

# Merkel Guide Ring Guivex KBK

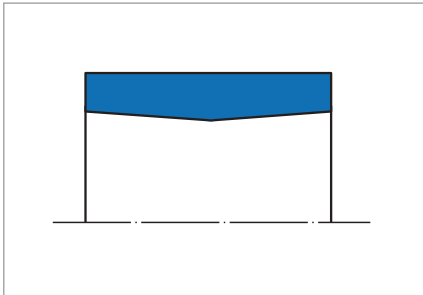


Fig. 1 Merkel Guide Ring Guivex KBK

## Product description

Profiled Merkel Guide Ring Guivex KBK made from fabric-base laminate. Patented product design (patent-no.: PCT/EP95/03874).

## Product advantages

Merkel KBK guide rings offer clear advantages over conventional guide strips/rings, designed for standardised housings according to ISO 10766 amongst others

- Interchangeable to existing operating environments of the types SB and SF
- High radial load
- Very good utilisation of the guide length through even distribution of stress
- Improved drawing-in of lubricating medium through optimised distribution of stress in the contact zone between guide bush and counter-acting surface
- Reduced stick-slip tendency
- Outstanding running behaviour with short guide distances (no clamping).

## Application

Long stroke cylinders (piston rod bowing under load), short guide distances (lateral buckling of the piston rod), short stroke (inadequate lubrication) friction-optimised sealing systems, additional item for metal guides, mobile hydraulics, heavy-duty hydraulics.

## Material

Ø range ≤300

Material	Code	Colour
Fabric-base laminate	HGW HG517	Dark grey
Fabric-base laminate	HGW HG650	Red

Ø range >300

Material	Code	Colour
Fabric-base laminate	HGW HG650	Red

## Operating conditions

Material	HGW HG517/HGW HG650
Temperature range in °C	
Hydraulic oils HL, HLP	-40 ... +120
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-40 ... +60
HFD fluids	-40 ... +120
Water	+5 ... +60
HETG (rapeseed oil)	-40 ... +80
HEES (synthetic esters)	-40 ... +100
HEPG (glycol)	-40 ... +80
Mineral greases	-40 ... +120

## Surface quality

Surface roughness	R <sub>a</sub>	R <sub>max</sub>
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M<sub>r</sub> >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

The long-term behaviour of the sealing component as well as the security against early failures are primarily determined by the quality of the counter-acting surface. This means that the surface must be precisely described and evaluated. Based on current knowledge we recommend supplementing the above definition of the surface quality of the

sliding surface with the quantities in the following table. The previous general description of the material component is significantly improved with the new quantities from the material component, particularly with reference to the abrasiveness of the surface.

→ Technical Manual.

**Design notes**

The diameter  $D_1$  given in the table of dimensions is to be considered exclusively in relation to the guide ring. The corresponding diameter for the adjacent seal housing is to be matched to the sealing component.

**Sliding surfaces**

Characteristic value	Limit position
$R_a$	>0,05 mm ... 0,30 mm
$R_{max}$	<2,50 mm
$R_{pkx}$	<0,50 mm
$R_{pk}$	<0,50 mm
$R_k$	>0,25 mm ... 0,70 mm
$R_{vk}$	>0,20 mm ... 0,65 mm
$R_{vkk}$	>0,20 mm ... 2,00 mm

The limit values listed in the table are not currently applicable for ceramic or partial ceramic counter-surfaces.

**Tolerance**

Production tolerance profile thickness S
-0,01 ... -0,06

**Surface load**

The value for the specific compression per unit area is dependent on the operating temperature and the size of the elastic deformation (deflection) of the guide element. The maximum possible deflection is limited in a sealing system by the smallest gap dimension behind the primary seal. → Technical Manual.

**Deflection**

- $e1 = 0,10$  for  $s = 2,5$
- $e1 = 0,15$  for  $s = 4,0$
- $e2 = 0,15$  for  $s = 2,5$
- $e2 = 0,20$  for  $s = 4,0$

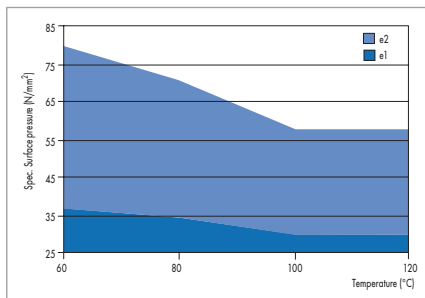
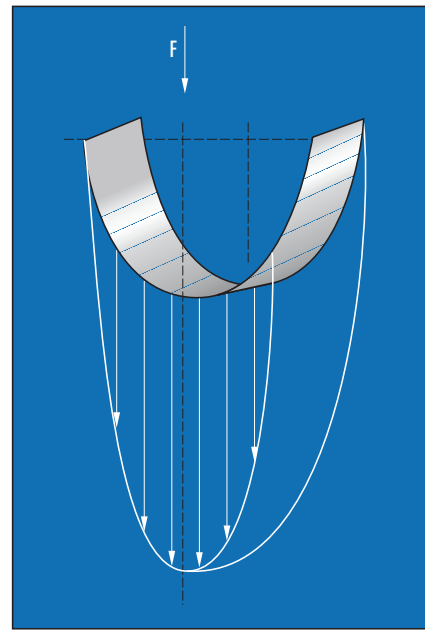


Fig. 2 Special surface pressure for parallel load

**Radial load**

The pressure distribution on the guide rings is non-linear. The non-linear pressure curve over the contact range was taken into account when calculating the permissible specific surface pressure. The required guide width can be calculated

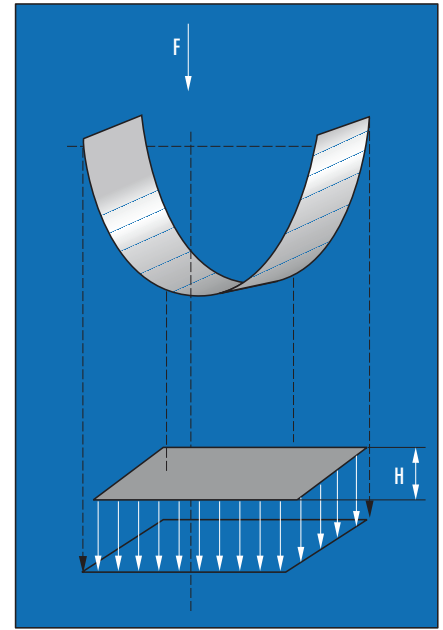


$$F = P \times A$$

$$H = F / (d \times P)$$

$H$  = guide strip width [mm]  
 $F$  = radial load [N]  
 $A$  = projected area [mm<sup>2</sup>]

using the following formulas. Taking the increased service life into consideration, a reduction of the load by selection of a wide guide can make sense in individual cases.



$P$  = perm. compression per unit area [N/mm<sup>2</sup>]  
 $d$  = rod diameter with rod guidance; piston diameter with piston guidance [mm].

**Mode of operation**

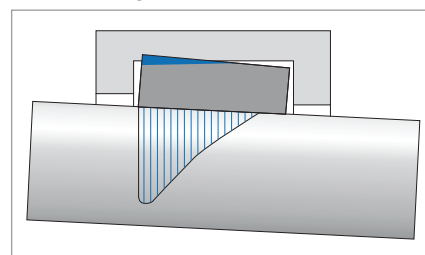


Fig. 3 Rectangular guide ring: stress peaks in the edge area

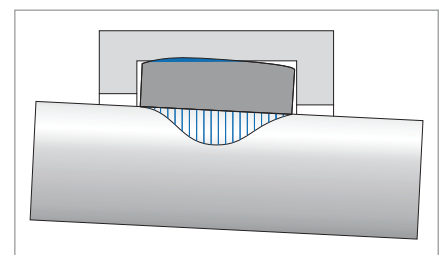
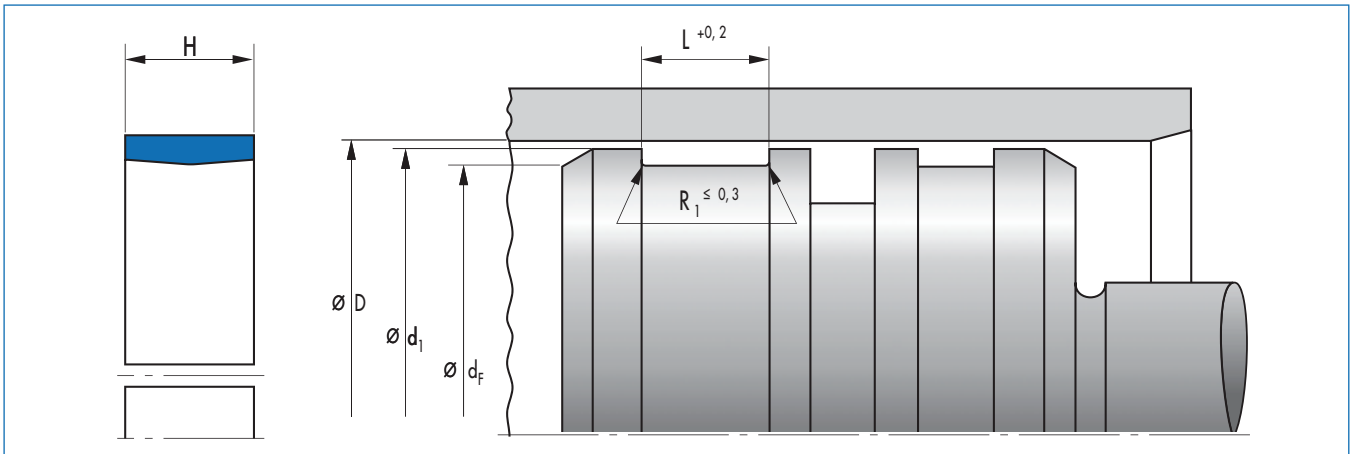


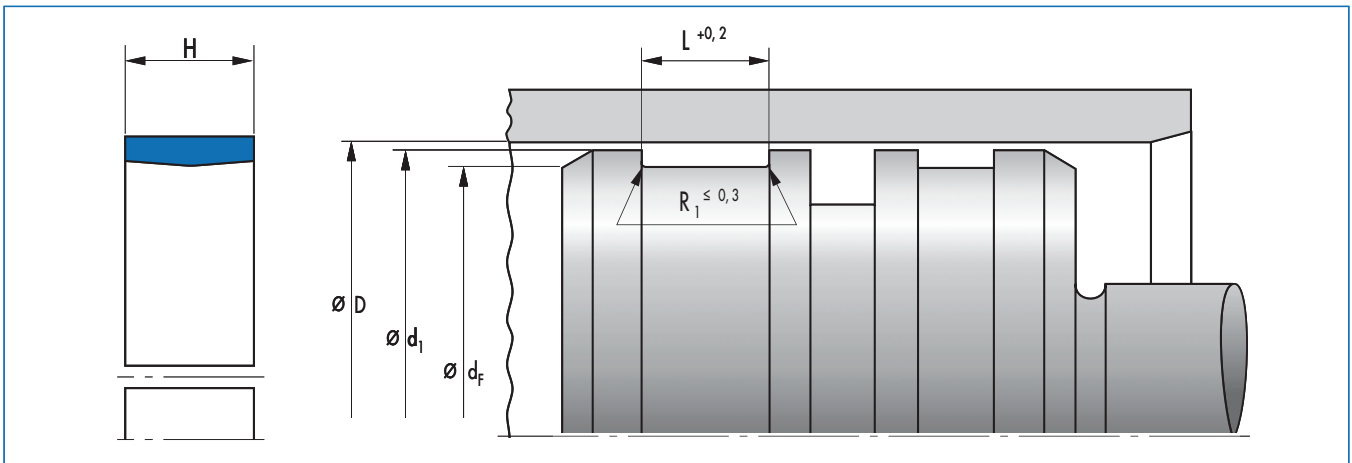
Fig. 4 Merkel Guide Ring Guivex KBK: even distribution of stress

Article list



D	d <sub>F</sub>	d <sub>1</sub>	L	H	Profile	Material	Article No.	
40	35	38,4	25	14,8	2,5	HGW HG517	24373629	○
50	45	48,4	9,7	9,5	2,5	HGW HG517	24376320	●
60	55	58,4	9,7	9,5	2,5	HGW HG517	24381008	○
63	58	61,4	9,7	9,5	2,5	HGW HG517	24377609	●
65	60	63,4	9,7	9,5	2,5	HGW HG517	24379281	○
70	65	68,4	9,7	9,5	2,5	HGW HG517	24378390	○
75	67	72,5	15	14,8	4	HGW HG517	49005284	○
75	70	73,4	9,7	9,5	2,5	HGW HG517	24379280	○
80	75	78,4	9,7	9,5	2,5	HGW HG517	24378388	●
85	80	83,4	9,7	9,5	2,5	HGW HG517	24380508	○
90	85	88,4	9,7	9,5	2,5	HGW HG517	49000753	○
95	90	93,4	9,7	9,5	2,5	HGW HG517	24378389	○
95	90	93,4	15	14,8	2,5	HGW HG517	24380164	○
98	93	96,4	9,7	9,5	2,5	HGW HG517	528477	○
100	92	97,5	20	19,8	4	HGW HG517	49005017	○
100	95	98,4	9,7	9,5	2,5	HGW HG517	49002078	○
100	95	98,4	15	14,8	2,5	HGW HG517	24375947	●
100	95	98,4	20	19,8	2,5	HGW HG517	24373283	○
105	100	103,4	9,7	9,5	2,5	HGW HG517	24367544	○
110	102	107,5	20	19,8	4	HGW HG517	24359047	○
110	102	107,5	25	24,5	4	HGW HG517	49004871	○
110	105	108,4	20	19,8	2,5	HGW HG517	24380278	○
115	110	113,4	15	14,8	2,5	HGW HG517	24378948	○
120	112	117,5	25	24,5	4	HGW HG517	49004872	○
120	115	118,4	15	14,8	2,5	HGW HG517	49000752	○
120	115	118,4	20	19,8	2,5	HGW HG517	24380279	○
125	120	123,4	9,7	9,5	2,5	HGW HG517	49000675	○
125	120	123,4	15	14,8	2,5	HGW HG517	24375948	●
130	122	127,5	25	24,5	4	HGW HG517	24358243	○
130	124	128	20	19,8	3	HGW HG517	49002431	○
130	125	128,4	9,7	9,5	2,5	HGW HG517	49002077	○
130	125	128,4	20	19,8	2,5	HGW HG517	531549	○
130	125	128,4	25	24,5	2,5	HGW HG517	528114	○
140	135	138,4	15	14,8	2,5	HGW HG517	24380185	●
140	135	138,4	20	19,8	2,5	HGW HG517	24380281	○
140	135	138,4	25	24,5	2,5	HGW HG517	528117	○

● Available from stock ○ On request: Tool is available, delivery at short notice

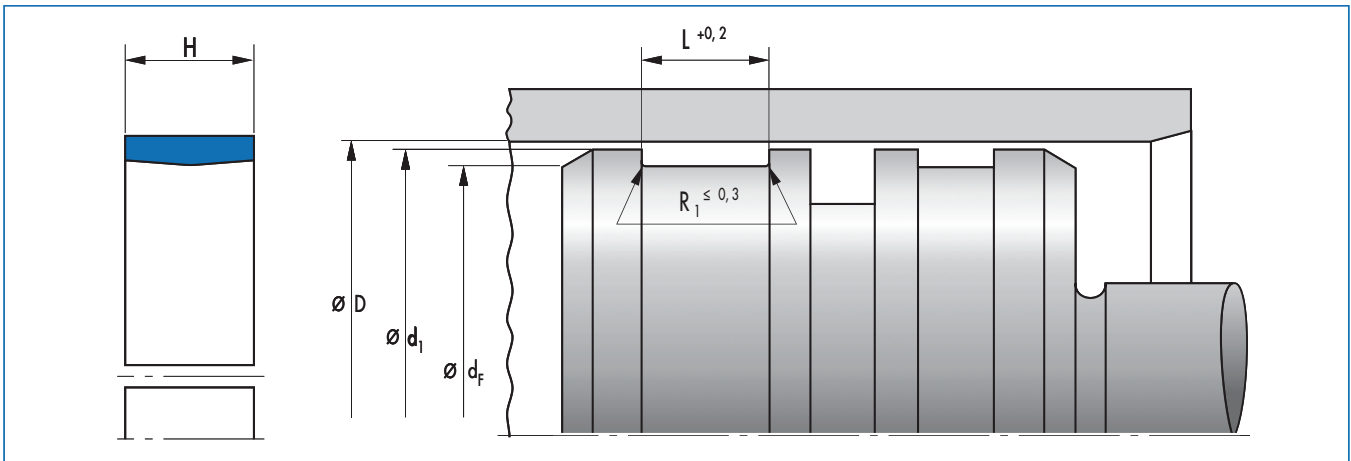


D	d <sub>F</sub>	d <sub>1</sub>	L	H	Profile	Material	Article No.	
149	144	147,4	15	14,8	2,5	HGW HG517	24380165	○
150	145	148,4	9,7	9,5	2,5	HGW HG517	49001347	○
150	145	148,4	25	24,5	2,5	HGW HG517	529384	○
160	155	158,4	15	14,8	2,5	HGW HG517	24378946	●
160	155	158,4	20	19,8	2,5	HGW HG517	526097	○
160	155	158,4	25	24,5	2,5	HGW HG517	24380280	○
160	155	158,4	35	34,5	2,5	HGW HG517	24379367	○
170	162	167,5	25	24,5	4	HGW HG517	49003985	○
170	165	168,4	25	24,5	2,5	HGW HG517	526071	○
180	172	177,5	25	24,5	4	HGW HG517	24380555	○
180	175	178,4	9,7	9,5	2,5	HGW HG517	49001427	○
180	175	178,4	15	14,8	2,5	HGW HG517	24378947	●
180	175	178,4	35	34,5	2,5	HGW HG517	24377817	○
190	185	188,4	15	14,8	2,5	HGW HG517	49003727	○
190	185	188,4	25	24,5	2,5	HGW HG517	24379077	○
200	192	197,5	35	34,5	4	HGW HG517	24380583	○
200	195	198,4	15	14,8	2,5	HGW HG517	49003728	○
200	195	198,4	20	19,8	2,5	HGW HG517	24380282	○
200	195	198,4	30	29,5	2,5	HGW HG517	24380416	○
200	195	198,4	35	34,5	2,5	HGW HG517	24380417	○
210	205	208,4	15	14,8	2,5	HGW HG517	49002879	○
210	205	208,4	35	34,5	2,5	HGW HG517	49001642	○
215	210	213,4	15	14,8	2,5	HGW HG517	24380699	●
220	215	218,4	15	14,8	2,5	HGW HG517	49018312	○
220	215	218,4	25	24,5	2,5	HGW HG517	49001458	○
220	215	218,4	25	34,5	2,5	HGW HG517	24379368	○
223,5	215,5	220,5	40	39,5	4	HGW HG517	49046270	○
225	217	222,5	40	39,5	4	HGW HG517	530604	○
225	220	223,4	25	24,5	2,5	HGW HG517	24380539	○
230	225	228,4	9,7	9,5	2,5	HGW HG517	24380706	○
230	225	228,4	15	14,8	2,5	HGW HG517	24372436	●
230	225	228,4	20	19,8	2,5	HGW HG517	24378298	○
230	225	228,4	35	34,5	2,5	HGW HG517	24378002	○
240	235	238,4	15	14,8	2,5	HGW HG517	24380340	○
240	235	238,4	25	24,5	2,5	HGW HG517	24379078	○
250	242	247,5	40	39,5	4	HGW HG517	24378050	○
250	245	248,4	15	14,8	2,5	HGW HG517	24378945	●

● Available from stock ○ On request: Tool is available, delivery at short notice

D	d <sub>F</sub>	d <sub>1</sub>	L	H	Profile	Material	Article No.	
250	245	248,4	25	24,5	2,5	HGW HG517	49002401	○
260	252	257,5	40	39,5	4	HGW HG517	24378051	○
260	255	258,4	25	24,5	2,5	HGW HG517	49002880	○
260	255	258,4	35	34,5	2,5	HGW HG517	529482	○
268	263	266,4	15	14,8	2,5	HGW HG517	24380700	●
270	265	268,4	25	24,5	2,5	HGW HG517	24379079	○
270	265	268,4	35	34,5	2,5	HGW HG517	49000025	○
280	272	277,5	40	39,5	4	HGW HG517	24378052	○
280	275	278,4	25	24,5	2,5	HGW HG517	527111	○
290	282	287,5	40	39,5	4	HGW HG517	528969	○
300	295	298,4	25	24,5	2,5	HGW HG600	24378787	●
300	295	298,4	35	34,5	2,5	HGW HG517	529484	○
310	302	307,5	40	39,6	4	HGW HG600	24378053	○
310	305	308,4	15	14,8	2,5	HGW HG600	24380701	●
320	312	317,5	25	24,5	4	HGW HG600	24379044	●
320	312	317,5	40	39,6	4	HGW HG600	24378054	○
330	322	327,5	30	29,5	4	HGW HG600	49004578	○
330	325	328,4	25	24,5	2,5	HGW HG600	24379256	●
340	332	337,5	25	24,5	4	HGW HG600	24379045	○
340	332	337,5	30	29,5	4	HGW HG600	528485	○
350	342	347,5	25	24,5	4	HGW HG600	530277	○
350	342	347,5	40	39,5	4	HGW HG600	533359	○
360	352	357,5	25	24,5	4	HGW HG600	531639	○
360	352	357,5	30	29,5	4	HGW HG600	24379154	●
360	352	357,5	40	39,5	4	HGW HG600	24378056	●
375	367	372,5	25	24,5	4	HGW HG600	24379080	○
375	370	373,4	25	24,5	2,5	HGW HG600	24378788	●
380	372	377,5	40	39,5	4	HGW HG600	24378057	○
400	392	397,5	40	39,5	4	HGW HG600	24378058	○
410	402	407,5	40	39,5	4	HGW HG600	531871	○
420	412	417,5	25	24,5	4	HGW HG600	24379046	○
420	412	417,5	40	39,5	4	HGW HG600	24378059	○
430	422	427,5	40	39,5	4	HGW HG600	49003308	○
440	432	437,5	25	24,5	4	HGW HG600	49002762	○
441	433	438,5	40	39,5	4	HGW HG600	532899	○
460	452	457,5	25	24,5	4	HGW HG600	24379348	●
460	452	457,5	40	39,5	4	HGW HG600	24379244	●
480	472	477,5	25	24,5	4	HGW HG600	24379081	○
480	472	477,5	40	39,5	4	HGW HG600	24378060	○
480	475	478,4	25	24,5	2,5	HGW HG600	24378805	●
500	492	497,5	25	24,5	4	HGW HG600	49002908	○
500	492	497,5	40	39,5	4	HGW HG600	531874	○
530	522	527,5	25	24,5	4	HGW HG600	530276	○
540	532	537,5	25	24,5	4	HGW HG600	24379047	○
540	535	538,4	25	24,5	2,5	HGW HG600	24378806	○
560	552	557,5	25	24,5	4	HGW HG600	24377622	○
580	572	577,5	25	24,5	4	HGW HG600	24379048	○
600	592	597,5	25	24,5	4	HGW HG600	24377999	○
600	592	597,5	40	39,5	4	HGW HG600	24379323	○
600	595	598,4	25	24,5	2,5	HGW HG600	24378808	○

● Available from stock ○ On request: Tool is available, delivery at short notice



D	d <sub>F</sub>	d <sub>1</sub>	L	H	Profile	Material	Article No.	
620	612	617,5	25	24,5	4	HGW HG600	49004662	○
630	622	627,5	25	24,5	4	HGW HG600	24379049	○
630	622	627,5	40	39,5	4	HGW HG600	49002675	○
640	632	637,5	25	24,5	4	HGW HG600	531869	○
680	672	677,5	25	24,5	4	HGW HG600	527133	○
680	672	677,5	40	39,5	4	HGW HG600	49004923	○
680	675	678,4	25	24,5	2,5	HGW HG600	526191	●
700	692	697,5	25	24,5	4	HGW HG600	24376187	○
700	692	697,5	35	34,5	4	HGW HG600	49003965	○
710	702	707,5	40	39,5	4	HGW HG600	49002676	○
740	732	737,5	35	34,5	4	HGW HG600	24378498	○
760	752	757,5	40	39,5	4	HGW HG600	24379321	○
800	792	797,5	20	19,8	4	HGW HG600	49000238	○
800	792	797,5	25	24,5	4	HGW HG600	24378000	○
850	842	847,5	25	24,5	4	HGW HG600	531637	○
865	857	862,5	20	19,8	4	HGW HG600	531678	○
865	857	862,5	40	39,5	4	HGW HG600	49003031	○
950	942	947,5	25	24,5	4	HGW HG600	24379050	●
952	942	948,5	25	24,5	5	HGW HG600	532858	○
965	957	962,5	25	24,5	4	HGW HG600	49003044	○
1050	1042	1047,5	25	24,5	4	HGW HG600	24376188	○
1160	1152	1157,5	40	39,5	4	HGW HG600	49002142	○
1200	1192	1197,5	25	24,5	4	HGW HG600	533290	○
1250	1242	1247,5	25	24,5	4	HGW HG600	530020	●
1450	1442	1447,5	40	39,5	4	HGW HG600	531903	○

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