Stratoflex
Crashworthy Fuel Breakaway Valves for the Aerospace Industry

Catalog 106-CFBV
August 1999

The World Standard
FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

Before selecting or using any Parker hose or fittings or related accessories, it is important that you read and follow Parker Safety Guide for Selecting and Using Hoses, Fittings, and Related Accessories (Parker Publication No. 106-SG).

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**Stratoflex Crashworthy Fuel Breakaway Valves**

**APPLICATIONS:**
Proven lifesavers, Stratoflex breakaway valves* separate under crash loads on fluid lines exceeding a predetermined value. Upon separation, the valves automatically seal the fluids in the lines to effectively prevent spills. Breakaway valves are typically used on fuel lines, main fuel tanks, extended range aircraft auxiliary fuel tanks, air-to-air refueling systems, and fall away external tanks. Tank vent lines often use the single valve versions.

**DESIGN FUNCTION:**
The basic design incorporates a butterfly valve mounted to a cam shaft loaded by a coil spring. This design allows for a small envelope, lightweight and minimum pressure drop across the coupling. The mechanism consists of two valve plates and/or a single plate and detent post, which are held against each other by spring action until the fuse section separates to allow valve closure. During this movement, leakage is prevented by an internal sealing sleeve. This construction permits a clean valve passage, minimizing ice formation and contamination. No parts are released to interfere with the valve operation during closure.

The primary function of breakaway valves is to protect attached fuel system lines from damage due to excessive separation loads. Breakaway valves safely separate at the fuse area, preventing fuel line rupture while sealing the fuel lines before the attached plumbing material can be stressed to the point of failure or leakage. The breakaway fuse is usually designed to separate at 25 to 50% of the attached plumbing's normal strength, allowing controlled and safe separation in the line, and valve closure before damage occurs.

**MATERIALS:**
Available in aluminum alloy, stainless steel, titanium, and other special materials. Stratoflex representatives will provide assistance on selection materials.

**SIZES:**
The breakaway valves are available in sizes from 3/8” to 3” with both single and dual valve closures.

**TROUBLE-FREE INSTALLATION:**
End fittings are free to swivel during installation, preventing torque from being transmitted to the fused section. They also permit easy bolt hole alignment of flange mounted couplings.

In the rare event of damage during maintenance, which may cause minor separation and valve closure, a red spring retainer moves forward and becomes visible through the plastic window, 360 around the coupling, indicating a closed valve. The Stratoflex design allows the fuse elements which control separation to be replaced at nominal cost.

*Patent Pending*
Stratoflex Crashworthy Fuel Breakaway Valves

TABLE OF COUPLING ENVELOPE DIMENSIONS

<table>
<thead>
<tr>
<th>Tube Size (Inches)</th>
<th>Dimensions in Inches (Millimeters)</th>
<th>A</th>
<th>B MAX</th>
<th>C</th>
<th>C1</th>
<th>D</th>
<th>D1</th>
<th>E</th>
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<tr>
<td>1/2 3/4</td>
<td></td>
<td>1.50 (38.1)</td>
<td>1.50 (38.1)</td>
<td>1.19 (30.2)</td>
<td>1.01 (25.6)</td>
<td>1.76 (44.7)</td>
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<td>2.06 (52.3)</td>
<td>2.18 (55.4)</td>
<td>1.61 (40.9)</td>
<td>1.36 (34.5)</td>
<td>2.17 (55.1)</td>
<td>1.92 (48.8)</td>
<td>1.13 (28.7)</td>
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<td>1-1/2</td>
<td></td>
<td>2.50 (63.5)</td>
<td>2.52 (64.0)</td>
<td>1.68 (42.7)</td>
<td>1.43 (36.3)</td>
<td>2.24 (56.9)</td>
<td>1.99 (50.5)</td>
<td>1.20 (30.5)</td>
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<td>2</td>
<td></td>
<td>3.20 (81.3)</td>
<td>3.25 (82.5)</td>
<td>1.85 (47)</td>
<td>1.60 (40.6)</td>
<td>2.85 (72.4)</td>
<td>2.60 (66)</td>
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<tr>
<td>2-1/2 3</td>
<td></td>
<td>4.25 (108)</td>
<td>4.25 (108)</td>
<td>2.18 (55.4)</td>
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<td>3.12 (79.2)</td>
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TABLE OF COUPLING CHARACTERISTICS

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<tr>
<th>Tube Size (Inches)</th>
<th>Single Valve Max. Weight LBS (KGS)</th>
<th>Double Valve Max. Weight LBS (KGS)</th>
<th>Rated Flow GPM (LPM)</th>
<th>Pressure Drop at Rated Flow PSI (BARS)</th>
<th>Fluid Loss CC</th>
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<tr>
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<td>2</td>
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<td>3.12 (1.42)</td>
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<td>1.5 (.10)</td>
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<tr>
<td>2-1/2 3</td>
<td>2.27 (1.03)</td>
<td>4.09 (1.86)</td>
<td>300 (1135)</td>
<td>2.5 (1.7)</td>
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1.0 GENERAL INSTRUCTIONS

1.1  Scope: This safety guide provides instructions for selecting and using (including assembling, installing, and maintaining) hose (including all rubber and/or PTFE products commonly called "hose" or "tubing"), fittings (including all products commonly called "couplings" or "coupling") for attachment to hose, and related accessories (including crimping and swaging machines and tooling). 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 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 will not endanger the property.

1.3  Distribution: Provide a copy of this safety guide to each person that is responsible for selecting or using hose and fittings. This guide is to be used with, or as a supplement to, the specific Parker publications for the specific hose, fittings and related accessories that are being considered for use.

1.4  User Responsibility: The user must always consult the technical service department.

1.5  Additional Questions: Consult the Parker technical service department if you have any questions or require any additional information. See the Parker publication for the product being considered or used, for telephone numbers of the appropriate technical service department.

2.0 HOSE AND FITTING SELECTION INSTRUCTIONS

2.1 Electrical Conductivity: Certain applications require that a hose be nonconductive to prevent electrical current flow or maintain electrical isolation. Other applications require the hose to be sufficiently conductive to drain off static electricity; this is typical of rubber hose and all aircraft fuel, oil and hydraulic PTFE hose. Extreme care must be exercised when selecting hose and fittings for these or any other applications in which electrical conductivity or non-conductivity is a factor.

2.2 Pressure: Hose selection must be made so that the published maximum recommended working pressure of the hose is equal to or greater than the maximum system pressure. Surge pressures in the system higher than the published maximum recommended working pressure would cause failure or shorten hose life. Do not confuse burst pressure with other pressure values with working pressure and do not use burst pressure or other pressure values for this purpose.

2.3 Suction: Hoses used for suction applications must be selected to assure that the hose will withstand the vacuum and pressure of the system. Improperly selected hose may collapse in suction application.

2.4 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. Care must be taken when routing hose near hot objects (e.g. manifolds) to properly insulate and protect the hose. Fire sleeve is not intended for insulating the hose.

2.5 Fluid Compatibility: Hose selection must assure compatibility of the hose tube, cover, reinforcement, and fittings with the fluid media used. Actual service life can only be determined by the end user by history or testing under all extreme conditions and other analysis.

2.6 Gaseous Permeation: Permeation (that is, passage through the hose) may occur from inside the hose to outside when hose is used with gases, liquid and gas fuels, and refrigerants (including but not limited to such materials as helium, fuel oil, natural gas, or refrigerants). This permeation may result in high concentrations of vapors, which are potentially flammable, explosive, or toxic, and in loss of fluid. Dangerous explosions, fires, and other hazards can result when using the wrong hose for such applications. The system designer must take into account the fact that this permeation will take place and must not use hose if this permeation could be hazardous. The system designer must take into account all legal, government, insurance, or any other special regulations, which govern the use of fuels and refrigerants. Never use a hose even though the fluid compatibility is acceptable without considering the potential hazardous effects that can result from permeation through the hose assembly.

3.0 ENVIRONMENTAL CONSIDERATIONS

3.1 Corrosion: This guide provides general corrosion information, and must be used in conjunction with test results from the specific Parker publication for the product being considered or selected.

3.2 Fluid Compatibility: Fluid compatibility must be considered for all applications. Parker and its distributors do not assume responsibility for the performance of any Parker or other hose or fitting when exposed to any and all environmental factors.

3.3 Permeation: Gaseous permeation, particularly through a PTFE hose, occurs primarily if the gas is "stored" at pressure in the hose. Most other pressures limit the amount of permissible permeation.

3.4 Temperature: Transmission of power by means of pressurized fluid varies with pressure and rate of flow. The size of the components must be adequate to keep losses to a minimum, and avoid damage due to heat generation or excessive fluid velocity.

3.5 Routing: Attention must be given to optimum routing to minimize inherent problems (kinking or flow restriction due to hose collapse).

3.6 Mechanical Loads: External forces can significantly reduce hose life or cause failure. 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 insulate no twist is put into the hose. Unusual applications may require special testing prior to hose selection.

3.7 Physical Damage: Care must be taken to protect hose from wear, snagging and cutting, which can cause premature hose failure. See Parker's Fire Guide.

3.8 Proper End Fitting: See instructions 3.2 through 3.5 below. Testing to industry standards such as MIL-A-5070, AS13539, J517, etc. must substantiate these recommendations.

3.9 Length: When establishing a proper hose length, motion absorption, hose length changes due to pressure, and hose and machine tolerances must be considered.

4.0 USER EXPERIENCE

4.1 Environmental Conditions: 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.

4.2 Fluid Compatibility: Fluid compatibility must be considered for all applications. Parker and its distributors do not assume responsibility for the performance of any Parker or other hose or fitting when exposed to any and all environmental factors.

4.3 Permeation: Gaseous permeation, particularly through a PTFE hose, occurs primarily if the gas is "stored" at pressure in the hose. Most other pressures limit the amount of permissible permeation.
2.14 Specifications and Standards: When selecting hose and fittings, government, industry, and Parker specifications and recommendations must be reviewed and followed as applicable.

2.15 Hose Cleanliness: Hose components may vary in cleanliness levels. Care must be taken to ensure that the assembly selected has an adequate level of compatibility for the application. See SAE AS611 for PTFE hose assembly cleanliness levels.

2.16 Fire Resistant Fluids: Some fire resistant fluids require the same hose as per Parker’s standard fire resistant oil. Some fluids will not work with any hose at all. See instructions 2.5 and 1.5. The wrong hose may fail after a very short time. In addition, all liquids but pure water may burn fiercely under certain conditions, and even pure water leakage may be hazardous.

2.17 Radiant Heat: Hose can be heated to destruction without contact by such nearby items as hot manifolds or molten metal. The same heat source may then ignite a fire. This can occur despite the presence of cool air around the hose.

2.18 Welding or Brazing: When using a torch or arc-welder in close proximity to hydraulic lines, the hydraulic lines should be removed or shielded with appropriate fire resistant materials. Flame or weld spatter could burn through the hose in an assembly. See instruction 2.19 for additional information.

2.19 Atomic Radiation: Atomic radiation affects all materials used in hose assemblies. Since it may be unknown, do not expose hose assemblies to atomic radiation.

3.0 HOSE AND FITTING ASSEMBLY AND INSTALLATION INSTRUCTIONS

3.1 Pre-Installation and Periodic Inspection: A careful examination of the hose assembly must be performed. All components must be examined for correct style, size, part number, length, and minimum bend radius. In addition, the hose must be examined for cleanliness, broken wires, cuts, kinks, obstructions, blisters, or foreign visible defects. Do not use any hose that has any of these conditions. See SAE ARP1858 for illustrations of damage conditions.

3.2 Hose and Fitting Assembly: Do not assemble a Parker fitting on a Parker hose that is not specifically listed for Parker that fitting unless authorized in writing by the Engineering/Technical Manager or Chief Engineer of the appropriate Parker division. Do not assemble a Parker fitting on another manufacturer’s hose or a Parker hose to another manufacturer’s fitting unless: (i) the Engineering/Technical Manager or Chief Engineer of the appropriate Parker division approves the assembly in writing, (ii) the user verifies the assembly and the application through analysis and testing or (iii) fabricating MILSPEC assemblies in accordance with proper instructions. See instruction 1.4 above.

The Parker published instructions must be followed for assembling the fitting on the hose provided in the Parker fitting catalog for the specific Parker industrial fitting being used; most MILSPEC and Aerospace hose fitting to hose fabrication is closely controlled to prevent or limit deadly gases.

3.3 Related Accessories: Do not crimp or swage any Parker hose or fittings with anything but the proper listed Parker swag or crimper and machine and dies in accordance with Parker published instructions. Do not crimp or swage any other manufacturer’s hose fitting with a Parker crimper or swage die unless authorized in writing by the chief engineer of the appropriate Parker division.

3.4 Parts: Do not use any Parker hose fitting part (including but not limited to, socket, seat, shell, nipple, or insert) except with the correct Parker fitting parts, in accordance with Parker published instructions, unless authorized in writing by the Engineering/Technical Manager or Chief Engineer of the appropriate Parker division. Do not use hose fitting components from Parker StratoFlex Division with any hose or fitting components from any other Parker Division without this specific authorization. Parker fitting components shall not be mixed.

3.5 Reusable/Permanent: Do not reuse any reusable fitting product that blew off or pulled off a hose. Do not reuse any fitting component that is cracked or deformed beyond new part tolerance. Do not reuse a Parker permanent (that is, crimped or swaged) hose fitting or any part thereof.

3.6 Minimum Bend Radius: Installation of a hose at less than the minimum listed bend radius may significantly reduce the hose life and cause premature failure. Particular attention must be given to preclude sharp bending at the hose-fitting juncture. If any Stratoflex Products Division hose has been bent to any radius less than its minimum bend radius during installation, do not use such hose. Such hose is damaged and cannot be used and should be discarded.

3.7 Twist Angle and Orientation: Hose installations must be such that the relative motion of machine components does not produce twisting. No twist in the hose is permitted during installation or use. See SAE ARP1858 for additional information.

3.8 Securement: In many applications, it may be necessary to restrain, protect, or guide the hose to protect it from damage by unnecessary flexing, pressure surges, and contact with other mechanical components. Care must be taken to insure such restraints do not introduce additional stress or wear points.

3.9 Proper Location of Ports: Proper physical installation of the hose requires a correctly installed port connection ensuring that no twist or torque is transferred to the hose to conform proper fabrication of the assembly. Gaseous test, including air-under-water, shall be at rated working pressure only and see 4.7 caution below. Care must be exercised to prevent water, or other fluid contaminants from entering or contacting reinforcing components.

3.10 External Damage: Proper installation is not complete without insuring that tensile loads, side loads, kinking, flattening, potential abrasion, thread damage, or damage to sealing surfaces are corrected or eliminated. See instruction 2.17.

3.11 System Checkout: All air entrapment must be eliminated (see 4.7) and the system pressurized. The Parker system must be examined and checked for proper function and freedom from leaks. Personnel must stay out of potential hazardous areas while testing and using.

3.12 Routing: Hose should be routed in such a manner so if a failure does occur, oil or fuel mist will not flow to any other working systems, open flame, or sparks, and the chance of personal injury is minimized.

4.0 HOSE AND FITTING INSPECTION INSTRUCTIONS

4.1 Even with proper selection and installation, hose life may be significantly reduced without a continuing inspection program. The frequency of inspection should be determined by the system designer or end user taking into account the severity of the application and risk potential. An inspection program must be established and followed by the user and, at minimum, must include instructions 4.2 through 4.7, listed below.

4.2 Visual Inspection Hose/Fitting: Any of the following conditions require immediate shut down and replacement of the hose assembly: (See also ARP1683 for illustrations.)
- Fitting slippage on hose.
- Damaged, cut or abraded cover (any reinforcement exposed).
- Hard, stiff, heat cracked, or charred hose.
- Cracked, damaged, or badly corrod-ed hose or fittings.
- Leaks at fitting or in hose.
- Kinked, crushed, flattened or twisted hose and;
- Blistered, soft, degraded, or loose cover;
- System malfunction including but not limited to, over-pressurization or pressure spikes.

4.3 Visual Inspection All Other: The following items must be tightened, replaced or repaired as required:
- Leaking port conditions;
- Remove excess dirt buildup;
- Clips, guards, shields, and:
- System fluid level, fluid type and any air entrapment.

4.4 Functional Test: Operate the system at maximum operating pressure and check for possible malfunctions and freedom from leaks. Personnel must avoid potential hazardous areas while testing and using the system.

4.5 Replacement Intervals: Specific replacement intervals must be considered based on previous service life, government or industry recommendations, or when failures could result in unacceptable downtime, damage, or injury risk. See instruction 4.4 above.

4.6 Inspecting a Pressurized System: Hydraulic power is accomplished by utilizing high-pressure fluids to do work. Hoses, fittings, and hose assemblies all contribute to doing work by transmitting fluids at high pressures. 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. Usually those failures are the result of some form of misapplication, abuse, or simply wear. When hoses fail, generally the high-pressure fluids inside escape in some sort of stream which may or may not be visible to the user. Under no circumstances should the user attempt to locate the leak by "feeling" with their hands or any other part of their body. Pressure fluids can and will penetrate the skin and cause severe tissue damage and possibly limb loss. Even seemingly minor hydraulic fluid injection injuries must be treated by a physician with knowledge of the tissue damaging properties of hydraulic fluid.

If a hose failure occurs, immediately shut down the equipment and leave the area until pressure has been completely released from the hose assembly. Simply shutting down the hydraulic pump may 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. Tiny holes in the hose, commonly known as pinholes, can eject small, dangerously powerful but hard to see streams of hydraulic fluid. It may take several minutes or even hours for the pressure to be relieved so that the hose assembly may be examined safely.

Once the pressure has been reduced to zero, the hose assembly may be taken off the equipment and examined. It must always be replaced if a failure has occurred. Never attempt to repair a hose assembly that has failed. Consult the nearest Parker distributor or the appropriate Parker division for hose assembly replacement information.

Never touch or examine a failed hose assembly unless it is obvious that the hose no longer contains fluid under pressure. The high-pressure fluid is extremely dangerous and can cause serious and potentially fatal injury.

4.7 Gases: Special care should be taken when working with gaseous systems. Gases are comprised, thus increasing the danger of over-pressurization, particularly during testing. Sudden escape of gases can cause blindness if the escaping gases contact the eye and can cause freezing or other severe injuries if it contacts any other portion of the body.

Parker Hannifin Corporation
Stratoflex Products Division
Fort Worth, Texas
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2. Payment: Payment shall be made by Buyer net 30 days from the date of delivery of the items purchased hereunder. Any claims by Buyer for omissions or shortages in a shipment shall be waived unless Seller receives notice thereof within 30 days after Buyer's receipt of the shipment.

3. Delivery: Unless otherwise provided on the face hereof, delivery shall be made F.O.B. Seller's plant. Regardless of the method of delivery, however, risk of loss shall pass to Buyer upon Seller's delivery to a carrier. Any delivery dates shown are approximate only and Seller shall have no liability for any delays in delivery.

4. Warranty: Seller warrants that the items sold hereunder shall be free from defects in material or workmanship for a period of 365 days from the date of shipment to Buyer, or 2.0.0.0 hours of use, whichever expires first. THIS WARRANTY COMPRISSE THE SOLE AND ENTIRE WAR, RANTY PERTAINING TO ITEMS PROVIDED HERUNDER. SELLER MAKES NO OTHER WARRANTY, GUARANTEE, OR REPRESENTATION OF ANY KIND WHATSOEVER. ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO, MERCHANTABILITY AND FITNESS FOR PURPOSE, WHETHER EXPRESS, IMPLIED OR ARISING BY OPERATION OF LAW, TRADE USAGE, OR COURSE OF DEALING ARE HEREBY DISCLAIMED. NOTWITHSTANDING THE FOREGOING, THERE ARE NO WARRANTIES, WHETHER OR TOLL, WITHOUT LIMITATION, NEGLIGENCE, FAILURE TO WARN OR STRICT LIABILITY.

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6. Changes, Reschedules and Cancellations: Buyer may request to modify the designs or specifications for the items sold hereunder as well as the quantities and delivery dates thereof, or may request to cancel all or part of this order, however, no such requested modification or cancellation shall become part of the contract between Buyer and Seller unless accepted by Seller in a written amendment to this Agreement. Acceptance of any such requested modification or cancellation shall be at Seller's discretion, and shall be upon such terms and conditions as Seller may require.

7. Special Tooling: A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture items sold pursuant to this contract. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the items sold hereunder, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

8. Buyer's Property: Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

9. Taxes: Unless otherwise indicated on the face hereof, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of the items sold hereunder. If any such taxes must be paid by Seller or if Seller is liable for the collection of such tax, the amount thereof shall be in addition to the amounts for the items sold. Buyer agrees to pay all such taxes or to reimburse Seller therefore upon receipt of its invoice. If Buyer claims exemption from any sales, use or other tax imposed by any taxing authority, Buyer shall save Seller harmless from and against any such tax, together with any interest or penalties thereon which may be assessed if the items are held to be taxable.

10. Indemnity For Infringement of Intellectual Property Rights: Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Part 10. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets (hereinafter "Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that an item sold pursuant to this contract infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If an item sold hereunder is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using said item, replace or modify said item so as to make it noninfringing, or offer to accept return of said item and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to items delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any item sold hereunder. The foregoing provisions of this Part 10 shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

If a claim is based on information provided by Buyer or if the design for an item delivered hereunder is specified in whole or in part by Buyer, Buyer shall defend and indemnify Seller for all costs, expenses or judgments resulting from any claim that such item infringes any patent, trademark, copyright, trade dress, trade secret or any similar right.

11. Force Majeure: Seller does not assume the risk of and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter "Events of Force Majeure"). Events of Force Majeure shall include without limitation, accidents, acts of God, strikes or labor disputes, acts, laws, rules or regulations of any government or government agency, fires, floods, delays or failures in delivery of carriers or suppliers, shortages of materials and any other cause beyond Seller's control.

12. Entire Agreement/Governing Law: The terms and conditions set forth herein, together with any amendments, modifications and any different terms or conditions expressly accepted by Seller in writing, shall constitute the entire Agreement concerning the items sold, and there are no oral or other representations or agreements which pertain thereto. This Agreement shall be governed in all respects by the law of the State of Ohio. No actions arising out of the sale of the items sold hereunder or this Agreement may be brought by either party more than two (2) years after the cause of action accrues.