

# Using Isco ProPak<sup>®</sup> Sample Bags for SW846 Trace Metal Analysis

By Phillip B. Liescheski

Under SW846, EPA promulgates official assay protocols for monitoring common organic and inorganic pollutants in waste water. One class of pollutants covered by SW846 is Target Analyte List Metals (a.k.a. TALs). According to the protocol, wastewater samples are to be collected and stored in plastic or glass bottles. Unfortunately, bottles are bulky and glass is fragile.

Isco has developed ProPak<sup>®</sup> disposable sample bags, a more convenient medium for collecting water samples. Under the EPA's new Performance Based Measurement Systems (PBMS), minor changes to official EPA protocol are acceptable as long as performance equivalency is demonstrated.



1,000 ml ProPak bags install quickly into light-weight, reusable holders. A 2-gallon capacity bag is also offered for composite sampling.

## Tested for Performance

To demonstrate performance equivalency between ProPak bags and glass bottles, a known solution of metals (plus Arsenic and Selenium) in the part-per-billion range was prepared, using deionized water (18 megohm) and a trace-metals standard.

This solution was prepared in a 2-L volumetric flask and stabilized with nitric acid below pH 2. Half of the solution was transferred to a ProPak bag, and the other half to a conventional 1-L glass sampling bottle.

Both were sealed with teflon-lined caps. The procedure was repeated until three ProPak bags and three glass bottles were filled. These containers were allowed to stand in the dark for over two weeks. After that period, the containers were shipped to Midwest Laboratories, Inc. (Omaha, NE) to be assayed for Target Analyte List Metals (TALs) according to approved EPA SW846 methods (EPA 200.7; EPA 245.1 for Hg; EPA 270.2 for Se).

## Excellent Results

When compared to conventional glass bottles in the SW846 analysis for Target Analyte List Metals, Isco ProPaks performed as well as the glass bottles in all categories except mercury (see Table 1.)

**Table 1. Comparison Test Results**

Pollutants	Method Detection Limits, mg/L (ppm)	Average Glass Results (n=3)	Average ProPak Results (n=3)	T-test Comparison (a=0.35)
Aluminum	0.05	0.55 ±.01	0.54 ±.01	Similar
Arsenic	0.05	0.09 ±.00	0.09 ±.02	Similar
Beryllium	0.0005	0.0860 ±.0010	0.0857 ±.0021	Similar
Cadmium	0.002	0.024 ±.002	0.023 ±.001	Similar
Chromium	0.01	0.09 ±.00	0.09 ±.00	Similar
Cobalt	0.01	0.09 ±.00	0.09 ±.00	Similar
Copper	0.01	0.09 ±.00	0.09 ±.00	Similar
Iron	0.01	0.09 ±.01	0.09 ±.00	Similar
Lead	0.05	0.09 ±.01	0.09 ±.01	Similar
Manganese	0.01	0.10 ±.00	0.10 ±.01	Similar
Mercuric	0.0004	0.0039 ±.0001	0.0033 ±.0001	Different
Nickel	0.01	0.08 ±.01	0.09 ±.01	Similar
Selenium	0.002	0.020 ±.001	0.227 ±.006	Similar
Zinc	0.01	0.10 ±.02	0.11 ±.02	Similar

**ProPak Disposable Sample Bag Specifications**

<b>Capacity</b>	1000 ml nominal	<b>Sample Identification</b>	Writable surface on bag; optional bar-code labels
<b>Material*</b>	3 mil low-density polyethylene (LDPE), FDA Certified	<b>Closure</b>	Foam-lined or Teflon screw cap seals
<b>Construction</b>	1/8" heat-welded double seams	<b>Recommended Temperature</b>	Sample bag: -40° to 167°F (-40 to 75°C) Bag Holder: -40° to 284° F (-40° to 140°C)
<b>Holder</b>	Wedge-shaped, polypropylene construction. Fits in place of Isco 1000 ml or equivalent wedge-shaped bottle	<i>1000 ProPak bags and 25 holders with Teflon-lined caps: Isco PN 68-6700-086</i>	

\*ProPak sample bags are recyclable. The society of Plastics Industry (SPI) code is 4.



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