Parker Safety Guide for Selecting and Using Hose, Tubing, Fittings and Related Accessories
Parker Publication No. 4400-B.1
Revised: May, 2002

WARNING: Failure or improper selection or improper use of hose, tubing, fittings, assemblies or related accessories (“Products”) can cause death, personal injury and property damage. Possible consequences of failure or improper selection or improper use of these Products include but are not limited to:

- Fittings thrown off at high speed.
- Explosions or burning of the conveyed fluid.
- Injuries resulting from inhalation, ingestion or exposure to fluids.

Before selecting or using any of these Products, it is important that you read and follow the instructions below. Only Hose from Parker’s Stratoflex Products Division is approved for in flight aerospace applications, and no other Hose can be used for such in flight applications.

1.0 GENERAL INSTRUCTIONS

1.1 Scope: This safety guide provides instructions for selecting and using (including assembling, installing, and maintaining) these Products. For convenience, all rubber and/or thermoplastic positive displacement hose is referred to as “Hose” or “tubing” and all hose assemblies referred to as “Hose Assemblies”. All products commonly called “hose” or “couplings” are called “Fittings”. All related accessories (including clamping and swaging machines and tooling) are called “Related Accessories”. This safety guide is a supplement to and is to be used with the specific Parker publications for the specific Hose, Fittings and Related Accessories that are being considered for use.

1.2 Fail-Safe Hose, and Hose Assemblies and Fittings can and do fail without warning for many reasons. Design all systems and equipment in a fail-safe mode, so that failure of the Hose or Hose Assembly or Fitting will not endanger persons or property.

1.3 Distribution: Provide a copy of this safety guide to each person that is responsible for selecting or using Hose and Fitting products. Do not select or use Parker Hose or Fittings without thoroughly reading and understanding this safety guide as well as the specific Parker publications for the products considered or selected.

1.4 User Responsibility: Due to the wide variety of operating conditions and applications for Hose and Fittings and Parker, and its distributors do not represent or warrant that any particular Hose or Fitting is suitable for any specific end use system. This operating guide does not analyze all technical parameters that must be considered in selecting a product. The user, through its own analysis and testing, is sole responsible for:

- Making the final selection of the Hose and Fitting.
- Assuring that the user’s requirements are met and that the application presents no health or safety hazards.
- Providing all appropriate health and safety warnings on the equipment on which the Hose and Fittings are used.
- Assuring compliance with all applicable government and industry standards.

1.5 Additional Questions: Call the appropriate Parker technical service department if you have any questions or require any additional information. See the Parker publication for the product being considered, or call 1-800-C-PARKER, or go to www.parker.com, for telephone numbers of the appropriate technical service department.

2.0 HOSE AND FITTING SELECTION INSTRUCTIONS

2.1 Electrical Conductivity: Certain applications require that the Hose be nonconductive to prevent electrical current flow. Other applications require the Hose and the Fitting and the Hose/Fitting interface to be sufficiently conductive to drain off static electricity. Extreme care must be exercised when selecting Hose and Fittings for these or any other applications in which electrical conditions are a factor.

The electrical conductivity or nonconductivity of Hose and Fittings is dependent upon many factors and may be susceptible to change. These factors include but are not limited to the various materials used to make the Hose and the Fitting, Fitting finish (some fitting finishes are electrically conductive while others are nonconductive), manufacturing methods (including moisture content), and the fluid media used. See the fluid compatibility chart in the Parker publication for the product concerned.

2.2 Electrically Conductive Hose: Parker manufacturers special Hose for certain applications that require electrically conductive Hose. Parker manufactures special Hose for conveying paint in airless paint spraying applications. This Hose is labeled “Electrically Conductive Airless Paint Spray Hose” on its layline and packaging. This Hose must be properly connected to the appropriate Parker Fittings and properly grounded in order to dissipate dangerous static charge buildup, which occurs in all airless paint spraying applications. Do not use any other Hose for airless paint spraying, even if electrically conductive. Use of any other Hose or failure to properly connect the Hose can cause a fire or an explosion resulting in death, personal injury, and property damage.

Parker manufactures a special Hose for certain compressed natural gas (“CNG”) applications where static electricity buildup may occur. Parker CNG Hose assemblies comply with AGA Requirements 1-93, “Hoses for Natural Gas Vehicles and Fuel Dispensers”. This Hose is labeled “Electrically Conductive for CNG Use” on its layline and packaging. This Hose must be properly connected to the appropriate Parker Fittings and properly grounded in order to dissipate dangerous static charge buildup, which occurs in, for example, high velocity CNG dispensing or transfer. Do not use any other Hose for CNG applications where static charge buildup may occur or where any other type of fire or explosion could result. Repairs to Hose must also be taken to prevent hose failure. Parker CNG Hose is intended for dispenser and vehicle use at a maximum temperature of 180°F. Parker CNG Hose should not be used in confined spaces and/or areas for which the system must be tested for leaks. CNG Hose Assemblies should be tested on a monthly basis for conductivity per AGA 1-93.

Parker manufacturers special Hose for aerospace in flight applications. Aerospace in flight applications employing Hose to transmit fuel, lubricating fluids and hydraulic fluids require a special Hose with a conductive inner tube. This Hose for in flight applications is available only from Parker’s Stratoflex Products Division. Do not use any other Parker Hose for in flight applications, even if electrical conductivity is a factor. Use of other hoses for in flight applications or failure to properly connect the Hose can cause a fire or an explosion resulting in death, personal injury, and property damage. These Hose assemblies for in flight applications must meet all applicable aerospace industry, aircraft, engine, and aircraft requirements.

2.3 Suction: Permeation (that is, seepage through the Hose) will occur from inside the Hose to outside when Hose is used with gases, liquids and gas fuels, and refrigerants (including but not limited to refrigeration and air conditioning systems), incorporation of sufficient drying capacity in the system or other appropriate system safeguards should be selected and used.

2.4 Permeation: Parker manufactures special hose for certain applications that require permeation through the Hose Assembly. This Hose must be properly connected to the appropriate Parker Fittings and properly grounded in order to prevent perming of the conveyed fluids or vapors.

2.5 Fluid Compatibility: Parker manufactures special Hose for conveying paint in airless paint spraying applications. This Hose is labeled “Electrically Conductive Airless Paint Spray Hose” on its layline and packaging. This Hose must be properly connected to the appropriate Parker Fittings and properly grounded in order to dissipate dangerous static charge buildup, which occurs in all airless paint spraying applications. Do not use any other Hose for airless paint spraying, even if electrically conductive. Use of any other Hose or failure to properly connect the Hose can cause a fire or an explosion resulting in death, personal injury, and property damage.

Parker manufacturers special Hose for certain compressed natural gas (“CNG”) applications where static electricity buildup may occur. Parker CNG Hose assemblies comply with AGA Requirements 1-93, “Hoses for Natural Gas Vehicles and Fuel Dispensers”. This Hose is labeled “Electrically Conductive for CNG Use” on its layline and packaging. This Hose must be properly connected to the appropriate Parker Fittings and properly grounded in order to dissipate dangerous static charge buildup, which occurs in, for example, high velocity CNG dispensing or transfer. Do not use any other Hose for CNG applications where static charge buildup may occur or where any other type of fire or explosion could result. Repairs to Hose must also be taken to prevent hose failure. Parker CNG Hose is intended for dispenser and vehicle use at a maximum temperature of 180°F. Parker CNG Hose should not be used in confined spaces and/or areas for which the system must be tested for leaks. CNG Hose Assemblies should be tested on a monthly basis for conductivity per AGA 1-93.

Parker manufacturers special Hose for aerospace in flight applications. Aerospace in flight applications employing Hose to transmit fuel, lubricating fluids and hydraulic fluids require a special Hose with a conductive inner tube. This Hose for in flight applications is available only from Parker’s Stratoflex Products Division. Do not use any other Parker Hose for in flight applications, even if electrical conductivity is a factor. Use of other hoses for in flight applications or failure to properly connect the Hose can cause a fire or an explosion resulting in death, personal injury, and property damage. These Hose assemblies for in flight applications must meet all applicable aerospace industry, aircraft, engine, and aircraft requirements.

2.6 Permeation: Parker manufactures special hose for certain applications that require permeation through the Hose Assembly. This Hose must be properly connected to the appropriate Parker Fittings and properly grounded in order to prevent perming of the conveyed fluids or vapors.

2.7 Temperature: Be certain that fluid and ambient temperatures, both steady and transient, do not exceed the limitations of the Hose. Temperatures below and above the recommended limit can degrade Hose to a point where a failure may occur and release fluid. Properly insulate and protect the Hose Assembly when routing near hot objects (e.g. manifolds). Do not use any Hose in any application where failure of the Hose could result in the conveyed fluids (or vapors or mist from the conveyed fluids) contacting any open flame, molten metal, or other potential fire ignition source that could cause burning or explosion of the conveyed fluids or vapors.

2.8 Routing: Parker manufactures special hose for certain applications that require permeation through the Hose Assembly. This Hose must be properly connected to the appropriate Parker Fittings and properly grounded in order to prevent perming of the conveyed fluids or vapors.

2.9 Environment: Environmental conditions including but not limited to ultraviolet radiation, sunlight, heat, ozone, moisture, water, salt water, chemicals, and air pollutants can cause degradation and premature failure of Hose connections and fittings. Assuring compliance with all applicable government and industry standards.

2.10 Mechanical Loads: Mechanical loads which must be considered include excessive flexing, twist, kinking, tensile or side loads, bend radius, and vibration. Use of swivel type Fittings or adapters may be required to insure no twist is put into the Hose. Unusual applications may require special testing prior to Hose selection.

(OVER)
3.13 Routing:  See instructions 3.2 through 3.5. These recommendations may be substantiated by testing to industry standards such as SAE J517 for hydraulic applications, or MIL-A-5070, AS1339, or ASIS17 for Hoses from Parker’s Stratoflex Products Division for aerospace applications.

3.12 System Checkout:  Prior to installation, a careful examination of the Hose Assembly must be performed. Inspect the Hose Assembly for any damage or defects. Do NOT use any Hose or Fittings in flight applications. Do not use any Hose or Fittings from Parker’s Stratoflex Products Division with any other Hose or Fittings, unless expressly approved in writing by the engineering manager of Stratoflex Products Division and verified by the user’s own testing and inspection of aerospace industry standards.

3.7 Minimum Bend Radius:  Any bending during installation at less than the minimum bend radius must be avoided. If any Hose is kinked during installation, the Hose must be discarded. See instruction 2.10.

3.6 Crimping and Swaging:  Do not crimp or swage any Parker Hose or Fitting with anything but the listed crimp or swage machine and dies in accordance with Parker published instructions. Door crimp or swage another manufacturer’s Fitting with a Parker crimp or swage die unless authorized in writing by the engineering manager or chief engineer of the appropriate Parker division.

3.5 Reusable/Permanent:  Do not reuse any Parker Fitting for anything but the listed swag or crimp machine and dies in accordance with Parker published instructions. Do not crimp or swage another manufacturer’s Fitting with a Parker crimp or swage die unless authorized in writing by the engineering manager of chief engineer of the appropriate Parker division.

3.4 Parts:  Do not assemble a Parker Fitting on a Parker Hose that is not specifically listed by Parker for that Fitting, unless authorized in writing by the engineering manager or chief engineer of the appropriate Parker division. Do not assemble a Parker Fitting on another manufacturer’s Hose or a Parker Hose on another manufacturer’s Fitting unless (i) the engineering manager or chief engineer of the appropriate Parker division approves the Assembly in writing or that combination is expressly approved in the appropriate Parker literature for the specific Parker product, and (ii) the user verifies the Assembly and the application through analysis and testing. For Parker Hose that does not specify a Parker Fitting, the user is solely responsible for the selection, assembly, and performance of Parker Hose and Fitting Assembly procedures. See instruction 1.4.

3.3 Visual Inspection:  The Hose published instructions must be followed for assembling the Fittings on the Hose. These instructions are provided in the Parker Fitting catalog for the specific Parker Fitting being used, or by calling 1-800-CPARKER, or at www.parker.com.

3.2 Hose and Fittings:  Do not or may not eliminate the pressure in the Hose Assembly. Many times check valves, etc., are employed in a system and can cause pressure to remain in a Hose Assembly even when pumps or equipment are not operating. Fluids under pressure can be dangerous and potentially lethal and, therefore, extreme caution must be exercised when working with fluids under pressure and handling the Hoses transporting the fluids. From time to time, Hose Assemblies will fail if they are not replaced at proper time intervals, based on previous service life, government or industry recommendations, or when failures could result in unacceptable downtime, damage, or injury risk. See section 1.2.

2.11 Physical Damage:  Hose or Fittings for in flight applications. Do not use any Hose or Fittings from Parker’s Stratoflex Products Division with any other Hose or Fittings, unless expressly approved in writing by the engineering manager or chief engineer of Stratoflex Products Division and verified by the user’s own testing and inspection of aerospace industry standards.

2.10 Radiation:  Do not assemble a Parker Fitting on a Parker Hose that is not specifically listed by Parker for that Fitting, unless authorized in writing by the engineering manager or chief engineer of the appropriate Parker division. Do not assemble a Parker Fitting on another manufacturer’s Hose or a Parker Hose on another manufacturer’s Fitting unless (i) the engineering manager or chief engineer of the appropriate Parker division approves the Assembly in writing or that combination is expressly approved in the appropriate Parker literature for the specific Parker product, and (ii) the user verifies the Assembly and the application through analysis and testing. For Parker Hose that does not specify a Parker Fitting, the user is solely responsible for the selection, assembly, and performance of Parker Hose and Fitting Assembly procedures. See instruction 1.4.

2.9 Crimping and Swaging:  Do not crimp or swage any Parker Hose or Fitting with anything but the listed crimp or swage machine and dies in accordance with Parker published instructions. Do not crimp or swage another manufacturer’s Fitting with a Parker crimp or swage die unless authorized in writing by the engineering manager or chief engineer of the appropriate Parker division.

2.8 Environmental:  The only Hose and Fittings that may be used for in flight aerospace applications are those available from Parker’s Stratoflex Products Division. Do not use any other Hose or Fittings for in flight applications. Do not use any Hose or Fittings from Parker’s Stratoflex Products Division with any other Hose or Fittings, unless expressly approved in writing by the engineering manager or chief engineer of Stratoflex Products Division and verified by the user’s own testing and inspection of aerospace industry standards.

2.7 Atmospheric:  Do not assemble a Parker Fitting on a Parker Hose that is not specifically listed by Parker for that Fitting, unless authorized in writing by the engineering manager or chief engineer of the appropriate Parker division. Do not assemble a Parker Fitting on another manufacturer’s Hose or a Parker Hose on another manufacturer’s Fitting unless (i) the engineering manager or chief engineer of the appropriate Parker division approves the Assembly in writing or that combination is expressly approved in the appropriate Parker literature for the specific Parker product, and (ii) the user verifies the Assembly and the application through analysis and testing. For Parker Hose that does not specify a Parker Fitting, the user is solely responsible for the selection, assembly, and performance of Parker Hose and Fitting Assembly procedures. See instruction 1.4.

2.6 Crimping and Swaging:  Do not crimp or swage any Parker Hose or Fitting with anything but the listed crimp or swage machine and dies in accordance with Parker published instructions. Do not crimp or swage another manufacturer’s Fitting with a Parker crimp or swage die unless authorized in writing by the engineering manager or chief engineer of the appropriate Parker division.

2.5 Hose and Fittings:  Do not assemble a Parker Fitting on a Parker Hose that is not specifically listed by Parker for that Fitting, unless authorized in writing by the engineering manager or chief engineer of the appropriate Parker division. Do not assemble a Parker Fitting on another manufacturer’s Hose or a Parker Hose on another manufacturer’s Fitting unless (i) the engineering manager or chief engineer of the appropriate Parker division approves the Assembly in writing or that combination is expressly approved in the appropriate Parker literature for the specific Parker product, and (ii) the user verifies the Assembly and the application through analysis and testing. For Parker Hose that does not specify a Parker Fitting, the user is solely responsible for the selection, assembly, and performance of Parker Hose and Fitting Assembly procedures. See instruction 1.4.

2.4 Physical:  Hose or Fittings for in flight applications. Do not use any Hose or Fittings from Parker’s Stratoflex Products Division with any other Hose or Fittings, unless expressly approved in writing by the engineering manager or chief engineer of Stratoflex Products Division and verified by the user’s own testing and inspection of aerospace industry standards.

2.3 Mechanical:  The only Hose and Fittings that may be used for in flight aerospace applications are those available from Parker’s Stratoflex Products Division. Do not use any other Hose or Fittings for in flight applications. Do not use any Hose or Fittings from Parker’s Stratoflex Products Division with any other Hose or Fittings, unless expressly approved in writing by the engineering manager or chief engineer of Stratoflex Products Division and verified by the user’s own testing and inspection of aerospace industry standards.

2.2 Hydraulic:  Hose or Fittings for in flight applications. Do not use any Hose or Fittings from Parker’s Stratoflex Products Division with any other Hose or Fittings, unless expressly approved in writing by the engineering manager or chief engineer of Stratoflex Products Division and verified by the user’s own testing and inspection of aerospace industry standards.

2.1 Environmental:  The only Hose and Fittings that may be used for in flight aerospace applications are those available from Parker’s Stratoflex Products Division. Do not use any other Hose or Fittings for in flight applications. Do not use any Hose or Fittings from Parker’s Stratoflex Products Division with any other Hose or Fittings, unless expressly approved in writing by the engineering manager or chief engineer of Stratoflex Products Division and verified by the user’s own testing and inspection of aerospace industry standards.