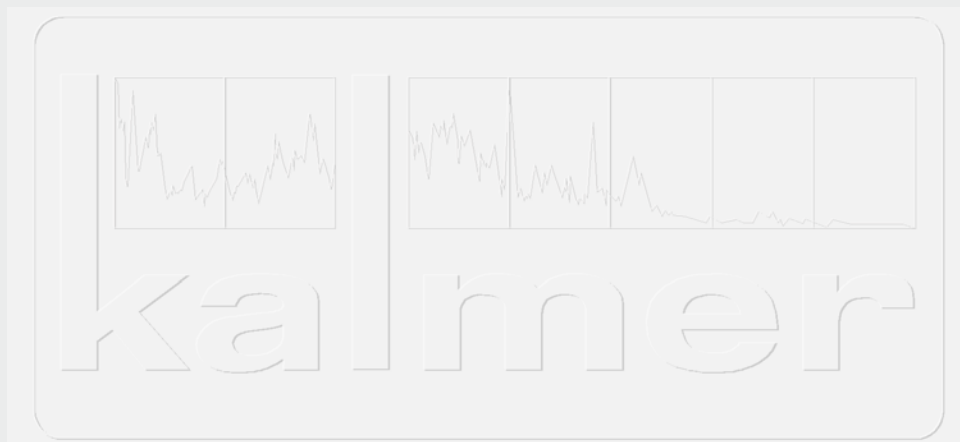


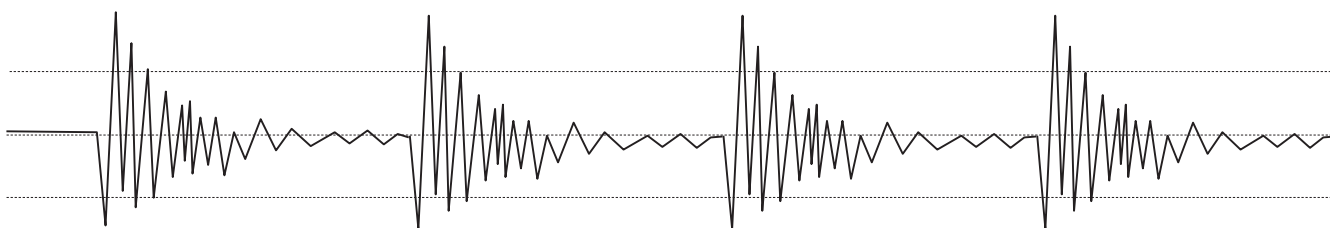
KALMER d.o.o.

meritve vibracij
balansiranje rotorjev in
vzdrževalni inženiring
Nasipi 49, 1420 Trbovlje
Tel.: (03) 56 - 14 - 702
Fax.: (03) 56 - 14 - 707



POROČILO

***O meritvi ravnosti površin
v tovarni Lesonit Ilirska Bistrica, dne 12.1.2024***



Meritev izvajal

Ime : Tadej Tušek, dipl. ing. str., Gregor Kolenc, dipl. ing. str.....

Ime : Dejan Ostanek, dipl. ing. str., Marjan Kozinc, dipl. ing. str.....

Rezultate analiziral

Ime : Gregor Kolenc, dipl. ing. str.....

Podpis :

Datum

15.1.2024

1. OPIS MERITVE

1.1 Merilna oprema:

1.1 Merilna oprema:

- EasyLaser **XT22**

1.2 Arhiviranje in analiza rezultatov:

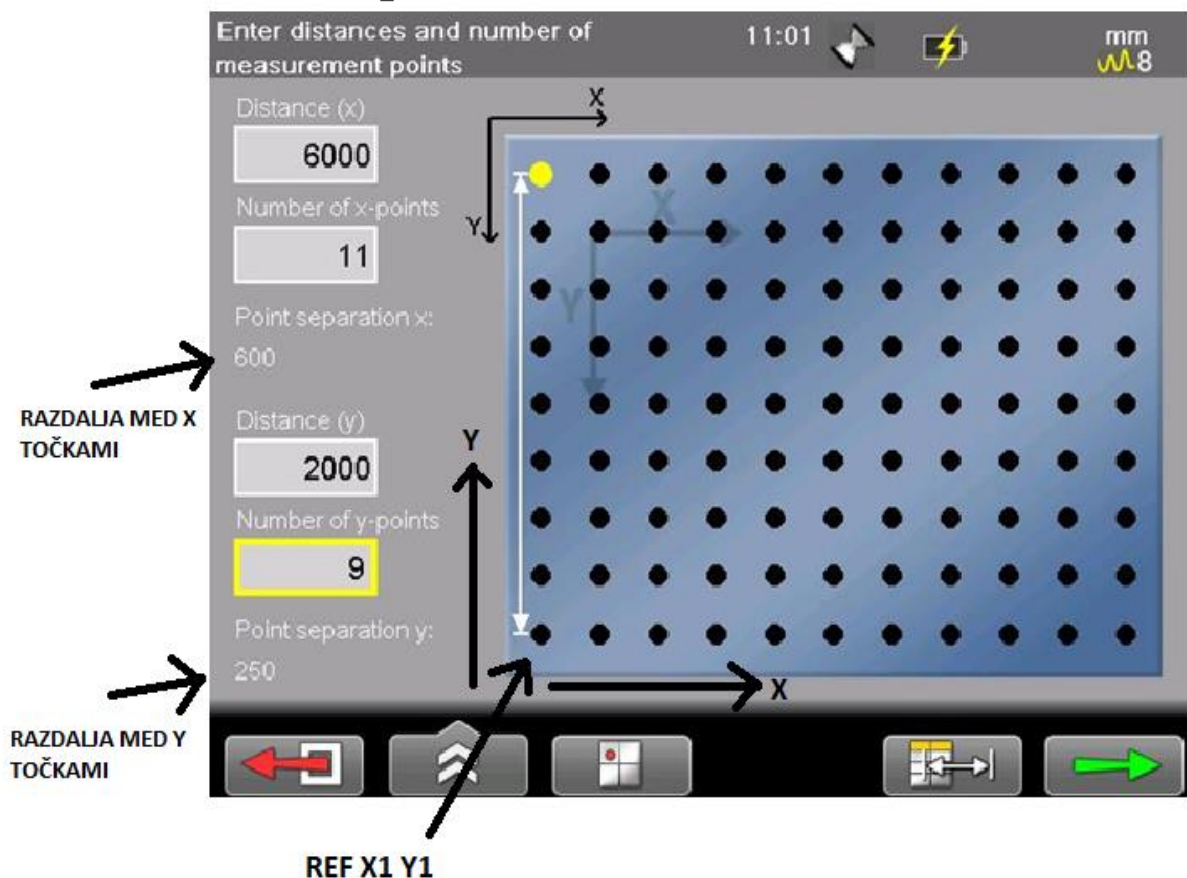
- računalnik **PC Pentium**
- tiskalnik **KONICA MINOLTA C364SeriesPCL**
- software **EasyLink 3**

1.3 Naloga meritve:

- ugotoviti ravnost površine zgornje in spodnje plošče preše.

2. REZULTATI MERITEV

2.1 Spodnja plošča preše



Y9	0,05	-0,45	-0,89	/	-1,37	-1,37	-1,24	-1,02	-0,66	/	-0,04
Y8	0,06	-0,42	-0,84	/	-1,27	-1,39	-1,27	-1,05	-0,96	-0,29	-0,01
Y7	0,02	-0,70	-1,14	-1,24	-1,38	-1,37	-1,14	-0,76	-0,68	-0,44	-0,06
Y6	0,01	-0,44	-0,61	-1,10	-1,37	-1,31	-1,15	-0,99	-0,75	-0,49	-0,14
Y5	0,00	-0,45	-0,92	-1,19	-1,28	-1,31	-1,29	-1,07	-0,82	-0,54	-0,18
Y4	-0,01	-0,46	-0,89	-1,23	-1,35	-1,35	-1,22	-1,06	-0,87	-0,64	-0,32
Y3	-0,01	-0,85	-1,08	-1,24	-1,37	-1,26	-1,10	-0,97	-0,72	-0,53	0,05
Y2	-0,01	-0,32	-0,73	-1,09	-1,26	-1,22	-1,04	-0,89	-0,75	-0,50	-0,21
Y1	0-REF	-0,32	-0,66	-0,94	-1,14	-1,25	-1,22	-1,12	-1,02	-0,86	-0,45
	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11

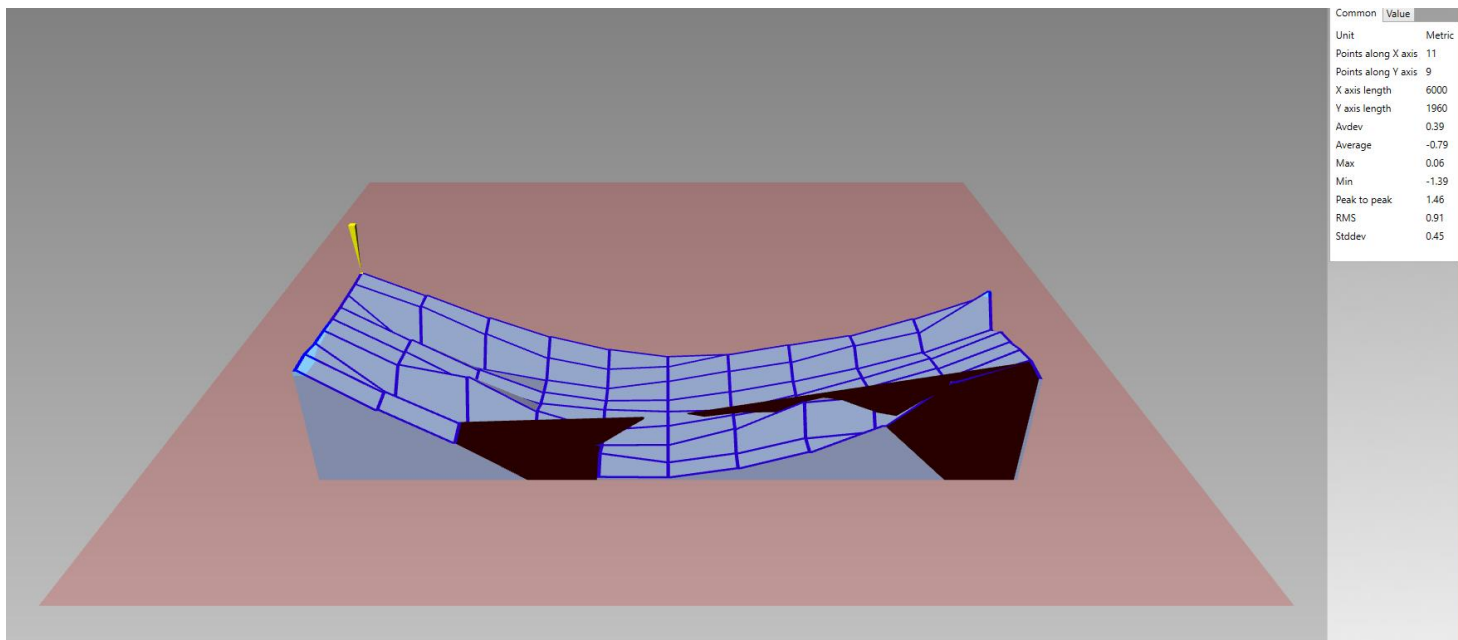
KOMENTAR:

Na spodnji plošči preše smo izvedli meritev ravnosti površine. Kot je prikazano na zgornji sliki smo na plošči dolžine 6000 mm v x-osi postavili 11 merilnih točk, v y-osi pri dolžini 2000 mm pa 9 merilnih točk. Za referenčno višino smo vzeli prvo izmerjeno točko x1y1. Na to referenčno točko se nanašajo vse ostale izmerjene točke, ki so prikazane v zgornji tabeli.

Iz tabele z rezultati je razvidno, da do največjega odstopanja prihaja na sredini plošče v X smeri v vrstah X5,X6 in X7. Do najvišjega odstopanja ravnosti pride na točki X6Y8 in sicer -1,39 mm.

Največja razlika med najnižjo in najvišjo točko (Peak-to-Peak) znaša 1,46 mm, to sta točki X6Y8(najnižja) in X1Y8(najvišja).

Na spodnji sliki je prikazan relief površine plošče preše(točke so zaradi same meritve postavljene zrcalno po Y smeri).



2.2 Zgornja plošča preše

Enter distances and number of measurement points

11:01

Distance (x):

Number of x-points:

Point separation x: 600

Distance (y):

Number of y-points:

Point separation y: 250

RAZDALJA MED X TOČKAMI

RAZDALJA MED Y TOČKAMI

REF X4 Y1

LESONIT Ilirska Bistrica

Y9	-1,15	-0,80	-0,50	-0,36	0,04	0,08	0,10	-0,01	-0,27	-	-
Y8	-1,11	-0,91	-0,52	-	0,00	0,11	0,12	-0,01	-0,24	-	-1,15
Y7	-1,13	-0,92	-	-	-	-	-	-	-	-0,83	-1,15
Y6	-1,12	-0,83	-	-	-	-	-	-	-	-	-
Y5	-1,10	-0,90	-	-	-	-	-	-	-	-0,86	-1,18
Y4	-1,13	-0,91	-	-0,70	-	-	-	-	-	-0,81	-1,16
Y3	-1,15	-0,92	-	-	-	0,03	-	0,33	-	-	-0,65
Y2	-1,19	-1,00	-	-	-	-	-	-	-	-	-
Y1	-	-	-	0 REF	-	0,38	-	0,39	-	-	-0,58
	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11

KOMENTAR:

Na zgornji plošči preše smo izvedli meritev ravnosti površine. Kot je prikazano na zgornji sliki smo na plošči dolžine 6000 mm v x-osi postavili 11 merilnih točk, v y-osi pri dolžini 2000 mm pa 9 merilnih točk. Za referenčno višino smo vzeli točko X4Y1. Na to referenčno točko se nanašajo vse ostale izmerjene točke, ki so prikazane v zgornji tabeli.


Iz tabele z rezultati je razvidno, da do največjega odstopanja prihaja na vrstah X1,X2,X10 in X11. Do najvišjega odstopanja ravnosti pride na točki X11Y5 in sicer -1,18 mm. Največja razlika med najnižjo in najvišjo točko (Peak-to-Peak) znaša 1,57 mm, to sta točki X11Y5(najnižja) in X8Y1(najvišja).

Vseh točk zaradi omejitve prostora ni bilo mogoče pomeriti.

Measurement data	
File name	lesonita presa spodaj
Measurement date	2024-01-12 12:23:05
Report generated from file	lesonita presa spodaj.2024-01-12 12-25-27.17.kalmer...
Report generated date	2024-01-12 12:25:39
Operator	kalmer
Measurement program	Flatness
Measurement unit	mm
Serial no. display/detector	182206 / 182237
Temperature	4.0°C (39.2 °F)

Points and distances		
X	Distance (x)	6000 mm
	Number of x-points	11
	Distance between points (x-axis)	600 mm
Y	Distance (y)	1960 mm
	Number of y-points	9
	Distance between points (y-axis)	245 mm
Total number of points		99
Reference type		Single reference point
Tolerance type		ISO 10791-1 (G15)
Tolerance value		0.04 mm

Statistics	
Peak-to-Peak	1.46 mm
Max	0.06 mm
Min	-1.39 mm
Average	-0.79 mm
Standard deviation	0.45 mm
Mean deviation from average	0.39 mm
RMS	0.91 mm

Measurement data					
X:Y	X(mm)	Y(mm)	Value(mm)	Offset(mm)	Tolerance
1:1 	0	0	0.00	0.00	Within tolerance
2:1	600	0	-0.32	0.00	Outside tolerance

 = Reference point

Measurement data					
X:Y	X(mm)	Y(mm)	Value(mm)	Offset(mm)	Tolerance
3:1	1200	0	-0.66	0.00	Outside tolerance
4:1	1800	0	-0.94	0.00	Outside tolerance
5:1	2400	0	-1.14	0.00	Outside tolerance
6:1	3000	0	-1.25	0.00	Outside tolerance
7:1	3600	0	-1.22	0.00	Outside tolerance
8:1	4200	0	-1.12	0.00	Outside tolerance
9:1	4800	0	-1.02	0.00	Outside tolerance
10:1	5400	0	-0.86	0.00	Outside tolerance
11:1	6000	0	-0.45	0.00	Outside tolerance
1:2	0	245	-0.01	0.00	Within tolerance
2:2	600	245	-0.32	0.00	Outside tolerance
3:2	1200	245	-0.73	0.00	Outside tolerance
4:2	1800	245	-1.09	0.00	Outside tolerance
5:2	2400	245	-1.26	0.00	Outside tolerance
6:2	3000	245	-1.22	0.00	Outside tolerance
7:2	3600	245	-1.04	0.00	Outside tolerance
8:2	4200	245	-0.89	0.00	Outside tolerance
9:2	4800	245	-0.75	0.00	Outside tolerance
10:2	5400	245	-0.50	0.00	Outside tolerance
11:2	6000	245	-0.21	0.00	Outside tolerance
1:3	0	490	-0.01	0.00	Within tolerance
2:3	600	490	-0.85	0.00	Outside tolerance
3:3	1200	490	-1.08	0.00	Outside tolerance
4:3	1800	490	-1.24	0.00	Outside tolerance
5:3	2400	490	-1.37	0.00	Outside tolerance
6:3	3000	490	-1.26	0.00	Outside tolerance
7:3	3600	490	-1.10	0.00	Outside tolerance
8:3	4200	490	-0.97	0.00	Outside tolerance
9:3	4800	490	-0.72	0.00	Outside tolerance
10:3	5400	490	-0.53	0.00	Outside tolerance
11:3	6000	490	0.05	0.00	Outside tolerance
1:4	0	735	-0.01	0.00	Within tolerance
2:4	600	735	-0.46	0.00	Outside tolerance
3:4	1200	735	-0.89	0.00	Outside tolerance
4:4	1800	735	-1.23	0.00	Outside tolerance

<i>Measurement data cont.</i>					
X:Y	X(mm)	Y(mm)	Value(mm)	Offset(mm)	Tolerance
5:4	2400	735	-1.35	0.00	Outside tolerance
6:4	3000	735	-1.35	0.00	Outside tolerance
7:4	3600	735	-1.22	0.00	Outside tolerance
8:4	4200	735	-1.06	0.00	Outside tolerance
9:4	4800	735	-0.87	0.00	Outside tolerance
10:4	5400	735	-0.64	0.00	Outside tolerance
11:4	6000	735	-0.32	0.00	Outside tolerance
1:5	0	980	0.00	0.00	Within tolerance
2:5	600	980	-0.45	0.00	Outside tolerance
3:5	1200	980	-0.92	0.00	Outside tolerance
4:5	1800	980	-1.19	0.00	Outside tolerance
5:5	2400	980	-1.28	0.00	Outside tolerance
6:5	3000	980	-1.31	0.00	Outside tolerance
7:5	3600	980	-1.29	0.00	Outside tolerance
8:5	4200	980	-1.07	0.00	Outside tolerance
9:5	4800	980	-0.82	0.00	Outside tolerance
10:5	5400	980	-0.54	0.00	Outside tolerance
11:5	6000	980	-0.18	0.00	Outside tolerance
1:6	0	1225	0.01	0.00	Within tolerance
2:6	600	1225	-0.44	0.00	Outside tolerance
3:6	1200	1225	-0.61	0.00	Outside tolerance
4:6	1800	1225	-1.10	0.00	Outside tolerance
5:6	2400	1225	-1.37	0.00	Outside tolerance
6:6	3000	1225	-1.31	0.00	Outside tolerance
7:6	3600	1225	-1.15	0.00	Outside tolerance
8:6	4200	1225	-0.99	0.00	Outside tolerance
9:6	4800	1225	-0.75	0.00	Outside tolerance
10:6	5400	1225	-0.49	0.00	Outside tolerance
11:6	6000	1225	-0.14	0.00	Outside tolerance
1:7	0	1470	0.02	0.00	Outside tolerance
2:7	600	1470	-0.70	0.00	Outside tolerance
3:7	1200	1470	-1.14	0.00	Outside tolerance
4:7	1800	1470	-1.24	0.00	Outside tolerance
5:7	2400	1470	-1.38	0.00	Outside tolerance
6:7	3000	1470	-1.37	0.00	Outside tolerance

<i>Measurement data cont.</i>					
X:Y	X(mm)	Y(mm)	Value(mm)	Offset(mm)	Tolerance
7:7	3600	1470	-1.14	0.00	Outside tolerance
8:7	4200	1470	-0.76	0.00	Outside tolerance
9:7	4800	1470	-0.68	0.00	Outside tolerance
10:7	5400	1470	-0.44	0.00	Outside tolerance
11:7	6000	1470	-0.06	0.00	Outside tolerance
1:8	0	1715	0.06	0.00	Outside tolerance
2:8	600	1715	-0.42	0.00	Outside tolerance
3:8	1200	1715	-0.84	0.00	Outside tolerance
4:8	1800	1715	-	0.00	-
5:8	2400	1715	-1.27	0.00	Outside tolerance
6:8	3000	1715	-1.39	0.00	Outside tolerance
7:8	3600	1715	-1.27	0.00	Outside tolerance
8:8	4200	1715	-1.05	0.00	Outside tolerance
9:8	4800	1715	-0.96	0.00	Outside tolerance
10:8	5400	1715	-0.29	0.00	Outside tolerance
11:8	6000	1715	-0.01	0.00	Within tolerance
1:9	0	1960	0.05	0.00	Outside tolerance
2:9	600	1960	-0.45	0.00	Outside tolerance
3:9	1200	1960	-0.89	0.00	Outside tolerance
4:9	1800	1960	-	0.00	-
5:9	2400	1960	-1.37	0.00	Outside tolerance
6:9	3000	1960	-1.37	0.00	Outside tolerance
7:9	3600	1960	-1.24	0.00	Outside tolerance
8:9	4200	1960	-1.02	0.00	Outside tolerance
9:9	4800	1960	-0.66	0.00	Outside tolerance
10:9	5400	1960	-	0.00	-
11:9	6000	1960	-0.04	0.00	Outside tolerance

Measurement data	
File name	lesonit zgornj1
Measurement date	2024-01-12 13:52:23
Report generated from file	lesonit zgornj1.2024-01-12 13-53-19.17.kalmer.EAN0...
Report generated date	2024-01-12 13:53:26
Operator	kalmer
Measurement program	Flatness
Measurement unit	mm
Serial no. display/detector	182206 / 182237
Temperature	3.0°C (37.4 °F)

Points and distances		
X	Distance (x)	5800 mm
	Number of x-points	11
	Distance between points (x-axis)	580 mm
Y	Distance (y)	2300 mm
	Number of y-points	9
	Distance between points (y-axis)	288 mm
Total number of points		99
Reference type		Single reference point
Tolerance type		ISO 10791-1 (G15)
Tolerance value		0.04 mm

Statistics	
Peak-to-Peak	1.57 mm
Max	0.39 mm
Min	-1.19 mm
Average	-0.58 mm
Standard deviation	0.52 mm
Mean deviation from average	0.46 mm
RMS	0.78 mm

Measurement data					
X:Y	X(mm)	Y(mm)	Value(mm)	Offset(mm)	Tolerance
1:1	0	0	-	0.00	-
2:1	580	0	-	0.00	-

Measurement data					
X:Y	X(mm)	Y(mm)	Value(mm)	Offset(mm)	Tolerance
3:1	1160	0	-	0.00	-
4:1	1740	0	0.00	0.00	Within tolerance
5:1	2320	0	-	0.00	-
6:1	2900	0	0.38	0.00	Outside tolerance
7:1	3480	0	-	0.00	-
8:1	4060	0	0.39	0.00	Outside tolerance
9:1	4640	0	-	0.00	-
10:1	5220	0	-	0.00	-
11:1	5800	0	-0.58	0.00	Outside tolerance
1:2	0	288	-1.19	0.00	Outside tolerance
2:2	580	288	-1.00	0.00	Outside tolerance
3:2	1160	288	-	0.00	-
4:2	1740	288	-	0.00	-
5:2	2320	288	-	0.00	-
6:2	2900	288	-	0.00	-
7:2	3480	288	-	0.00	-
8:2	4060	288	-	0.00	-
9:2	4640	288	-	0.00	-
10:2	5220	288	-	0.00	-
11:2	5800	288	-	0.00	-
1:3	0	575	-1.15	0.00	Outside tolerance
2:3	580	575	-0.92	0.00	Outside tolerance
3:3	1160	575	-	0.00	-
4:3	1740	575	-0.70	0.00	Outside tolerance
5:3	2320	575	-	0.00	-
6:3	2900	575	0.03	0.00	Outside tolerance
7:3	3480	575	-	0.00	-
8:3	4060	575	0.33	0.00	Outside tolerance
9:3	4640	575	-	0.00	-
10:3	5220	575	-	0.00	-
11:3	5800	575	-0.65	0.00	Outside tolerance
1:4	0	863	-1.13	0.00	Outside tolerance
2:4	580	863	-0.91	0.00	Outside tolerance
3:4	1160	863	-	0.00	-
4:4	1740	863	-	0.00	-

● = Reference point

<i>Measurement data cont.</i>					
X:Y	X(mm)	Y(mm)	Value(mm)	Offset(mm)	Tolerance
5:4	2320	863	-	0.00	-
6:4	2900	863	-	0.00	-
7:4	3480	863	-	0.00	-
8:4	4060	863	-	0.00	-
9:4	4640	863	-	0.00	-
10:4	5220	863	-0.81	0.00	Outside tolerance
11:4	5800	863	-1.16	0.00	Outside tolerance
1:5	0	1150	-1.10	0.00	Outside tolerance
2:5	580	1150	-0.90	0.00	Outside tolerance
3:5	1160	1150	-	0.00	-
4:5	1740	1150	-	0.00	-
5:5	2320	1150	-	0.00	-
6:5	2900	1150	-	0.00	-
7:5	3480	1150	-	0.00	-
8:5	4060	1150	-	0.00	-
9:5	4640	1150	-	0.00	-
10:5	5220	1150	-0.86	0.00	Outside tolerance
11:5	5800	1150	-1.18	0.00	Outside tolerance
1:6	0	1438	-1.12	0.00	Outside tolerance
2:6	580	1438	-0.83	0.00	Outside tolerance
3:6	1160	1438	-	0.00	-
4:6	1740	1438	-	0.00	-
5:6	2320	1438	-	0.00	-
6:6	2900	1438	-	0.00	-
7:6	3480	1438	-	0.00	-
8:6	4060	1438	-	0.00	-
9:6	4640	1438	-	0.00	-
10:6	5220	1438	-	0.00	-
11:6	5800	1438	-	0.00	-
1:7	0	1725	-1.13	0.00	Outside tolerance
2:7	580	1725	-0.92	0.00	Outside tolerance
3:7	1160	1725	-	0.00	-
4:7	1740	1725	-	0.00	-
5:7	2320	1725	-	0.00	-
6:7	2900	1725	-	0.00	-

<i>Measurement data cont.</i>					
X:Y	X(mm)	Y(mm)	Value(mm)	Offset(mm)	Tolerance
7:7	3480	1725	-	0.00	-
8:7	4060	1725	-	0.00	-
9:7	4640	1725	-	0.00	-
10:7	5220	1725	-0.83	0.00	Outside tolerance
11:7	5800	1725	-1.15	0.00	Outside tolerance
1:8	0	2013	-1.11	0.00	Outside tolerance
2:8	580	2013	-0.91	0.00	Outside tolerance
3:8	1160	2013	-0.52	0.00	Outside tolerance
4:8	1740	2013	-	0.00	-
5:8	2320	2013	0.00	0.00	Within tolerance
6:8	2900	2013	0.11	0.00	Outside tolerance
7:8	3480	2013	0.12	0.00	Outside tolerance
8:8	4060	2013	-0.01	0.00	Within tolerance
9:8	4640	2013	-0.24	0.00	Outside tolerance
10:8	5220	2013	-	0.00	-
11:8	5800	2013	-1.15	0.00	Outside tolerance
1:9	0	2300	-1.15	0.00	Outside tolerance
2:9	580	2300	-0.80	0.00	Outside tolerance
3:9	1160	2300	-0.50	0.00	Outside tolerance
4:9	1740	2300	-0.36	0.00	Outside tolerance
5:9	2320	2300	0.04	0.00	Outside tolerance
6:9	2900	2300	0.08	0.00	Outside tolerance
7:9	3480	2300	0.10	0.00	Outside tolerance
8:9	4060	2300	-0.01	0.00	Within tolerance
9:9	4640	2300	-0.27	0.00	Outside tolerance
10:9	5220	2300	-	0.00	-
11:9	5800	2300	-	0.00	-