

**SECURALINK™ CLOSED SYSTEM  
DEVELOPMENTS IN COTTON  
INSECTICIDES FOR 2000  
John Backscheider  
Sotera Systems, Tuthill Transfer Systems  
Ft. Wayne, IN**

**Abstract**

Securalink-G starts with improved health and safety for the grower. In a market study conducted by Sotera Systems, growers indicated their number one concern in handling chemicals was their risk of exposure. The convenience of the 2½ gallon or 10 liter jug, combined with an extended application season and millions of jugs on the market, makes safety in this area a very real concern. Securalink-G designates a system for closed delivery of crop protectants, which is simple and effective for all users from the largest custom applicator to the individual grower.

Following the first-season introduction of Securalink-G in 1999, Sotera initiated several changes and improvements in system design, based on user feedback. These changes improve the rate of transfer, the ease of use and the ability to rinse a standard jug in a closed system.

**Background**

Securalink-G technology was developed and manufactured by Sotera Systems of Tuthill Transfer Systems in partnership with Bayer and other leading Life Science manufacturers. Securalink-G was developed to provide safer transfer of products at risk under FQPA and for other products or markets where closed system use is required or desirable.

Tuthill Transfer Systems is a world leader in developing, manufacturing and marketing fluid transfer systems to industrial, petroleum, and agricultural industries. The company is supported by seven manufacturing plants in the United States and Europe, with products in-use on six continents. Sotera Systems is the business arm of Tuthill focused on the crop protection industry. The mission of Sotera is to be a world leader in the development, manufacturing and marketing of closed transfer systems and accurate measuring systems for concentrated crop protection products.

**Components**

The basic Securalink-G system consists of three components:

1. Closed system valve designed to attach to a standard chemical container
2. Tank adapter (platform) for installation directly on the sprayer tank
3. Closed system power jug rinser

Materials of construction in the valve are polyethylene copolymer and either viton or EPDM elastomer, depending on the chemistry to be handled. The valve materials were chosen to be recyclable along with the jug. The tank adapter and rinser contain high-density polyethylene, polypropylene, viton and 316 stainless steel. These two components are designed for repeat use by the grower or customer applicator.

**Description of Use**

The product user, either grower applicator or custom applicator prepares for system use by installing a tank adapter at a convenient location on the spray tank or mix/fill tank.

The Securalink-G valve replaces the standard 63mm threaded cap on a 2 ½ gal (or similar) sized jug and will be installed at the formulation plant when the jug is filled. The valve includes a locking mechanism to prevent removal from the container and a tamper-evident cap.

When the tamper-evident cap is removed, the jug is inverted and locks to the tank adapter using symmetrical ears that are keyed to openings in the tank adapter. Rotating the jug opens the valve to start the flow and can be controlled for top-off without compromising the closed-system. If the jug is disconnected at any time, the Securalink-G valve closes maintaining the system's closed system integrity. When contents are emptied, the jug is triple rinsed using approved current technology or an optional closed system rinser introduced by Sotera late in the '99 season.

**From the Field**

Extensive use of Securalink-G technology was seen in the mid-South, Texas and California markets. The Sotera Field Sales Force and Dealer Marketing personnel were in contact with dealers and growers both before and during the use season. The objective was to educate and aid users in the proper use of Securalink technology. At the same time, they were able to gather first-hand information on how well the system worked in the field. User comments during the first-year introduction of Securalink-G pointed to several areas that offer improvement:

- Increase the rate of dispense
- Ability to dispense more viscous products
- Alternates to the tank adapter

Avoiding user problems of the valve slipping or jamming in tank adapter during operation  
Alternate to poking the container with a spear for rinsing

### **Changes to the Valve**

The operation of the valve was changed for the '00 use season to increase the rate of product transfer. This is accomplished by extending the "throw" of the valve allowing it to open wider, thus providing faster flow and the ability to dispense thicker formulations (See Tables 1 & 2).

Flow results due to this change are 40-50% faster flow rate with a low viscosity fluid like water and a 65-70% faster flow rate with a higher viscosity fluid like 30 wt. Oil. Securalink-G valves can now offer closed system protection when dispensing thicker fluids from a standard 2 ½ gallon or 10 liter chemical jug.

Sotera has also redesigned the valve housing into a single piece construction. This helps reduce problems associated with the valve sticking or slipping in the tank adapter during the transfer process. The operation of the Securalink closed system will appear smooth and easy to most users. The change to one piece construction also helps make the Securalink-G valve more economical to produce.

### **Installation Options**

In the middle of season, the last thing a grower wants to do is install a special adapter. The tank adapter installs on any convenient flat spot on the sprayer tank or mix-fill tank. It is the mating part required for the Securalink-G closed system to work. Sotera will be working between now and into next season to both educate on the system use and to encourage dealers and their grower customers to install the tank adapter before the season. Installation only takes about 15 minutes.

For the tank that will not accommodate installation of the standard tank adapter, Sotera Systems is developing a Dispensing Station. The Dispensing Station works like a small inductor. It features a 3 1/2 gallon poly tank with cone bottom attached to a ball valve and venturi. A Securalink tank adapter is provided by Sotera mounted to the lid of the tank. The Dispensing Station tank includes markings on the side to aid in chemical measurement. The tank can mount anywhere on the spray that is convenient, using a metal bracket furnished with the tank. Rinsing of the Dispensing Station is integral to the design.

To use the Dispensing Station, the venturi is hooked into the water line used to fill the grower's spray tank. Chemical is transferred from the chemical jug into the Dispensing Station

tank as described above. When water is flowing into the sprayer tank, the grower opens the ball valve and the chemical is pulled into the water stream by the venturi. The dispensing station is planned for first quarter '00 availability.

### **Rinsing Options**

Sotera Systems developed a closed system jug rinser for Securalink-G and had a limited introduction late in Spring '99. The jug rinser attaches to the grower's water source through a standard hose and ball valve. After the jug is emptied, the rinser can be quickly attached between the tank adapter and the jug to rinse the container before disposal.

With the rinser and inverted jug in place, the grower pushes a slide on the rinser forward. This action pushes a flexible nozzle through the closed system valve and into the neck of the jug. Turning on the rinse water produces an engineered spray pattern within the jug to effectively reach all corners of the jug.

When the jug is rinsed completely, the water is turned off. All rinsate flows through the closed system directly into the spray tank, eliminating any exposure rinse during this operation. To complete the operation, the grower pulls the slide back into its extended position and disconnects the jug and rinser. The jug is ready to go to disposal.

Complete user instructions will be included in each rinser and tank adapter kit. Rigorous engineering standards and testing are in place for both the complete Securalink-G valve and individual components to assure high product quality.

### **Market Availability**

The Securalink-G valve is being offered on a broad market basis to all life science companies and formulators. To assure easy use of the product, tank adapters and the jug rinser will be widely marketed through the local fertilizer/chemical dealers, coops and other interested parties. An expanded group of products from several manufacturers will be available to growers for 2000 season use.

The basic Sotera model numbers for Securalink components discussed in this paper are:

- Securalink-G valve, standard version, viton seals:  
SLVC50F3X
- Securalink-G valve, vented version, viton seals:  
SLVC50F3VY
- Tank Adapter Kit with dust cap:  
SLTA50
- Closed system jug rinser:  
SLRG7279
- Dispensing Station with stand:

## SL-DS

Other Securalink valve models are available to the market based on alternate seal materials or fluorination levels.

### **References**

All information contained in this document is the property of Tuthill Transfer Systems, Sotera Systems.

Table 1. Changes to Valve in Circumference

	<b>Circumference Area</b>	<b>Opening Height</b>
1 <sup>st</sup> Generation	4.872 609 square in.	.125
2 <sup>nd</sup> Generation	4.872 1.461 square in.	.300

(Circumference area = circumference x height)

Table 2. Changes to Valve in Radius

	<b>Volume</b>	<b>Opening Height</b>
1 <sup>st</sup> Generation	.7755 .236 cubic in.	.125
2 <sup>nd</sup> Generation	.7755 .567 cubic in.	.300

(Volume =  $3.14159 \times R^2 \times \text{height}$ )