

## WAO/WBO

Rotary shaft seal in standard design with a grooved elastomer outer sheath covering a metal insert without an energised spring on the sealing lip. The WBO model is provided with a metal outer surface.

### Standard materials

NBR 70

Colour: green/black

Metal insert: non-alloy steel according to DIN EN 10139

### Areas of application

Secondary sealing e.g. as a dust, dirt or spray protection seal in electric engines, as a grease retainer.

### Function

The WAO/WBO is a single action rotary shaft seal for rotating or pivoting shafts. The sealing lip design without a spring produces less friction. As a result the sealing action in comparison to rotary shaft seals with energised springs is reduced. The elastomer outer sheath provides good static sealing, good thermal expansion balance e.g. in light-metal housings, better sealing with greater roughness and secure sealing for split housings as well as good static sealing with thin fluid or gaseous media.

Tight and accurate fitting is achieved by the metal outer casing. The WBO model has limited sealing action with thin fluid or gaseous media and in split housings. To guarantee a high level of static sealing on the outer surface, better surface treatment of the housing bore is necessary.

### Media

Good chemical resistance to various mineral oils and greases. Please also refer to our media resistance tables on page 22 of this catalogue.

### Operational application limits

Pressure (Mpa/bar): 0/0

Temperature (°C): -40 to +100

Peripheral speed (m/s):  $\leq 6$

Please also refer to our rotational speed diagram on page 20 of this catalogue.

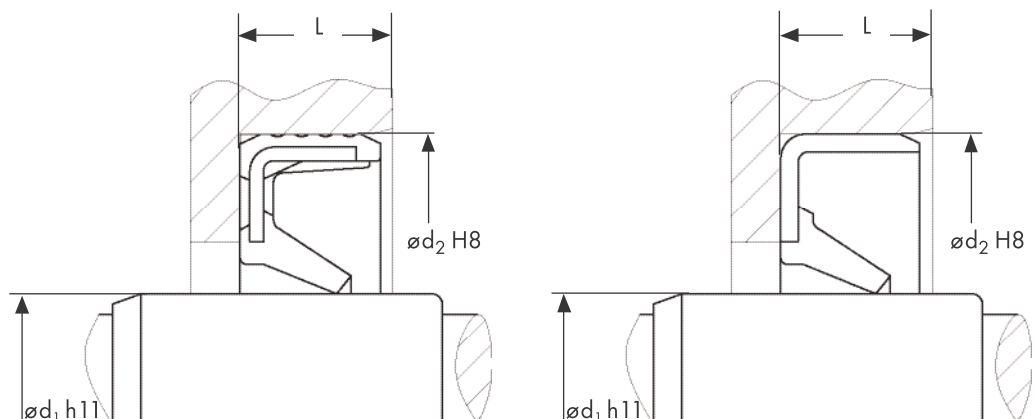
### Installation

Suitable tools should be used for installation. It is recommended that the installation housing is designed to provide the rotary shaft seal with axial support. Please also refer to our general installation instructions on page 30 of this catalogue.

### Remarks

The nominal widths mentioned on the following pages represent the standard dimensions.

Other dimensions and different designs, e.g. double dust protection lip, spiral on the sealing lip, springs or metal inserts made of other steel grades can be produced as well as all kinds of special designs. Minimum quantities may be obligatory for dimensions outside of the standard.

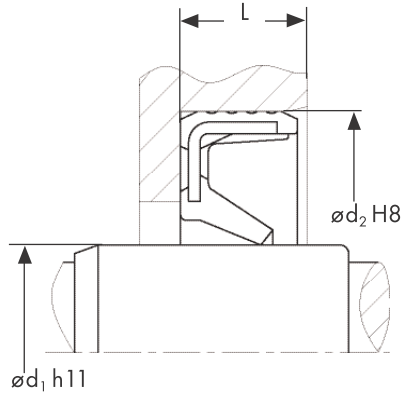


## WAO

Sizes  
metric

Part No.	Dimensions in mm			Part No.	Dimensions in mm		
	ød <sub>1</sub>	ød <sub>2</sub>	L		ød <sub>1</sub>	ød <sub>2</sub>	L
157122	2.3	10	3	116521	12	28	7
22037	4	8	2	39292	12	35	4.5
22038	5	9	2	39291	12	35	14
22039	5	10	2	19585	12	37	7
134053	5	11	3	39294	12.7	19	3
39257	5	15	5	39321	13	18	3
22040	6	10	2	22053	13	19	3
22041	6	12	2	19572	13	22	5
64714	6	12	3	39296	13	26	4
40471	6	15	4	36642	14	18	3
72502	6	16	7	22054	14	20	3
39262	6	21	8	19571	14	20	5
39259	6.5	19	5.5	22055	14	21	3
22042	7	11	2	22056	14	22	3
39261	7	12.7	3	19573	14	22	4
22043	7	14	2	39015	14	24	5
131111	7	16.7	3	39325	14	24.5	6
83778	7	17	7	39327	14	27	3
22044	8	12	3	22057	15	21	3
39264	8	12.8	3.2	44142	15	21	4
59462	8	13	3.5	39330	15	21	5
83938	8	14	4	39332	15	22	3
22045	8	15	3	39333	15	22	4
123340	8	16	3	39334	15	23	2.5
131117	8	18	4	22058	15	23	3
39263	8.5	15	3.5	131122	15	23	4
152787	9	13	2	39335	15	23	5
22046	9	13	3	40472	15	24	7
39013	9	15	3	77606	15	25	3
22047	9	16	3	131112	15	26	7
39270	9	22	4	133464	15	35	7
39268	9	22.5	5	39331	15.5	22	3
22048	10	14	3	22059	16	22	3
131118	10	16	3	19574	16	22	4
39271	10	16	4	39341	16	23	4
39014	10	16	5	22060	16	24	3
22049	10	17	3	19575	16	24	4
46405	10	17	4	19576	16	24	5
150695	10	20	2.7	22061	16	25	3
77303	10	21	4	39835	17	21	3
48924	10	22	3	22062	17	23	3
39277	10	26	5	57050	17	23	4
39278	10	30	6	40473	17	23	5
22050	12	16	3	19577	17	24	4
131121	12	17	4	35092	17	24	7
22051	12	18	3	22063	17	25	3
38480	12	18	4	117898	17	26	4
39284	12	18	4.5	128095	17	28	3.5
131107	12	18	5	19581	17	30	5
77246	12	18	5.5	131119	17	32	6
22052	12	19	3	19584	17	35	5
69015	12	20	4	22064	18	24	3
39285	12	20	5	19578	18	24	4
39286	12	22	4	75201	18	25	3
131106	12	24	4	39843	18	25	4

Sizes metric



Part No.	Dimensions in mm			Part No.	Dimensions in mm		
	$\varnothing d_1$	$\varnothing d_2$	L		$\varnothing d_1$	$\varnothing d_2$	L
22065	18	26	4	152832	25	37	5
39844	18	26	5	40478	25	38	5
48931	18	27	4	40611	25	40	7
39846	18	27	5	40689	25	45	4
40474	18	37	5	40692	25	47	5
39852	18	48	10	40693	25	47	6
39853	19	26	5	22076	26	34	4
22066	19	27	4	40697	27	33.7	4
39855	19	28	7	40696	27	35.5	5
39854	19	28.7	5	40699	27	36	4
39863	19	32	8	40700	27	37	5
39871	19.1	25.4	3	40479	27	40	3
82490	20	24	2.5	40705	27	43	9
22067	20	26	4	131105	27	53	7
26511	20	26	10	40480	28	33	6
39872	20	28	3.5	40706	28	34	4
22068	20	28	4	22077	28	35	4
39873	20	28	4.5	40707	28	35	7
39875	20	28	10	68265	28	36	5
131123	20	30	4	22078	28	37	4
39876	20	30	5	40713	28	38	7
131113	20	30	7	40481	28	40	5
40476	20	32	4	40716	29	35	3.5
39880	20	32	5	22079	29	38	4
40505	20	32	7	40718	29	39	4
19777	20	35	5	40719	29	40.5	4
40509	20	35	6	80807	30	36	4
40515	20	42	6	131097	30	36	5
40518	21	27	3	93287	30	37	3.2
22069	21	29	4	22080	30	37	4
40520	21	33	7	40483	30	37	8
22070	22	28	4	123746	30	38	4
75912	22	28	4.5	56784	30	40	4
80411	22	28	5	40720	30	40	5
40524	22	28.5	4	131115	30	40	7
83734	22	29	4	40722	30	42	5
22071	22	30	4	40485	30	45	6
40525	22	30	5	40726	30	50	5
26512	22	30	10	40486	30	62	6
40527	22	32	4.5	40737	31	38.5	4
88218	23	28	3	40742	31.7	38.1	4
40535	23	31	5	22081	32	42	4
22072	24	32	4	22082	32	45	4
40477	24	33	4	156106	33	40	3
40549	24.5	29.8	4	40764	33	42	5
117155	25	30	7	40765	33	47.5	9.1
40551	25	31	4	85235	33	52	2
40552	25	31	5	22083	35	42	4
22073	25	32	4	40487	35	42	8
22074	25	33	4	40775	35	43	5
40554	25	33	6	22084	35	45	4
40555	25	33	8	40781	35	47	4
22075	25	35	4	128152	35	47	5
40553	25	35	6	40786	35	50	4
131114	25	35	7	40787	35	50	5

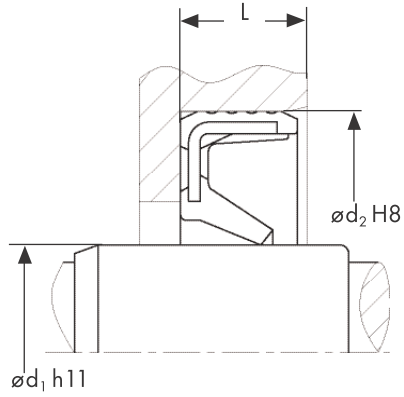
**WAO**

**Sizes  
metric**

Part No.	Dimensions in mm			Part No.	Dimensions in mm		
	ød <sub>1</sub>	ød <sub>2</sub>	L		ød <sub>1</sub>	ød <sub>2</sub>	L
40794	35	50	8	40968	55	70	6
131108	35	52	7	19785	55	72	7
40488	35	55	5	40970	55	75	12
40806	35	62	5	21504	60	70	10
68267	36	44	4	40996	60	70	13.5
68268	36	44	5	49315	60	72	4
22085	37	47	4	41001	60	80	4
22086	38	48	4	41006	60	110	4
40489	38	48	6	20675	62	70	10
40818	38	53	5	68269	63	73	5
39016	38	58	5	41014	63	75	5
124841	38	62	4	49323	65	75	5
39017	38	62	12	40790	65	88	5
22087	40	47	4	40791	65	88	12
46418	40	47	5	22097	70	78	5
92834	40	48	4	68270	70	80	5
22088	40	50	4	81349	70	81.5	6
131120	40	50.15	4	41035	70	83.5	3
22089	40	52	5	41036	70	85.6	5.3
131116	40	52	7	41060	70	92	5
40491	40	54	5	40789	70	95	5
40492	40	54	7	39020	74	95	7
39018	40	55	5	44594	75	90	6
40836	40	55	10	92937	80	90	5
40837	40	58	6	20653	80	90	12
40493	40	62	5	41088	80	95	5
40846	41	47	4	41092	80	105	7
40849	42	50	10	41096	81	88	3.8
22090	42	52	4	41103	85	105	9
131098	42	52	5	41117	90	105	6
81261	42	52	5.5	41118	90	110	7
22091	43	53	4	41119	90	115	5
26513	44	52	10	41122	90	115	13
40867	44	55	5	41123	90	120	8
22092	45	52	4	41129	95	120	8
22093	45	55	4	40504	95	135	13
40495	45	60	6	68271	100	110	5
40881	45	68	5	60187	100	115	15
40886	46	58	5	127469	125	140	7
40889	47	54	3.5	41410	133	159	6
115463	48	55	3.5	41412	135	165	14
19588	48	58	4	41413	150	180	14
19780	48	62	5	41414	176	214	12
40497	48	72	12	120902	178	194	8
22094	50	58	4	41415	210	236	12
40935	50	60	4				
22095	50	62	5				
19783	50	68	7				
19784	50	72	5				
40945	50	75	6				
40950	52	65	6				
40956	53	70	6				
144153	53.3	65	5				
40963	54	76.5	13				
22096	55	63	5				

**WAO**

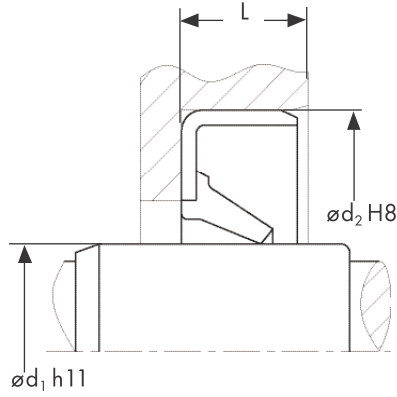
**Sizes  
inch**



Part No.	Dimensions in mm			Dimensions in inch		
	$\varnothing d_1$	$\varnothing d_2$	L	$\varnothing d_1$	$\varnothing d_2$	L
131109	2.3	12.7	6.4	0.091	0.5	0.252
131110	3.18	12.7	6.4	0.125	0.5	0.252
118578	6.35	12.7	3.17	0.25	0.5	0.125
39258	6.35	19.05	6.35	0.25	0.75	0.25
60021	7.93	12.57	2.92	0.312	0.495	0.115
36138	9.52	15.87	3.17	0.375	0.625	0.125
84281	9.52	17.46	3.56	0.375	0.687	0.14
144105	12.7	17.46	2.4	0.5	0.687	0.094
60022	12.7	22.22	3.17	0.5	0.875	0.125
60023	14.28	19.05	2.92	0.562	0.75	0.115
144293	15.87	20.63	2.38	0.625	0.812	0.094
92938	17.46	23.81	3.18	0.687	0.937	0.125
156359	25.4	31.75	3.9	1	1.25	0.154
149007	26.98	34.03	4.26	1.062	1.34	0.168
60024	30.16	41.33	6.35	1.187	1.627	0.25
60025	31.75	50.8	9.92	1.25	2	0.391
39019	40.08	50.85	4.1	1.578	2.002	0.161
37749	41.27	50.8	6.35	1.625	2	0.25
41071	74.61	88.9	7.93	2.937	3.5	0.312
41416	241.3	304.8	25.4	9.5	12	1

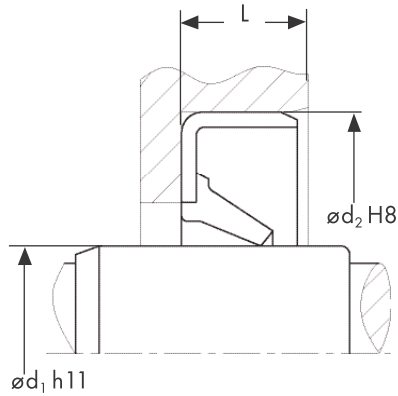
**WBO**

**Sizes  
metric**



Part No.	Dimensions in mm			Part No.	Dimensions in mm		
	$\varnothing d_1$	$\varnothing d_2$	L		$\varnothing d_1$	$\varnothing d_2$	L
84122	4	8	2	41221	17	22	3
89828	5	9	2	20942	17	23	3
92830	5	10	2	110710	17	25	3
74145	6	10	2	41222	18	24	3
92831	6	12	2	41223	18	25.5	6
19765	6	13	4.5	41224	18	28.5	4.5
92832	7	11	2	41225	19	24	3
92833	7	14	2	41226	19	27	3.5
19766	8	11.5	3	41227	19	30	3
73883	8	12	3	40475	19	40	5
73080	8	14	3	89238	20	24	2.5
125653	8	14	6	41228	20	25.45	4
48922	8	15	3	126429	20	26	3
41206	9	13	3	56001	20	26	4
19767	9	16	4	110709	20	28	3
19570	10	14	3	19775	20	28	4
19768	10	15	3	117515	20	28	5
19769	10	15.5	3	19776	20	30	4
19770	10	16	4	41229	20	32	5
48923	10	17	3	41230	21	28	5
131126	11	17	3	75080	21	28	5.5
41207	11	18	15	41231	21	37	6
77946	12	16	3	61768	22	28	4
19771	12	18	3	61769	22	30	4
41209	12	18	5	41232	22	31.5	4.5
41208	12	19	2.5	153022	22.2	28.5	3
48925	12	19	3	41233	22.2	28.7	3
19773	12	20	4	73958	23	28	3
41210	12	22	6	41235	23	30	4
20658	12	25	3	41234	23	32	5
19774	12	30	5	80829	24	30	3
41211	12	35	4.5	39054	24	32	5
41213	13	18	3	41238	24.5	28.5	2.5
41214	13	19	3	80516	24.7	30	4
41215	13	19	5	65028	25	31	2.5
57041	13	25	7	41241	25	32	3
131128	14	18	3	41242	25	32	4
110708	14	22	3	41239	25	32	4.5
41216	14	22	6	19778	25	32	5
57043	14	24	4	41240	25	32	7
48928	15	21	2	41237	25	33	4
48926	15	21	3	129868	25	35	4
41217	15	22	3	41243	25	35	6
41218	15	23	3	41244	25	35	8
131124	15	23	3.8	41236	25	38	3
57045	15	24.5	5	39055	25	45	5
131127	15	25	3.8	20659	25	46.5	4.8
117978	15	26	4.5	72780	26	31	3
57046	15	28	3	41246	26	35	5
19582	15	32	5.5	41247	26	36	3
44211	16	20	2.5	115803	27	32	3
41220	16	21	3	41248	27	33	3
41219	16	22	3	55931	27	34	3
110711	16	24	3	41249	28	33.3	3.5
56910	16	25	4	41250	28	35	4

Sizes metric



Part No.	Dimensions in mm			Part No.	Dimensions in mm		
	$\varnothing d_1$	$\varnothing d_2$	L		$\varnothing d_1$	$\varnothing d_2$	L
41251	28	35	5	41743	42	47	6
41252	28	36	5	41742	42	60	7
110712	28	37	4	110707	43	53	4
41253	28.2	35	3.3	19779	45	50	3
41254	29	37	6	121261	45	52	3
150143	29.5	37	4	79602	45	52	4
41255	30	35	3	41751	45	55	5
72895	30	37	3	40494	45	55	6
40482	30	37	4	41752	45	57	4
41256	30	37	4.5	39057	45	65	5
41257	30	39	7	42071	45	69	9
48932	30	40	4	40496	45	72	12
41258	30	40	5	42074	47	55	10
40484	30	40	6	42076	48	62	6
41259	30	42	5	42078	49	56	9
41260	30	45	6	74073	50	58	4
41261	30	55	15	42080	50	58	5
77838	31	37	3	143527	50	62	5
41262	31.5	45	5.5	19782	50	65	6
41264	32	40	5	83591	50	90	6
41266	32	42	4	42084	50.8	65	6
41271	32	42	14	42087	51	58	4
41265	32	42.5	6.5	42088	52	69	11
41267	32	48	6	61089	55	63	5
41268	32	58	6.5	42092	55	65	5
78714	33	40	3	42093	55	67	5
41270	33	45	5.5	40499	55	70	9
41269	33.4	58	6.4	42095	55	70.8	4
41272	34	42	14	42094	55	74	6
77585	34.5	40	4	40498	55	82	10
84044	35	42	1.9	83947	55	90	6
79601	35	42	3.5	132700	58	65	3.5
110713	35	42	4	79603	60	67	4
35083	35	45	4	42535	60	75	5
41274	35	45	6	42536	60	75	6
87077	35	47	5	42537	60	75	10
41273	35	48	5	40501	60	78	7
39056	35	55	5	40502	60	78	10
129722	36	42	3.5	42552	65	77	4
41276	38	42	3	42554	65	85	5
35385	38	43	3	60349	65	88	6
46548	38	45	3	42558	70	82	7
125202	38	45	4	42557	70	85	8.5
41277	38	47	9	42559	71	86	5
116657	38	48	4	42563	75	90	5
41275	38	57.2	9.5	156488	80	85	3
143411	40	47	4	42579	80	95	5
41278	40	48	3	42580	80	100	7
34469	40	48	4	42578	80	100	8
41279	40	48	6	42576	80	100	10
41280	40	50	4	42582	80	106	8
40490	40	50	6	42577	80	110	10
41733	40	55	6	42805	86	110	13
41738	41	52	5.5	42808	89	120.8	6.5
152706	41.5	49	4	156449	90	95	3

**WBO**

Part No.      Dimensions in mm  
                    $\varnothing d_1$      $\varnothing d_2$     L

**Sizes  
metric**

84929      125      140      7

**WBO**

Part No.      Dimensions in mm      Dimensions in inch  
                    $\varnothing d_1$      $\varnothing d_2$     L       $\varnothing d_1$      $\varnothing d_2$     L

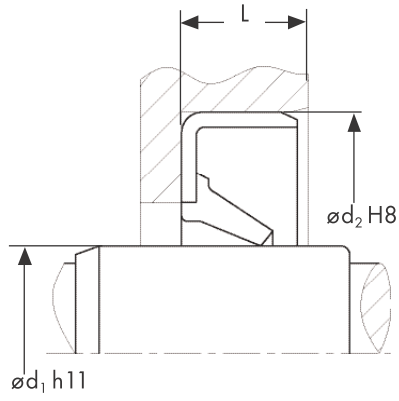
**Sizes  
inch**

134975	6.35	12.7	3.17	0.25	0.5	0.125
90064	6.35	12.7	4.76	0.25	0.5	0.187
83024	9.52	14.28	2.38	0.375	0.562	0.094
89320	9.62	14.28	2.38	0.379	0.562	0.094
60741	11.11	19.05	3.17	0.437	0.75	0.125
60742	11.11	20.98	4.76	0.437	0.826	0.187
41212	12.5	22.3	6.5	0.492	0.878	0.256
60743	12.7	17.46	3.17	0.5	0.687	0.125
60826	12.7	22.22	3.17	0.5	0.875	0.125
78375	14.28	20.64	4	0.562	0.813	0.157
60744	15.87	23.81	4.76	0.625	0.937	0.187
130048	15.87	25.4	4	0.625	1	0.157
60745	17.46	22.22	3.17	0.687	0.875	0.125
60746	17.46	25.4	3.17	0.687	1	0.125
57052	19.05	25.4	3.17	0.75	1	0.125
60747	19.05	27	4.6	0.75	1.063	0.181
60748	19.05	28.57	3.17	0.75	1.125	0.125
60749	19.05	31.75	3.17	0.75	1.25	0.125
60750	19.05	31.75	6.35	0.75	1.25	0.25
60751	22.22	28.57	3.17	0.875	1.125	0.125
60752	22.22	34.92	4.76	0.875	1.375	0.187
57055	25.4	31.75	3.17	1	1.25	0.125
41245	25.4	38	3.2	1	1.496	0.126
144100	25.4	39.68	4.76	1	1.562	0.187
60754	25.4	45.24	11.91	1	1.781	0.469
81153	28.57	34.92	3.17	1.125	1.375	0.125
84024	28.57	35	2.2	1.125	1.378	0.087
79604	28.57	35.1	4	1.125	1.382	0.157
60755	28.57	38.1	4.76	1.125	1.5	0.187
60756	28.57	41.27	12.7	1.125	1.625	0.5
46824	30.16	50.8	6.35	1.187	2	0.25
60757	30.96	50.27	6.35	1.219	1.979	0.25
41263	31.7	38.1	3.2	1.248	1.5	0.126
61692	31.75	38.1	3.96	1.25	1.5	0.156
60758	31.75	42.86	4.76	1.25	1.687	0.187
42641	31.75	44.45	6.35	1.25	1.75	0.25
60759	31.75	50.01	11.11	1.25	1.969	0.437
60760	34.92	50.4	6.35	1.375	1.984	0.25
157029	38.1	47.62	4.76	1.5	1.875	0.187
153170	39.69	52.38	5.31	1.563	2.062	0.209
127689	42.86	59.13	12.7	1.687	2.328	0.5
60763	42.86	66.62	9.52	1.687	2.623	0.375
60764	43.66	65.08	12.7	1.719	2.562	0.5
124952	44.45	57.15	6.35	1.75	2.25	0.25
75800	44.45	57.15	12.7	1.75	2.25	0.5



**WBO**

**Sizes  
inch**



Part No.	Dimensions in mm			Dimensions in inch		
	$\varnothing d_1$	$\varnothing d_2$	L	$\varnothing d_1$	$\varnothing d_2$	L
60765	44.45	68.99	9.12	1.75	2.716	0.359
57163	47.62	63.65	6.35	1.875	2.506	0.25
60766	49.21	63.75	7.14	1.937	2.51	0.281
79539	50.8	60.32	4.76	2	2.375	0.187
60767	50.8	60.32	6.35	2	2.375	0.25
46825	53.97	73.02	6.35	2.125	2.875	0.25
60768	53.97	85.72	7.93	2.125	3.375	0.312
115606	53.97	93	6.35	2.125	3.661	0.25
40500	57.15	73.02	7.93	2.25	2.875	0.312
60769	57.15	85.72	9.52	2.25	3.375	0.375
60770	57.15	87.38	6.35	2.25	3.44	0.25
60771	58.73	76.2	6.35	2.312	3	0.25
76102	114.3	130.17	7.93	4.5	5.125	0.312