Evans PW Series Water Stick Regulator

(Product Test Report)

Image above shows the wetted surface of Evans PW Regulator before (left) and after (right) the PWEA treatment. Competitors PCW regulators have brass wetted internal components. Due to aggressive nature of Semiconductor PCW systems, exposed brass components can be subject to stress corrosion cracking due to dezincification of the brass.

PWEA Technical Details

Evans Components proprietary wetted surface treatment PWEA® to prevent stress corrosion cracking and leaching of brass for PCW applications.

Through the process of continuous product improvement Evans Components began treating all PW Series regulators with the PWEA® treatment in 2016. This new process eliminates the potential dezincification of brass wetted internals which in some cases has caused leakage around the stem/poppet due to stress corrosion cracking.

The PWEA® treatment is an electrodeposited intermetallic alloy which substitutes the classic electrolytic nickel-chrome deposit. The name of this process is PWEA®, it complies with limits stated by international standards on drinkable water standards which include:

NSF 61 section 8- pH5 Hot Commercial (82°C) for industrial applications that can be considered the stiffest test on the subject. PWEA®, process also meets NSF 4, UNI 10531 and UNI 11460 for industrial equipment "food zone" devices.

The process can produce polished deposits with wide resistance guarantee against wear and corrosion (hardness 400 Vickers – 200 neutral saline smoke according to DIN 50021, ASTM B 117, and UNI ISO 9227).

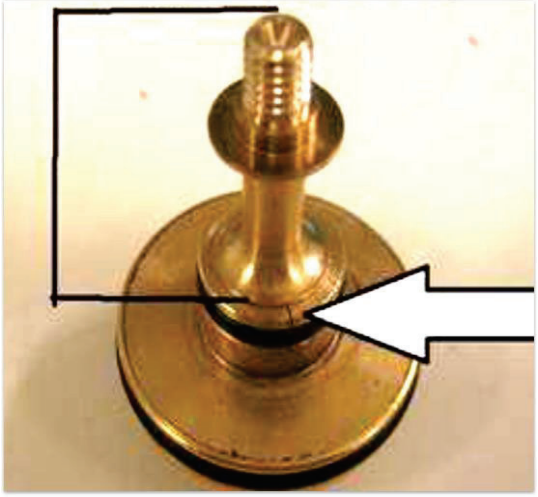
This process is stable to ordinary temperatures with Vickers hardness of about 400 D.P.H.

The absence of porosity in this alloy guarantees the resistance to corrosion, leaching of material and a long term polished effect in an equal way to nickel and chromium deposits with same thickness, with the advantage of being chemically inert.

This process enables PWEA® polished deposits directly on all wetted brass alloys of the regulator at a current density of 0, 1 to 4 A/dm². The color of the deposit is constant regardless of the variations in the solved product concentrations. All the above mentioned features provide superior resistance to corrosion, which is equal to the one produced by a chromium deposit with same thickness.

EVANS PWEA Treated Internals

Non-Treated Internals



Stress Corrosion Cracking, Regulator Poppet

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EVANS COMPONENTS

½” Evans PW Series Regulator vs. Competitor

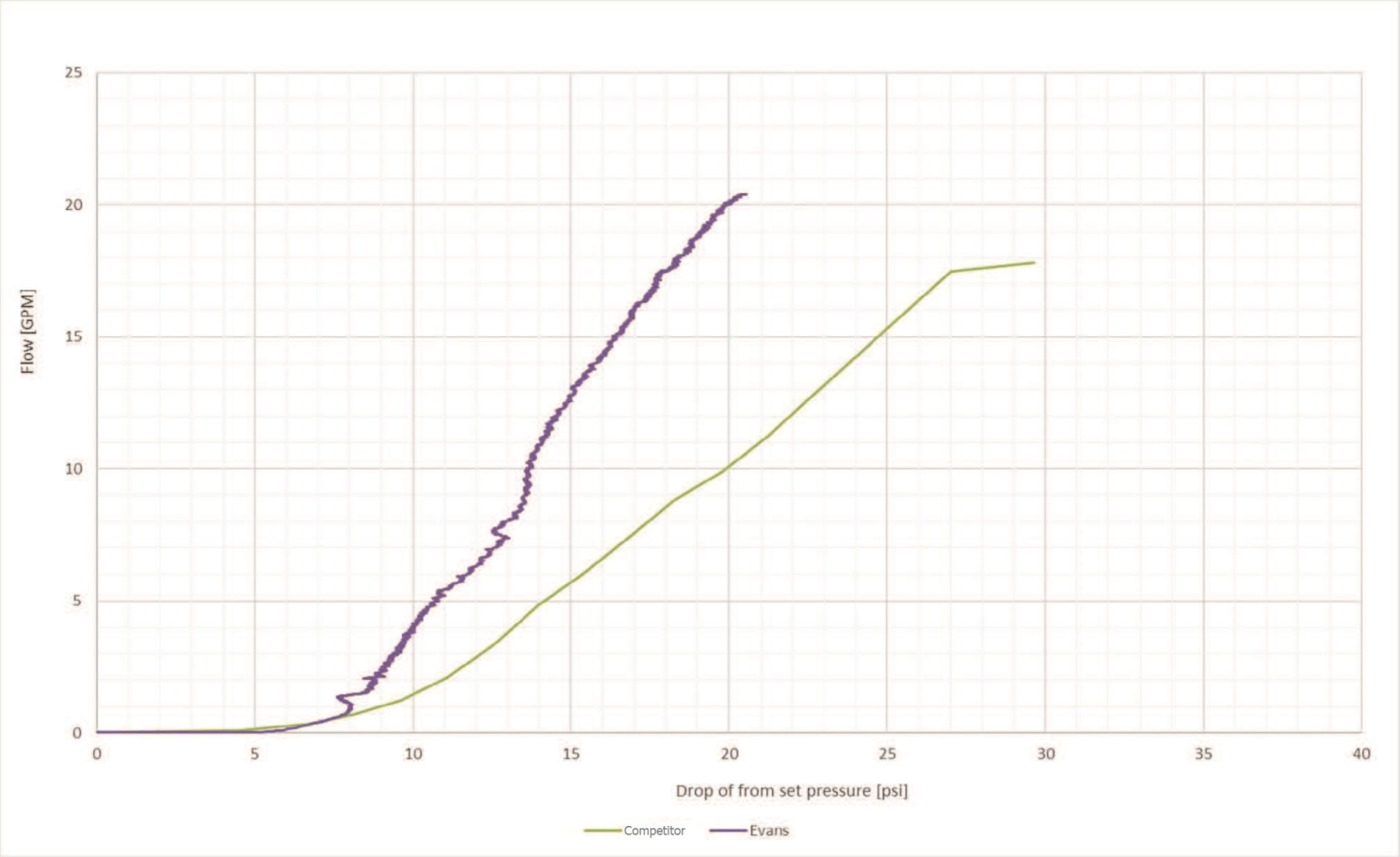
1. Summary:

Scope of this section is to report the differences found between Evans PW Series regulator and Competitor

2. Results of test performed:

Herein attached performance flow curve performed by certified third party testing lab. (set pressure 35 psi, inlet 70 psi)

2.1 ½” Evans vs. Competitor:



In the above chart, the Competitor PRV has a higher pressure drop vs. Evans resulting in less flow under same conditions

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3. Engineering Comments/Conclusion:

Evans PRV has an average of more flow vs. competition from a minimum of 75% at 9 psi to a maximum of 103% more at 20 psi. The gap between Competitor PRV and Evans is essentially due to undersized piston/spring mechanism which cannot support higher flows without loss of outlet pressure and substandard internal machining, water path design.

The inadequate internal geometry can generate higher turbulence with loss of energy which in addition to resulting lower flow vs. Evans could initiate potential risk of cavitation in certain flow conditions.

Photographs below captured from the Competitor PRV show what is described above. The spring/piston mechanism also shows signs of corrosion.

4. Test Procedure:

The procedure followed to test the PRV’s is detailed in the EN1567 and NF standards where we only change the inlet and set pressure which are differently specified in this test.

EVANS PWEA Treated Internals

Competitor Non-Treated Internals

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½” Evans PW Series Regulator vs. Competitor

Competitor PRV body/piston

Evans PRV body/piston

Competitor Regulator Body

Substandard machining geometry, untreated

EVANS Regulator Body

PWEA Treated Internals

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Competitor’s PRV “Steel” Spring (corrosion shown)

Evans PRV Spring “Stainless Steel”

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EVANS COMPONENTS

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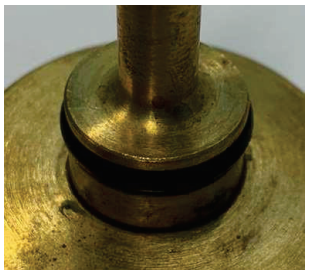

Competitor’s PRV untreated piston

Evans PRV piston with PWEA treatment

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