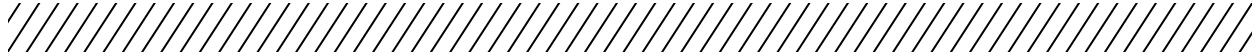




## FLUID POWER TECHNICAL NOTE



### **MXG 4K and MXT Pass SAE J1754 Cool Down Tests**

#### **Gates Delivers Advanced Performance in MXG 4K and MXT**

Gates MXG™ 4K hose and MXT™ hose have both been qualified to provide leak-free performance per SAE J1754.

MXG 4K with GlobalSpiral™ GS couplings has been qualified to meet SAE J1754 class A cool-down requirements in all sizes -6 through -16.

Gates MXT hose with MegaCrimp™ couplings has been qualified to meet SAE J1754 class B cool-down requirements in all sizes -4 through -16.

#### **Background: Leaks and the Fluid Power Industry**

Eliminating leaks is one of the most critical issues in the fluid power industry. Leaks can have a negative impact on customer satisfaction including downtime, machine performance, human frustration, dirty equipment appearance and environmental costs.

Equipment and machinery OEMs, hose and coupling manufacturers and industry organizations are continually improving products, standards, assembly methods and test programs to eliminate leaks.

#### **Evolution of Leak Requirements and Standards**

The earliest test methods to check for leaks were static proof, leak and burst (using water, linear pressure increase, ambient temperature and straight assemblies.)

The more recent test method to check for leak leaks is impulse testing (using hydraulic fluid, pressure cycles, high temperature and bent assemblies.)

The most current and advanced methods to check for leak resistance combine impulse testing with cool-down cycles. The idea is to better simulate (1) the effects of heat and age on the ability of the hose to maintain a leak-free seal between the stem and ferrule, and (2) the ability of the O-rings to maintain a dry seal between the coupling, adapter and port.

#### **SAE J1754 Cool Down Tests (Advanced Leak Tests)**

The SAE J1754-1 standard was issued in 1996 to cover “steel wire reinforced rubber hose assemblies using connectors specified in SAE J516 for use in hydraulic systems using petroleum



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based hydraulic fluids with maximum working pressures of 1.7 to 42 MPa.” The current SAE J1754-1 revision is JUL2017.

There are five tests in the J1754-1 standard that include leak requirements. The static tests remain the same as J517, but some changes were made to the impulse tests.

1. Proof test (same as J517)
2. Burst test (same as J517)
3. Leakage test (same as J517)
4. Cold Bend test (same as J517)
5. Impulse test (added Class A, Class B and Class C specifications)

Three different classifications “determined by type of application, duty cycle, working pressure, pressure surges (spikes) above nominal system pressure, flow velocity, flexing and/or the environment in which it is used” were added to the impulse section.

- Class A: High frequency or severity of flexing and/or pressure impulse cycles.
- Class B: Normal frequency or severity of flexing and/or pressure impulse cycles.
- Class C: Meets SAE J517 impulse test requirements.

The test pressures, number of impulse cycles, cool-down cycles and leak requirements vary for each classification of hose per the below table.

| Class   | Test Pressure | Impulse Cycles | Cool Down Test   | 1 <sup>st</sup> Cool Down | 2 <sup>nd</sup> Cool Down | Leak Requirement  |
|---------|---------------|----------------|------------------|---------------------------|---------------------------|-------------------|
| Class A | 150% WP       | 300k           | J1405 Option III | 150k cycles               | 300k cycles               | SAE J1176 Class 0 |
| Class B | 133% WP       | 200k           | J1405 Option III | 100k cycles               | 200k cycles               | SAE J1176 Class 0 |
| Class C | SAE J517      | SAE J517       | J1405 Option III | None                      | None                      | SAE J517          |

### **Additional Information**

Please see Gates Tech Note “FPTN009401 - SAE Leak Test Standards” for additional information about industry standards for leak tests.

Should you have any questions or concerns regarding Gates hydraulic and industrial hose products, please contact Product Application in Denver, Colorado at (303) 744-5070 or by e-mail at [FPPASUPPORT@gates.com](mailto:FPPASUPPORT@gates.com).