

Patented



ADVANCE PRODUCTS & SYSTEMS

KLEERBAND® FLANGE PROTECTORS & RADOLID® PROTECTION CAPS

Radolid® Bolt Protection Caps • Now with VCI - patent pending*

*Patent Pending only applies to Radolid Caps with VCI

ISO 9001 CERTIFIED COMPANY - FM537405



Kleerband® Flange Protectors: The quick, easy and effective way to apply protection and prevent corrosion

Grease Injection Fitting

All metal wormgear screw connection for ease of installation (No special tools needed for installation) *patented

Radolid® Protection Caps

Transparent Polyband Allows 360 Degree Continuous Inspection

Positive Loading Relief Vent Plug

The Kleerband® Flange Protectors are designed to protect flange face, studs, and gaskets on raised face, full face, and ring joint flanges from atmospheric corrosion encountered in chemical plants, refineries, gas plants, offshore platforms, onshore oil fields, metering stations, water and wastewater plants, pump stations, and underground pipelines.

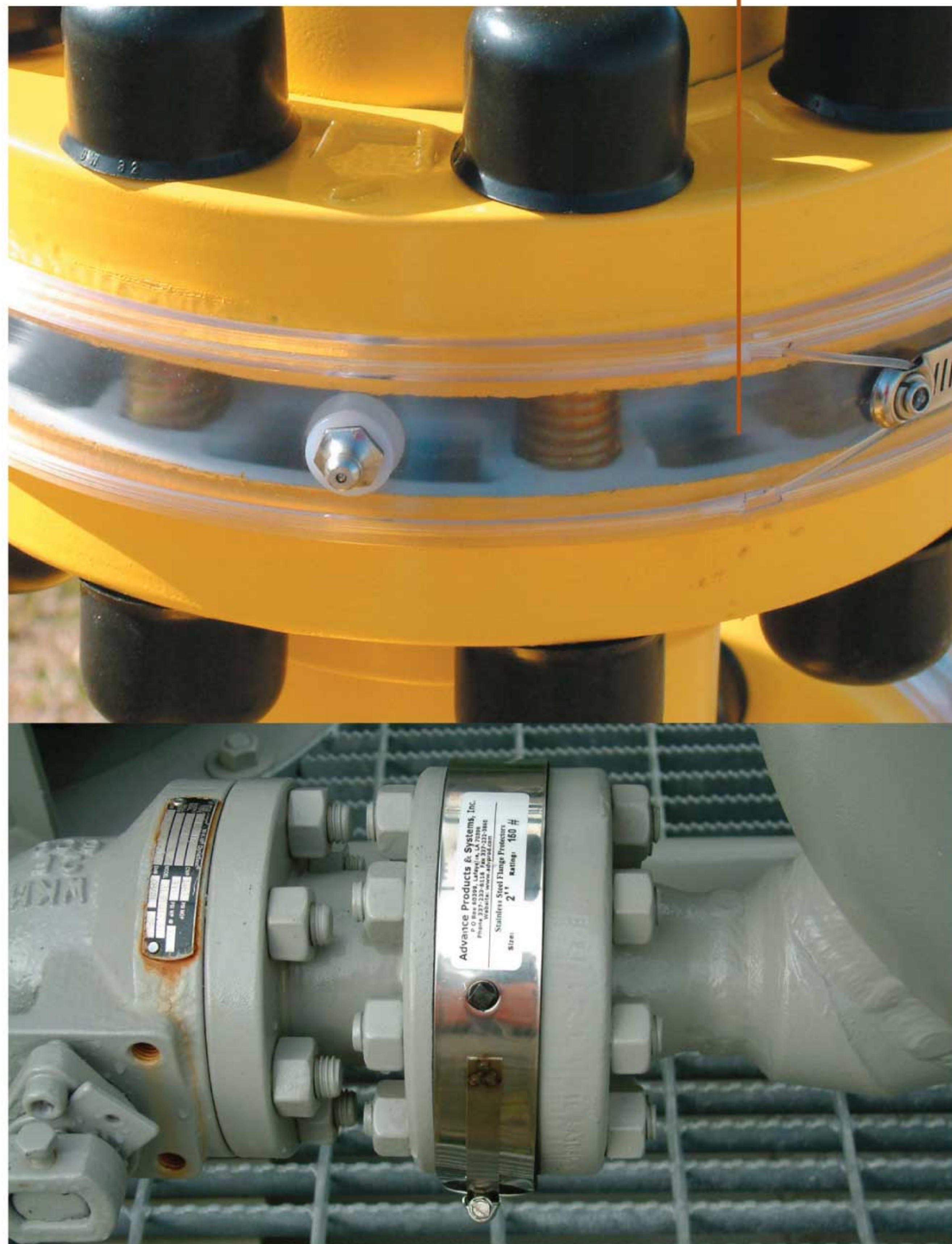
Controlling corrosion and being aware of its damaging effects is paramount in pipeline maintenance. With the use of Kleerband® Flange Protectors and Kleergel® Corrosion Inhibitor, flanges remain safe from hazardous and unsightly corrosion that can cause leakage, failure, or even shutdown of equipment. The down time, coupled with the cost of cutting and welding a new flange, replacing flange bolts, nuts and seals, can become very expensive.

Kleerband® Flange Protectors are also designed for use on cathodically isolated flanges to prevent foreign matter from shorting out or bridging over an isolating gasket. All Kleerband® Flange Protectors are equipped with an exclusive positive loading relief vent and plug that assures complete loading of flange cavities, and the extruded, clear, flexible polyband allows visual inspection without removal of the protector and ensures complete filling of the flange cavity. In addition, it is non-corroding, providing many years of service life and is completely reusable.

APS presently manufactures Kleerband® Flange Protectors to fit all ANSI flanges 150# series to 2500# series, from ½" to 144" and are available in two widths, 1 ½" and 2 ½". Flanges up to 6" require the 1 ½" wide flange protector and flanges 8" and over require a 2 ½" wide flange protector. Also available

Why try and protect flanges the old way when APS has the clear advantage to prevent corrosion?

With the Kleerband® design, visual inspection of the flange surface can be accomplished without removing the flange protector.



Shrink Sleeves



Shrink sleeve flange shields consist of multiple components (i.e. shrink sleeve, skirting, mastic filler material, masting tape), require numerous tools for installation (i.e. propane tank, torch, hose, regulator, knife, rags, approved solvent, temperature measuring device, hammer, screwdriver, pliers), along with safety equipment (i.e. gloves, goggles and a fire watch), and extra time and personnel to

properly install. Due partly to its many installation steps, it is an awkward and complicated method of flange protection. Once installed, flanges cannot be inspected for corrosion without removal of the shrink sleeves and the necessity to repeat the entire installation process. In addition, shrink sleeves are very expensive and must be burned or cut off for removal.

Tape products must be wrapped completely around the circumference of the flange, though not all flanges can be accessed in this manner. Tape covered flanges are not easily filled and usually result in voids in the flange cavity where condensation forms. Tape products, besides trapping moisture, are non-fillable and not inspectable, making it necessary to cut away and dispose of this non-reusable means of protection.

Tapes



Wax Fillers



Wax and epoxy fillers are both messy and difficult to apply. These fillers require many tools and are extremely time-consuming. Wax must be melted and poured into a form until it hardens. Epoxy must be injected under high pressure, or troweled on the flanges, leaving potential voids. Both wax and epoxy fillers have a tendency to shrink and separate from the flange surface over time, allowing moisture to migrate between the filler and the flange causing hidden corrosion growth. Once installed, wax and epoxy fillers are non-inspectable for corrosion, and messy and difficult to remove and dispose of safely.

are Flange Protectors to fit API 2000# to 15,000# flanges, API Integral flanges, API obsolete flanges and AWWA flanges.

Stainless Steel Flange Protectors

The 7100 series flange protector is manufactured with 22 gauge 304L or 316L stainless steel band, stainless steel worm-gear strap, and grease fitting. This standard coupling is practically indestructible and is appropriate for extreme temperatures. APS Flange Protectors are manufactured according to ANSI B16.5 specifications up to 24". Above 24", please provide the specifications of your flange including the circumference.

Specifications:

Kleerband® Flange Protectors are manufactured of 100% virgin vinyl compound. The polyvinyl chloride resin used to make this compound, as well as the plasticizers and all of the other ingredients, have been granted approval by the FDA in accordance with regulations.

Compound Physical Evaluation

Hardness - Shore A (± 3) - instantaneous.....	80
-10 second delay.....	75
Specific Gravity (± .02)	1.22
Tensile Strength (PSI)	2425
100% Modulus (PSI).....	1175
Elongation (%).....	435
Low Temperature Brittleness (°F).....	-15
Operating Temperature (°F).....	Min.-13
Operating Temperature (°F).....	Max.+167

APS' Radolid® Protection Caps:

The quick, easy, and cost effective way to apply nut and bolt protection

Radolid® Bolt Protection Caps
Now with VCI - patent pending



Practical, efficient and reusable



Unprotected

Protected

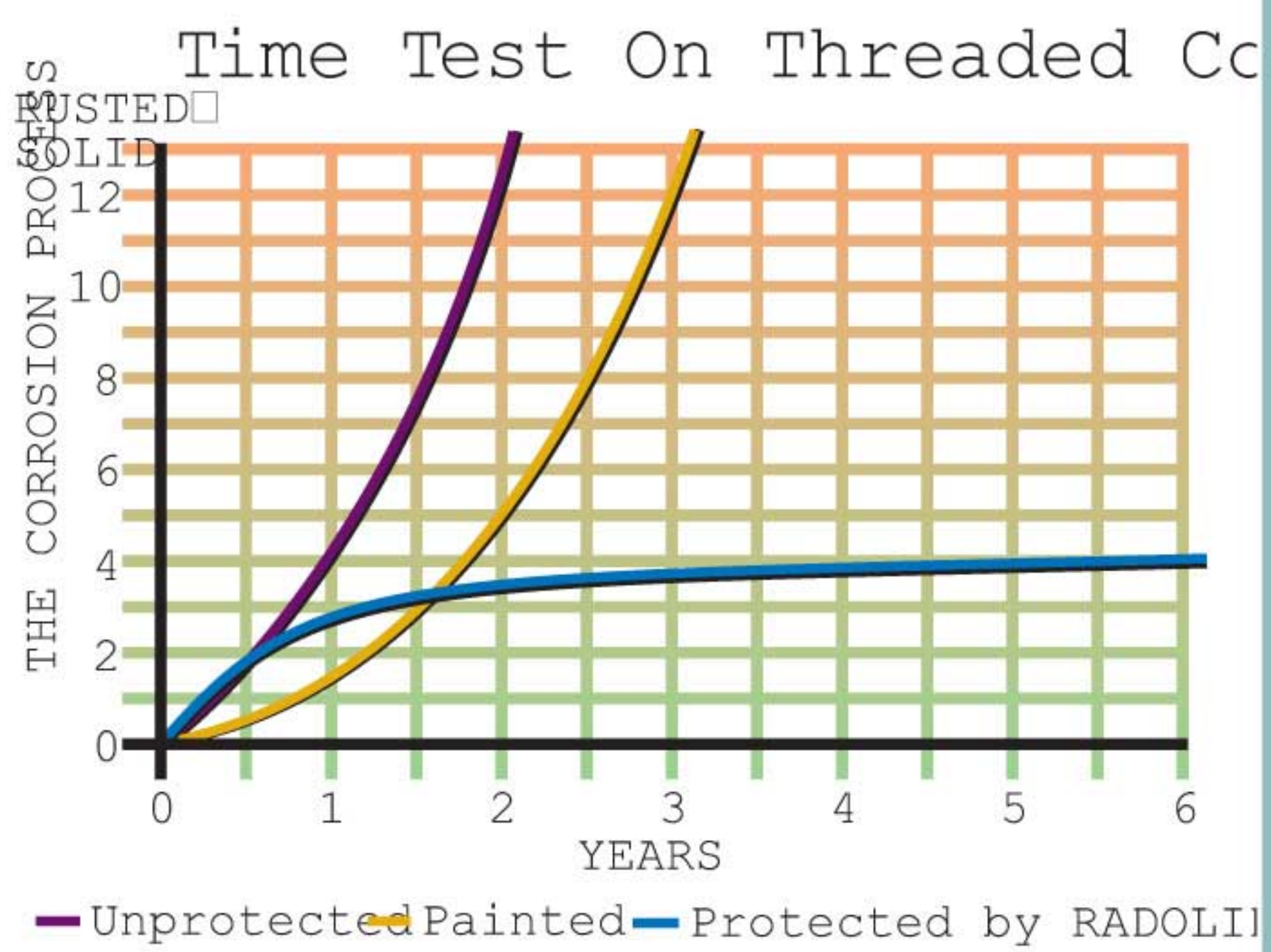
Radolid® Protection Caps are used to eliminate corrosion of nuts and bolts, thus allowing quick removal when necessary. These caps are easily installed by being pressed on to the bolted joint by hand. The barbed edge snaps in place, preventing the caps from accidentally being removed. Manufactured of high density black or white UV-resistant polyethylene, these caps are reusable and will keep nuts and bolts corrosion free for years. *(APS recommends coating the nuts, studs and bolt heads with APS Kleergel® High Melt Corrosion Inhibitor Grease for added protection.)*

Size Range: 1/4" to 3 1/2" diameter bolt or stud
Standard Operating Temperature(°F).....Min -84
Standard Operating Temperature(°F)...Max +210
Other high temp material available to 430°F Max

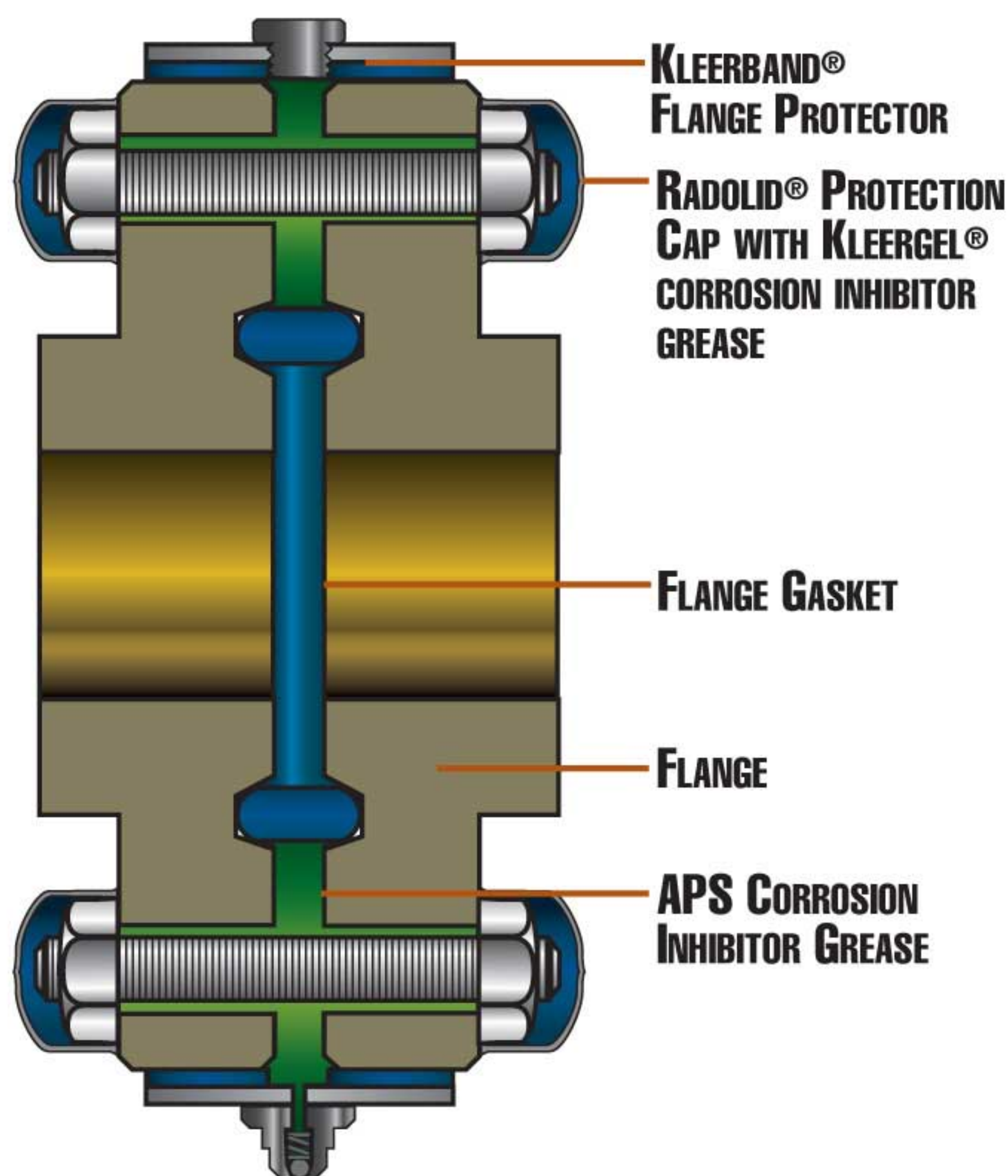
What is VCI? Volatile Corrosion Inhibitors (VCIs) are a class of corrosion inhibiting compounds, some or all of whose ingredients have sufficient energy (vapor pressure) to release molecules from the resin compound into the air and block the corrosive effects of electrolytes. VCI molecules condense in a microscopic layer on all surfaces they can reach. For VCI to work properly, caps must be secured onto head of bolt or nut fitting flush with the surface of the flange or substrate. This is to maintain the VCI's integrity under the cap. Radolid® bolt protection caps, with VCI additive, are the only nut and bolt cap available in the market. Radolid® caps with VCI can be reused 2 to 3 times before requiring grease to be added to the caps.

Independent Laboratory Corrosion Test Results Show the Importance of Good Flange and Nut & Bolt Protection

Radolid® Nut Cap Exposure Test



Protects The Entire Flange



Certified copy of test results available on request.

Flange Protection Corrosion Test

Flange assembly #1 was plain and unprotected. Flange #2 was protected with a Kleerband® Flange Protector and Radolid® Nut Caps. Testing consisted of 500 hours ASTM B 117 salt fog exposure.

(Actual test result documents available upon request. Salt spray test for VCI enhanced Radolid® caps available upon request.)

	#1 Unprotected Flange	#2 Protected Flange
0-Hours		
500-Hours		
500-Hours Disassembled		
	<p>End result: Flange, nuts and bolts badly corroded making flange seal failure possible and maintenance difficult at best.</p>	<p>End result: Flange, nuts and bolts in good repair with seal integrity safe for years and maintenance able to be achieved with efficiency.</p>

Kleerband® Flange Protectors prevent this type of damage from occurring. Typical cost to replace and repair this 12" ANSI 600# flange full face or RTJ gasket with nuts and bolts is \$1,450.00.



ORDERING INFORMATION: KLEERBAND® FLANGE PROTECTORS

- Flange size
- ANSI or API

RADOLID PROTECTION CAPS

- Bolt diameter
- Width across flat of nuts
- Special length caps, if required
- Colors other than black

KLEERGEL® CORROSION INHIBITOR GREASE

- 11 oz aerosol can
- 14 oz cartridge
- 35 lb pail
- 120 lb drum

KLEERGEL®

SPECIFICATIONS:

Proprietary synthetic lubricant that will not breakdown under high temperatures. Kleergel® is opaque in color (almost clear), which allows for easy inspection. FDA approved for used on potable water systems.

Dielectric Strength	(Volts/mil) ASTM-D149	500
Flash Point	ASTM D92	180° C
Continuous Use Temp.	Grease remains flexible & stable	-41° C to 204° C
Salt Spray Test	ASTM B117	Pass
Rust Preventative Test	ASTM D1743	Pass



ISO 9001
FM 537405

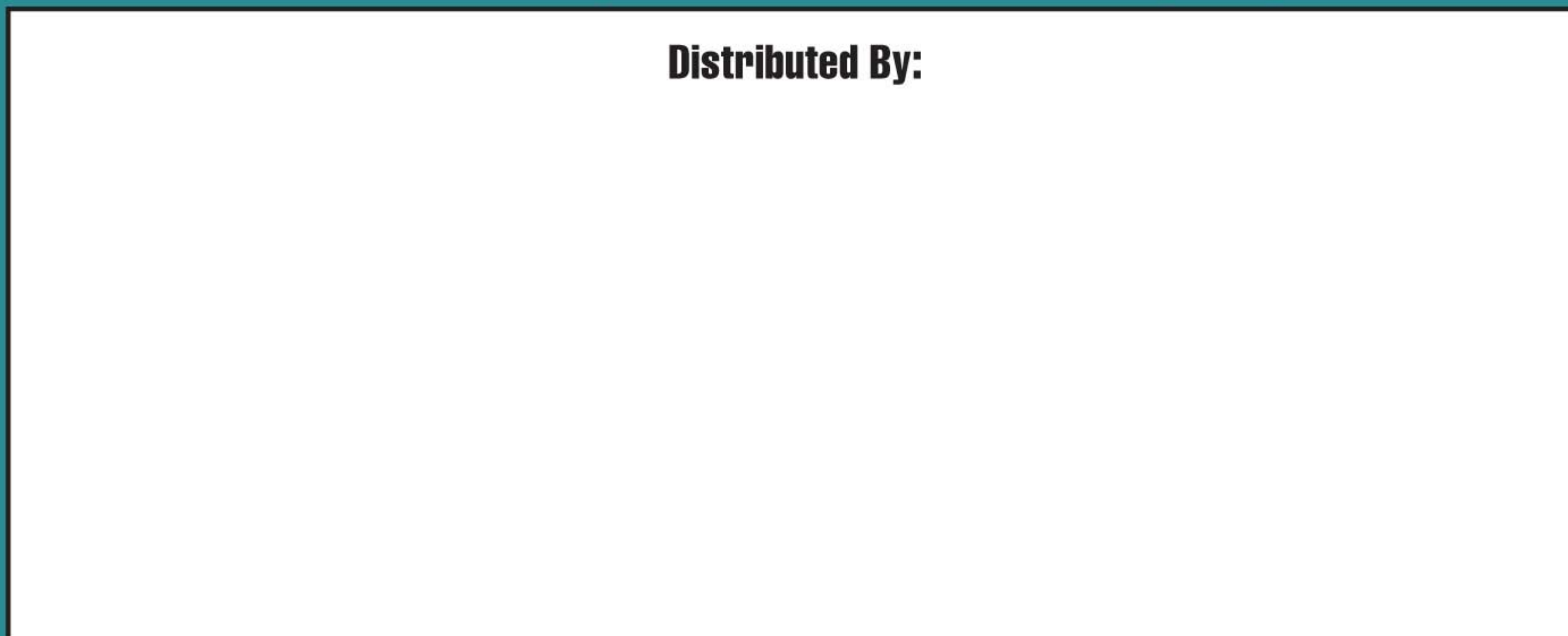


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