



McCanna/MARPAC Valves

Product Data Bulletin
FCD MMAPS0002-01
(Part PDB-1)

Carbon Graphite Seated McCannaSeal[®] Ball Valves

Carbon-graphite is a specific blend of carbon and graphite powders compressed in a confined die followed by baking in a non-oxidizing atmosphere. Seats of this material are usable in a wide temperature range but are specifically used in the higher temperatures applications. The wedge-seat design of the McCannaSeal valve permits the use of this material in temperatures as high as 1000°F in most services. Carbon-graphite works best in clean liquids with some lubricating properties. Within specified limits, the material is serviceable in wet, saturated or super heated steam. Refer to Bulletin MMAPS0013 for parameters. Carbon Graphite cannot be expected to be bubble-tight in air or gaseous services. Leakage rates are better than Class V.

Carbon-graphite is practically inert and is unaffected by most chemical reagents. Exceptions are the highly oxidizing reagents such as high concentrations of nitric acid, oxychlorides and similar reagents. In oxidizing services, the applications must be limited in temperature to 700°F. Caution should be used in applying carbon-graphite up to 1000°F since pressure and temperature ratings are not mutually selective. Use at very high temperatures requires discretion concerning the pressure capability of the valve body materials. ANSI ratings for the body material must be maintained. All carbon-graphite seated valves applied at temperatures of 500°F or greater must have ball stops. Refer to MMABR1023 for pressure/temperature charts.

In assembly, the valve body seats must be cleaned and lapped to a finish of 63 microinches Ra. Balls must be of the best spherical quality and lapped with the carbon graphite seats. The backs of the seats are also lapped to ensure flatness, and a tight fit to the body.

The following precautions should be taken in repairing valves with carbon graphite seats:

1. Standard valves in the field cannot be converted to high temperature service by simply inserting carbon-graphite seats. The ball must be round to G-1 quality and then lapped with the seats. The valve body seats must also be machine-lapped to a flat finish of 63 microinches Ra or better.
2. Replacement seats and ball must be ordered as a set in order to be match-lapped at the factory. The body seat surfaces should be cleaned and lapped again if not perfectly flat.
3. If replacement seats only are ordered, the user must take full responsibility to lap fit a ball of best spherical quality only to the new seats. The body seat surfaces also must be clean and lapped again if not flat.



Seat Ring Material						
Standard Material M-110						
Properties	SS 316	Hc	A 20	Monel	Ti	Inconel
Filler Material	Carbon	Carbon	Carbon	Carbon	Carbon	Carbon
Scleroscope Hardness (Ave)	90	90	90	90	90	90
Compressive Strength (psi, Ave)	28,000	28,000	28,000	28,000	28,000	28,000
Flexural Strength (psi, Ave)	9,000	9,000	9,000	9,000	9,000	9,000
Operating Temp (°F, Max) Oxidizing	500	700	700	700	700	500
Neutral or Non-Oxidizing	500	1,000	1,000	1,000	1,000	500
Apparent Density (gm/cc, Ave)	1.85	1.85	1.85	1.85	1.85	1.85
RMC # 19535	C1	C7	C10	C14	C2	C3

Note: Replaces M-58 Material

Alternate Material M-344						
Properties	SS 316	Hc	A 20	Monel	Ti	Inconel
Filler Material	Antimony	Antimony	Antimony	Antimony	Antimony	Antimony
Scleroscope Hardness (Ave)	90	90	90	90	90	90
Compressive Strength (psi, Ave)	40,000	40,000	40,000	40,000	40,000	40,000
Flexural Strength (psi, Ave)	12,000	12,000	12,000	12,000	12,000	12,000
Operating Temp (°F, Max) Oxidizing	700	700	700	700	700	700
Neutral or Non-Oxidizing	1,000	1,000	1,000	1,000	1,000	1,000
Apparent Density (gm/cc, Ave)	2.15	2.15	2.15	2.15	2.15	2.15
RMC # 19536	C3	C7	C10	C6	C8	C5

Alternate Material M-312						
Properties	SS 316	Hc	A 20	Monel	Ti	Inconel
Filler Material	Nickel	Nickel	Nickel	Nickel	Nickel	Nickel
Scleroscope Hardness (Ave)	95	95	95	95	95	95
Compressive Strength (psi, Ave)	55,000	55,000	55,000	55,000	55,000	55,000
Flexural Strength (psi, Ave)	16,000	16,000	16,000	16,000	16,000	16,000
Operating Temp (°F, Max) Oxidizing	700	700	700	700	700	700
Neutral or Non-Oxidizing	1,000	1,000	1,000	1,000	1,000	1,000
Apparent DenMcCannaSeal (gm/cc, Ave)	2.4	2.4	2.4	2.4	2.4	2.4
RMC # 19537	C1	N/A	C10	N/A	N/A	C2

Porosity: In a finished seat assembly the material can hold 90 psig gas pressure at ambient temperature without leakage through the seat material. Note: Average values can vary up to 20% in larger sizes.

Marpac® is a registered trademark of Flowserve Corporation. McCannaSeal® is a registered trademark of Flowserve Corporation.

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