



DEPARTMENT OF THE NAVY
NAVAL SURFACE WARFARE CENTER
CARDEROCK DIVISION

NAVAL SHIP SYSTEMS
ENGINEERING STATION
5001 S. BROAD STREET
PHILADELPHIA, PA 19112-1403

IN REPLY REFER TO

9165

Ser 9234/056

29 Nov 2005

From: Commander, Carderock Division, Naval Surface Warfare Center,
Philadelphia, PA 19112-1403

To: Commanding Officer, Naval Sea Systems Command, Washington, DC

Subj: APPROVAL OF SWAGELOK[®], 1/4" TO 1" OD, 3750 PSIG AND 6000 PSIG, MONEL,
MECHANICALLY ATTACHED FITTINGS (MAF), NON-FIRE HARDENED
APPLICATIONS, SURFACE SHIPS ONLY

Ref: (a) Swagelok Company, Test Report, Alloy 400/R-405, Tube Fittings, IAW ASTM
F 1387-99 with Copper-Nickel Tubing, 21 January 2005
(b) ASTM F 1387-99, Standard Specification for the Performance of Mechanically
Attached Fittings
(c) MIL-STD-777E (SH), Schedule of Piping, Valves, Fittings, and Associated Piping
Components for Naval Surface Ships
(d) Naval Ship's Technical Manual (NSTM), S9086-RK-STM-010/CH-505, Piping
Systems
(e) Swagelok[®] Tube Fitter's Manual, F.J. Callahan, 1998
(f) Uniform Industrial Process Instruction (UIPI) 5050-913, Grip Type Mechanically
Attached Fittings (Swagelok[®]) Shipboard Installation Procedure

1. As requested from the Program Executive Office Ships, PMS 400D, the Naval Surface Warfare Center, Carderock Division, Piping and Auxiliary Equipment Systems Section, Code 9234, conducted Life Cycle Management (LCM), engineering oversight and review of reference (a) in accordance with reference (b), MAF Performance Testing and references (c) and (d) requirements.

2. Code 9234 approves reference (a) for use on US Navy, Surface Ships, Seawater and Firemain Systems; applications within references (c) and (d). This approval does not apply to Submarines, Nuclear Systems, Nuclear Surface Ship's Machinery Spaces or Level 1 applications.

3. NAVSEA approval is for the Swagelok[®] Company, Solon, OH, Grip-Type MAFs; designated as Type IV, Grade C, Class 8 (Class 10 for 1/4"), 600 deg F, Separable, 70/30 NiCu Fittings, 3750 psig (6000 psig for 1/4" OD) pressure rating when used with 70/30 CuNi or 90/10 CuNi (400 psig max) tubing in accordance with MIL-T-16420K, Type 1, Grade 2, Alloy 715, for size ranges, 1/4" to 1" OD (0.035" to 0.134" wall thickness). Non-fire hardened applications only.

4. Swagelok[®] MAF applications are contingent on a Navy approved training program based on reference (e), manufacturer's installation instructions. Prior to installation, contractors must submit a process control procedure to the Naval Contracting Activity, where work is to be conducted. Additional installation requirements will be outlined in reference (f); to be issued by sepcor.

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5. NSWCCD-SSES, Code 923 is the Life Cycle Manager for Fluid System piping and
components. Questions or comments should be directed to D. Luciani, Code 9234, Commercial
(215) 897-7875, DSN 443-7875 or email: domenic.luciani@navy.mil.



T.A. PERRY
By direction

Copy to:
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PEO SHIPS, PMS 400D

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