

PRODUCT RANGE

VALVE SEAT INSERTS

OUR **HEART** BEATS FOR YOUR ENGINE.

VALVE SEAT INSERTS

Since usage of aluminium cylinder heads, valve seat inserts have significantly gained in importance. Together with the valves they seal off the combustion chamber of the cylinder head. The valve seat insert prevents the impact/burying of the valve into the cylinder head. It absorbs a proportion of the combustion heat with which the valve is charged. The valve seat insert gives off this heat to the cylinder head. To meet the different strains, an optimum material composition of the valve seat inserts must be found. Not only must the operating conditions in the engine be considered, but also the machinability of the material for the engine reconditioner.

Materials

In the most recent engine generations of renowned car manufacturers, valve seat inserts made of sintered material (powder metallurgical procedure) are used. The increasingly high, thermal strain of the seat insert in the combustion chamber can hardly be met anymore by materials from conventional casting processes.

For this reason, Motorservice offers sintered valve seat inserts amongst others from three different material combinations, which covers the entire application range of future engines.

Overview

	HM	HT	HT+	G1	G2	G3
Fuel type/ combustion	Petrol (unleaded), diesel	Petrol (unleaded), diesel	Petrol (unleaded), diesel, CNG, LPG, propane gas, flex fuel	Petrol (unleaded), diesel	CNG, LPG, flex fuel, petrol (unleaded), diesel	CNG, LPG, flex fuel, petrol (unleaded), diesel
Cylinder head materials	Aluminium, grey cast iron	Aluminium, grey cast iron	Aluminium, grey cast iron	Aluminium, grey cast iron	Aluminium, grey cast iron	Aluminium, grey cast iron
Engines	low-power petrol and diesel engines with low to normal strain	powerful, highly charged and highly stressed petrol and diesel engines	used in gas engines like LPG, CNG, propane gas, flex fuel, powerful petrol and diesel engines	naturally aspirated engines, turbocharged engines	highly strained engines, performance- enhanced engines, all above mentioned gas engines	highly strained engines, performance- enhanced engines, all above mentioned gas engines



ATTENTION

Extreme operating conditions as well as high strains of the respective engine must be taken into consideration and are the responsibility of the engine repairer. The selection of the specification of engine parts must be carefully checked by the engine repairer.



- HM= High Machinability
- HT = High Temperature Resistance
- HT+= High Temperature Resistance +
- G1 = High Temperature Resistance
- G2 = High Wear-Resistance
- G3 = High Temperature & Wear – Resistance

Installation instructions

Kolbenschmidt and TRW Engine Components valve seat inserts are machined and finished on the external diameter. The dimension for the locating hole in the cylinder head can be determined based on the following overlap table. For the sintered metal seat inserts, the valve seat angle must be machined after insertion. The cast iron seat inserts are finished.

Insert the sintered metal valve seat inserts

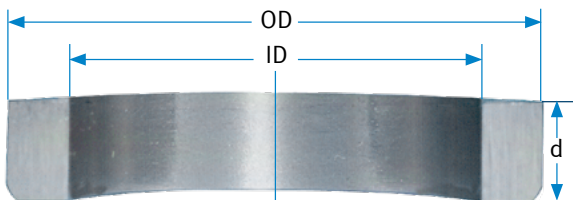
Make sure that the seat insert to be inserted is always attached with the radius side downwards. Due to the radius and the “spring effect”, the Kolbenschmidt sintered metal valve seat insert does not require liquid nitrogen for cooling down the seat inserts and no heating up of the cylinder head to press in the valve seat inserts into the cylinder head. The seat inserts are driven in cold with a respective tool.

NOTE

Replacing valve seat inserts and valves within the scope of the gas conversion always represents an interference with the original engine specifications. Whether the new material combinations harmonise and the desired results are achieved under the changed conditions can only be estimated in advance. Extreme operating conditions and the specific engine strains must be taken into consideration. These are the sole responsibility of the engine modifier.

ATTENTION

Heed valve specifications when performing conversion work.



Main dimensions of a valve seat insert

OD = overall diameter, ID = internal diameter, d = depth

Kolbenschmidt and TRW Engine Components recommends the following overlaps / press fittings

Outer diameter valve seat insert		Cast iron cylinder head		Aluminium cylinder head	
[mm]	[inch]	[mm]	[inch]	[mm]	[inch]
20 – 30	0.7874 – 1.1811	0.06	0.0024	0.08	0.0031
30 – 40	1.1811 – 1.5748	0.08	0.0031	0.10	0.0040
40 – 50	1.5748 – 1.9685	0.10	0.0040	0.12	0.0047
50 – 60	1.9685 – 2.3622	0.12	0.0047	0.14	0.0055
60 – 70	2.3622 – 2.7559	0.14	0.0055	0.16	0.0063

HEADQUARTERS:

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OD	ID	d	HM	HT	HT*	G1 G2 G3	Valve seat angle	OD	ID	d	HM	HT	HT*	G1 G2 G3	Valve seat angle
[mm]	[mm]	[mm]	semifinished	semifinished	semifinished	finished*		[mm]	[mm]	[mm]	semifinished	semifinished	semifinished	finished*	
22	19	8		50009624				33.7	28.6	6.4	50004726				
24	18	8		50009610				33.7	28.6	6.4		50004903			
24	18	8			50009650			33.7	27	8			50009699		
24.1	18.8	6.5		50009602				33.7	27	8		50004902			
24.1	18	6.5		50009603				34	26	8.5	50004727				
25	19	8		50009611				34	27	10	50004801				
25	19	8			50009651			34	24	10	50004827				
25.12	20	6	50004700					34	27	10		50004948			
26	20	8		50009612				34	24	10		50004949			
26.7	20	5.7	50004701					34	27	10		50009670			
26.7	20	5.7		50004900				34	24	10		50009671			
26.7	20	5.7			50009696			34.25	27	8	50004728				
27	21	10		50009613				34.5	27	10	50004828				
27	20	8			50009693			34.5	27	10		50004950			
27.13	22.1	6.4	50004702					34.5	27	10		50009672			
27.15	20.1	6.6	50004703					34.7	28.3	7.5	50004729				
28	22	10	50004811					34.76	32.1	7.8			92-22016		
28	22	10		50004932				35	28.5	7.9	50004730				
28	22	10			50009652			35	28	10	50004829				
28.5	22	10	50004812					35	25	10	50004830				
28.5	22	10		50004933				35	28	10		50004951			
28.5	22	10			50009653			35	25	10		50004952			
28.7	22.1	4.9	50004704					35	28	10		50009673			
28.75	21	7.2	50004705					35	25	10		50009674			
28.8	24	8.6		50009615				35.05	27	6.4	50004731				
29	23	10		50004934				35.07	28.5	6.4	50004733				
29	23	10	50004813					35.07	26.9	6.4	50004732				
29	18	10		50009614				35.075	28	7.65			92-16165		
29	23	10			50009654			35.1	25.4	10.4	50004734				
29	18	10			50009697			35.1	25.4	7.1	50004735				
29.5	23	10	50004814					35.25	28	8	50004736				
29.5	23	10		50004935				35.37	28	7.7			92-16159		
29.5	23	10			50009655			35.5	29	10	50004802				
30	23	10	50004815					35.5	29.5	9.5	50004806				
30	20	10	50004816					35.5	28	10	50004831				
30	23	10		50004936				35.5	28	10		50004953			
30	20	10		50004937				35.5	28	10		50009500			
30	20	10			50009657			35.6	29	8	50004737				
30	23	10			50009656			35.9	29.7	7.9			92-22015	30.0 deg	
30.02	23.5	6.2	50004706					36	29	10	50004832				
30.15	25	6.3	50004707					36	26	10	50004833				
30.15	25	6.3		50004901				36	29	10		50004954			
30.19	24.1	8.1		50004920				36	26	10		50004955			
30.19	24.1	8.1			50009658			36	29	10		50009675			
30.3	23.7	6.4	50004708					36	26	10		50009676			
30.31	22.1	6.4	50004709					36.073	28.5	6.45			92-25027		
30.33	23.7	6.6	50004710					36.12	29.3	8	50004738				
30.5	25	6.5	50004711					36.5	29	10	50004834				
30.5	23	10		50004938				36.5	29	10		50004956			
30.5	23	10	50004817					36.5	29	10		50009677			
30.5	23	10			50009659			36.59	30.1	7.9	50004739				
31	24	10	50004818					36.64	28.6	6.4	50004740				
31	21	10	50004819					36.64	28.6	8	50004741				
31	24	10		50004939				36.66	26.9	6.4	50004742				
31	21	10		50004940				36.68	31.2	6.4	50004743				
31	18	7.5			50009623			36.8	28.4	7.5			92-22020		
31	24	10			50009660			37	28	9	50004744				
31	21	10			50009661			37	30	8	50004745				
31.5	24	10		50004941				37	30	8		50004904			
31.5	24	10	50004820					37	31	10	50004803				
31.5	24	10			50009662			37	30	10	50004835				
31.83	27.4	8.5		50004921				37	30	10		50004957			
31.83	27.4	8.5			50009698			37	30	10		50009678			
31.88	26.8	6.4	50004712					37.01	30.15	7.55			92-22008	45.0 deg	
31.88	25.4	6.4	50004713					37.03	27.9	9	50004746				
31.9	25.3	6.4	50004715					37.07	28.6	7.2			92-22011	45.0 deg	
31.9	23.7	6.4	50004714					37.08	30.56	7			92-16124	30.0 deg	
31.93	23.1	7.2	50004716					37.2	30	7	50004747				
32	22	10	50004822					37.2	30	7		50004905			
32	24	9		50004928				37.5	31	8.5	50004748				
32	22	10		50004943				37.5	30	10	50004836				
32	25	10		50004942				37.5	30	10		50004958			
32	25	10	50004821					37.5	31.2	6.95		50009617			
32	24	9			50009663			37.5	30	10		50009501			
32	25	10			50009664			37.59	30.5	7.3			92-16125		
32	22	10			50009665			38	30	7		50004906			
32.33	27.4	8.5		50009600				38	30	7	50004749				
32.5	25	10	50004823					38	31	10	50004804				
32.5	25	10		50004944				38	28	10		50004960			
32.5	25	10			50009666			38	28	10	50004837				
32.65	25.5	8	50004717					38	31	10		50004959			
32.65	26	8.5	50004718					38	31	10		50009679			
32.8	28.5	8.8		50009616				38	28	10		50009680			
32.83	27.4	8.5		50009601				38.07	30	7.9			92-16154	45.0 deg	
33	25	8.5	50004719					38.07	30	8.5			92-16109	45.0 deg	
33	25	4.5	50004796					38.1	30.2	6.4	50004797				
33	26	10	50004824					38.21	28.6	6.4	50004750				
33	23	10	50004825					38.23	31	8		50004907			
33	26	10		50004945				38.23	28.6	6.4	50004753				
33	23	10		50004946				38.23	31.8	9.5	50004754				
33	23	10			50009668			38.23	31	8	50004755				
33	26	10			50009667			38.23	31	8		50009503			
33.47	25.4	6.4	50004720					38.25	31.7	6.4	50004752				
33.48	25.3	6.4	50004721					38.25	30.1	6.4	50004751				
33.48	26.9	6.4	50004722					38.28	27.9	8	50004756				
33.5	26.5	8	50004723					38.38	30	8.5			92-16131	45.0 deg	
33.5	24.8	7.1	50004724					38.5	31	10	50004838				
33.5	27	9	50004805					38.5	31	10		50004961			
33.5	26	10	50004826					38.5	31	10		50009504			
33.5	26	10		50004947				38.95	31	8.5	50004757				
33.5	26	10			50009669			38.95	31	8.5		50004908			
33.7	27	8	50004725					39	29	10	50004840				

OD	ID	d	HM	HT	HT*	G1 G2 G3	Valve seat angle	OD	ID	d	HM	HT	HT*	G1 G2 G3	Valve seat angle
[mm]	[mm]	[mm]	semifinished	semifinished	semifinished	finished*		[mm]	[mm]	[mm]	semifinished	semifinished	semifinished	finished*	
39	32	10		50004839				39	32	10		50004962			
39	32	10						39	29	10		50004963			
39	32	10													