

Seven Easy Steps For Selecting The Proper Hose

An effective way to remember hose selection criteria is to remember the word...

STAMPED

S = Size

T = Temperature

A = Application

M = Material to be conveyed

P = Pressure

E = Ends or couplings

D = Delivery (volume and velocity)

1. Hose Size (Dash Numbers)

The inside diameter of the hose must be adequate to keep pressure loss to a minimum and avoid damage to the hose due to heat generation or excessive turbulence. See hose sizing Nomographic chart.

To determine the replacement hose size, read the layline printing on the side of the original hose. If the original hose layline is painted over or worn off, the original hose must be cut and the inside diameter measured for size.

NOTE: Before cutting an original hose assembly, measure the overall assembly length and fitting orientation.

These measurements will be required to build the replacement assembly.

The hydraulics industry has adopted a measuring system called Dash Numbers to indicate hose and coupling size. The number which precedes the hose or coupling description is the dash size (see following table). This industry standard number denotes hose I.D. in sixteenths of an inch. (The exception to this is the SAE100R5 hoses C5C, C5D, C5E, C5M as well as, C14 and AC134a, where dash sizes denote hose I.D. equal to equivalent tube O.D.) See chart to right.

| Dash No. | Hose I.D. (Inches) | | | |
|----------|--------------------------------------|-------------|---------------------------|-------------|
| | All Except C5 Series, C14 and AC134a | | C5 Series, C14 and AC134a | |
| | Inches | Millimeters | Inches | Millimeters |
| -2 | 1/8 | 3.2 | -- | -- |
| -3 | 3/16 | 4.8 | -- | -- |
| -4 | 1/4 | 6.4 | 3/16 | 4.8 |
| -5 | 5/16 | 7.9 | 1/4 | 6.4 |
| -6 | 3/8 | 9.5 | 5/16 | 7.9 |
| -8 | 1/2 | 12.7 | 13/32 | 10.3 |
| -10 | 5/8 | 15.9 | 1/2 | 12.7 |
| -12 | 3/4 | 19.0 | 5/8 | 15.9 |
| -14 | 7/8 | 22.2 | -- | -- |
| -16 | 1 | 25.4 | 7/8 | 22.2 |
| -20 | 1-1/4 | 31.8 | 1-1/8 | 28.6 |
| -24 | 1-1/2 | 38.1 | 1-3/8 | 34.9 |
| -32 | 2 | 50.8 | 1-13/16 | 46.0 |
| -36 | 2-1/4 | 57.6 | -- | -- |
| -40 | 2-1/2 | 63.5 | 2-3/8 | 60.3 |
| -48 | 3 | 76.2 | -- | -- |
| -56 | 3-1/2 | 88.9 | -- | -- |
| -64 | 4 | 101.6 | -- | -- |
| -72 | 4-1/2 | 115.2 | -- | -- |

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Hose O.D. can be a critical factor when hose routing clamps are used or hoses are routed through bulkheads. Check individual hose specification tables for O.D.'s.

2. Temperature

When selecting a replacement assembly, two areas of temperature must be considered. These are fluid temperature and ambient temperature. The hose selected must be capable of withstanding the minimum and maximum temperature seen by the system. Care must be taken when routing near hot manifolds and in extreme cases a heat shield may be advisable.

See the Gates Hydraulic Hose Selection Guide, Hose Specification Pages, and/or the Additional Temperature Limits for Gates Hydraulic Hose Chart or temperature ranges and limits for water, water/oil emulsions and water/glycol solutions.

3. Application

Determine where or how the replacement hose or assembly is to be used. Most often only a duplicate of the original hose will have to be made. To fulfill the requirements of the application, additional questions may need to be answered, such as:

- Where will hose be used?
- Fluid and/or Ambient Temperature?
- Hose Construction?
- Equipment Type?
- Fluid Compatibility?
- Thread End Connection Type?
- Working and Surge Pressures?
- Environmental Conditions?
- Permanent or Field Attachable Couplings?
- Suction Application?
- Routing Requirements?
- Thread Type?
- Government and Industry Standards Being Met?
- Unusual Mechanical Loads?
- Minimum Bend Radius?
- Non-Conductive Hose Required?
- Excessive Abrasion?

4. Material to be Conveyed

Some applications require specialized oils or chemicals to be conveyed through the system. Hose selection must assure compatibility of the hose tube, cover, couplings and O-rings with the fluid used. Additional caution must be exercised in hose selection for gaseous applications such as refrigerants and LPG.

NOTE: All block type couplings contain nitrile O-rings which must be compatible with the fluids being used.

5. Pressure

Most important in the hose selection process is knowing system pressure, including pressure spikes. Published working pressures must be equal to or greater than the system pressure. Pressure spikes greater than the published working pressure will shorten hose life and must be taken into consideration. Gates DOES NOT recommend using hoses on applications having pressure spikes greater than published working pressures of the hose.

6. Ends of Couplings

Identify end connections using Gates coupling templates and measuring tools or Coupling Identification section. Once thread ends have been identified, consult the appropriate section of the catalog for specific part number selection.

7. Delivery (Volume and Velocity)

If the same I.D. of the original hose is used, assume the system is properly sized to efficiently transport fluid. If the system is new or altered, determine the hose I.D. needed to transport required fluid volume flow by using the Nomographic Chart.