



## Valve-Gard® Safety Shields: Introduction

Because of the wide range of harsh environments and performance requirements in the chemical processing industries, a wide selection of valves is necessary. However, approximately one-third of all chemical plant emissions come from equipment leaks — **and valves are the biggest potential source of leaks and sprayouts**. They are a major weak point in a piping system because they contain several areas from which leaks or sprayouts can occur.

When selecting a valve, in addition to process fluid, [temperature and pressure](#) of the line, the operating principles of the major valve groups also should be considered. And lastly, another important factor is the appropriate selection of a safety shield.

Safety shields for valves complement those for flanges, providing a system that protects employees from injuries and equipment from damage and shut-down.

Unlike flanges, valve dimensions vary extensively, both among manufacturers and styles. Due to this wide variance in specifications, each valve shield requires its own design. To address this challenge, RAMCO® maintains an extensive library of US and International valve manufacturers. And with changes in valve technology, these data are updated.

## Vue-Gard® Spra-Gard® Safety Shields

Another Spra-Gard® product is the innovative “See-Thru” shield that permits easy identification and inspection of all pipe joints, including flanges, valves, threaded connections and expansion joints.

Constructed of TFE coated fiberglass that is burnt orange in color with a wide center band of clear film (ECTFE), the Vue-Gard® Safety Shield permits visual inspection of pipe joints by personnel so leaks can be detected rapidly.

This unique viewing shield withstands temperatures up to 300°F (150°C) and pressures to 1000 psi (69 bar). It demonstrates a broad spectrum of chemical resistance, especially to most corrosive chemicals and organic solvents.

Similar in construction to the other Spra-Gard® Shields, the Vue-Gard®’s overlap design completely encompasses a flange connection down to the outside diameter of the pipe; thus, containing both

frontal and lateral sprayouts in systems carrying hazardous or toxic chemicals, even under high pressure conditions.

Because of its [novel characteristics](#), this “See-Thru” shield demonstrates a wide scope of applications in the chemical processing industries. In addition to chemical and pharmaceutical uses, this shield is appropriate in refineries as well as pulp and paper operations.

An ideal application of the Vue-Gard® Safety Shield is its custom fabrication for use with sight flow indicators. The clear design of the shield allows easy visualization of the sight window and sight window retainers, as well as the pipe connections.

Judged as a major contribution toward more efficient, effective plant operations in the chemical processing industries, the RAMCO® Vue-Gard® Safety Shield was honored with an award by CHEMICAL PROCESSING in Maintenance/Safety.

## **Spra-Gard® Safety Shield Products**

RAMCO® Spra-Gard® Safety Shields, the work horse of safety shields, are most frequently specified because of their wide range of physical characteristics.

RAMCO® Spra-Gard® Safety Shields are fabricated in three proprietary thermoplastic textiles:

**Teflon\***(tetrafluoroethylene or TFE coated fiberglass)

**Polypropylene (PPL)**

**ECTFE**

The two woven cloths — TFE and PPL —are developed exclusively for RAMCO® according to specifications. These fabrics are produced to a patented design and a “porosity concept” that has been very carefully engineered. Rather than using impenetrable fabrics, Spra-Gard® Safety Shields are made of slightly porous textiles — too slight to permit a sprayout but sufficient to allow fluid to seep through to the indicating patch in the event of a leak.

ECTFE, a fluoropolymer clear film, is the material that forms the wide center band of the Spra-Gard® “See-Thru” Shields. This non-flammable film withstands temperatures up to 300°F (150°C) and has very high tensile strength. It also demonstrates excellent chemical resistance.

Another common feature of Spra-Gard® Shields is the sensitive pH patch or indicator that is incorporated in each safety shield. Should the slightest amount of leaking fluid come in contact with the patch, the patch undergoes color change immediately signaling trouble in the line. Yellow/orange in color, the indicator turns brilliant red with an acid leak and bright green with an alkali leak. While the affected patch can no longer be used, it can be removed and replaced with another patch after the shield has been neutralized. The shield is then ready for reuse.

Spra-Gard® Safety Shields have an overlap design. The shields wrap around the pipe connections completely to prevent a lateral sprayout. During installation, they are held in place by means of a velcro fastener. No tools are required, and a single installer can secure a shield over a flange or valve in less than a minute.

All Spra-Gard® Shields have been subjected to ultraviolet (UV) testing and have performed without degradation for approximately 500 hours.

Material is considered acceptable if it withstands approximately 200 hours of exposure without degradation. This is equivalent to approximately four to five years of outdoor exposure in the tropics and even longer in a temperate zone. Thus, Spra-Gard® Shields are inhibited against ultra-violet rays and can be installed both indoors and outdoors.

Other critical features of RAMCO® Spra-Gard® Safety Shields are their ability to resist ignition and flame propagation.

Because each Spra-Gard® Safety Shield is produced from a different thermoplastic cloth, parameters for pressure and temperature tolerance and chemical resistance vary.

### Valve-Gard® Safety Shields: Valves with Stems

Butterfly, ball, plug and diaphragm valves present a common design consideration in the fabrication of Valve-Gard® Shields. The shields fabricated for these valves envelop the entire body of the valve and any mating flanges. A small opening is made for the stem to protrude for either manual or automatic operation.

Valve-Gard® Shields are designed for installation over existing in-line valves and require no mechanical adjustment or separation of the valve from the pipeline.

Special valves with multiple ports, multi-valve configurations or valves with instrumentation can also be fitted with appropriate Valve-Gard® Shields.

Control and actuated valves are also candidates for Valve-Gard® Shields. As long as the manufacturer's name and valve model number are provided, a safety shield can be fabricated easily..

### Valve-Gard® Safety Shields: Valves Without Stems

Valve-Gard® Shields are also available for most types of check valves. They are constructed in a similar fashion to ball and plug valves but do not require an opening for a stem. Check valve shields cover the valve and mating flanges as a single unit.

## **RAMCO® SAFETY SHIELDS FOR PIPE CONNECTIONS PHYSICAL CHARACTERISTICS\***

CONDITIONS	SPRA-GARD® SHIELDS**				ECONO-GARD® SHIELDS**		METAL SHIELDS		
	TFE	VUE	PPL	PPL (VUE)	PE	PVC (RED, WHITE, CLEAR)	GALVANIZED	"304"	"316"
TEMPERATURE °F (MAX.) [°C]	450 [232]	300 [150]	225 [107]	225 [107]	140 [60]	140 [60]	800 [427]	2650 [1454]	2650 [1454]
PRESSURE PSI [BAR]	1650 [114]	1000 [69]	1100 [76]	1000 [69]	350 [24]	435 [30]	3000+ [207+]	3000+ [207+]	3000+ [207+]

\* Limited by chemical applications.

\*\*Shields are inhibited against UV degradation.

+With steel bands.

### Installations

Installing a RAMCO® Safety Shield is both simple and rapid, usually requiring less than a minute. Whether a shield is placed over a flange, valve or fitting, the method of installation is the same.

The complete line of RAMCO® Shields, produced from either thermoplastics or metals, are wraparounds. The difference between the two groups is the method of securing them on the pipe connection or valve. Fabric shields are fastened securely by tie-down cords; whereas, metal shields are held firmly in place by metal screws or bands.

All shields are shipped directly from the RAMCO® plant ready for installation. Each package of shields includes installation instructions for quick reference. Thermoplastic shields require no tools for installation, and metal shields need only the use of a Phillips screwdriver.

## Installing Thermoplastic Safety Shields

Incorporated within each RAMCO® thermoplastic shield is a velcro fastener that holds the shield in place over a flange, pipe connection or valve allowing installation of the shield by a single worker in less than a minute.

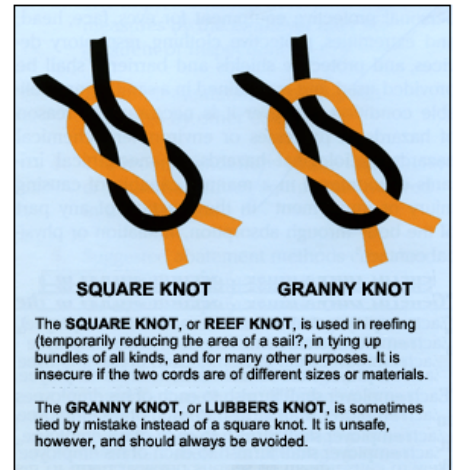
Installation steps are as follows:

1. Wrap the safety shield tightly around the flange, valve or fitting.
2. Press the two portions of the velcro fastener together to close the shield.
3. Pull the tie cords together tightly on each side, take one or two turns around the pipe and fasten over the pipe with a square knot.

NOTE: ONLY A SQUARE KNOT SHOULD BE USED.

In the event of a leak, a square knot tightens when subjected to pressure, avoiding the risk that the shield loosens and slides off the fitting or valve. If incorrectly tied, a granny knot results and under pressure, this knot becomes untied allowing the shield to be ineffective in preventing a sprayout.

4. Do not cut the tie cords but tuck them between the flange and shield



▲ Square Knot vs. Granny Knot

## That's It in a Nut Shell For Installing RAMCO® Safety Shields ...

These unique safety devices installed over flanges, pipe fittings and valves contribute to a safe work environment. In the event of a leak, the indicating patch in each thermoplastic shield (except the "See-Thru" Shields, of course) will turn color signaling an alert. These shields will contain and deflect temporarily the escaping hazardous, toxic chemical, and thereby, mitigate the effects of a potentially devastating sprayout.