Material Specifications for Cartridge Valves and Manifolds

In order to provide its customers with the highest quality hydraulic cartridge valves and manifolds, HydraForce follows a strict incoming inspection process on all parts and materials. All finished cartridge valves and manifolds are 100% tested and carry a five-year warranty against defects in material and workmanship. Here is a summary of HydraForce material specifications.

Standard Cartridge Valves

Cartridge Valve: Steel with hardened work surfaces to prevent scratching and wear; zinc-plated exposed surfaces. Free-machining, low carbon steel, such as 12L14 is typically used. Where needed, higher grade, heat-treatable steel, such as 86L20, or higher strength UNS 1144, is used.

Internal Cartridge Components: Hardened precision poppets, seats, spools and cages for long life and low leakage. Free-machining, low carbon steel, such as 12L14 is typically used.

External Cartridge Components: Adjustment screws are constructed of a wide variety of ferrous or brass metals, all protected against corrosion. Anodized aluminum knobs and caps. Durable, unitized, molded coils. Water/weather resistant coils are available with IP65 and IP69 rated connectors. Coils are rated for continuous duty operation.

Standard Plating: Standard valves come with zinc plating that meets ASTM B633 specifications. Type III (HydraForce PLT005) clear plating has a rating of 12 hours minimum to red rust on any surface. Type II (HydraForce PLT006) yellow plating has a rating of 96 hours minimum to red rust.

Corrosion-Resistant (G) Plating: Corrosion-resistant plating has a rating of 1000-hours minumum to red rust on any surface. HydraForce conducts salt-spray testing according to ASTM Standard B117 on its corrosion-resistant zinc-nickel plating. This plating is light gray in color and may have yellowish or purple hue that may vary from cartridge to cartridge.

RoHS compliance: HydraForce valves meet RoHS environmental requirements restricting the use of cadmium, quicksilver, lead, hexavalent chrome, polybrominated biphenyl (PPB) or polybrominated diphenyl ester (PPDE) in products, components and packing materials.

OSHA compliance: All HydraForce products meet requirements limiting the use of hazardous materials as identified in OSHA Standard 1910.1200(g).

HyPerformance™ Cartridge Valves

Cartridge Valve: Steel with hardened work surfaces to prevent scratching and wear; zinc-plated exposed surfaces. Free-machining, low carbon steel, such as 12L14 is typically used. Where needed, higher grade, heat-treatable steel, such as 86L20, or higher strength UNS 1144, is used.

Internal Cartridge Components: Hardened precision poppets, seats, spools and cages for long life and low leakage. Free-machining, low carbon steel, such as 12L14 is typically used.

External Cartridge Components: Adjustment screws are constructed of a wide variety of ferrous or brass metals, all protected against corrosion. Anodized aluminum knobs and caps. Durable, unitized, molded coils. Water/weather resistant coils are available with IP65 and IP69 rated connectors. Coils are rated for continuous duty operation.

Corrosion-Resistant (G) Plating: Corrosion-resistant plating has a rating of 1000-hours minumum to red rust on any surface. HydraForce conducts salt-spray testing according to ASTM Standard B117 on its corrosion-resistant zinc-nickel plating. This plating is light gray in color and may have yellowish or purple hue that may vary from cartridge to cartridge.

RoHS compliance: HydraForce valves meet RoHS environmental requirements restricting the use of cadmium, quicksilver, lead, hexavalent chrome, polybrominated biphenyl (PPB) or polybrominated diphenyl ester (PPDE) in products, components and packing materials.

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OSHA compliance: All HydraForce products meet requirements limiting the use of hazardous materials as identified in OSHA Standard 1910.1200(g).

Solenoid Valve Coils (E-Coils)

Coil Shell: Rugged external steel shell provides exceptional protection against physical damage, ensuring durability under harsh operating conditions. UNS 10060, SAE-AISI 1006-AK draw quality sheet steel is used for 8- and 10-size E-coils. salt-spray rated for 1000 hours per ASTM B117 specifications.

Coil Windings: Copper wire per NEMA Standard MW 1000.

Connectors: ASTM B 36 Alloy 260 half hard temper yellow brass.

Manifolds and Valve Bodies

Aluminum : Anodized high-strength aluminum alloy, rated to 210 bar (3000 psi) for a minimum of one million impulse cycles. Standard aluminum housings have a thin, clear-coat anodized finish which enhances quality by providing increased surface hardness, improved surface finish and increased corrosion-resistance. Anodized aluminum is easier to deburr and clean, which results in an overall better appearance.

Cast iron: Cast iron manifold housings can be custom ordered to fit the needs of a specific application.

Ductile Iron: Ductile (nodular cast) iron manifolds and valve housings are rated for pressures up to 345 bar (5000 psi). Zinc-plated for corrosion-resistance and surface sealing.

Seals

Buna N (Nitrile) seals:
Temperature range (per ASTM Standard D2000/SAE J200) -40 to 100°C (-40 to 212°F). Durometer is 70. High durometer nitrile seals are 90. O-rings are black in color. Cartridges with Buna N seals will also contain backup rings, which may be PolyTetra FluorEthylene (PTFE), Teflon®, Hytrel® or Polymyte.

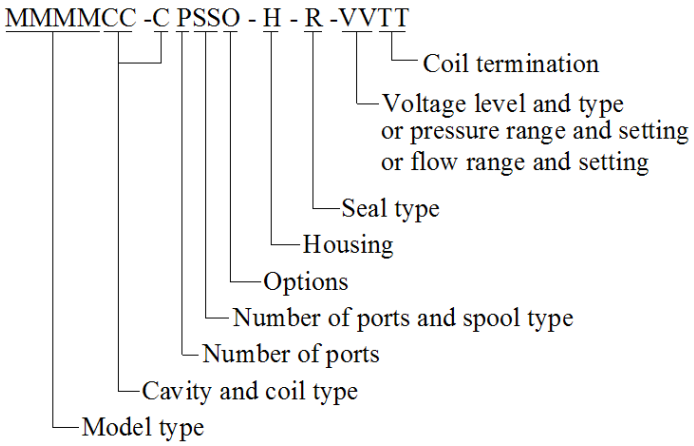
Fluorocarbon seals:
Temperature range (per ASTM Standard D2000/SAE J200) -26 to 204°C (-15 to 400°F). Durometer is 75 or 90, depending on the application. O-rings are brown in color. Cartridges with fluorocarbon seals will also contain backup rings, which may be PolyTetra FluorEthylene (PTFE), Teflon®, Hytrel® or Polymyte.

Polyurethane seals:
Temperature range (per ASTM Standard D2000/SAE J200) -54 to 104°C (-65 to 225°F). Durometer is 90. O-rings are off-white in color. Cartridges with polyurethane seals will also contain backup rings, which may be PolyTetra FluorEthylene (PTFE), Teflon®, Hytrel® or Polymyte.

PPDI Urethane seals:
Temperature range (per ASTM Standard D2000/SAE J200) -54 to 135°C (-65 to 275°F). Durometer is 90. O-rings are yellow in color. Urethane seals for HyPerformance™ cartridge valves have a distinctive "D" shape that provides an effective seal without the use of backup rings.

How to Order A HydraForce Valve

The HydraForce model code is the key to specifying the right cartridge valve for your application.



How To Specify a Material When Ordering

Material choices are listed under each option. If in doubt, contact HydraForce Customer Service.

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