

Materials, design and construction

The following table outlines the range of materials most commonly used.

Reference	Materials	Max. # Temp. (°C)	Max. Speed m/s	General Features
M1	Nitrile (NBR)	120	15	Our standard material suitable for most applications. A flexible rubberised fabric back and rubber lip.
M2	Nitrile (NBR)	120	10	Material combination comprising rubber lip and a rigid fibre back. A self-retaining seal suitable for open housings.
M5	Butyl (IIR)	120	5	Used in some fluids for which nitrile (NBR) is not chemically compatible.
M6	Nitrile (NBR)	120	12	Incorporates a steel band in the seal back. A self retaining seal suitable for open housings.
M8	Fluoroelastomer (FPM)	200	20	A self retaining seal suitable for open housings. Incorporates a stainless steel band located in the seal back.
M9	Fluoroelastomer (FPM)	140	25	As M1, but for applications which would preclude the selection of NBR materials, i.e. higher speeds, chemical compatibility.
NM28/80	Nitrile (NBR)	120	15	Rubber compounds incorporating lubricants to reduce seal wear and increase speed capability under adverse lubrication conditions.
NM48/80	Nitrile (NBR)	120	15	
Elast-O-Lion®	Hydrogenated Nitrile (HNBR)	150	15	High strength elastomer suitable for more aggressive applications including those where additional wear resistance is required.
Fluolion®	PTFE	260	3	Rigid plastic material used for chemical and food processing applications.

Also see comments under "Performance" on page 2

Other rubber compounds and material combinations are available to meet your exacting demands. If assistance in material selection is required, advice is freely available from James Walker's applications engineers and our materials specialists.

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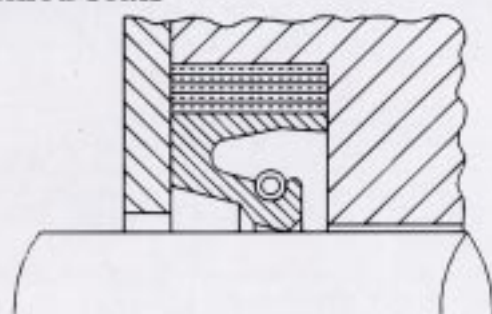
The above material designations in combination with the D6 design reference form a code which should be used for specifying Walkerseals e.g. M1/D6 Walkerseals are manufactured from M1 material (nitrile rubber lip with a rubberised fabric back). Separate literature is available for other designs such as the D7.



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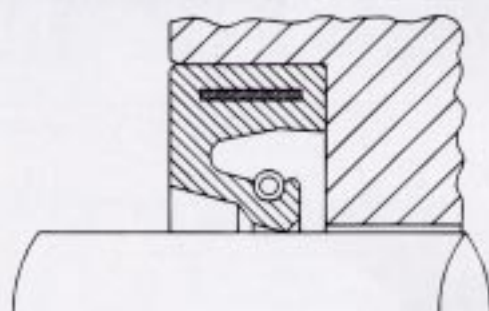
The D6 design of Walkersele is available to suit two types of housing:

Retained seals



These seals must be used in housings fitted with retaining plates. Our standard M1/D6 seals as indicated in charts 56 and 57 should be fitted in this way. Such seals can be supplied in either split or endless form as required. See pages 6 & 7.

Self-retained seals



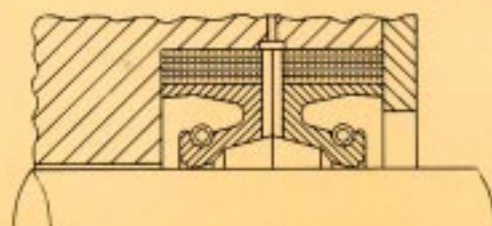
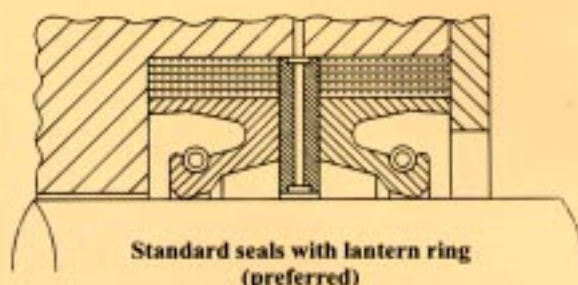
These seals may be fitted in open ended housings. Our standard M6/D6, as indicated in charts 104, 105 and 376 are normally fitted in this way. Supplied in endless form only. See pages 8 & 9.

Ease of fitting

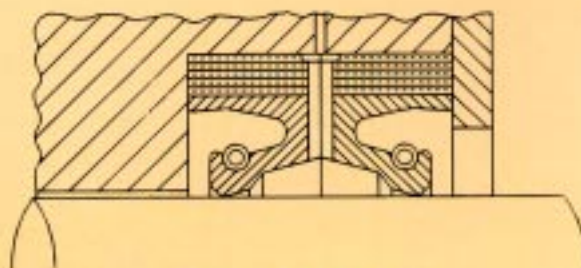
Ease of installation is a prime consideration for all Walkersele products. Unlike rigid metal backed seals, the total flexibility of the Walkersele allows for easy fitting and removal. To reduce fitting time, retained seals can be supplied in split form. A solid rubber portion is included in the seal back through which the split is made. The close mating of the abutting ends ensures that a potential leakage path is closed. Walkersele OSJ (on-site join) is available where endless seal integrity is required but down-time costs associated with the fitting of endless seals would prove prohibitive. See separate brochure for details.

Seal lubrication

When two or more seals are fitted in the same housing and inter-seal lubrication is required, we strongly recommend that an inter-seal lantern-ring be fitted, suitably ported to allow access to the lubricating fluid. Where there is insufficient axial space to incorporate such a ring, access ports and where necessary an annular groove can be incorporated into the seal base. Seals featuring this design modification are available on request.

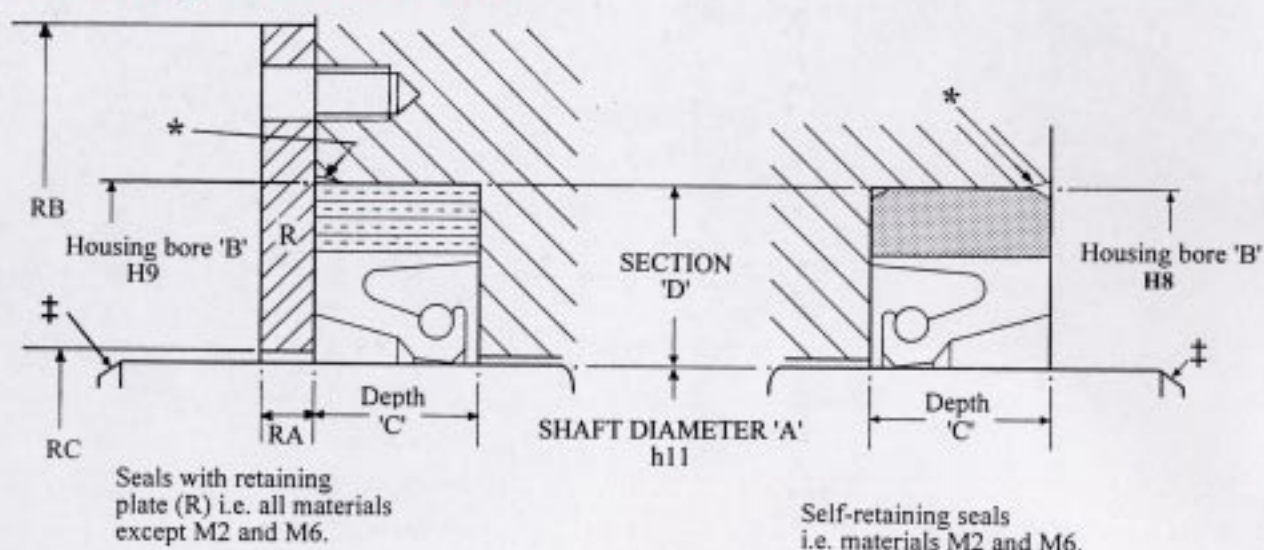


Seals with axial ports



Seals with axial ports and
annular groove

Housing tolerances



Housing depth (C) limits		
Single seals	mm	inch
	± 0.1	± 0.004
Double seals	mm	inch
	+0.2 - 0	+0.008 - 0

± Shaft chamfer ±					
mm			inch		
Shaft Dia 'A'		Chamfer min. axial depth	Shaft Dia 'A'		Chamfer min. axial depth
>	≤		>	≤	
3	50	8 x 15°	0.12	1.97	5/16 x 15°
50	250	10 x 15°	1.97	9.85	3/4 x 15°
250	800	15 x 15°	9.85	31.5	9/16 x 15°
800		20 x 15°	31.5		3/4 x 15°

*Housing chamfer

A chamfer should be provided at the entrance to the housing to facilitate assembly (particularly for M2 and M6 Walkersles). Where the nominal housing depth is equal to the seal depth, the chamfer dimensions should not exceed 1mm x 30° for seals up to and including 10mm deep, 2mm x 30° for seals over 10mm deep and 0.080 in x 30° for seals over 3/8 in deep.

N.B. - M6 seals are not available below 50mm outside diameter.

Retaining plate (R) dimensions.

All dimensions in mm

NOMINAL SHAFT DIAMETER A		MINIMUM THICKNESS (RA)		(RB) Min	(RC) Max	BOLTING		
Above	Up to & Inc.	Single Seals	Double Seals			Size	No.	P.C.D.
	35	3	4.5	B + 28	A + 0.75C	M 5	4	B+13
35	65	4	6	B + 30	A + 0.75C	M 5	6	B+13
65	100	5	7.5	B + 43	A + 0.75C	M 8	6	B+20
100	250	7	10.5	B + 45	A + 0.75C	M 8	8	B+20
250	400	8	12	B + 56	A + 0.75C	M10	8	B+24
400	600	10	15	B + 65	A + 0.75C	M12	12	B+30
600	900	12.5	18.8	B + 76	A + 0.75C	M14	16	B+34
900	1200	12	22.5	B + 76	A + 0.75C	M14	20	B+34

Shaft surfaces

The sealing area of the shaft should be a fine ground finish of 0.4 to 0.8 μ m Ra (16 to 32 μ in CLA) for most applications but, for higher speeds it is recommended that the surface finish be improved to 0.2 to 0.4 μ m Ra (8 to 16 μ in CLA). In all cases it is important that the shaft sealing area is free from machining marks, dents, burrs, scratches and single pass grinding wetness patterns.