces" and/or "rolling resistance" pursuant to UN/ECE REGULATION No. 117 supplement 12 to the 02 series of amendments.
The characteristics of the tested samples are detailed in the annexes to the test report.

Performed by:

Yu(alex) Zhang
HOMOLOGATION ENGINEER

Revised by:

Josep Masip Gomez
DEPARTMENT MANAGER

REPORT Nº CN21040504

SUMMARY

1. Dimensions included in the type of tyre : See Manufacturer's technical documentation attached

2. Tyre sizes selected for testing

   2.1. Tyre size tested for rolling sound emissions : 255/35R20 97V XL (largest nominal section width)
   See Annex 1, Test report CN20120409, IDIADA, 07/12/2020

   2.2. Tyre size tested for adhesion on wet surfaces: 255/35R20 97V XL (meets extra 10%)
   See Annex 2, Test report CN20120410, IDIADA, 01/12/2020

   2.3. Tyre tested for rolling resistance : 145/70R13 71T (lowest load index)
   See Annex 3, Test report CN21030885, IDIADA, 25/03/2021

   2.4. Tyre tested for snow performance : 255/35R20 97V XL (widest nominal section width)
   See Annex 4, Test report CN21040261, IDIADA, 01-02/03/2021

3. Reason(s) of extension (if applicable) : N/A

4. New limit value according to Announcement for the technical service 2018-01

   In case a test tyre is selected which does not have the worst case properties the following applies:

   A test tyre, not having the worst case properties, performing at least ten percent (≥10%) above the minimum required wet grip performance level can represent the whole tyre size range of tyre types

   New limit value is 1.1 < 1.11 (Wet grip test result)

5. List of Annexes to this report
   5.1. Annex 1: Test report according to rolling sound emission level.
   5.2. Annex 2: Test report according to adhesion on wet surfaces.
   5.3. Annex 3: Test report according to rolling resistance.
   5.4. Annex 4: Test report according to snow performance.
   5.5. Annex: Manufacturer's technical documentation.

Place and date of issue: L'Albornar, Santa Oliva (Tarragona), 15/04/2021

Yu(alex) Zhang
HOMOLOGATION ENGINEER

ANNEX 1 TO THE TEST REPORT
ROLLING SOUND EMISSIONS, REPORT Nº CN20120409

1. TEST DATA

1.1. Test tyre details

1.1.1	Applicant	: ZODO TIRE CO., LIMITED The South of Yalujiang Road, Wenzhuang Village, Qinghe Agency of Cao County, Heze City, Shandong Province, 274400, China (PRC)
1.1.2	Manufacturer	: ZODO TIRE CO., LIMITED The South of Yalujiang Road, Wenzhuang Village, Qinghe Agency of Cao County, Heze City, Shandong Province, 274400, China (PRC)
1.1.3	Tyre class	: C1
1.1.4	Category of use	: Snow (for use in severe snow conditions)
1.1.5	Traction tyre	: N/A
1.1.6	Brand name / Trade mark	: GRENLANDER
1.1.7	Trade description / Commercial name	: ICEHAWKE Ⅰ
1.1.8	Tyre size	: 255/35R20 97V XL
1.1.9	Load index / Corresponding mass Q_r [kg]	: 97 / 730
1.1.10	Tyre structure	: Radial
1.1.11	Date code, other manufacturer markings	: 4720, 17BNWK3PD
1.1.12	Reference inflation pressure P_r [kPa]	: 290
1.1.13	Test inflation pressure P_t [kPa]	:

	P_t [kPa] admissible values
Front axle left wheel	233.59 ≤ 240.00 ≤ 256.95
Front axle right wheel	219.41 ≤ 220.00 ≤ 241.35
Rear axle left wheel	193.44 ≤ 200.00 ≤ 212.78
Rear axle right wheel	195.27 ≤ 200.00 ≤ 214.80

Pt ≥ 150 kPa

FULFILS / ~~NOT FULFILS~~

1.1.14 Test tyre internal reference :

Front left	Front right
CN-2011/04234-01	CN-2011/04234-02

Rear left	Rear right
CN-2011/04234-03	CN-2011/04234-04

1.1.15 Test rim : 9.0 x 20

1.1.16 Test rim internal reference :

Front left	Front right
CN-1912/02733-01	CN-1912/02733-02

Rear left	Rear right
CN-1912/02733-03	CN-1912/02733-04

1.1.17 Test tyre load [kg] :

	kg	Q_t [N] / % $\frac{Q_t}{Q_r}$
Front axle left wheel	614	50 < 84.11 < 90
Front axle right wheel	584	50 < 80.00 < 90
Rear axle left wheel	528	50 < 72.33 < 90
Rear axle right wheel	532	50 < 72.88 < 90

FULFILS / ~~NOT FULFILS~~

$Q_{t,\,avr}$ [N] / % $\frac{Q_{t,avr}}{Q_r}$
70 ≤ 77.33≤ 80

FULFILS / ~~NOT FULFILS~~

1.2. Test vehicle

1.2.1	Trade name	: VOLKSWAGEN
1.2.2	Model	: TOUAREG
1.2.3	Year	: 2014
1.2.4	Transmission	: Automatic
1.2.5	Wheelbase [mm]	: 2,904

For Class C1 less than 3,500 mm.

FULFILS / ~~NOT FULFILS~~

1.2.6	Vehicle internal reference	: CN-2001/02096

1.3. Test equipment

1.3.1	Sound level meter 1	: 3024593
1.3.2	Sound level meter 2	: 3024412
1.3.3	Manometer	: DYM3
1.3.4	Weight scale	: SCS-5 / SCS-10
1.3.5	Track temperature measurement device	: 182329
1.3.6	Wind speed measurement device	: MM-0316
1.3.7	Speed measurement device	: VBOX sport 07013178
1.3.8	Ambient temperature measurement device	: 182330

2. TEST TRACK

2.1. Environment

2.1.1 Air temperature T_a [ºC] : 8.0

$5.0 < T_a < 40.0$

FULFILS / ~~NOT FULFILS~~

2.1.2. Test surface temperature T_s [ºC] : 8.5

$5.0 \leq T_s \leq 50.0$

FULFILS / ~~NOT FULFILS~~

2.1.3 Wind speed [m/s] : 3.1

Less than 5 m/s

FULFILS / ~~NOT FULFILS~~

2.1.4 Ambient noise [dB(A)] : 41.4

Test result – Ambient noise ≥ 10 dB(A)

FULFILS / ~~NOT FULFILS~~

2.1.5 Wind direction [º] : 20.0

2.2. Date and method of check on compliance of the test surface with ISO 10844:2014:

- March 8th 2019
- Mean profile depth
- Issued by : IDIADA

3. TEST RESULTS

Reference Speed: v_{ref} [km/h] : 80
Range Speed [km/h] : 70.0 - 90.0

Run No.	Test speed [km/h]	Direction of run	Sound level left measured [dB(A)]	Sound level right measured [dB(A)]	Air temp. [ºC]	Surface temp. [ºC]	Sound level left temp. corrected [dB(A)]	Sound level right temp. corrected [dB(A)]
1	72.3	N → S	68.8	68.8	7.9	8.7	68.1	68.1
2	73.8	S → N	70.0	70.0	7.6	8.0	69.3	69.3
3	75.8	S → N	70.5	70.3	8.3	7.1	69.7	69.5
4	77.8	S → N	71.1	71.3	8.1	9.0	70.4	70.6
5	82.1	S → N	71.6	71.6	7.8	9.0	70.9	70.9
6	83.9	S → N	72.6	72.8	8.3	8.9	71.9	72.1
7	85.8	S → N	73.5	73.4	8.1	8.5	72.8	72.7
8	87.9	S → N	73.8	73.3	7.9	8.4	73.1	72.6

3.1. Regression line slope : 52.83

3.2. Sound level after temperature correction according to paragraph 4.3 of Annex 3 [dB(A)] : 70.8

3.3. **Sound level according to paragraph 4.4. and 4.5. of Annex 3 [dB(A)] : 69**

3.4. Limit value [dB(A)] :

C1	
Stage 2	
Nominal Section width	Limit dB (A)
185 and lower	70
Over 185 up to 245	71
Over 245 up to 275	72
Over 275	74

The above limits shall be increased by 1 dB(A) for "snow tyre for use in severe snow conditions" , extra load tyres or reinforced tyres, or any combination of these classifications.

4. TEST TYRE PICTURES

Picture 1. Sidewall

Picture 2. Tread pattern

Place of test: ICPG, China
Date of test: 07/12/2020

Yu(alex) Zhang
HOMOLOGATION ENGINEER

ANNEX 2 TO THE TEST REPORT

ADHESION ON WET SURFACES, REPORT Nº CN20120410

1. TEST DATA

1.1. Test tyre details

1.1.1	Applicant	: ZODO TIRE CO., LIMTED. The South of Yalujiang Road, Wenzhuang Village Qinghe Agency of Cao County Heze City, Shandong Province 274400 China (PRC).
1.1.2	Manufacturer	: ZODO TIRE CO., LIMTED. The South of Yalujiang Road, Wenzhuang Village Qinghe Agency of Cao County Heze City, Shandong Province 274400 China (PRC).
1.1.3	Tyre class	: C1
1.1.4	Category of use	: Snow (for use in severe snow conditions)
1.1.5	Traction tyre	: N/A
1.1.6	Brand name / Trade mark	: GRENLANDER
1.1.7	Trade description / Commercial name	: ICEHAWKE I
1.1.8	Tyre size	: 255/35R20 97V XL
1.1.9	Load index / Corresponding mass Q_r [kg]	: 97 / 730
1.1.10	Tyre structure	: Radial
1.1.11	Date code, other manufacturer markings	: 4720, 17BNWK3PD
1.1.12	Inflation pressure [kPa]	: 220
1.1.13	Test tyre internal reference	:

Front left	Front right
CN-2011/04234-01	CN-2011/04234-02

Rear left	Rear right
CN-2011/04234-03	CN-2011/04234-04

1.1.14	Test rim	: 9.0 x 20
1.1.15	Test rim internal reference	:

Front left	Front right
CN-1912/02733-01	CN-1912/02733-02

Rear left	Rear right
CN-1912/02733-03	CN-1912/02733-04

1.1.16	Test SRTT identification	: UNIROYAL P225/60R16 - ASTM F 2493-08

1.1.17 Test SRTT internal reference :

Front left	Front right
CN-2010/03718-01	CN-2010/03718-02

Rear left	Rear right
CN-2010/03718-03	CN-2010/03718-04

1.1.18 Test SRTT rim : 6.5 x 16

1.1.19 Test SRTT rim internal reference :

Front left	Front right
CN-1912/02725-01	CN-1912/02725-02

Rear left	Rear right
CN-1912/02725-03	CN-1912/02725-04

1.1.20 Control tyre : 245/45R18 100W XL

1.1.21 Control tyre inflation pressure [kPa] : 220

1.1.22 Control tyre internal reference :

Front left	Front right
CN-1911/04284-01	CN-1911/04284-02

Rear left	Rear right
CN-1911/04284-03	CN-1911/04284-04

1.1.23 Control tyre rim : 8.0 x 18

1.1.24 Control tyre rim internal reference :

Front left	Front right
CN-1912/02729-01	CN-1912/02729-02

Rear left	Rear right
CN-1912/02729-03	CN-1912/02729-04

1.1.25 Control tyre load [kg] :

SRTT 1		Control tyre			SRTT 2	
FL	510	FL	506	63.3% Qr	FL	486
FR	496	FR	498	62.3% Qr	FR	482
RL	504	RL	502	62.8% Qr	RL	506
RR	506	RR	508	63.5% Qr	RR	516

1.1.26 Test tyre load [kg] :

Control tyre 1		Candidate tyre			Control tyre 2	
FL	634	FL	638	87.4% Qr	FL	626
FR	612	FR	616	84.4% Qr	FR	608
RL	546	RL	552	75.6% Qr	RL	538
RR	566	RR	570	78.1% Qr	RR	560

Between 60 per cent and 90 per cent of the load value corresponding to the load index of the tyre.

FULFILS / ~~NOT FULFILS~~

1.2. Control tyre test vehicle

1.2.1 Trade name : Volkswagen

1.2.2 Model : Passat

1.2.3 Year : 2016

1.2.4 Transmission : Automatic

1.2.5 Wheelbase [mm] : 2,803

1.2.6 Vehicle internal reference : CN-2001/02095

1.3. Test vehicle

1.3.1 Trade name : Volkswagen

1.3.2 Model : Touareg

1.3.3 Year : 2014

1.3.4 Transmission : Automatic

1.3.5 Wheelbase [mm] : 2,904

1.3.6 Vehicle internal reference : CN-2001/02096

1.4. Test equipment

1.4.1	Manometer	: DYM3
1.4.2	Weight scale	: SCS-5 / SCS-10
1.4.3	Thermometer	: 182330
1.4.4	Track temperature measurement device	: 182329
1.4.5	Speed measurement device	: VBOX SPORT 070131178
1.4.6	Force pedal	: 19-2039-07

2. TEST TRACK

2.1. Location : Straight line braking B, ICPG

2.2. Date of check on compliance of the test surface : April 1st 2020

2.3. Test track characteristics:

2.3.1 Texture depth [mm] : 0.64

2.3.2 BPN : 52.0

2.3.3 Water depth [mm] : Between 0.50 and 1.50

2.4. Test method : Vehicle

2.5. Air temperature T_a [ºC] : 11.2

2.6. Wet surface temperature T_w [ºC] :

$5.0 \leq Tw \leq 35.0$

SRTT 1	Control tyre	SRTT 2
5.8	7.1	7.8

FULFILS / ~~NOT FULFILS~~

Variation during the test less than 10 ºC

FULFILS / ~~NOT FULFILS~~

$2.0 \leq Tw \leq 20.0$

Control tyre 1	Candidate tyre	Control tyre 2
8.5	7.3	5.2

FULFILS / ~~NOT FULFILS~~

Variation during the test less than 10 ºC

FULFILS / ~~NOT FULFILS~~

Wetted surface temperature is within ±5ºC of the temperature of the first test cycle

FULFILS / ~~NOT FULFILS~~

3. TEST RESULTS

Test run	SRTT 1		Control tyre		SRTT 2	
	Braking distance [m]	Average deceleration [m/s²]	Braking distance [m]	Average deceleration [m/s²]	Braking distance [m]	Average deceleration [m/s²]
1	25.05	9.24	24.47	9.46	26.13	8.86
2	25.03	9.25	24.40	9.49	25.96	8.92
3	25.31	9.15	24.25	9.55	26.13	8.86
4	-	-	24.88	9.30	-	-
5	-	-	24.90	9.30	-	-
6	-	-	24.37	9.50	-	-

Coefficient of variation

SRTT 1	Control tyre	SRTT 2
0.62	1.12	0.38
< 3 per cent	< 3 per cent	< 3 per cent

FULFILS / ~~NOT FULFILS~~

Run No	Test Speed [km/h]	Direction of run	SRTT	Control tyre	Mean fully developed deceleration (mfdd)	BFC(R)	BFC(C)	Pedal force [N]
1	80 - 20	S - N	P225/60R16	---	9.21 m/s²	---	---	> 600
2	80 - 20	S - N	---	245/45R18	9.43 m/s²	0.92	0.96	> 600
3	80 - 20	S - N	P225/60R16	---	8.88 m/s²	---	---	> 600

Calculation of the wet grip index of the control tyre:

$$G_1 = \left[\frac{BFC(C)}{BFC(R)} \times 125 + a \times (t - t_0) + b \times \left(\frac{BFC(R)}{BFC(R_0)} - 1,0\right)\right] \times 10^{-2}$$

where:

a = -0.4232
b = -8.297
t_0 = 20ºC
$BFC(R_0)$ = 0.68

Wet grip index of the control tyre G1 = 1.33

Test run	Control tyre 1		Candidate tyre		Control tyre 2	
	Braking distance [m]	Average deceleration [m/s²]	Braking distance [m]	Average deceleration [m/s²]	Braking distance [m]	Average deceleration [m/s²]
1	25.78	8.98	31.11	7.44	26.13	8.86
2	25.74	8.99	31.70	7.30	26.58	8.71
3	25.38	9.12	32.26	7.18	26.26	8.81
4	-	-	29.91	7.74	-	-
5	-	-	31.35	7.38	-	-
6	-	-	30.25	7.65	-	-

Coefficient of variation

Control tyre 1	Candidate tyre	Control tyre 2
0.86	2.86	0.88
< 3 per cent	< 3 per cent	< 3 per cent

FULFILS / ~~NOT FULFILS~~

Run No	Test Speed [km/h]	Direction of run	Control tyre	Candidate tyre	Mean fully developed deceleration (mfdd)	BFC(C)	BFC(T)	Pedal force [N]
1	80 - 20	S - N	245/45R18	---	9.03 m/s²	---	---	> 600
2	80 - 20	S - N	---	255/35R20	7.45 m/s²	0.91	0.76	> 600
4	80 - 20	S - N	245/45R18	---	8.79 m/s²	---	---	> 600

Calculation of the wet grip index of the candidate tyre:

$$G_2 = (BFC(T) / BFC(C)) = 0.83$$

Wet grip index of the candidate tyre

Wet grip index (G) = (G1 x G2) = 1.11

3.1. Limit value :

C1		
Category of use	Wet grip index (G)	+10% Wet Grip index (G)
Normal	≥ 1.1	≥ 1.21
Snow		
Snow in severe conditions and speed symbol R and above (including H)	≥ 1.0	≥ 1.1
Snow in severe conditions and speed symbol Q or below (excluding H)	≥ 0.9	≥ 0.99
Special	-	-

4. TEST TYRE PICTURES

Picture 1. Sidewall

Picture 2. Tread pattern

Place of test: ICPG, China
Date of test: 01/12/2020

Yu(alex) Zhang
HOMOLOGATION ENGINEER

ANNEX 3 TO THE TEST REPORT
ROLLING RESISTANCE, REPORT Nº CN21030885

1. TEST DATA

1.1. Test tyre details

1.1.1	Applicant	: ZODO TIRE Co., LIMITED The South of Yalujiang Road, Wenzhuang Village Qinghe Agency of Cao County Heze City, Shandong Province 274400 China(PRC)
1.1.2	Manufacturer	: ZODO TIRE Co., LIMITED The South of Yalujiang Road, Wenzhuang Village Qinghe Agency of Cao County Heze City, Shandong Province 274400 China(PRC)
1.1.3	Tyre class	: C1
1.1.4	Category of use	: Snow (for use in severe snow conditions)
1.1.5	Traction tyre	: N/A
1.1.6	Brand name / Trade mark	: GRENLANDER
1.1.7	Trade description / Commercial name	: ICEHAWKE I
1.1.8	Tyre size	: 145/70R13 71T
1.1.9	Load index / Corresponding mass Q_r [kg]	: 71 / 345
1.1.10	Tyre structure	: Radial
1.1.11	Date code, other manufacturer markings	: 0221, 17B AMB3PD
1.1.12	Inflation pressure [kPa]	: 210
1.1.13	Test tyre internal reference	: CN21030885
1.1.14	Test rim	: 4.50B x 13
1.1.15	Test rim internal reference	: RIM-4.50B x 13
1.1.16	Test rim material	: Steel

1.2. Test machine data

1.2.1	Identification	: TJR-RR-PC/TB(Y)
1.2.2	Drum diameter [mm]	: 2.0 m

FULFILS/~~NOT FULFILS~~

1.2.3	Surface	: Smooth steel
1.2.4	Roughness [µm]	: ≤ 6.3

FULFILS/~~NOT FULFILS~~

1.3. Test data

1.3.1	Measurement method	: Force
1.3.2	Test speed [km/h]	: 80

C1: 80 km/h (all speed and load symbols);

FULFILS/~~NOT FULFILS~~

1.3.3	Load Index (LI) / Load [kg]	: 71 / 345
1.3.4	Test load [kg / N]	: 276 / 2,706

C1 (% of maximum load capacity): 80

FULFILS/~~NOT FULFILS~~

1.3.5	Test inflation pressure, initial [kPa]	: 210

C1: 210 kPa if standard/ 250 kPa if reinforced

FULFILS/~~NOT FULFILS~~

1.3.6	Distance from the tyre axis to the drum outer surface under steady state conditions during test (r_L)[m]	: 0.2469
1.3.7	Distance from the tyre axis to the drum outer surface under steady state conditions during skim test (r_L)[m]	: 0.3
1.3.8	Ambient temperature T_{am} [ºC]	: 26.14

$20.0 \leq T_{am} \leq 30.0$

FULFILS/~~NOT FULFILS~~

1.3.9	Skim test load [N]	: 101.6

C1 ≤ 200 N

FULFILS/~~NOT FULFILS~~

1.3.10	Spindle force (Ft) [N]	: 23.42
1.3.11	Spindle force during skim test (Ft) [N]	: 2.38

1.3.12 Parasitic loss (Fpl) [N] : 3.094

1.3.13 Rolling resistance (Fr) [N] : 26.11

2. TEST RESULTS

2.1. Rolling resistance coefficient

2.1.1 Initial value (or average in the case of more than 1) [N/kN] : 9.65

2.1.2 Temperature corrected value [N/kN] : 9.73

2.1.3 Temperature and drum diameter corrected value [N/kN] : 9.73

Rolling resistance coefficient Cr [N/kN] = 9.73

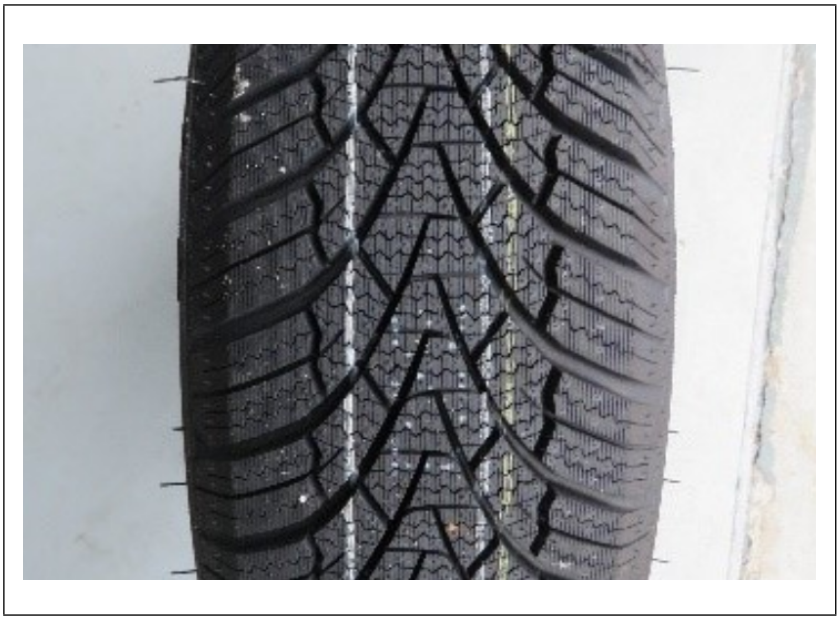
2.2. Limit value [N/kN]

	Stage 1	Stage 2
C1	12.0	10.5
C2	10.5	9.0
C3	8.0	6.5

For "snow tyre for use in severe snow conditions", the limits shall be increased by 1 N/kN.

3. TEST TYRE PICTURES

Picture 1. Sidewall



Picture 2. Tread pattern

Place of test: Yancheng, China
Date of test: 25/03/2021

Yu(alex) Zhang
HOMOLOGATION ENGINEER

ANNEX 4 TO THE TEST REPORT

SNOW PERFORMANCE, REPORT Nº CN21040261

1. TEST DATA

1.1. Test tyre details

1.1.1	Applicant [1]	: ZODO TIRE CO., LIMITED The South of Yalujiang Road, Wenzhuang Village, Qinghe Agency of Cao County, Heze City, Shandong Province, 274400, China (PRC)
1.1.2	Manufacturer [1]	: ZODO TIRE CO., LIMITED The South of Yalujiang Road, Wenzhuang Village, Qinghe Agency of Cao County, Heze City, Shandong Province, 274400, China (PRC)
1.1.3	Tyre class	: C1
1.1.4	Category of use	: Snow (for use in severe snow conditions)
1.1.5	Traction tyre	: No
1.1.6	Brand name / Trade mark	: GRENLANDER
1.1.7	Trade description / Commercial name	: ICEHAWKE I
1.1.8	Tyre size	: 255/35R20 97V XL
1.1.9	Load index / Corresponding mass Q_r [kg]	: 97 / 730
1.1.10	Tyre structure	: Radial
1.1.11	Date code, other manufacturer markings	: 4720, 17BNWK3PD
1.1.12	Inflation pressure [kPa]	: 240
1.1.13	Test rim	: 10 x 20
1.1.14	Test SRTT identification	: UNIROYAL P195/75R14 - ASTM E 1136-93
1.1.15	Test SRTT rim	: 5.5 x 14
1.1.16	Control tyre	: 225/60R16 94T
1.1.17	Control tyre rim	: 7.5 x 16

[1] Information provided by the client. The laboratory is not responsible for such information

1.1.18 Test tyre load [kg] :

Measurement 1

SRTT 1			Control			SRTT 2		
FL	550	87.3% Qr	FL	550	82.1% Qr	FL	550	87.3% Qr
FR	505	80.2% Qr	FR	505	75.4% Qr	FR	505	80.2% Qr
RL	510	81.0% Qr	RL	510	76.1% Qr	RL	510	81.0% Qr
RR	545	86.5% Qr	RR	545	81.3% Qr	RR	545	86.5% Qr
Control 1			**Candidate**			**Control 2**		
FL	550	82.1% Qr	FL	550	75.3% Qr	FL	550	82.1% Qr
FR	560	83.6% Qr	FR	560	76.7% Qr	FR	560	83.6% Qr
RL	585	87.3% Qr	RL	585	80.1% Qr	RL	585	87.3% Qr
RR	565	84.3% Qr	RR	565	77.4% Qr	RR	565	84.3% Qr

Measurement 2

SRTT 1			Control			SRTT 2		
FL	550	87.3% Qr	FL	550	82.1% Qr	FL	550	87.3% Qr
FR	505	80.2% Qr	FR	505	75.4% Qr	FR	505	80.2% Qr
RL	510	81.0% Qr	RL	510	76.1% Qr	RL	510	81.0% Qr
RR	545	86.5% Qr	RR	545	81.3% Qr	RR	545	86.5% Qr
Control 1			**Candidate**			**Control 2**		
FL	550	82.1% Qr	FL	550	75.3% Qr	FL	550	82.1% Qr
FR	560	83.6% Qr	FR	560	76.7% Qr	FR	560	83.6% Qr
RL	585	87.3% Qr	RL	585	80.1% Qr	RL	585	87.3% Qr
RR	565	84.3% Qr	RR	565	77.4% Qr	RR	565	84.3% Qr

1.2. Control test vehicle

1.2.1 Trade name : Volkswagen

1.2.2 Model : Golf

1.2.3 Year : 2012

1.2.4 Transmission : Automatic

1.2.5 Vehicle identification number : LFV2B21K5B3266669

1.3. Test vehicle

1.3.1	Trade name	: MITSUBISHI
1.3.2	Model	: PAJERO
1.3.3	Year	: 2013
1.3.4	Transmission	: Automatic
1.3.5	Vehicle identification number	: LL62HBC01BB008460

1.4. Test equipment

1.3.1	Temperature	: Fluke 52-II, 43230321WS; Testo 410-1, 38444908/412
1.3.2	Speed measurement device	: VBox 3, 030477
1.3.3	Weight scale	: SCS-HT-D, 21701001902
1.3.4	Tyre pressure	: PCL ACCURA 1, 150202069
1.3.5	Snow hardness	: CTI Penetrometer, 266, ZX-JC-15
1.3.6	Standard reference test tyre (SRTT)	: UNIROYAL P195/75R14 - ASTM E 1136-93

2. TEST TRACK

2.1. Location : Snow straight track,
NenJiang red valley automotive test center Co., Ltd.

2.2. Test track characteristics measurement 1

	At start of tests	*At end of tests*	*Specification*
Weather	Outdoor	Outdoor	
Ambient temperature T_a [ºC]	-7.5ºC	-7.5ºC	-2 ºC to -15 ºC
Snow temperature T_s [ºC]	-7.7ºC	-7.7ºC	-4 ºC to -15 ºC
CTI index	81		75 to 85

FULFILS / ~~NOT FULFILS~~

2.3. Test track characteristics measurement 2

	At start of tests	*At end of tests*	*Specification*
Weather	Outdoor	Outdoor	
Ambient temperature T_a [ºC]	-12.3ºC	-12.3ºC	-2 ºC to -15 ºC
Snow temperature T_s [ºC]	-9.7ºC	-9.7ºC	-4 ºC to -15 ºC
CTI index	80		75 to 85

FULFILS / ~~NOT FULFILS~~

3. TEST RESULTS – MEASUREMENT 1 CONTROL TYRE TEST

3.1. Test method : Brake

3.2. Test sequence : R1–C–R2

3.3. Candidate : C

3.4. Test results:

Test run	SRTT 1	Control	SRTT 2
	Average deceleration [m/s^2]	Average deceleration [m/s^2]	Average deceleration [m/s^2]
1	3.16	3.73	3.14
2	3.23	3.79	3.13
3	3.27	3.77	3.35
4	3.30	3.79	3.34
5	3.15	3.72	3.16
6	2.94	3.68	3.20

MFDD Mean

SRTT 1	Control Tyre	SRTT 2
3.17	3.75	3.22

Std. deviation

SRTT 1	Control Tyre	SRTT 2
0.13	0.04	0.10

Coefficient of variation

SRTT 1	Control Tyre	SRTT 2
4.04%	1.17%	3.12%
≤ 6 per cent	≤ 6 per cent	≤ 6 per cent

FULFILS / ~~NOT FULFILS~~

Wa (SRTT) : 3.197
SRTT validation [%] : 1.42
SRTT validation ≤ 5%

FULFILS / ~~NOT FULFILS~~

Snow index (SG1) = 1.17

4. TEST RESULTS – MEASUREMENT 1 CANDIDATE TYRE TEST

4.1. Test method : Brake

4.2. Test sequence : C1–T1–C2

4.3. Candidate : T1

4.4. Test results:

Test run	Control 1	Candidate	Control 2
	Average deceleration [m/s^2]	Average deceleration [m/s^2]	Average deceleration [m/s^2]
1	3.39	3.37	3.33
2	3.46	3.46	3.32
3	3.28	3.32	3.29
4	3.41	3.34	3.29
5	3.29	3.54	3.30
6	3.33	3.37	3.38

MFDD Mean

Control 1	Candidate Tyre	Control 2
3.36	3.40	3.32

Std. deviation

Control 1	Candidate Tyre	Control 2
0.07	0.08	0.03

Coefficient of variation

Control 1	Candidate Tyre	Control 2
2.05%	2.49%	1.00%
≤ 6 per cent	≤ 6 per cent	≤ 6 per cent

FULFILS / ~~NOT FULFILS~~

Wa (SRTT) : 3.338
SRTT validation [%] : 1.34
SRTT validation ≤ 5%

FULFILS / ~~NOT FULFILS~~

Snow index (SG2) = 1.02

Snow index first run (SG1 x SG2) = 1.19

5. TEST RESULTS – MEASUREMENT 2 CONTROL TYRE TEST

5.1. Test method : Brake

5.2. Test sequence : R1–C–R2

5.3. Candidate : C

5.4. Test results:

Test run	SRTT 1	Control	SRTT 2
	Average deceleration [m/s^2]	Average deceleration [m/s^2]	Average deceleration [m/s^2]
1	3.12	3.77	3.20
2	3.22	3.87	3.14
3	3.16	3.81	3.24
4	3.06	3.90	3.21
5	3.07	3.87	3.26
6	3.06	3.90	3.15

MFDD Mean

SRTT 1	Control Tyre	SRTT 2
3.12	3.85	3.20

Std. deviation

SRTT 1	Control Tyre	SRTT 2
0.06	0.05	0.05

Coefficient of variation

SRTT 1	Control Tyre	SRTT 2
2.08%	1.40%	1.50%
≤ 6 per cent	≤ 6 per cent	≤ 6 per cent

FULFILS / ~~NOT FULFILS~~

Wa (SRTT) : 3.157
SRTT validation [%] : 2.69
SRTT validation ≤ 5%

FULFILS / ~~NOT FULFILS~~

Snow index (SG1) = 1.22

6. TEST RESULTS – MEASUREMENT 2 CANDIDATE TYRE TEST

6.1. Test method : Brake

6.2. Test sequence : C1–T1–C2

6.3. Candidate : T1

6.4. Test results:

Test run	Control 1	Candidate	Control 2
	Average deceleration [m/s^2]	Average deceleration [m/s^2]	Average deceleration [m/s^2]
1	3.37	3.66	3.36
2	3.53	3.66	3.43
3	3.53	3.73	3.45
4	3.40	3.64	3.52
5	3.29	3.60	3.44
6	3.60	3.62	3.53

MFDD Mean

Control 1	Candidate Tyre	Control 2
3.45	3.65	3.45

Std. deviation

Control 1	Candidate Tyre	Control 2
0.12	0.04	0.06

Coefficient of variation

Control 1	Candidate Tyre	Control 2
3.47%	1.23%	1.81%
≤ 6 per cent	≤ 6 per cent	≤ 6 per cent

FULFILS / ~~NOT FULFILS~~

Wa (SRTT) : 3.453
SRTT validation [%] : 0.02
SRTT validation ≤ 5%

FULFILS / ~~NOT FULFILS~~

Snow index (SG2) = 1.06

Snow index second run (SG1 x SG2) = 1.29

7. TEST RESULTS

Measured Snow index value relative to SRTT : Measurement 1 : 1.19
Measurement 2 : 1.29
Average : 1.24

SNOW INDEX: 1.24

7.1 Limit values :

Class of tyre	Snow grip index (brake on Snow method)	
	Ref: C1-SRTT 14	Ref: C2-SRTT 16C
C1	1.07 (1.10**)	-
C2	-	1.02 (1.05**)

**These limit values represent the minimum required Snow grip index plus an extra safety margin allowing the sample to represent the whole tyre range.

8. TEST TYRE PICTURE

Picture 1. Tread pattern

Place of test: NenJiang red valley automotive test center Co., Ltd., China
Date of test: 01-02/03/2021

Yu(alex) Zhang
HOMOLOGATION ENGINEER