

Annex XX

Measurement of tyre abrasion per unit distance travelled — Method of drum

1. Scope
 - 1.1 This document specifies the method for measuring tyre abrasion per distance travelled, under controlled laboratory conditions, for new pneumatic tyres of Class C1 tyres. This document applies to all C1 tyres except for:
 - 1.1.1 Tyres designed as "Temporary use spare tyres" and marked "Temporary use only"
 - 1.1.2 Tyres fitted with additional devices to improve traction properties (e.g. studded tyres).
 - 1.1.3 Tyre not homologated for on road permanent usage
 - 1.1.4 [Free rolling tyres (trailers, caravan...)]
 - 1.1.5 Tyres designed for competitions;
 - 1.1.6 Tyres designed only to be fitted to vehicles registered for the first time before 1 October 1990;
 - 1.1.7 Professional off-road tyres.
 2. Definitions and Terms
 - 2.1 "Tyre abrasion" means tyre wear that is observed as the loss of tyre during usage
 - 2.2 "Mass loss" means amount of the mass lost due to tyre abrasion
Note 1 to entry: It is expressed in grams.
 - 2.3 "Abrasion rate" means mass loss per unit distance travelled
Note 1 to entry: It is expressed in milligrams per kilometre.
 - 2.4 "Abrasion index" means index that is calculated as the abrasion rate of a candidate tyre compared to the abrasion rate of a reference tyre under the same test method and conditions specified in this document.
 - 2.5 "Test tyre" means tyre that is used for an evaluation programme, either candidate tyres or reference tyres
 - 2.5.1 Candidate tyre
 - T test tyre that is part of an evaluation programme and that is evaluated with the reference tyre using the same test method
 - 2.5.2 Reference tyre

- R special test tyre that is used as a benchmark in an evaluation programme
- 2.5.2.1 "Standard Reference Test Tyre" or "SRTT" means a tyre that is produced, controlled and stored in accordance with the standards of ASTM International:
 [(a) F2493 for the size P225/60R16 and referred to as "SRTT16"]
 [(b) Fxxxx for the size 225/45R17 and referred to as "SRTT17S"]
 [(c) Fyyyy for the size 225/45R17 and referred to as "SRTT17W"]
- 2.6 "Mean profile depth" is measured mean profile depth (MPD) specified in ISO13473-1.
- 2.7 "Coordination system" is tyre coordinate system specified in ISO 8855.
- 2.8 Vertical force
 F_z normal force of a tyre exerted on the road resulting from the mass supported by the tyre,
 Note 1 to entry: It is expressed in Newtons.
- 2.9 Lateral force
 F_y force of a tyre generated from lateral direction during cornering
 Note 1 to entry: It is expressed in Newtons.
 Positive sign turning left
 Negative sign turning right
- 2.10 Longitudinal force
 F_x force of a tyre generated from the longitudinal direction during acceleration or braking
 Note 1 to entry: It is expressed in newtons.
 positive sign for speed increase,
 negative sign for speed decrease (e.g. braking)
- 2.11 Loaded radius
 r_L The distance from the tyre axis to the drum outer surface under steady-state conditions at 0 speed and 0 camber as well while the test load and pressure is applied at room temperature and refer to the thermal conditioning of section 4.2, in meter
- 2.12 Tyre torque
 M_y Moment on tyre rotation axle
- 2.13 "Load index means" the Maximum tyre load-carrying capacity corresponding to the service conditions specified by the tyre manufacturers shall be indicated by a load index per tyre.
3. Test method
- 3.1 General
 This test method evaluates the mass loss of the candidate tyre relative to the reference tyre.
 In measuring tyre tread wear per distance travelled, it is necessary to control vertical force, lateral force and longitudinal force given to a test tyre.

This test method uses a tread wear test equipment with a cylindrical flywheel (drum) with test surface external surface of drum.

3.2 Drum specification

3.2.1 Tyre Wear Test Equipment

Tread wear test equipment shall consist of a drum, a tyre mounting device, a loading device and adhesion prevention system. There can be one, two, or more tyre mounting devices.

3.2.2 Diameter

The test dynamometer shall have a cylindrical flywheel (drum) with a diameter of at least [1,7 m]. The roller diameter shall be defined and reported considering the thickness of test surface, to compute test speed and running distance correctly.

The roller diameter tolerance shall be within $\pm[10.0]$ mm. The roller shaft runout shall be within [0.25] mm.

3.2.3 Surface

The test surface shall be applied to external surface of the cylindrical drum. The test surface of drum shall:

- (a) have MPD measured at the start and the end of the drum test, according to [ISO 13473-1] except for low pass filter, applied from [0,2 mm] to [2,0 mm]
- (b) low pass filter cut-off shall be [0,1]mm for MPD data processing procedure of tyre abrasion evaluation. measurement resolution (Laser spot, vertical resolution and horizontal resolution) shall be less than 0,1 mm
- (c) be textured with sands, stone or an alternative material, e.g., aluminium oxide resin.
- (d) The drum surface shall be built with rigid and not deformable material.
- (e) The test surface, including voids, shall be dry and clean for all measurements.

The abrasion rate of the reference tyre for all surface shall be in the range [30] mg/km to [100] mg/km (Abrasion Rate shall be calculated according to the method in paragraph7).

In case of sand paper used for surface it shall be replaced as specified in Appendix X.

Intermediate inspection of the abrasion rate for the reference tyre is recommended to ensure abrasion rate within range [30] mg/km to [100]mg/km.

3.2.4 Width

The width of the test surface shall always exceed the width of the test tyre contact patch throughout entire test duration.

3.3 Tyre carriage and drive system

The tyre carriage and drive system shall be able to provide dynamic control of:

- (a) tyre lateral force developed by the drag force produced by tyre slip angle during running
- (b) Longitudinal tyre force or torque developed by tractive force by the tyre during braking and accelerating

Admitted deviation from the nominal value of load(F_z), lateral force(F_y), longitudinal force(F_x) and tyre torque(M_y) during the testing is:

Fz: $\pm 150\text{N}$ or 3% whichever is greater

Fy: $\pm 100\text{N}$ or 5 % whichever is greater, for the difference between input peaks and actually generated peaks.

Fx: $\pm 100\text{N}$ or 5% whichever is greater, for the difference between input peaks and actually generated peaks.

My: $\pm 40\text{Nm}$ or 5 % whichever is greater, for the difference between input peaks and actually generated peaks.

3.4 Adhesion prevention system

Tread wear test equipment shall be equipped with the powder delivery system to spray a controlled volume of such material (e.g., talc) on the test surface near the test tyre contact patch so that a test tyre does not adhere to and change the test surface.

3.5 Load, alignment, control and instrumental accuracies

Measurement of these parameters shall be sufficiently accurate and precise to provide the required test data. The specific and respective values are shown in Appendix 2.

3.6 Mass scale

Mass scale for test tyres shall have:

- (a) mass capacity being able to weigh test tyre
- (b) The accuracy of the mass scale shall be within ± 2 g.

Mass scale shall be fully calibrated.

4. Test Conditions

4.1 General

The test consists of a measurement of tyre mass loss in which the tyre is inflated to the required cold pressure and the inflation pressure allowed to build up (i.e. “capped inflation”).

4.2 Test load

The load Fz on the tyre to measure shall be calculated from its LI load, corresponding to the maximum mass associated with the LI of the tyre;

The standard test load shall be computed from the values shown in Table 1 and shall be kept within the tolerance specified in Appendix 2.

4.3 Tyre inflation pressure

The inflation pressure shall be in accordance with that shown in Table 1 and shall be capped with the accuracy specified in Appendix 2

Table 1 — Test loads and inflation pressures

Tyre type	C1 ^a	
	Standard load or light load	Reinforced or extra load
Load -% of maximum load capacity	80	80
Inflation pressure ^b [kPa]	210	250

^a For those C1 tyres belonging to categories which are not shown in ISO 4000-1:2015, Annex B, the inflation pressure shall be the inflation pressure recommended by the tyre manufacturer, corresponding to the maximum tyre load capacity, reduced by 30 kPa.

^b The inflation pressure shall be capped with the accuracy specified in Appendix 2.

- 4.4 Testing condition (Longitudinal force, lateral force, speed, running distance)
 Longitudinal force, lateral force shall be computed from the values shown in Appendix 1. Speed shall be in accordance with that shown in Appendix 2.
 Running distance is 5,000km.
 The total distance of an actual test shall not differ more than $\pm 5\%$ from the total input distance.
5. Test procedure
- 5.1 General
 The test procedure steps described below are to be followed in the sequence given.
 Both reference and candidate tyres shall be new when starting the test.
 Test tyres with specified direction of rotation shall be rolling in the forward direction.
 Direction of rolling shall be kept in the same direction throughout the test.
- 5.2 Thermal conditioning
 Place the inflated tyre in the thermal environment of the test location for a minimum of 3 h.
- 5.3 Pressure adjustment
 After thermal conditioning, the inflation pressure shall be adjusted to the test pressure.
- 5.4 Thermal environment
 During the test, the ambient temperature, at a distance of not less than 0,15m and not more than 1 m from the tyre, shall be $25\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$
 Average temperature for reference and candidate tyre during test shall not differ by more than 2 degrees)
- 5.5 Mass measurement
 The mass of tyre shall be measured before and after 5,000km of run set out in paragraph 5.6 for both reference and candidate tyres.
- 5.6 Test cycle
- 5.6.1 Input condition
 Both reference tyre and candidate tyre shall be tested according to input condition of Appendix 2. The Appendix 2 test condition of 250 km is set as one set, and the test cycle shall be repeated 20 times until 5000 km is reached.
- 5.6.2 Basic test cycle(2position)
 Both reference tyre and candidate tyre shall be mounted different position of one drum. Test of both reference tyre and candidate tyre shall be conducted at the same time.
 Tyres mounted at the two positions shall be exchanged once after the completion of 2,500km. Direction of rotation shall remain constant throughout the test.
 Visual inspection of tyre is recommended after the completion of 2,500km to ensure no tread chunking.
- 5.6.3 Alternative test cycle (1postion)

In case test of reference tyre and candidate tyre is not possible at the same time, the alternative test cycle is available. As Reference tyre(R) and Candidate tyre(T), test order is following:

R(1000km)- T(2000km)- R(2000km) – T(2000km)- R(2000km) – T(1000km)

Repeat a set of Appendix 1 input conditions 4 times for 1000 km and 8 times for 2000 km.

Visual inspection of tyre is recommended around the completion of 2,500km to ensure no tread chunking.

5.6.4 Measurement and recording

The following shall be measured and recorded:

- (a) Test speed, U_n ;
- (b) Load on the tyre normal to the drum surface, L_m ;
- (c) Test inflation pressure: initial and middle of the test, as defined in 5.3;
- (d) Ambient temperature measured in degree °C, t_{amb} ;
- (e) Force or torque applied to the test tyre and testing duration, with a maximum time interval of 1s;
- (f) Test rim size;
- (g) Mass of tyre;
- (h) MPD of the test surface; at the beginning and the end of the test
- (i) Photograph of tyre after test run;

Note 1 to entry: During the measurement of the force or torque applied to the test tyre, a moving average over one wheel revolution may be used to eliminate first and/or second harmonic of the tyre.

Note 2 to entry: During the measurement of the force or torque applied to the test tyre, a low pass filter may be used to eliminate first and/or second harmonic of the tyre.

6. Validation

When a tyre has been subjected to the test method specified in paragraph 3 using a test rim and a valve that undergo no permanent deformation and allow no loss of air, there shall be no visual evidence of tread, sidewall, ply, cord, inner liner, belt or bead separation, chunking, open splices, cracking, broken cords or rubber adhesion.

7. Processing of measurement results

Calculation method for Abrasion Index and Abrasion rate are following:

$$MIT = MT_b - MT_a$$

$$MIR = MR_b - MR_a$$

MIT is Mass loss of candidate tyre, in grams

MIR is Mass loss of reference tyre, in grams

MT_b is Mass of candidate tyre before test cycle, in grams

MTa is Mass of candidate tyre after test cycle, in grams
 MRb is Mass of reference tyre before test cycle, in grams
 MRa is Mass of reference tyre after test cycle, in grams

Abrasion Index ;Ari :

$$Ari = ArT (g) / ArR (g)$$

Where,

ArT : Abrasion rate(mg/km) of candidate tyre, $ArT = MIT (g) / DT(km) \times 1000(mg/g)$

ArR : Abrasion rate(mg/km) of reference tyre, $ArR = MIR (g) / DR(km) \times 1000(mg/g)$

DT is Testing mileage of candidate tyre

DR is Testing mileage of reference tyre

Annex XX – Appendix 1

Input of test cycle

In order to calculate the input forces Fx and Fy, longitudinal and lateral acceleration indices, as G(x) and G(y) respectively, are introduced as below.

For torque control testing machine, tyre torque (My) is calculated with longitudinal force (Fx) and loaded radius (RL)

$$Fx = Fz \times G(x) \text{ or } My = \text{Test load}(Fz) \times G(x) \times RL$$

$$Fy = Fz \times G(y)$$

Fz is the test load defined in 2.10. Fy is the test load defined in 2.11. Fx is the test load defined in 2.12.

G(x) and G(y) represent the index compared to the standard acceleration due to earth gravity ($g= 9.80665m/s^2$), alternatively the local earth gravity can be defined

Table A1 defines the time, G(x), G(y), and speed of test cycle, where:

T represents the total test duration from the beginning of the test;

At a point of test duration T, the values of G(x) and G(y) shall be equal to those listed in Table A1;

G(x) and G(y) shall change linearly between two adjacent points.

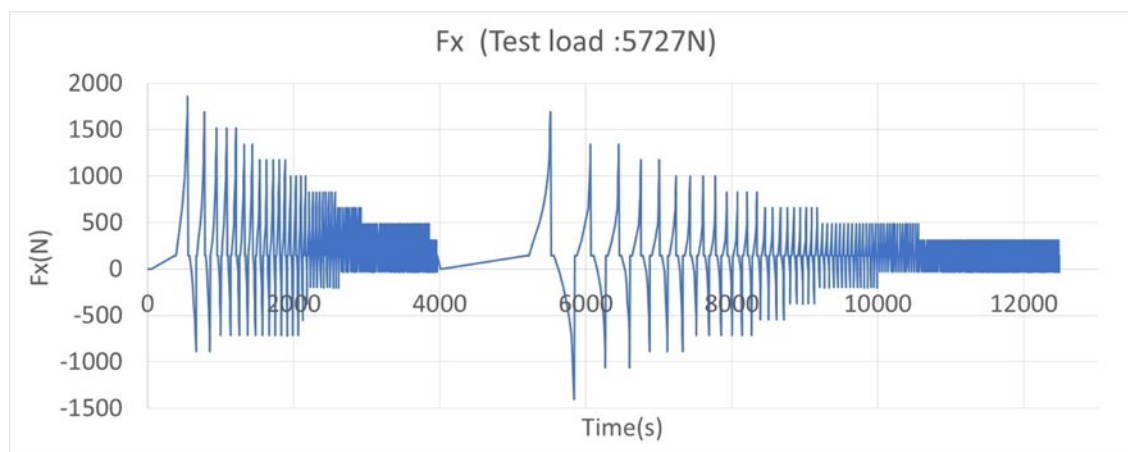
Therefore, the values of Fx and Fy will also change linearly from one point to another. The following graphs show samples of linear change for Fx or Fy with respect to T.

T means the driving time from starting test.

The value of G(x) and G(y) at driving time T is mentioned in Table A1.

G(x) and G(y) between each point changes linearly through those two points.

Graph A.1 – Example of F_x , with a test load of 5727N



Graph A.2 – Example of F_y , with a test load of 5727N

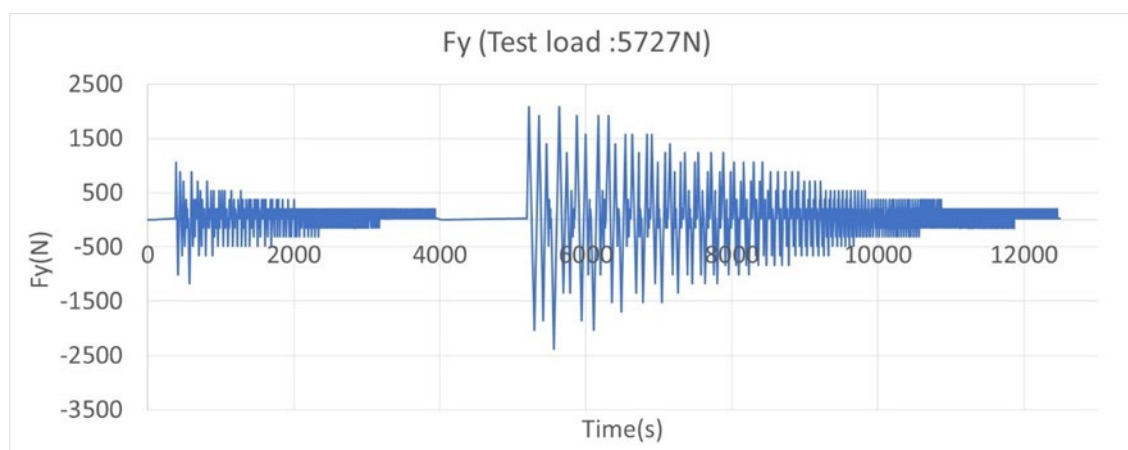


Table A1. – Input of test cycle

T	v	G(x)	G(y)
[s]	[kph]		
0	100	0.000	0
50	100	0.000	0.000
373.2	100	0.025	0.005
388.4	100	0.025	0.185
418.7	100	0.055	-0.175
446.5	100	0.085	0.155
471.7	100	0.115	-0.115
491.9	100	0.145	0.125
509.6	100	0.175	-0.085

522.3	100	0.205	0.065
532.4	100	0.235	-0.025
540.0	100	0.265	0.035
545.0	100	0.295	0.005
547.5	100	0.325	0.005
556.8	100	0.025	0.005
574.5	100	0.025	-0.205
602.3	100	-0.005	0.155
620.0	100	-0.035	-0.085
632.6	100	-0.065	0.065
645.2	100	-0.095	-0.055
657.9	100	-0.125	0.065
662.9	100	-0.155	0.005
668.8	100	0.025	0.005
678.9	100	0.025	0.125
699.1	100	0.055	-0.115
719.3	100	0.085	0.095
737.0	100	0.115	-0.085
747.1	100	0.145	0.065
757.2	100	0.175	-0.025
764.8	100	0.205	0.035
769.9	100	0.235	0.005
774.9	100	0.265	0.035
777.4	100	0.295	0.005
785.9	100	0.025	0.005
796.0	100	0.025	-0.115
816.2	100	-0.005	0.125
826.3	100	-0.035	-0.025
833.9	100	-0.065	0.035
841.4	100	-0.095	-0.025
849.0	100	-0.125	0.035
851.6	100	-0.155	0.005
857.4	100	0.025	0.005
865.0	100	0.025	0.095
885.2	100	0.055	-0.115
902.9	100	0.085	0.095

915.6	100	0.115	-0.055
923.1	100	0.145	0.035
930.7	100	0.175	-0.025
935.8	100	0.205	0.035
940.8	100	0.235	0.005
945.9	100	0.265	0.035
953.5	100	0.025	0.005
961.0	100	0.025	-0.085
978.7	100	-0.005	0.095
986.3	100	-0.035	-0.025
991.3	100	-0.065	0.035
996.4	100	-0.095	0.005
1001.5	100	-0.125	0.035
1006.5	100	0.025	0.005
1014.1	100	0.025	0.095
1031.8	100	0.055	-0.085
1049.5	100	0.085	0.095
1059.6	100	0.115	-0.025
1067.1	100	0.145	0.035
1072.2	100	0.175	0.005
1077.2	100	0.205	0.035
1082.3	100	0.235	0.005
1084.8	100	0.265	0.005
1092.4	100	0.025	0.005
1100.0	100	0.025	-0.085
1112.6	100	-0.005	0.065
1120.2	100	-0.035	-0.025
1125.3	100	-0.065	0.035
1130.3	100	-0.095	0.005
1135.4	100	-0.125	0.035
1140.4	100	0.025	0.005
1148.0	100	0.025	0.095
1165.7	100	0.055	-0.085
1180.8	100	0.085	0.065
1188.4	100	0.115	-0.025
1193.5	100	0.145	0.035

1198.5	100	0.175	0.005
1203.6	100	0.205	0.035
1206.1	100	0.235	0.005
1208.6	100	0.265	0.005
1216.2	100	0.025	0.005
1223.8	100	0.025	-0.085
1236.4	100	-0.005	0.065
1241.5	100	-0.035	0.005
1246.5	100	-0.065	0.035
1251.6	100	-0.095	0.005
1256.6	100	-0.125	0.035
1261.7	100	0.025	0.005
1269.3	100	0.025	0.095
1284.4	100	0.055	-0.085
1299.6	100	0.085	0.065
1307.2	100	0.115	-0.025
1312.2	100	0.145	0.035
1317.3	100	0.175	0.005
1322.3	100	0.205	0.035
1324.8	100	0.235	0.005
1331.6	100	0.025	0.005
1339.2	100	0.025	-0.085
1351.8	100	-0.005	0.065
1356.8	100	-0.035	0.005
1361.9	100	-0.065	0.035
1366.9	100	-0.095	0.005
1372.0	100	-0.125	0.035
1377.1	100	0.025	0.005
1382.1	100	0.025	0.065
1397.3	100	0.055	-0.085
1409.9	100	0.085	0.065
1417.5	100	0.115	-0.025
1422.5	100	0.145	0.035
1427.6	100	0.175	0.005
1432.6	100	0.205	0.035
1435.2	100	0.235	0.005

1441.9	100	0.025	0.005
1447.0	100	0.025	-0.055
1457.1	100	-0.005	0.065
1462.1	100	-0.035	0.005
1467.2	100	-0.065	0.035
1472.2	100	-0.095	0.005
1477.3	100	-0.125	0.035
1482.3	100	0.025	0.005
1487.4	100	0.025	0.065
1502.5	100	0.055	-0.085
1515.2	100	0.085	0.065
1522.7	100	0.115	-0.025
1527.8	100	0.145	0.035
1532.9	100	0.175	0.005
1535.4	100	0.205	0.005
1541.3	100	0.025	0.005
1546.3	100	0.025	-0.055
1556.4	100	-0.005	0.065
1561.5	100	-0.035	0.005
1566.5	100	-0.065	0.035
1571.6	100	-0.095	0.005
1576.6	100	-0.125	0.035
1581.7	100	0.025	0.005
1586.8	100	0.025	0.065
1601.9	100	0.055	-0.085
1614.5	100	0.085	0.065
1619.6	100	0.115	0.005
1624.6	100	0.145	0.035
1629.7	100	0.175	0.005
1632.2	100	0.205	0.005
1638.1	100	0.025	0.005
1643.2	100	0.025	-0.055
1650.8	100	-0.005	0.035
1655.8	100	-0.035	0.005
1660.9	100	-0.065	0.035
1663.4	100	-0.095	0.005

1665.9	100	-0.125	0.005
1671.0	100	0.025	0.005
1676.0	100	0.025	0.065
1691.2	100	0.055	-0.085
1703.8	100	0.085	0.065
1708.9	100	0.115	0.005
1713.9	100	0.145	0.035
1719.0	100	0.175	0.005
1721.5	100	0.205	0.005
1727.4	100	0.025	0.005
1732.4	100	0.025	-0.055
1740.0	100	-0.005	0.035
1745.1	100	-0.035	0.005
1747.6	100	-0.065	0.005
1750.1	100	-0.095	0.005
1752.7	100	-0.125	0.005
1757.7	100	0.025	0.005
1762.8	100	0.025	0.065
1775.4	100	0.055	-0.055
1788.0	100	0.085	0.065
1793.1	100	0.115	0.005
1798.1	100	0.145	0.035
1800.7	100	0.175	0.005
1803.2	100	0.205	0.005
1809.1	100	0.025	0.005
1814.1	100	0.025	-0.055
1821.7	100	-0.005	0.035
1826.8	100	-0.035	0.005
1829.3	100	-0.065	0.005
1831.8	100	-0.095	0.005
1834.3	100	-0.125	0.005
1839.4	100	0.025	0.005
1844.5	100	0.025	0.065
1857.1	100	0.055	-0.055
1867.2	100	0.085	0.035
1872.2	100	0.115	0.005

1877.3	100	0.145	0.035
1879.8	100	0.175	0.005
1882.3	100	0.205	0.005
1888.2	100	0.025	0.005
1893.3	100	0.025	-0.055
1900.9	100	-0.005	0.035
1905.9	100	-0.035	0.005
1908.5	100	-0.065	0.005
1911.0	100	-0.095	0.005
1913.5	100	-0.125	0.005
1918.6	100	0.025	0.005
1923.6	100	0.025	0.065
1936.2	100	0.055	-0.055
1946.4	100	0.085	0.035
1951.4	100	0.115	0.005
1956.5	100	0.145	0.035
1959.0	100	0.175	0.005
1964.0	100	0.025	0.005
1969.1	100	0.025	-0.055
1976.7	100	-0.005	0.035
1981.7	100	-0.035	0.005
1984.2	100	-0.065	0.005
1986.8	100	-0.095	0.005
1989.3	100	-0.125	0.005
1994.4	100	0.025	0.005
1999.4	100	0.025	0.065
2009.5	100	0.055	-0.055
2019.6	100	0.085	0.035
2024.7	100	0.115	0.005
2029.7	100	0.145	0.035
2032.3	100	0.175	0.005
2037.3	100	0.025	0.005
2042.4	100	0.025	-0.055
2049.9	100	-0.005	0.035
2055.0	100	-0.035	0.005
2057.5	100	-0.065	0.005

2060.0	100	-0.095	0.005
2062.6	100	-0.125	0.005
2067.6	100	0.025	0.005
2070.1	100	0.025	0.035
2080.3	100	0.055	-0.055
2087.8	100	0.085	0.035
2092.9	100	0.115	0.005
2097.9	100	0.145	0.035
2100.5	100	0.175	0.005
2105.5	100	0.025	0.005
2108.0	100	0.025	-0.025
2115.6	100	-0.005	0.035
2120.7	100	-0.035	0.005
2123.2	100	-0.065	0.005
2125.7	100	-0.095	0.005
2129.9	100	0.025	0.005
2132.5	100	0.025	0.035
2142.6	100	0.055	-0.055
2150.2	100	0.085	0.035
2155.2	100	0.115	0.005
2160.3	100	0.145	0.035
2162.8	100	0.175	0.005
2167.8	100	0.025	0.005
2170.4	100	0.025	-0.025
2177.9	100	-0.005	0.035
2180.5	100	-0.035	0.005
2183.0	100	-0.065	0.005
2186.4	100	0.025	0.005
2188.9	100	0.025	0.035
2199.0	100	0.055	-0.055
2206.6	100	0.085	0.035
2211.6	100	0.115	0.005
2214.2	100	0.145	0.005
2218.4	100	0.025	0.005
2220.9	100	0.025	-0.025
2228.5	100	-0.005	0.035

2231.0	100	-0.035	0.005
2233.5	100	0.025	0.005
2236.1	100	0.025	0.035
2246.2	100	0.055	-0.055
2253.7	100	0.085	0.035
2258.8	100	0.115	0.005
2261.3	100	0.145	0.005
2265.5	100	0.025	0.005
2268.1	100	0.025	-0.025
2275.6	100	-0.005	0.035
2278.2	100	-0.035	0.005
2280.7	100	0.025	0.005
2283.2	100	0.025	0.035
2293.3	100	0.055	-0.055
2300.9	100	0.085	0.035
2306.0	100	0.115	0.005
2308.5	100	0.145	0.005
2312.7	100	0.025	0.005
2315.2	100	0.025	-0.025
2322.8	100	-0.005	0.035
2325.3	100	-0.035	0.005
2327.8	100	0.025	0.005
2330.4	100	0.025	0.035
2340.5	100	0.055	-0.055
2348.1	100	0.085	0.035
2353.1	100	0.115	0.005
2355.6	100	0.145	0.005
2359.9	100	0.025	0.005
2362.4	100	0.025	-0.025
2370.0	100	-0.005	0.035
2372.5	100	-0.035	0.005
2375.0	100	0.025	0.005
2377.5	100	0.025	0.035
2385.1	100	0.055	-0.025
2392.7	100	0.085	0.035
2397.7	100	0.115	0.005

2400.3	100	0.145	0.005
2404.5	100	0.025	0.005
2407.0	100	0.025	-0.025
2412.1	100	-0.005	0.035
2414.6	100	-0.035	0.005
2417.1	100	0.025	0.005
2419.6	100	0.025	0.035
2427.2	100	0.055	-0.025
2434.8	100	0.085	0.035
2439.9	100	0.115	0.005
2442.4	100	0.145	0.005
2446.6	100	0.025	0.005
2449.1	100	0.025	-0.025
2454.2	100	-0.005	0.035
2456.7	100	-0.035	0.005
2459.2	100	0.025	0.005
2461.8	100	0.025	0.035
2469.3	100	0.055	-0.025
2476.9	100	0.085	0.035
2482.0	100	0.115	0.005
2484.5	100	0.145	0.005
2488.7	100	0.025	0.005
2491.2	100	0.025	-0.025
2496.3	100	-0.005	0.035
2498.8	100	-0.035	0.005
2501.3	100	0.025	0.005
2503.9	100	0.025	0.035
2511.4	100	0.055	-0.025
2519.0	100	0.085	0.035
2524.1	100	0.115	0.005
2526.6	100	0.145	0.005
2530.8	100	0.025	0.005
2533.3	100	0.025	-0.025
2538.4	100	-0.005	0.035
2540.9	100	-0.035	0.005
2543.4	100	0.025	0.005

2546.0	100	0.025	0.035
2553.5	100	0.055	-0.025
2561.1	100	0.085	0.035
2563.7	100	0.115	0.005
2566.2	100	0.145	0.005
2570.4	100	0.025	0.005
2572.9	100	0.025	-0.025
2578.0	100	-0.005	0.035
2580.5	100	-0.035	0.005
2583.0	100	0.025	0.005
2585.5	100	0.025	0.035
2593.1	100	0.055	-0.025
2600.7	100	0.085	0.035
2603.2	100	0.115	0.005
2606.6	100	0.025	0.005
2609.1	100	0.025	-0.025
2614.2	100	-0.005	0.035
2616.7	100	-0.035	0.005
2619.2	100	0.025	0.005
2621.8	100	0.025	0.035
2629.3	100	0.055	-0.025
2636.9	100	0.085	0.035
2639.4	100	0.115	0.005
2642.8	100	0.025	0.005
2645.3	100	0.025	-0.025
2650.4	100	-0.005	0.035
2652.1	100	0.025	0.005
2654.6	100	0.025	0.035
2662.2	100	0.055	-0.025
2669.8	100	0.085	0.035
2672.3	100	0.115	0.005
2675.7	100	0.025	0.005
2678.2	100	0.025	-0.025
2683.2	100	-0.005	0.035
2684.9	100	0.025	0.005
2687.4	100	0.025	0.035

2695.0	100	0.055	-0.025
2702.6	100	0.085	0.035
2705.1	100	0.115	0.005
2708.5	100	0.025	0.005
2711.0	100	0.025	-0.025
2716.1	100	-0.005	0.035
2717.8	100	0.025	0.005
2720.3	100	0.025	0.035
2727.9	100	0.055	-0.025
2735.5	100	0.085	0.035
2738.0	100	0.115	0.005
2741.3	100	0.025	0.005
2743.9	100	0.025	-0.025
2748.9	100	-0.005	0.035
2750.6	100	0.025	0.005
2753.1	100	0.025	0.035
2760.7	100	0.055	-0.025
2765.8	100	0.085	0.035
2768.3	100	0.115	0.005
2771.7	100	0.025	0.005
2774.2	100	0.025	-0.025
2779.2	100	-0.005	0.035
2780.9	100	0.025	0.005
2783.5	100	0.025	0.035
2791.0	100	0.055	-0.025
2796.1	100	0.085	0.035
2798.6	100	0.115	0.005
2802.0	100	0.025	0.005
2804.5	100	0.025	-0.025
2809.6	100	-0.005	0.035
2811.2	100	0.025	0.005
2813.8	100	0.025	0.035
2821.4	100	0.055	-0.025
2826.4	100	0.085	0.035
2828.9	100	0.115	0.005
2832.3	100	0.025	0.005

2834.8	100	0.025	-0.025
2839.9	100	-0.005	0.035
2841.6	100	0.025	0.005
2844.1	100	0.025	0.035
2851.7	100	0.055	-0.025
2856.7	100	0.085	0.035
2859.2	100	0.115	0.005
2862.6	100	0.025	0.005
2865.1	100	0.025	-0.025
2870.2	100	-0.005	0.035
2871.9	100	0.025	0.005
2874.4	100	0.025	0.035
2882.0	100	0.055	-0.025
2887.0	100	0.085	0.035
2889.6	100	0.115	0.005
2892.9	100	0.025	0.005
2895.5	100	0.025	-0.025
2900.5	100	-0.005	0.035
2902.2	100	0.025	0.005
2904.7	100	0.025	0.035
2912.3	100	0.055	-0.025
2917.4	100	0.085	0.035
2919.9	100	0.115	0.005
2923.3	100	0.025	0.005
2925.8	100	0.025	-0.025
2930.8	100	-0.005	0.035
2932.5	100	0.025	0.005
2935.0	100	0.025	0.035
2942.6	100	0.055	-0.025
2947.7	100	0.085	0.035
2950.2	100	0.025	0.005
2952.7	100	0.025	-0.025
2957.8	100	-0.005	0.035
2959.5	100	0.025	0.005
2962.0	100	0.025	0.035
2969.6	100	0.055	-0.025

2974.6	100	0.085	0.035
2977.2	100	0.025	0.005
2979.7	100	0.025	-0.025
2984.7	100	-0.005	0.035
2986.4	100	0.025	0.005
2988.9	100	0.025	0.035
2996.5	100	0.055	-0.025
3001.6	100	0.085	0.035
3004.1	100	0.025	0.005
3006.6	100	0.025	-0.025
3011.7	100	-0.005	0.035
3013.4	100	0.025	0.005
3015.9	100	0.025	0.035
3023.5	100	0.055	-0.025
3028.5	100	0.085	0.035
3031.0	100	0.025	0.005
3036.1	100	0.025	0.005
3041.2	100	-0.005	0.035
3042.8	100	0.025	0.005
3045.4	100	0.025	0.035
3052.9	100	0.055	-0.025
3058.0	100	0.085	0.035
3060.5	100	0.025	0.005
3065.6	100	0.025	0.005
3070.6	100	-0.005	0.035
3072.3	100	0.025	0.005
3074.8	100	0.025	0.035
3082.4	100	0.055	-0.025
3087.5	100	0.085	0.035
3090.0	100	0.025	0.005
3095.1	100	0.025	0.005
3100.1	100	-0.005	0.035
3101.8	100	0.025	0.005
3104.3	100	0.025	0.035
3111.9	100	0.055	-0.025
3116.9	100	0.085	0.035

3119.5	100	0.025	0.005
3124.5	100	0.025	0.005
3129.6	100	-0.005	0.035
3131.3	100	0.025	0.005
3133.8	100	0.025	0.035
3141.4	100	0.055	-0.025
3146.4	100	0.085	0.035
3149.0	100	0.025	0.005
3154.0	100	0.025	0.005
3159.1	100	-0.005	0.035
3160.7	100	0.025	0.005
3163.3	100	0.025	0.035
3170.8	100	0.055	-0.025
3175.9	100	0.085	0.035
3178.4	100	0.025	0.005
3183.5	100	0.025	0.005
3188.5	100	-0.005	0.035
3190.2	100	0.025	0.005
3192.7	100	0.025	0.035
3197.8	100	0.055	0.005
3202.8	100	0.085	0.035
3205.4	100	0.025	0.005
3210.4	100	0.025	0.005
3215.5	100	-0.005	0.035
3217.2	100	0.025	0.005
3219.7	100	0.025	0.035
3224.7	100	0.055	0.005
3229.8	100	0.085	0.035
3232.3	100	0.025	0.005
3237.4	100	0.025	0.005
3242.4	100	-0.005	0.035
3244.1	100	0.025	0.005
3246.6	100	0.025	0.035
3251.7	100	0.055	0.005
3256.7	100	0.085	0.035
3259.3	100	0.025	0.005

3264.3	100	0.025	0.005
3269.4	100	-0.005	0.035
3271.1	100	0.025	0.005
3273.6	100	0.025	0.035
3278.6	100	0.055	0.005
3283.7	100	0.085	0.035
3286.2	100	0.025	0.005
3291.3	100	0.025	0.005
3296.3	100	-0.005	0.035
3298.0	100	0.025	0.005
3300.5	100	0.025	0.035
3305.6	100	0.055	0.005
3310.6	100	0.085	0.035
3313.2	100	0.025	0.005
3318.2	100	0.025	0.005
3323.3	100	-0.005	0.035
3325.0	100	0.025	0.005
3327.5	100	0.025	0.035
3332.5	100	0.055	0.005
3335.1	100	0.085	0.005
3337.6	100	0.025	0.005
3342.6	100	0.025	0.005
3347.7	100	-0.005	0.035
3349.4	100	0.025	0.005
3351.9	100	0.025	0.035
3357.0	100	0.055	0.005
3359.5	100	0.085	0.005
3362.0	100	0.025	0.005
3367.1	100	0.025	0.005
3372.1	100	-0.005	0.035
3373.8	100	0.025	0.005
3376.3	100	0.025	0.035
3381.4	100	0.055	0.005
3383.9	100	0.085	0.005
3386.4	100	0.025	0.005
3391.5	100	0.025	0.005

3394.0	100	-0.005	0.005
3395.7	100	0.025	0.005
3398.2	100	0.025	0.035
3403.3	100	0.055	0.005
3405.8	100	0.085	0.005
3408.3	100	0.025	0.005
3413.4	100	0.025	0.005
3415.9	100	-0.005	0.005
3417.6	100	0.025	0.005
3420.1	100	0.025	0.035
3425.2	100	0.055	0.005
3427.7	100	0.085	0.005
3430.2	100	0.025	0.005
3435.3	100	0.025	0.005
3437.8	100	-0.005	0.005
3439.5	100	0.025	0.005
3442.0	100	0.025	0.035
3447.1	100	0.055	0.005
3449.6	100	0.085	0.005
3452.1	100	0.025	0.005
3457.2	100	0.025	0.005
3459.7	100	-0.005	0.005
3461.4	100	0.025	0.005
3463.9	100	0.025	0.035
3469.0	100	0.055	0.005
3471.5	100	0.085	0.005
3474.0	100	0.025	0.005
3479.1	100	0.025	0.005
3481.6	100	-0.005	0.005
3483.3	100	0.025	0.005
3485.8	100	0.025	0.035
3490.9	100	0.055	0.005
3493.4	100	0.085	0.005
3495.9	100	0.025	0.005
3501.0	100	0.025	0.005
3503.5	100	-0.005	0.005

3505.2	100	0.025	0.005
3507.7	100	0.025	0.035
3512.8	100	0.055	0.005
3515.3	100	0.085	0.005
3517.8	100	0.025	0.005
3522.9	100	0.025	0.005
3525.4	100	-0.005	0.005
3527.1	100	0.025	0.005
3529.6	100	0.025	0.035
3534.7	100	0.055	0.005
3537.2	100	0.085	0.005
3539.7	100	0.025	0.005
3544.8	100	0.025	0.005
3547.3	100	-0.005	0.005
3549.0	100	0.025	0.005
3551.5	100	0.025	0.035
3556.6	100	0.055	0.005
3559.1	100	0.085	0.005
3561.6	100	0.025	0.005
3566.7	100	0.025	0.005
3569.2	100	-0.005	0.005
3570.9	100	0.025	0.005
3573.4	100	0.025	0.035
3578.5	100	0.055	0.005
3581.0	100	0.085	0.005
3583.5	100	0.025	0.005
3588.6	100	0.025	0.005
3591.1	100	-0.005	0.005
3592.8	100	0.025	0.005
3595.3	100	0.025	0.035
3600.3	100	0.055	0.005
3602.9	100	0.085	0.005
3605.4	100	0.025	0.005
3610.5	100	0.025	0.005
3613.0	100	-0.005	0.005
3614.7	100	0.025	0.005

3617.2	100	0.025	0.035
3619.7	100	0.055	0.005
3622.2	100	0.085	0.005
3624.8	100	0.025	0.005
3629.8	100	0.025	0.005
3632.3	100	-0.005	0.005
3634.0	100	0.025	0.005
3636.6	100	0.025	0.035
3639.1	100	0.055	0.005
3641.6	100	0.085	0.005
3644.1	100	0.025	0.005
3649.2	100	0.025	0.005
3651.7	100	-0.005	0.005
3653.4	100	0.025	0.005
3655.9	100	0.025	0.035
3658.5	100	0.055	0.005
3661.0	100	0.085	0.005
3663.5	100	0.025	0.005
3668.6	100	0.025	0.005
3671.1	100	-0.005	0.005
3672.8	100	0.025	0.005
3675.3	100	0.025	0.035
3677.8	100	0.055	0.005
3680.4	100	0.085	0.005
3682.9	100	0.025	0.005
3687.9	100	0.025	0.005
3690.5	100	-0.005	0.005
3692.1	100	0.025	0.005
3694.7	100	0.025	0.035
3697.2	100	0.055	0.005
3699.7	100	0.085	0.005
3702.2	100	0.025	0.005
3707.3	100	0.025	0.005
3709.8	100	-0.005	0.005
3711.5	100	0.025	0.005
3714.0	100	0.025	0.035

3716.6	100	0.055	0.005
3719.1	100	0.085	0.005
3721.6	100	0.025	0.005
3726.7	100	0.025	0.005
3729.2	100	-0.005	0.005
3730.9	100	0.025	0.005
3733.4	100	0.025	0.035
3735.9	100	0.055	0.005
3738.5	100	0.085	0.005
3741.0	100	0.025	0.005
3746.0	100	0.025	0.005
3748.6	100	-0.005	0.005
3750.3	100	0.025	0.005
3752.8	100	0.025	0.035
3755.3	100	0.055	0.005
3757.8	100	0.085	0.005
3760.4	100	0.025	0.005
3765.4	100	0.025	0.005
3767.9	100	-0.005	0.005
3769.6	100	0.025	0.005
3772.1	100	0.025	0.035
3774.7	100	0.055	0.005
3777.2	100	0.085	0.005
3779.7	100	0.025	0.005
3784.8	100	0.025	0.005
3787.3	100	-0.005	0.005
3789.0	100	0.025	0.005
3791.5	100	0.025	0.035
3794.0	100	0.055	0.005
3796.6	100	0.085	0.005
3799.1	100	0.025	0.005
3804.1	100	0.025	0.005
3806.7	100	-0.005	0.005
3808.4	100	0.025	0.005
3810.9	100	0.025	0.035
3813.4	100	0.055	0.005

3815.9	100	0.085	0.005
3818.5	100	0.025	0.005
3823.5	100	0.025	0.005
3826.0	100	-0.005	0.005
3827.7	100	0.025	0.005
3830.3	100	0.025	0.035
3832.8	100	0.055	0.005
3835.3	100	0.085	0.005
3837.8	100	0.025	0.005
3842.9	100	0.025	0.005
3845.4	100	-0.005	0.005
3847.1	100	0.025	0.005
3849.6	100	0.025	0.035
3852.2	100	0.055	0.005
3854.7	100	0.085	0.005
3857.2	100	0.025	0.005
3862.3	100	0.025	0.005
3864.8	100	-0.005	0.005
3866.5	100	0.025	0.005
3869.0	100	0.025	0.035
3871.5	100	0.055	0.005
3873.2	100	0.025	0.005
3878.3	100	0.025	0.005
3880.8	100	-0.005	0.005
3882.5	100	0.025	0.005
3885.0	100	0.025	0.035
3887.5	100	0.055	0.005
3889.2	100	0.025	0.005
3894.3	100	0.025	0.005
3896.8	100	-0.005	0.005
3898.5	100	0.025	0.005
3901.0	100	0.025	0.035
3903.5	100	0.055	0.005
3905.2	100	0.025	0.005
3910.3	100	0.025	0.005
3912.8	100	-0.005	0.005

3914.5	100	0.025	0.005
3917.0	100	0.025	0.035
3919.5	100	0.055	0.005
3921.2	100	0.025	0.005
3926.3	100	0.025	0.005
3928.8	100	-0.005	0.005
3930.5	100	0.025	0.005
3933.0	100	0.025	0.035
3935.5	100	0.055	0.005
3937.2	100	0.025	0.005
3942.3	100	0.025	0.005
3944.8	100	-0.005	0.005
3946.5	100	0.025	0.005
3951.5	100	0.025	0.005
3954.1	100	0.055	0.005
3955.7	100	0.025	0.005
3960.8	100	0.025	0.005
3963.3	100	-0.005	0.005
3965.0	100	0.025	0.005
4015.0	60	0.000	0.000
5188.3	60	0.025	0.005
5221.7	60	0.025	0.365
5291.3	60	0.055	-0.355
5358.1	60	0.085	0.335
5416.6	60	0.115	-0.325
5458.3	60	0.145	0.245
5486.2	60	0.175	-0.085
5497.3	60	0.205	0.065
5505.6	60	0.235	-0.025
5511.2	60	0.265	0.035
5514.0	60	0.295	0.005
5523.3	60	0.025	0.005
5562.2	60	0.025	-0.415
5637.4	60	-0.005	0.365
5693.1	60	-0.035	-0.235
5737.6	60	-0.065	0.215

5779.3	60	-0.095	-0.235
5801.6	60	-0.125	0.095
5818.3	60	-0.155	-0.055
5826.7	60	-0.185	0.035
5835.0	60	-0.215	-0.025
5837.8	60	-0.245	0.005
5847.1	60	0.025	0.005
5877.7	60	0.025	0.335
5941.7	60	0.055	-0.325
5991.8	60	0.085	0.275
6033.6	60	0.115	-0.175
6047.5	60	0.145	0.065
6055.8	60	0.175	-0.025
6061.4	60	0.205	0.035
6067.0	60	0.235	0.005
6074.4	60	0.025	0.005
6107.8	60	0.025	-0.355
6169.0	60	-0.005	0.335
6202.4	60	-0.035	-0.175
6227.5	60	-0.065	0.095
6246.9	60	-0.095	-0.085
6258.1	60	-0.125	0.065
6266.4	60	-0.155	-0.025
6269.2	60	-0.185	0.005
6276.6	60	0.025	0.005
6307.3	60	0.025	0.335
6360.1	60	0.055	-0.265
6404.7	60	0.085	0.245
6429.7	60	0.115	-0.085
6440.9	60	0.145	0.035
6446.4	60	0.175	0.005
6452.0	60	0.205	0.035
6454.8	60	0.235	0.005
6462.2	60	0.025	0.005
6490.0	60	0.025	-0.295
6542.9	60	-0.005	0.275

6562.4	60	-0.035	-0.085
6576.3	60	-0.065	0.065
6587.4	60	-0.095	-0.055
6595.8	60	-0.125	0.035
6601.4	60	-0.155	0.005
6604.1	60	-0.185	0.005
6611.6	60	0.025	0.005
6636.6	60	0.025	0.275
6686.7	60	0.055	-0.235
6725.7	60	0.085	0.215
6739.6	60	0.115	-0.055
6745.2	60	0.145	0.035
6750.7	60	0.175	0.005
6753.5	60	0.205	0.005
6760.0	60	0.025	0.005
6785.1	60	0.025	-0.265
6835.2	60	-0.005	0.275
6849.1	60	-0.035	-0.055
6857.4	60	-0.065	0.035
6865.8	60	-0.095	-0.025
6871.3	60	-0.125	0.035
6874.1	60	-0.155	0.005
6880.6	60	0.025	0.005
6905.7	60	0.025	0.275
6950.2	60	0.055	-0.205
6983.6	60	0.085	0.185
6994.7	60	0.115	-0.025
7000.3	60	0.145	0.035
7005.9	60	0.175	0.005
7008.7	60	0.205	0.005
7015.2	60	0.025	0.005
7040.2	60	0.025	-0.265
7082.0	60	-0.005	0.215
7093.1	60	-0.035	-0.025
7101.4	60	-0.065	0.035
7109.8	60	-0.095	-0.025

7115.4	60	-0.125	0.035
7118.1	60	-0.155	0.005
7124.6	60	0.025	0.005
7146.9	60	0.025	0.245
7185.9	60	0.055	-0.175
7213.7	60	0.085	0.155
7224.8	60	0.115	-0.025
7230.4	60	0.145	0.035
7233.2	60	0.175	0.005
7238.7	60	0.025	0.005
7261.0	60	0.025	-0.235
7297.2	60	-0.005	0.185
7305.5	60	-0.035	-0.025
7313.9	60	-0.065	0.035
7319.5	60	-0.095	0.005
7325.0	60	-0.125	0.035
7327.8	60	-0.155	0.005
7334.3	60	0.025	0.005
7353.8	60	0.025	0.215
7392.8	60	0.055	-0.175
7412.2	60	0.085	0.095
7420.6	60	0.115	-0.025
7426.2	60	0.145	0.035
7428.9	60	0.175	0.005
7434.5	60	0.025	0.005
7454.0	60	0.025	-0.205
7490.2	60	-0.005	0.185
7498.5	60	-0.035	-0.025
7506.9	60	-0.065	0.035
7512.4	60	-0.095	0.005
7515.2	60	-0.125	0.005
7520.8	60	0.025	0.005
7540.3	60	0.025	0.215
7576.5	60	0.055	-0.175
7595.9	60	0.085	0.095
7601.5	60	0.115	0.005

7607.1	60	0.145	0.035
7609.9	60	0.175	0.005
7615.4	60	0.025	0.005
7634.9	60	0.025	-0.205
7665.5	60	-0.005	0.155
7673.9	60	-0.035	-0.025
7679.4	60	-0.065	0.035
7685.0	60	-0.095	0.005
7687.8	60	-0.125	0.005
7693.4	60	0.025	0.005
7712.8	60	0.025	0.215
7749.0	60	0.055	-0.175
7765.7	60	0.085	0.095
7771.3	60	0.115	0.005
7774.1	60	0.145	0.005
7776.9	60	0.175	0.005
7782.4	60	0.025	0.005
7801.9	60	0.025	-0.205
7832.5	60	-0.005	0.155
7840.9	60	-0.035	-0.025
7846.4	60	-0.065	0.035
7849.2	60	-0.095	0.005
7852.0	60	-0.125	0.005
7857.6	60	0.025	0.005
7877.1	60	0.025	0.215
7910.5	60	0.055	-0.145
7924.4	60	0.085	0.065
7929.9	60	0.115	0.005
7932.7	60	0.145	0.005
7937.4	60	0.025	0.005
7954.1	60	0.025	-0.175
7984.7	60	-0.005	0.155
7993.0	60	-0.035	-0.025
7998.6	60	-0.065	0.035
8001.4	60	-0.095	0.005
8004.2	60	-0.125	0.005

8009.7	60	0.025	0.005
8026.4	60	0.025	0.185
8057.1	60	0.055	-0.145
8068.2	60	0.085	0.065
8073.8	60	0.115	0.005
8076.5	60	0.145	0.005
8081.2	60	0.025	0.005
8097.9	60	0.025	-0.175
8122.9	60	-0.005	0.125
8128.5	60	-0.035	0.005
8134.1	60	-0.065	0.035
8136.8	60	-0.095	0.005
8139.6	60	-0.125	0.005
8145.2	60	0.025	0.005
8161.9	60	0.025	0.185
8192.5	60	0.055	-0.145
8203.6	60	0.085	0.065
8209.2	60	0.115	0.005
8212.0	60	0.145	0.005
8216.6	60	0.025	0.005
8233.3	60	0.025	-0.175
8255.6	60	-0.005	0.125
8261.2	60	-0.035	0.005
8266.7	60	-0.065	0.035
8269.5	60	-0.095	0.005
8272.3	60	-0.125	0.005
8277.9	60	0.025	0.005
8294.6	60	0.025	0.185
8322.4	60	0.055	-0.115
8333.5	60	0.085	0.065
8339.1	60	0.115	0.005
8341.9	60	0.145	0.005
8346.5	60	0.025	0.005
8360.4	60	0.025	-0.145
8382.7	60	-0.005	0.125
8388.3	60	-0.035	0.005

8391.1	60	-0.065	0.005
8393.8	60	-0.095	0.005
8398.5	60	0.025	0.005
8415.2	60	0.025	0.185
8440.2	60	0.055	-0.115
8451.4	60	0.085	0.065
8456.9	60	0.115	0.005
8460.6	60	0.025	0.005
8474.6	60	0.025	-0.145
8494.0	60	-0.005	0.095
8499.6	60	-0.035	0.005
8502.4	60	-0.065	0.005
8505.2	60	-0.095	0.005
8509.8	60	0.025	0.005
8523.7	60	0.025	0.155
8548.8	60	0.055	-0.115
8557.1	60	0.085	0.035
8562.7	60	0.115	0.005
8566.4	60	0.025	0.005
8580.3	60	0.025	-0.145
8599.8	60	-0.005	0.095
8605.4	60	-0.035	0.005
8608.2	60	-0.065	0.005
8610.9	60	-0.095	0.005
8615.6	60	0.025	0.005
8629.5	60	0.025	0.155
8654.5	60	0.055	-0.115
8662.9	60	0.085	0.035
8665.7	60	0.115	0.005
8669.4	60	0.025	0.005
8683.3	60	0.025	-0.145
8702.8	60	-0.005	0.095
8708.4	60	-0.035	0.005
8711.1	60	-0.065	0.005
8713.9	60	-0.095	0.005
8718.6	60	0.025	0.005

8732.5	60	0.025	0.155
8752.0	60	0.055	-0.085
8760.3	60	0.085	0.035
8763.1	60	0.115	0.005
8766.8	60	0.025	0.005
8780.7	60	0.025	-0.145
8797.4	60	-0.005	0.095
8800.2	60	-0.035	0.005
8803.0	60	-0.065	0.005
8806.7	60	0.025	0.005
8820.6	60	0.025	0.155
8840.1	60	0.055	-0.085
8848.5	60	0.085	0.035
8851.2	60	0.115	0.005
8854.9	60	0.025	0.005
8866.1	60	0.025	-0.115
8882.8	60	-0.005	0.095
8885.6	60	-0.035	0.005
8888.3	60	-0.065	0.005
8892.1	60	0.025	0.005
8906.0	60	0.025	0.155
8925.5	60	0.055	-0.085
8933.8	60	0.085	0.035
8936.6	60	0.115	0.005
8940.3	60	0.025	0.005
8951.4	60	0.025	-0.115
8968.1	60	-0.005	0.095
8970.9	60	-0.035	0.005
8973.7	60	-0.065	0.005
8977.4	60	0.025	0.005
8988.5	60	0.025	0.125
9008.0	60	0.055	-0.085
9013.6	60	0.085	0.035
9016.4	60	0.115	0.005
9020.1	60	0.025	0.005
9031.2	60	0.025	-0.115

9045.1	60	-0.005	0.065
9047.9	60	-0.035	0.005
9050.7	60	-0.065	0.005
9054.4	60	0.025	0.005
9065.6	60	0.025	0.125
9085.0	60	0.055	-0.085
9090.6	60	0.085	0.035
9093.4	60	0.115	0.005
9097.1	60	0.025	0.005
9108.2	60	0.025	-0.115
9122.1	60	-0.005	0.065
9124.9	60	-0.035	0.005
9127.7	60	-0.065	0.005
9131.4	60	0.025	0.005
9142.6	60	0.025	0.125
9162.0	60	0.055	-0.085
9167.6	60	0.085	0.035
9170.4	60	0.115	0.005
9174.1	60	0.025	0.005
9185.2	60	0.025	-0.115
9199.2	60	-0.005	0.065
9201.9	60	-0.035	0.005
9204.7	60	0.025	0.005
9215.9	60	0.025	0.125
9235.3	60	0.055	-0.085
9240.9	60	0.085	0.035
9243.7	60	0.025	0.005
9254.8	60	0.025	-0.115
9268.7	60	-0.005	0.065
9271.5	60	-0.035	0.005
9274.3	60	0.025	0.005
9282.7	60	0.025	0.095
9299.4	60	0.055	-0.055
9304.9	60	0.085	0.035
9307.7	60	0.025	0.005
9318.8	60	0.025	-0.115

9332.8	60	-0.005	0.065
9335.5	60	-0.035	0.005
9338.3	60	0.025	0.005
9346.7	60	0.025	0.095
9363.4	60	0.055	-0.055
9368.9	60	0.085	0.035
9371.7	60	0.025	0.005
9380.1	60	0.025	-0.085
9394.0	60	-0.005	0.065
9396.8	60	-0.035	0.005
9399.6	60	0.025	0.005
9407.9	60	0.025	0.095
9421.8	60	0.055	-0.055
9427.4	60	0.085	0.035
9430.2	60	0.025	0.005
9438.5	60	0.025	-0.085
9449.7	60	-0.005	0.065
9452.4	60	-0.035	0.005
9455.2	60	0.025	0.005
9463.6	60	0.025	0.095
9477.5	60	0.055	-0.055
9483.1	60	0.085	0.035
9485.8	60	0.025	0.005
9494.2	60	0.025	-0.085
9505.3	60	-0.005	0.065
9508.1	60	-0.035	0.005
9510.9	60	0.025	0.005
9519.2	60	0.025	0.095
9533.2	60	0.055	-0.055
9538.7	60	0.085	0.035
9541.5	60	0.025	0.005
9549.9	60	0.025	-0.085
9561.0	60	-0.005	0.065
9563.8	60	-0.035	0.005
9566.6	60	0.025	0.005
9574.9	60	0.025	0.095

9588.8	60	0.055	-0.055
9594.4	60	0.085	0.035
9597.2	60	0.025	0.005
9605.5	60	0.025	-0.085
9616.7	60	-0.005	0.065
9619.4	60	-0.035	0.005
9622.2	60	0.025	0.005
9630.6	60	0.025	0.095
9644.5	60	0.055	-0.055
9650.1	60	0.085	0.035
9652.8	60	0.025	0.005
9661.2	60	0.025	-0.085
9669.5	60	-0.005	0.035
9672.3	60	-0.035	0.005
9675.1	60	0.025	0.005
9683.5	60	0.025	0.095
9697.4	60	0.055	-0.055
9700.2	60	0.085	0.005
9702.9	60	0.025	0.005
9708.5	60	0.025	-0.055
9716.9	60	-0.005	0.035
9719.6	60	-0.035	0.005
9722.4	60	0.025	0.005
9730.8	60	0.025	0.095
9744.7	60	0.055	-0.055
9747.5	60	0.085	0.005
9750.3	60	0.025	0.005
9755.8	60	0.025	-0.055
9764.2	60	-0.005	0.035
9767.0	60	-0.035	0.005
9769.7	60	0.025	0.005
9778.1	60	0.025	0.095
9792.0	60	0.055	-0.055
9794.8	60	0.085	0.005
9797.6	60	0.025	0.005
9803.1	60	0.025	-0.055

9811.5	60	-0.005	0.035
9814.3	60	-0.035	0.005
9817.1	60	0.025	0.005
9825.4	60	0.025	0.095
9839.3	60	0.055	-0.055
9842.1	60	0.085	0.005
9844.9	60	0.025	0.005
9850.5	60	0.025	-0.055
9858.8	60	-0.005	0.035
9861.6	60	-0.035	0.005
9864.4	60	0.025	0.005
9869.9	60	0.025	0.065
9883.9	60	0.055	-0.055
9886.6	60	0.085	0.005
9889.4	60	0.025	0.005
9895.0	60	0.025	-0.055
9903.3	60	-0.005	0.035
9906.1	60	-0.035	0.005
9908.9	60	0.025	0.005
9914.5	60	0.025	0.065
9925.6	60	0.055	-0.025
9928.4	60	0.085	0.005
9931.2	60	0.025	0.005
9936.7	60	0.025	-0.055
9945.1	60	-0.005	0.035
9947.9	60	-0.035	0.005
9950.7	60	0.025	0.005
9956.2	60	0.025	0.065
9967.4	60	0.055	-0.025
9970.1	60	0.085	0.005
9972.9	60	0.025	0.005
9978.5	60	0.025	-0.055
9986.8	60	-0.005	0.035
9989.6	60	-0.035	0.005
9992.4	60	0.025	0.005
9998.0	60	0.025	0.065

10009.1	60	0.055	-0.025
10011.9	60	0.085	0.005
10014.7	60	0.025	0.005
10020.2	60	0.025	-0.055
10028.6	60	-0.005	0.035
10030.4	60	0.025	0.005
10036.0	60	0.025	0.065
10047.1	60	0.055	-0.025
10049.9	60	0.085	0.005
10052.7	60	0.025	0.005
10058.3	60	0.025	-0.055
10066.6	60	-0.005	0.035
10068.5	60	0.025	0.005
10074.1	60	0.025	0.065
10085.2	60	0.055	-0.025
10088.0	60	0.085	0.005
10090.8	60	0.025	0.005
10096.3	60	0.025	-0.055
10104.7	60	-0.005	0.035
10106.5	60	0.025	0.005
10112.1	60	0.025	0.065
10123.2	60	0.055	-0.025
10126.0	60	0.085	0.005
10128.8	60	0.025	0.005
10134.4	60	0.025	-0.055
10142.7	60	-0.005	0.035
10144.6	60	0.025	0.005
10150.1	60	0.025	0.065
10161.3	60	0.055	-0.025
10164.0	60	0.085	0.005
10166.8	60	0.025	0.005
10172.4	60	0.025	-0.055
10180.7	60	-0.005	0.035
10182.6	60	0.025	0.005
10188.2	60	0.025	0.065
10196.5	60	0.055	-0.025

10199.3	60	0.085	0.005
10202.1	60	0.025	0.005
10207.7	60	0.025	-0.055
10216.0	60	-0.005	0.035
10217.9	60	0.025	0.005
10223.4	60	0.025	0.065
10231.8	60	0.055	-0.025
10234.6	60	0.085	0.005
10237.3	60	0.025	0.005
10242.9	60	0.025	-0.055
10251.3	60	-0.005	0.035
10253.1	60	0.025	0.005
10258.7	60	0.025	0.065
10267.0	60	0.055	-0.025
10269.8	60	0.085	0.005
10272.6	60	0.025	0.005
10278.2	60	0.025	-0.055
10286.5	60	-0.005	0.035
10288.4	60	0.025	0.005
10293.9	60	0.025	0.065
10302.3	60	0.055	-0.025
10305.1	60	0.085	0.005
10307.9	60	0.025	0.005
10313.4	60	0.025	-0.055
10321.8	60	-0.005	0.035
10323.6	60	0.025	0.005
10329.2	60	0.025	0.065
10337.5	60	0.055	-0.025
10340.3	60	0.085	0.005
10343.1	60	0.025	0.005
10348.7	60	0.025	-0.055
10357.0	60	-0.005	0.035
10358.9	60	0.025	0.005
10364.4	60	0.025	0.065
10372.8	60	0.055	-0.025
10375.6	60	0.085	0.005

10378.4	60	0.025	0.005
10383.9	60	0.025	-0.055
10392.3	60	-0.005	0.035
10394.1	60	0.025	0.005
10399.7	60	0.025	0.065
10408.1	60	0.055	-0.025
10410.8	60	0.085	0.005
10413.6	60	0.025	0.005
10419.2	60	0.025	-0.055
10427.5	60	-0.005	0.035
10429.4	60	0.025	0.005
10435.0	60	0.025	0.065
10443.3	60	0.055	-0.025
10446.1	60	0.085	0.005
10448.9	60	0.025	0.005
10454.4	60	0.025	-0.055
10462.8	60	-0.005	0.035
10464.6	60	0.025	0.005
10470.2	60	0.025	0.065
10478.6	60	0.055	-0.025
10481.3	60	0.085	0.005
10484.1	60	0.025	0.005
10489.7	60	0.025	-0.055
10498.0	60	-0.005	0.035
10499.9	60	0.025	0.005
10505.5	60	0.025	0.065
10513.8	60	0.055	-0.025
10516.6	60	0.085	0.005
10519.4	60	0.025	0.005
10525.0	60	0.025	-0.055
10533.3	60	-0.005	0.035
10535.2	60	0.025	0.005
10540.7	60	0.025	0.065
10549.1	60	0.055	-0.025
10551.9	60	0.085	0.005
10554.6	60	0.025	0.005

10560.2	60	0.025	-0.055
10568.6	60	-0.005	0.035
10570.4	60	0.025	0.005
10576.0	60	0.025	0.065
10584.3	60	0.055	-0.025
10586.2	60	0.025	0.005
10589.0	60	0.025	-0.025
10597.3	60	-0.005	0.035
10599.2	60	0.025	0.005
10604.7	60	0.025	0.065
10613.1	60	0.055	-0.025
10615.0	60	0.025	0.005
10617.7	60	0.025	-0.025
10626.1	60	-0.005	0.035
10627.9	60	0.025	0.005
10633.5	60	0.025	0.065
10641.9	60	0.055	-0.025
10643.7	60	0.025	0.005
10646.5	60	0.025	-0.025
10654.8	60	-0.005	0.035
10656.7	60	0.025	0.005
10662.3	60	0.025	0.065
10670.6	60	0.055	-0.025
10672.5	60	0.025	0.005
10675.3	60	0.025	-0.025
10683.6	60	-0.005	0.035
10685.5	60	0.025	0.005
10691.0	60	0.025	0.065
10699.4	60	0.055	-0.025
10701.2	60	0.025	0.005
10704.0	60	0.025	-0.025
10712.4	60	-0.005	0.035
10714.2	60	0.025	0.005
10719.8	60	0.025	0.065
10728.1	60	0.055	-0.025
10730.0	60	0.025	0.005

10732.8	60	0.025	-0.025
10741.1	60	-0.005	0.035
10743.0	60	0.025	0.005
10748.6	60	0.025	0.065
10756.9	60	0.055	-0.025
10758.8	60	0.025	0.005
10761.5	60	0.025	-0.025
10769.9	60	-0.005	0.035
10771.7	60	0.025	0.005
10777.3	60	0.025	0.065
10785.7	60	0.055	-0.025
10787.5	60	0.025	0.005
10790.3	60	0.025	-0.025
10798.7	60	-0.005	0.035
10800.5	60	0.025	0.005
10806.1	60	0.025	0.065
10814.4	60	0.055	-0.025
10816.3	60	0.025	0.005
10819.1	60	0.025	-0.025
10827.4	60	-0.005	0.035
10829.3	60	0.025	0.005
10834.8	60	0.025	0.065
10843.2	60	0.055	-0.025
10845.0	60	0.025	0.005
10847.8	60	0.025	-0.025
10856.2	60	-0.005	0.035
10858.0	60	0.025	0.005
10863.6	60	0.025	0.065
10871.9	60	0.055	-0.025
10873.8	60	0.025	0.005
10876.6	60	0.025	-0.025
10884.9	60	-0.005	0.035
10886.8	60	0.025	0.005
10889.6	60	0.025	0.035
10897.9	60	0.055	-0.025
10899.8	60	0.025	0.005

10902.6	60	0.025	-0.025
10908.1	60	-0.005	0.035
10910.0	60	0.025	0.005
10912.8	60	0.025	0.035
10921.1	60	0.055	-0.025
10923.0	60	0.025	0.005
10925.8	60	0.025	-0.025
10931.3	60	-0.005	0.035
10933.2	60	0.025	0.005
10936.0	60	0.025	0.035
10944.3	60	0.055	-0.025
10946.2	60	0.025	0.005
10949.0	60	0.025	-0.025
10954.5	60	-0.005	0.035
10956.4	60	0.025	0.005
10959.2	60	0.025	0.035
10967.5	60	0.055	-0.025
10969.4	60	0.025	0.005
10972.1	60	0.025	-0.025
10977.7	60	-0.005	0.035
10979.6	60	0.025	0.005
10982.4	60	0.025	0.035
10990.7	60	0.055	-0.025
10992.6	60	0.025	0.005
10995.3	60	0.025	-0.025
11000.9	60	-0.005	0.035
11002.8	60	0.025	0.005
11005.5	60	0.025	0.035
11013.9	60	0.055	-0.025
11015.8	60	0.025	0.005
11018.5	60	0.025	-0.025
11024.1	60	-0.005	0.035
11026.0	60	0.025	0.005
11028.7	60	0.025	0.035
11037.1	60	0.055	-0.025
11038.9	60	0.025	0.005

11041.7	60	0.025	-0.025
11047.3	60	-0.005	0.035
11049.2	60	0.025	0.005
11051.9	60	0.025	0.035
11057.5	60	0.055	0.005
11059.4	60	0.025	0.005
11062.1	60	0.025	-0.025
11067.7	60	-0.005	0.035
11069.6	60	0.025	0.005
11072.3	60	0.025	0.035
11077.9	60	0.055	0.005
11079.8	60	0.025	0.005
11082.6	60	0.025	-0.025
11088.1	60	-0.005	0.035
11090.0	60	0.025	0.005
11092.8	60	0.025	0.035
11098.3	60	0.055	0.005
11100.2	60	0.025	0.005
11103.0	60	0.025	-0.025
11108.5	60	-0.005	0.035
11110.4	60	0.025	0.005
11113.2	60	0.025	0.035
11118.7	60	0.055	0.005
11120.6	60	0.025	0.005
11123.4	60	0.025	-0.025
11128.9	60	-0.005	0.035
11130.8	60	0.025	0.005
11133.6	60	0.025	0.035
11139.1	60	0.055	0.005
11141.0	60	0.025	0.005
11143.8	60	0.025	-0.025
11149.4	60	-0.005	0.035
11151.2	60	0.025	0.005
11154.0	60	0.025	0.035
11159.6	60	0.055	0.005
11161.4	60	0.025	0.005

11164.2	60	0.025	-0.025
11169.8	60	-0.005	0.035
11171.6	60	0.025	0.005
11174.4	60	0.025	0.035
11180.0	60	0.055	0.005
11181.8	60	0.025	0.005
11184.6	60	0.025	-0.025
11187.4	60	-0.005	0.005
11189.2	60	0.025	0.005
11192.0	60	0.025	0.035
11197.6	60	0.055	0.005
11199.5	60	0.025	0.005
11202.2	60	0.025	-0.025
11205.0	60	-0.005	0.005
11206.9	60	0.025	0.005
11209.7	60	0.025	0.035
11215.2	60	0.055	0.005
11217.1	60	0.025	0.005
11219.9	60	0.025	-0.025
11222.6	60	-0.005	0.005
11224.5	60	0.025	0.005
11227.3	60	0.025	0.035
11232.9	60	0.055	0.005
11234.7	60	0.025	0.005
11237.5	60	0.025	-0.025
11240.3	60	-0.005	0.005
11242.1	60	0.025	0.005
11244.9	60	0.025	0.035
11250.5	60	0.055	0.005
11252.3	60	0.025	0.005
11255.1	60	0.025	-0.025
11257.9	60	-0.005	0.005
11259.8	60	0.025	0.005
11262.5	60	0.025	0.035
11268.1	60	0.055	0.005
11270.0	60	0.025	0.005

11272.7	60	0.025	-0.025
11275.5	60	-0.005	0.005
11277.4	60	0.025	0.005
11280.2	60	0.025	0.035
11285.7	60	0.055	0.005
11287.6	60	0.025	0.005
11290.4	60	0.025	-0.025
11293.2	60	-0.005	0.005
11295.0	60	0.025	0.005
11297.8	60	0.025	0.035
11303.4	60	0.055	0.005
11305.2	60	0.025	0.005
11308.0	60	0.025	-0.025
11310.8	60	-0.005	0.005
11312.6	60	0.025	0.005
11315.4	60	0.025	0.035
11321.0	60	0.055	0.005
11322.8	60	0.025	0.005
11325.6	60	0.025	-0.025
11328.4	60	-0.005	0.005
11330.3	60	0.025	0.005
11333.1	60	0.025	0.035
11338.6	60	0.055	0.005
11340.5	60	0.025	0.005
11343.3	60	0.025	-0.025
11346.0	60	-0.005	0.005
11347.9	60	0.025	0.005
11350.7	60	0.025	0.035
11356.2	60	0.055	0.005
11358.1	60	0.025	0.005
11360.9	60	0.025	-0.025
11363.7	60	-0.005	0.005
11365.5	60	0.025	0.005
11368.3	60	0.025	0.035
11371.1	60	0.055	0.005
11372.9	60	0.025	0.005

11375.7	60	0.025	-0.025
11378.5	60	-0.005	0.005
11380.4	60	0.025	0.005
11383.2	60	0.025	0.035
11385.9	60	0.055	0.005
11387.8	60	0.025	0.005
11390.6	60	0.025	-0.025
11393.4	60	-0.005	0.005
11395.2	60	0.025	0.005
11398.0	60	0.025	0.035
11400.8	60	0.055	0.005
11402.6	60	0.025	0.005
11405.4	60	0.025	-0.025
11408.2	60	-0.005	0.005
11410.1	60	0.025	0.005
11412.8	60	0.025	0.035
11415.6	60	0.055	0.005
11417.5	60	0.025	0.005
11420.3	60	0.025	-0.025
11423.0	60	-0.005	0.005
11424.9	60	0.025	0.005
11427.7	60	0.025	0.035
11430.5	60	0.055	0.005
11432.3	60	0.025	0.005
11435.1	60	0.025	-0.025
11437.9	60	-0.005	0.005
11439.7	60	0.025	0.005
11442.5	60	0.025	0.035
11445.3	60	0.055	0.005
11447.2	60	0.025	0.005
11450.0	60	0.025	-0.025
11452.7	60	-0.005	0.005
11454.6	60	0.025	0.005
11457.4	60	0.025	0.035
11460.2	60	0.055	0.005
11462.0	60	0.025	0.005

11464.8	60	0.025	-0.025
11467.6	60	-0.005	0.005
11469.4	60	0.025	0.005
11472.2	60	0.025	0.035
11475.0	60	0.055	0.005
11476.9	60	0.025	0.005
11479.6	60	0.025	-0.025
11482.4	60	-0.005	0.005
11484.3	60	0.025	0.005
11487.1	60	0.025	0.035
11489.8	60	0.055	0.005
11491.7	60	0.025	0.005
11494.5	60	0.025	-0.025
11497.3	60	-0.005	0.005
11499.1	60	0.025	0.005
11501.9	60	0.025	0.035
11504.7	60	0.055	0.005
11506.6	60	0.025	0.005
11509.3	60	0.025	-0.025
11512.1	60	-0.005	0.005
11514.0	60	0.025	0.005
11516.8	60	0.025	0.035
11519.5	60	0.055	0.005
11521.4	60	0.025	0.005
11524.2	60	0.025	-0.025
11527.0	60	-0.005	0.005
11528.8	60	0.025	0.005
11531.6	60	0.025	0.035
11534.4	60	0.055	0.005
11536.2	60	0.025	0.005
11539.0	60	0.025	-0.025
11541.8	60	-0.005	0.005
11543.7	60	0.025	0.005
11546.4	60	0.025	0.035
11549.2	60	0.055	0.005
11551.1	60	0.025	0.005

11553.9	60	0.025	-0.025
11556.7	60	-0.005	0.005
11558.5	60	0.025	0.005
11561.3	60	0.025	0.035
11564.1	60	0.055	0.005
11565.9	60	0.025	0.005
11568.7	60	0.025	-0.025
11571.5	60	-0.005	0.005
11573.4	60	0.025	0.005
11576.1	60	0.025	0.035
11578.9	60	0.055	0.005
11580.8	60	0.025	0.005
11583.6	60	0.025	-0.025
11586.3	60	-0.005	0.005
11588.2	60	0.025	0.005
11591.0	60	0.025	0.035
11593.8	60	0.055	0.005
11595.6	60	0.025	0.005
11598.4	60	0.025	-0.025
11601.2	60	-0.005	0.005
11603.0	60	0.025	0.005
11605.8	60	0.025	0.035
11608.6	60	0.055	0.005
11610.5	60	0.025	0.005
11613.2	60	0.025	-0.025
11616.0	60	-0.005	0.005
11617.9	60	0.025	0.005
11620.7	60	0.025	0.035
11623.5	60	0.055	0.005
11625.3	60	0.025	0.005
11628.1	60	0.025	-0.025
11630.9	60	-0.005	0.005
11632.7	60	0.025	0.005
11635.5	60	0.025	0.035
11638.3	60	0.055	0.005
11640.2	60	0.025	0.005

11642.9	60	0.025	-0.025
11645.7	60	-0.005	0.005
11647.6	60	0.025	0.005
11650.4	60	0.025	0.035
11653.1	60	0.055	0.005
11655.0	60	0.025	0.005
11657.8	60	0.025	-0.025
11660.6	60	-0.005	0.005
11662.4	60	0.025	0.005
11665.2	60	0.025	0.035
11668.0	60	0.055	0.005
11669.8	60	0.025	0.005
11672.6	60	0.025	-0.025
11675.4	60	-0.005	0.005
11677.3	60	0.025	0.005
11680.0	60	0.025	0.035
11682.8	60	0.055	0.005
11684.7	60	0.025	0.005
11687.5	60	0.025	-0.025
11690.3	60	-0.005	0.005
11692.1	60	0.025	0.005
11694.9	60	0.025	0.035
11697.7	60	0.055	0.005
11699.5	60	0.025	0.005
11702.3	60	0.025	-0.025
11705.1	60	-0.005	0.005
11707.0	60	0.025	0.005
11709.7	60	0.025	0.035
11712.5	60	0.055	0.005
11714.4	60	0.025	0.005
11717.2	60	0.025	-0.025
11719.9	60	-0.005	0.005
11721.8	60	0.025	0.005
11724.6	60	0.025	0.035
11727.4	60	0.055	0.005
11729.2	60	0.025	0.005

11732.0	60	0.025	-0.025
11734.8	60	-0.005	0.005
11736.6	60	0.025	0.005
11739.4	60	0.025	0.035
11742.2	60	0.055	0.005
11744.1	60	0.025	0.005
11746.8	60	0.025	-0.025
11749.6	60	-0.005	0.005
11751.5	60	0.025	0.005
11754.3	60	0.025	0.035
11757.1	60	0.055	0.005
11758.9	60	0.025	0.005
11761.7	60	0.025	-0.025
11764.5	60	-0.005	0.005
11766.3	60	0.025	0.005
11769.1	60	0.025	0.035
11771.9	60	0.055	0.005
11773.8	60	0.025	0.005
11776.5	60	0.025	-0.025
11779.3	60	-0.005	0.005
11781.2	60	0.025	0.005
11784.0	60	0.025	0.035
11786.7	60	0.055	0.005
11788.6	60	0.025	0.005
11791.4	60	0.025	-0.025
11794.2	60	-0.005	0.005
11796.0	60	0.025	0.005
11798.8	60	0.025	0.035
11801.6	60	0.055	0.005
11803.4	60	0.025	0.005
11806.2	60	0.025	-0.025
11809.0	60	-0.005	0.005
11810.9	60	0.025	0.005
11813.6	60	0.025	0.035
11816.4	60	0.055	0.005
11818.3	60	0.025	0.005

11821.1	60	0.025	-0.025
11823.9	60	-0.005	0.005
11825.7	60	0.025	0.005
11828.5	60	0.025	0.035
11831.3	60	0.055	0.005
11833.1	60	0.025	0.005
11835.9	60	0.025	-0.025
11838.7	60	-0.005	0.005
11840.6	60	0.025	0.005
11843.3	60	0.025	0.035
11846.1	60	0.055	0.005
11848.0	60	0.025	0.005
11850.8	60	0.025	-0.025
11853.5	60	-0.005	0.005
11855.4	60	0.025	0.005
11858.2	60	0.025	0.035
11861.0	60	0.055	0.005
11862.8	60	0.025	0.005
11865.6	60	0.025	-0.025
11868.4	60	-0.005	0.005
11870.2	60	0.025	0.005
11873.0	60	0.025	0.035
11875.8	60	0.055	0.005
11877.7	60	0.025	0.005
11883.2	60	0.025	0.005
11886.0	60	-0.005	0.005
11887.9	60	0.025	0.005
11890.7	60	0.025	0.035
11893.4	60	0.055	0.005
11895.3	60	0.025	0.005
11900.9	60	0.025	0.005
11903.6	60	-0.005	0.005
11905.5	60	0.025	0.005
11908.3	60	0.025	0.035
11911.1	60	0.055	0.005
11912.9	60	0.025	0.005

11918.5	60	0.025	0.005
11921.3	60	-0.005	0.005
11923.1	60	0.025	0.005
11925.9	60	0.025	0.035
11928.7	60	0.055	0.005
11930.5	60	0.025	0.005
11936.1	60	0.025	0.005
11938.9	60	-0.005	0.005
11940.8	60	0.025	0.005
11943.5	60	0.025	0.035
11946.3	60	0.055	0.005
11948.2	60	0.025	0.005
11953.7	60	0.025	0.005
11956.5	60	-0.005	0.005
11958.4	60	0.025	0.005
11961.2	60	0.025	0.035
11963.9	60	0.055	0.005
11965.8	60	0.025	0.005
11971.4	60	0.025	0.005
11974.2	60	-0.005	0.005
11976.0	60	0.025	0.005
11978.8	60	0.025	0.035
11981.6	60	0.055	0.005
11983.4	60	0.025	0.005
11989.0	60	0.025	0.005
11991.8	60	-0.005	0.005
11993.6	60	0.025	0.005
11996.4	60	0.025	0.035
11999.2	60	0.055	0.005
12001.1	60	0.025	0.005
12006.6	60	0.025	0.005
12009.4	60	-0.005	0.005
12011.3	60	0.025	0.005
12014.0	60	0.025	0.035
12016.8	60	0.055	0.005
12018.7	60	0.025	0.005

12024.3	60	0.025	0.005
12027.0	60	-0.005	0.005
12028.9	60	0.025	0.005
12031.7	60	0.025	0.035
12034.5	60	0.055	0.005
12036.3	60	0.025	0.005
12041.9	60	0.025	0.005
12044.7	60	-0.005	0.005
12046.5	60	0.025	0.005
12049.3	60	0.025	0.035
12052.1	60	0.055	0.005
12053.9	60	0.025	0.005
12059.5	60	0.025	0.005
12062.3	60	-0.005	0.005
12064.1	60	0.025	0.005
12066.9	60	0.025	0.035
12069.7	60	0.055	0.005
12071.6	60	0.025	0.005
12077.1	60	0.025	0.005
12079.9	60	-0.005	0.005
12081.8	60	0.025	0.005
12084.6	60	0.025	0.035
12087.3	60	0.055	0.005
12089.2	60	0.025	0.005
12094.8	60	0.025	0.005
12097.5	60	-0.005	0.005
12099.4	60	0.025	0.005
12102.2	60	0.025	0.035
12105.0	60	0.055	0.005
12106.8	60	0.025	0.005
12112.4	60	0.025	0.005
12115.2	60	-0.005	0.005
12117.0	60	0.025	0.005
12119.8	60	0.025	0.035
12122.6	60	0.055	0.005
12124.5	60	0.025	0.005

12130.0	60	0.025	0.005
12132.8	60	-0.005	0.005
12134.7	60	0.025	0.005
12137.4	60	0.025	0.035
12140.2	60	0.055	0.005
12142.1	60	0.025	0.005
12147.6	60	0.025	0.005
12150.4	60	-0.005	0.005
12152.3	60	0.025	0.005
12155.1	60	0.025	0.035
12157.9	60	0.055	0.005
12159.7	60	0.025	0.005
12165.3	60	0.025	0.005
12168.1	60	-0.005	0.005
12169.9	60	0.025	0.005
12172.7	60	0.025	0.035
12175.5	60	0.055	0.005
12177.3	60	0.025	0.005
12182.9	60	0.025	0.005
12185.7	60	-0.005	0.005
12187.5	60	0.025	0.005
12190.3	60	0.025	0.035
12193.1	60	0.055	0.005
12195.0	60	0.025	0.005
12200.5	60	0.025	0.005
12203.3	60	-0.005	0.005
12205.2	60	0.025	0.005
12208.0	60	0.025	0.035
12210.7	60	0.055	0.005
12212.6	60	0.025	0.005
12218.2	60	0.025	0.005
12220.9	60	-0.005	0.005
12222.8	60	0.025	0.005
12225.6	60	0.025	0.035
12228.4	60	0.055	0.005
12230.2	60	0.025	0.005

12235.8	60	0.025	0.005
12238.6	60	-0.005	0.005
12240.4	60	0.025	0.005
12243.2	60	0.025	0.035
12246.0	60	0.055	0.005
12247.8	60	0.025	0.005
12253.4	60	0.025	0.005
12256.2	60	-0.005	0.005
12258.1	60	0.025	0.005
12260.8	60	0.025	0.035
12263.6	60	0.055	0.005
12265.5	60	0.025	0.005
12271.0	60	0.025	0.005
12273.8	60	-0.005	0.005
12275.7	60	0.025	0.005
12278.5	60	0.025	0.035
12281.2	60	0.055	0.005
12283.1	60	0.025	0.005
12288.7	60	0.025	0.005
12291.5	60	-0.005	0.005
12293.3	60	0.025	0.005
12296.1	60	0.025	0.035
12298.9	60	0.055	0.005
12300.7	60	0.025	0.005
12306.3	60	0.025	0.005
12309.1	60	-0.005	0.005
12310.9	60	0.025	0.005
12313.7	60	0.025	0.035
12316.5	60	0.055	0.005
12318.4	60	0.025	0.005
12323.9	60	0.025	0.005
12326.7	60	-0.005	0.005
12328.6	60	0.025	0.005
12331.3	60	0.025	0.035
12334.1	60	0.055	0.005
12336.0	60	0.025	0.005

12341.6	60	0.025	0.005
12344.3	60	-0.005	0.005
12346.2	60	0.025	0.005
12349.0	60	0.025	0.035
12351.8	60	0.055	0.005
12353.6	60	0.025	0.005
12359.2	60	0.025	0.005
12362.0	60	-0.005	0.005
12363.8	60	0.025	0.005
12366.6	60	0.025	0.035
12369.4	60	0.055	0.005
12371.2	60	0.025	0.005
12376.8	60	0.025	0.005
12379.6	60	-0.005	0.005
12381.4	60	0.025	0.005
12384.2	60	0.025	0.035
12387.0	60	0.055	0.005
12388.9	60	0.025	0.005
12394.4	60	0.025	0.005
12397.2	60	-0.005	0.005
12399.1	60	0.025	0.005
12401.9	60	0.025	0.035
12404.6	60	0.055	0.005
12406.5	60	0.025	0.005
12412.1	60	0.025	0.005
12414.8	60	-0.005	0.005
12416.7	60	0.025	0.005
12419.5	60	0.025	0.035
12422.3	60	0.055	0.005
12424.1	60	0.025	0.005
12429.7	60	0.025	0.005
12432.5	60	-0.005	0.005
12434.3	60	0.025	0.005
12437.1	60	0.025	0.035
12439.9	60	0.055	0.005
12441.8	60	0.025	0.005

12447.3	60	0.025	0.005
12450.1	60	-0.005	0.005
12452.0	60	0.025	0.005
12454.7	60	0.025	0.035
12457.5	60	0.055	0.005
12459.4	60	0.025	0.005
12464.9	60	0.025	0.005
12467.7	60	-0.005	0.005
12469.6	60	0.025	0.005
12475.2	60	0.025	0.005
12477.9	60	0.055	0.005
12479.8	60	0.025	0.005
12485.4	60	0.025	0.005
12488.1	60	-0.005	0.005
12490.0	60	0.025	0.005

Annex XX – Appendix 2

Test equipment tolerances

Table B.1 - Instrumentation accuracy

Parameter	Control accuracy	Instrumentation accuracy
Tyre forces and torque	<p>Fz: $\pm 150\text{N}$ or 3% whichever is greater, for semi-static input.</p> <p>Fy: $\pm 100\text{N}$ or 5% whichever is greater, for the difference between input peaks and actually generated peaks.</p> <p>Fx: $\pm 100\text{N}$ or 5% whichever is greater, for the difference between input peaks and actually generated peaks.</p> <p>My: $\pm 40\text{Nm}$ or 5% whichever is greater, for the difference between input peaks and actually generated peaks.</p>	<p>Fz: $\pm 1\%$</p> <p>Fy: $\pm 1\%$</p> <p>Fx: $\pm 1\%$ My : $\pm 1\%$</p>
Inflation pressure	$\pm 3\text{ kPa}$	$\pm 3\text{ kPa}$
Mass scale	$\pm 2\text{ g}$	$\pm 2\text{ g}$
Test duration	For the test durations, the total time of an actual test shall not differ more than $\pm 5\%$ from the total input time, 68.83h (247,800s). The interval of measurement shall be minimum 1Hz.	$\pm 0.02\text{s}$ for the time increments
Speed	$\pm 2\text{ km/h}$	$\pm 0.1\%$

Annex XX – Appendix 3

Replacement of sandpaper surface

Sandpaper surface shall be replaced either when :

Running distance reached [20,000]km for 2 positions drum in case of 3m, [40,000]km for 1 position drum in case of 3m,

or

abrasion rate of the reference tyre decreased to more than [**]mg/km or [%] compared to brand new surface.

Annex XX – Appendix 4

Example of a test report