SCP SCIENCE

Water Analysis Handbook

Vol. 2

pH

TOC

BOD

COD

METALS

ANIONS

CONDUCTIVITY

TOTAL PHOSPHORUS

TOTAL KJELDAHL NITROGEN

Introduction

For over 10 years, **SCP SCIENCE** *has been manufacturing quality analytical standards, reagents and instrumentation for inorganic analysis. This Water Analysis Handbook is a sampling of the products available for the Water/Wastewater Professionals. Additional products can be found in our two catalogs: "Standards and Reagents" and "Instruments and Supplies".*

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SM # * refer to analytical methods detailed in***
"Standard Methods for the Examination of Water & Wastewater", 20th Edition

Chemical Oxygen Demand

Standard Method # 5220. The determination of Chemical Oxygen Demand (COD) is widely used in municipal and industrial laboratories to measure the overall level of organic contamination in wastewater. The contamination level is determined by measuring the equivalent amount of oxygen required to oxidize organic matter in the sample. COD differs from BOD in that it measures the oxygen demand to digest all organic content, not just that portion which could be consumed by biological processes. *Perform your COD analysis using the Digi***PREP CUBE** *Digestion System and Accu***SPEC** *Pre-filled COD Tubes. Standards and reagents are available as well.*

*Digi***PREP CUBE** *Digestion System*

*Digi***PREP CUBE** *Digestion System is an innovative, 25-position Digestion Block designed for Chemical Oxygen Demand and other digestions employing 16 mm tubes. Digi***PREP CUBE** *is a vertically integrated system with a built-in temperature controller, timer, and graphic display. Simple operation is achieved through keypad selection of timer settings, 15, 60, 90, or 120 minutes, and pre-set temperatures of 100 and 150 °C. The digestion block is Teflon-Coated Graphite to resist corrosion and acid attack.*

Ordering Information

Catalog Number (115V)	010-510-003
Catalog Number (230V)	010-510-004
Capacity	25 Tubes
Timer	15, 60, 90, & 120 minutes
Power	250 W
Temperature	Pre-set 100 °C / 150 °C
Over-Temp Protection	Yes
Heating Block	Teflon Coated Graphite
Controller	Built-in
Certification	CE/UL/CSA

*Accu***SPEC** *Pre-Filled COD Digestion Tubes*

*Accu***SPEC** *COD Digestion Tubes, designed to work with 16 mm well diameter COD Reactor Systems, minimize contact with hazardous chemicals and reduce the amount of hazardous waste. Contain* $HgSO_4$ *to remove up to 2000 ppm* Cl^- *interference. Fully consistent with Standard Methods and EPA procedures. Each package of Accu***SPEC** *COD Tubes includes a free Performance Evaluation Standard (certified through round-robin) for Laboratory COD Quality Control.*

Available in packages of 25

Purchase 4 boxes and receive a discount !

Concentration Range (ppm)	Quantity	Catalog Number
0 - 150	25 + 1 QC	250-130-006
0 - 1500	25 + 1 QC	250-130-016
0 - 15000	25 + 1 QC	250-130-026

Chemical Oxygen Demand

Accu**SPEC** COD Standards and Reagents

*Accu***SPEC** COD Standards and Reagents save valuable time by removing the need to prepare standards and reagents prior to analysis. All products are prepared following guidelines from "Standards Methods for the Examination of Water and Wastewater", 20th Ed. and available in wide range of volumes.

Solutions	Concentration	Catalog Number			
		125 ml	500 ml	1 L	4 L
1,10-Phenanthroline, $C_{12}H_8N_2$	0.1%	250-120-521	250-120-522	250-120-523	
COD Standard	100 mg/l O_2		250-130-550	250-130-551	
COD Standard	1000 mg/l O_2		250-130-600	250-130-601	
COD Standard	10,000 mg/l O_2		250-130-650	250-130-651	
COD Standard Plus (contains Chloride)	100 mg/l O_2		250-130-700	250-130-701	
COD Standard Plus (contains Chloride)	1000 mg/l O_2		250-130-750	250-130-751	
COD Standard Plus (contains Chloride)	10,000 mg/l O_2		250-130-800	250-130-801	
CRM for COD, Low level	200 ppm		140-715-101**		
CRM for COD, High level	1000 ppm		140-715-102**		
Ferrous Ammonium Sulfate, $Fe(NH_4)_2(SO_4)_2$	0.00282 N		250-130-150	250-130-151	250-130-152
Ferrous Ammonium Sulfate, $Fe(NH_4)_2(SO_4)_2$	0.05 N		250-130-200	250-130-201	250-130-202
Ferrous Ammonium Sulfate, $Fe(NH_4)_2(SO_4)_2$	0.1 N		250-130-250	250-130-251	250-130-252
Ferrous Ammonium Sulfate, $Fe(NH_4)_2(SO_4)_2$	0.25 N		250-130-300	250-130-301	250-130-302
Ferrous Ammonium Sulfate, $Fe(NH_4)_2(SO_4)_2$	0.4 N		250-130-350	250-130-351	250-130-352
Ferrous Ammonium Sulfate, $Fe(NH_4)_2(SO_4)_2$	1 N		250-130-400	250-130-401	250-130-402
Ferrous Ammonium Sulfate, $Fe(NH_4)_2(SO_4)_2$	20% w/v		250-130-450	250-130-451	250-130-452
Sulfuric Acid Reagent for COD testing, H_2SO_4			250-130-500	250-130-501	250-130-502*

* indicates 5L Glass Bottle
** indicates 20 ml Glass Bottle

Total Organic Carbon

Standard Method # 5310. Organic matter plays a major role in aquatic systems. It affects biogeochemical processes, nutrient cycling, biological availability, chemical transport and interactions. It also has direct implications in the planning of wastewater treatment and drinking water treatment. Organic matter content is typically measured as total organic carbon and dissolved organic carbon, which are essential components of the carbon cycle.

*Accu***SPEC** *prepared standards for TOC and TIC reduce analysis costs and maximize productivity.*

Solutions	Concentration	Catalog Number	
		125 ml	500 ml
Total Inorganic Carbon Standard (TIC)	1000 µg/ml	250-250-000	250-250-001
Total Organic Carbon Standard (TOC)	1000 µg/ml	250-250-050	250-250-051

Biological Oxygen Demand

Standard Method # 5210. Microorganisms such as bacteria are responsible for decomposing organic waste. When organic matter such as dead plants, leaves, grass clippings, manure, sewage, or even food waste is present in a water supply, the bacteria will begin the process of breaking down this waste. When this happens, much of the available dissolved oxygen is consumed by aerobic bacteria, robbing other aquatic organisms of the oxygen they need to live. Biological Oxygen Demand (BOD) is a measure of the oxygen used by microorganisms to decompose this waste. *Accu***SPEC** *prepared reagents for Biological Oxygen Demand are available in different volumes, to provide the maximum cost effectiveness for your laboratory.*

Solutions	Concentration	Catalog Number		
		500 ml	1 L	5 L
Buffer pH 7.2 (phosphate)		250-110-100	250-110-101	250-110-102
Calcium Chloride, $CaCl_2$	2.75% w/v	250-110-200	250-110-201	250-110-202
Ferric Chloride, $FeCl_3$	0.025% w/v	250-110-300	250-110-301	250-110-302
Magnesium Sulfate, $MgSO_4$	2.25% w/v	250-110-400	250-110-401	250-110-402
Acid Solution, H_2SO_4	1.0 N	250-060-280	250-060-281	250-060-282
Alkali Solution, NaOH	1.0 N	250-108-400	250-108-401	250-108-402

Total Dissolved Solids

Standard Method # 2540. Total Dissolved Solids refer to the amount of physical matter dissolved in water. Determination of the "solids" content is important for both aesthetic and practical reasons, Drinking water with a high solids content can have an disagreeable palatability. Water with high mineral content can cause heavy deposition and be unsuitable for many industrial applications.

*Accu***SPEC** *prepared Total Dissolved Solids standard values are expressed as a concentration of KCl. Exact values are dependant on the aliquot taken for the analysis. Use pe***CHECK** *Mineral Standard as a performance evaluation standard in conjunction with Accu***SPEC** *Standards.*

Conc. KCl mg/L	Catalog Number	
	500 ml	1 L
6,000	250-160-390	250-160-391
10,000	250-160-410	250-160-411
12,000	250-160-430	250-160-431
18,000	250-160-450	250-160-451
30,000	250-160-470	250-160-471
40,000	250-160-490	250-160-491
70,000	250-160-510	250-160-511

*See page 12 for more information on pe***CHECK** *Standards.*

Anion (Inorganic Nonmetallic) Analysis

Analysis of the common anions are important for monitoring water quality prior, during and after treatment. The two common methods of analysis are Ion Chromatography, Standard Method # 4110, and Ion Selective Electrode Analysis Standard Method Series # 4500.

*Accu***SPEC** *Anion Standards are designed for use with both methods of analysis, Ion Chromatography and Ion Selective Electrode. In addition to the single and multi-element standards, custom standards designed for your specific application are also available. Visit www.scpscience.com to submit your request over the web or contact your nearest* **SCP SCIENCE** *office or your local distributor.*

Anion Calibration Standards

Anion Standards		Catalog Number			
		1000 µg/ml		10,000 µg/ml	
		125 ml	500 ml	125 ml	500 ml
Acetate	CH_3COO^-	250-220-100	250-220-101		
Bromate	BrO_3^-	250-220-220	250-220-221		
Bromide	Br^-	250-220-235	250-220-236	250-221-235	250-221-236
Chlorate	ClO_3^-	250-220-355	250-220-356		
Chloride	Cl^-	250-220-370	250-220-371	250-180-231	250-180-235
Fluoride	F^-	250-220-400	250-220-401	250-221-400	250-221-401
Formate	$HCOO^-$	250-220-415	250-220-416		
Nitrate	NO_3^-	250-220-505	250-220-506	250-221-505	250-221-506
Nitrate-Nitrogen	NO_3^- as N	250-220-520	250-220-521		
Nitrite	NO_2^-	250-220-535	250-220-536	250-221-535	250-221-536
Nitrite-Nitrogen	NO_2^- as N	250-220-550	250-220-551		
Oxalate	$C_2O_4^{2-}$	250-220-565	250-220-566		
Perchlorate	ClO^{4-}	250-220-580	250-220-581		
Phosphate	PO_4^{3-}	250-220-595	250-220-596	250-221-595	250-221-596
Phosphate-Phosphorus	PO_4^{3-} as P	250-220-610	250-220-611		
Sulfate	SO_4^{2-}	250-220-700	250-220-701	250-221-700	250-221-701
Sulfate-Sulfur	SO_4^{2-} as S	250-220-715	250-220-716		

*All Anion Calibration Standards have a water matrix

Multi-Element Standards				
Element	Concentration	Concentration	Concentration	Concentration
Cl^-	30 µg/ml	10 µg/ml	100 µg/ml	1000 µg/ml
F^-	20 µg/ml	10 µg/ml	100 µg/ml	1000 µg/ml
Br^-			100 µg/ml	1000 µg/ml
NO_3^-	100 µg/ml	10 µg/ml	100 µg/ml	1000 µg/ml
PO_4^{-3}	150 µg/ml	10 µg/ml	100 µg/ml	1000 µg/ml
SO_4^{-2}	150 µg/ml	10 µg/ml	100 µg/ml	1000 µg/ml
NO_2^-			100 µg/ml	1000 µg/ml
Catalog Number				
125 ml	140-315-001	140-315-011	250-225-001	250-225-101
500 ml	140-315-005	140-315-015	250-225-005	250-225-105

Custom Multi-Element Standards for your application are available.

Ion Chromatography Eluents

Eluent Concentrates	Concentration	Catalog Number		
		100 ml	500 ml	1 L
Bicarbonate/Sodium Hydroxide	0.003/0.002 M		250-220-190	250-220-191
Carbonate/Bicarbonate	0.0018/0.0017 M		250-220-265	250-220-266
Carbonate/Bicarbonate	0.0022/0.0028 M		250-220-280	250-220-281
Carbonate/Bicarbonate	0.003/0.0024 M		250-220-295	250-220-296
Methanesulfonic Acid, CH_3SO_3H	20 mM	250-220-475		

Eluent Concentrates	Concentration	Catalog Number		
		100 ml	500 ml	1 L
Bicarbonate/Sodium Hydroxide concentrate	0.3/0.2 M	250-220-205		
Carbonate/Bicarbonate concentrate	0.18/0.17 M	250-220-310		
Carbonate/Bicarbonate concentrate	0.22/0.28 M	250-220-325		
Carbonate/Bicarbonate concentrate	0.30/0.24 M	250-220-340		
Hydrochloric Acid Eluent concentrate, HCl	1 M	250-220-430	250-220-431	250-220-432
Methanesulfonic Acid concentrate, CH_3SO_3H	1 M			250-220-490
Sodium Bicarbonate Eluent concentrate, $NaHCO_3$	0.5 M	250-220-655	250-220-656	250-220-657
Sodium Carbonate Eluent concentrate, Na_2CO_3	0.5 M	250-220-670	250-220-671	250-220-672

Ion Selective Electrode Solutions

Electrode Maintenance Solutions		Catalog Number				
	Orion P/N	125 ml	500 ml	1 L	5 L	10 L
Ag/AgCl Reference Electrode Fill Solution	900011	250-180-100	250-180-101			
Ammonia Electrode Filling Solution	951202	250-180-125	250-180-126			
Combination Chloride Reference Internal Filling	900017	250-180-250	250-180-251			
Double Junction Reference Electrode Inner Fill	900002	250-180-275	250-180-276			
Double Junction Reference Electrode Outer Fill	900003	250-180-285	250-180-286			
Potassium Chloride w/Silver Chloride, KCl/AgCl, (4 M)			250-180-475			
Potassium Chloride, KCl, (Saturated)			250-180-450			
Ross Reference Electrode Filling Solution	810007	250-180-500	250-180-501			
Single Junction Reference Internal Filling Solution	900001	250-180-525	250-180-526			
Buffer TISAB with CDTA (concentrate)	940911				250-200-430	250-200-431
Buffer TISAB II with CDTA					250-200-460	250-200-461
Electrode Cleaning Solution		250-180-300	250-180-301	250-180-302	250-180-303	
Electrode Storage Solution	910001	250-180-325	250-180-326	250-180-327	250-180-328	
Ionic Strength Adjuster (ISA) for Solid State	940009	250-180-400	250-180-401			
Sodium Ionic Strength Adjuster	841111	250-180-575	250-180-576			
Sulfide Anti-Oxidant Buffer (SAOB)	941609A			250-180-625		

In addition to these products, an extensive listing of solutions and reagents for Ion Chromatography and Ion Selective Electrode Analysis are offered in our "Standards and Reagents" Catalog.

Cation (Metal) Analysis

Standard Method Series # 3000. Metals in water or wastewater can have either a beneficial or dangerous effect depending on the element and the concentration. Certain metals, such as selenium, are an essential minerals at very low levels but toxic at higher concentrations. Typical analysis methods include acid digestion followed by atomic absorption or ICP spectroscopy, ion chromatography, or ion selective electrode analysis.

SCP SCIENCE *manufactures the Digi***PREP** *Family of Digestion Systems; specifically designed for acid digestion methods. In addition to the full sized Digi***PREP** *System, other instruments are available to suit your specific laboratory needs. Plasma***CAL** *and Accu***SPEC** *Calibration Standards provide a NIST traceable method to calibrating your analytical instrument.*

*Digi***PREP Classic**

*Digi***PREP Jr.**

Ordering Information & Specifications

*Digi*PREP Classic*

Catalog Number (115V)	010-500-001
Catalog Number (230V)	010-500-002
Includes	Rack (2), 24 position *Digi***TUBEs** (50), W.G. Samples
Temperature	Ambient - 180 ºC
Uniformity	+/- 1 °C (In *Digi***TUBE** at 95 °C)
Stability	+/- 0.2 °C
Time to Temperature	35 min. Ambient to 95 ºC
Recovery Time	30 min. Ambient to 95 ºC
Over-Temp Protection	Yes
Heating Block	Teflon Coated Graphite
Power	925 W
Size (in)	18W x 14D x 7H
Size (cm)	46W x 36D x 18H
Weight (lb/kg)	60/27
Certification	CSA, CE, UL

*Digi*PREP Jr.*

Catalog Number (115V)	010-505-001
Catalog Number (230V)	010-505-002
Includes	Rack (1), 24 position
Temperature	Ambient - 180 ºC
Uniformity	+/- 1°C (In *Digi***TUBE** at 95 °C)
Stability	+/- 0.2°C
Time to Temperature	20 min. Ambient to 95 ºC
Recovery Time	40 min. Ambient to 95 ºC
Over-Temp Protection	Yes
Heating Block	Teflon Coated Graphite
Power	572 W
Size (in)	13W x 9.5D x 4.75H
Size (cm)	33W x 24D x 12H
Weight (lb/kg)	18.5/8.5
Certification	CSA, CE, UL

**** Digi*PROBE *sold separately***

Call* SCP SCIENCE *for other options.

Calibration Standards for Cations (Metals)

SCP SCIENCE *manufactures a complete line of cation/metal standards for AA, IC and ICP-AES/MS analysis. These standards are manufactured following an ISO 9002 Certified Quality Program and are tracable to NIST. In addition to the elements listed below, more standards are available in the "Standards and Reagents" Catalog.*

Elements		AA Standard 500 ml 1000 µg/ml	IC Standard 500 ml 1000 µg/ml	IC Standard 500 ml 10 000 µg/ml	ICP-AES/MS Standard 500 ml 1000 µg/ml	ICP-AES/MS Standard 500 ml 10 000 µg/ml
Ammonia-N_2	NH_3		250-220-116			
Ammonium	NH_4^+		250-220-131			
Aluminum	Al	140-002-135			140-052-135	140-062-135
Antimony	Sb	140-001-515			140-051-515	140-061-515
Arsenic	As	140-001-335			140-051-335	140-061-335
Barium	Ba	140-001-565	250-220-176		140-051-565	140-061-565
Beryllium	Be	140-001-045			140-051-045	140-061-045
Bismuth	Bi	140-001-835			140-051-835	140-061-835
Boron	B	140-000-055			140-050-055	140-060-055
Cadmium	Cd	140-001-485			140-051-485	140-061-485
Calcium	Ca	140-001-205	250-220-251	250-221-251	140-051-205	140-061-205
Chromium	Cr	140-002-245			140-052-245	140-062-245
Cobalt	Co	140-001-275			140-051-275	140-061-275
Copper	Cu	140-001-295			140-051-295	140-061-295
Gold	Au	140-002-795			140-052-795	140-062-795
Iron	Fe	140-001-265			140-051-265	140-061-265
Lead	Pb	140-001-825			140-051-825	140-061-825
Lithium	Li	140-001-035	250-220-446		140-051-035	140-061-035
Magnesium	Mg	140-001-125	250-220-461	250-221-461	140-051-125	140-061-125
Manganese	Mn	140-001-255			140-051-255	140-061-255
Mercury	Hg	140-001-805			140-051-805	140-061-805
Molybdenum	Mo	140-000-425			140-050-425	140-060-425
Nickel	Ni	140-001-285			140-051-285	140-061-285
Potassium	K	140-001-195	250-220-626	250-221-626	140-051-195	140-061-195
Selenium	Se	140-001-345			140-051-345	140-061-345
Silicon	Si	140-000-145			140-050-145	140-060-145
Silver	Ag	140-001-475			140-051-475	140-061-475
Sodium	Na	140-001-115	250-220-641	250-221-641	140-051-115	140-061-115
Strontium	Sr	140-001-385	250-220-686		140-051-385	140-061-385
Tin	Sn	140-002-505			140-052-505	140-062-505
Titanium	Ti	140-000-225			140-050-225	140-060-225
Vanadium	V	140-001-235			140-051-235	140-061-235
Zinc	Zn	140-001-305			140-051-305	140-061-305

In addition to these products, standards for ICP-AES/MS analysis are listed in our "Standards and Reagents" Catalog.

Custom Multi-Element Standards for your application are available.

Acidity, Alkalinity & pH

Standard Methods # 2310, 2320, and 4500 H^+. Acidity and alkalinity are measures of the aggregate properties of water. Acidity contributes to corrosiveness and influence chemical reaction rates, chemical speciation, and biological processes. A water sample will have either an acidity value or an alkalinity value, never both; but both are commonly reported as mg $CaCO_3$/L. The pH of a sample can impact every phase of the drinking water/wastewater cycle. In fact, the success of the treatment procedure is dependent on the proper pH being maintained at each step. pH is measured using a glass and reference electrode which have been calibrated against a buffer of known value. *Accu***SPEC** *Titrants, Buffers, and Indicators are available for every method. In addition, filling and storage solutions for combination and reference electrodes are available. The "Standards and Reagents" Catalog contains many products in addition to the ones listed below.*

Standards & Titrants	Concentration	Catalog Number		
		500 ml	1 L	5 L
Potassium Hydrogen Phthalate, $HOCOC_6H_4COOK$	0.05 N	250-305-440	250-305-441	250-305-442*
Hydrochloric Acid, HCl	0.02 N	250-030-130	250-030-131	250-030-132
Hydrochloric Acid, HCl	0.1 N	250-030-190	250-030-191	250-030-192
Sodium Carbonate, Na_2CO_3	0.05 N	250-310-480	250-310-481	250-310-482
Sodium Hydroxide, NaOH	0.02 N	250-108-130	250-108-131	250-108-132
Sodium Hydroxide, NaOH	0.1 N	250-108-220	250-108-221	250-108-222
Sodium Thiosulfate, $Na_2S_2O_3$	0.1 N	250-230-350	250-230-351	250-230-352*
Sulfuric Acid, H_2SO_4	0.02 N	250-060-100	250-060-101	250-060-102
Sulfuric Acid, H_2SO_4	0.1 N	250-060-160	250-060-161	250-060-162

* 4L in Glass

Buffer Solutions (All buffers certified at 25 ºC)	Catalog Number 500 ml	1 L	5 L
Buffer pH 4 red	250-204-501		250-204-502
Buffer pH 4 concentrate	250-204-701	250-204-702	
Buffer pH 7 yellow	250-207-501		250-207-502
Buffer pH 7 concentrate	250-207-701	250-207-702	
Buffer pH 10 blue	250-210-501		250-210-502
Buffer pH 10 concentrate	250-210-701	250-210-702	
Buffer Set (pH 4 Red, pH7 Yellow, pH 10 Blue)	250-200-000		

Indicators	Concentration	Catalog Number		
		60 ml	125 ml	500 ml
Bromcresol Green	0.1%	250-120-130	250-120-131	250-120-132
Bromcresol Green - Methyl Red (Aqueous)		250-120-140	250-120-141	250-120-142
Bromcresol Green - Methyl Red (Isopropanol)		250-120-150	250-120-151	250-120-152
Bromophenol Blue	0.1%	250-120-180	250-120-181	250-120-182
Bromophenol Blue	0.4%	250-120-190	250-120-191	250-120-192
m-Cresol Purple (Aqueous)	0.1%	250-120-260	250-120-261	250-120-262
Phenolphthalein (Ethanol 1+1)	0.5%	250-120-560	250-120-561	250-120-562

pH Electrode Solutions

Electrode Solutions	Catalog Number		
	125 ml	500 ml	1 L
Ag/AgCl Reference Electrode Fill Solution	250-180-100	250-180-101	
Dbl. Junction Electrode Inner Fill Solution	250-180-275	250-180-276	
Dbl. Junction Electrode Outer Fill Solution	250-180-285	250-180-286	
Electrode Cleaning Solution	250-180-300	250-180-301	250-180-302
Electrode Storage Solution	250-210-702	250-210-701	250-210-702
4M Potassium/Silver Chloride KCl/AgCl		250-180-475	
Saturated Potassium Chloride - KCl		250-180-450	
Ross Reference Electrode Filling Solution	250-180-500	250-180-501	
Single Junction Reference Internal Soltn.	250-180-525	250-180-526	

Hardness

Standard Method # 2340. Hardness is due to the presence of multivalent metal ions which come from minerals dissolved in water. Hardness is based on the ability of these ions to react with soap to form a precipitate. Hardness is also a very important indicator of the ability of the water to deposit 'scale' or Ca/Mg salts over time in plumbing fixtures, Therefore, the practice is to express hardness in terms of mg/L $CaCO_3$, as calculated by either titration or ICP-AES analysis.

*In addition to the routine volumes and concentrations listed below, additional Accu***SPEC** *Standards and Reagents are available in the "Standards and Reagents" Catalog.*

Reagents	Concentration	Catalog Number			
		125 ml	500 ml	1 L	5 L
Ammonium Chloride - EDTA			250-260-175	250-260-176	250-260-177
EDTA Disodium Salt	0.01 M			250-300-480	250-300-481
Sodium Hydroxide, NaOH	0.1 N		250-108-220	250-108-221	250-108-222
Calmagite Indicator	0.1%	250-120-211	250-120-212	250-120-213	
Erichrome Black T	0.5%	250-120-351	250-120-352	250-120-353	

Standards	Concentration (mg/L)	Catalog Number		
		500 ml	1 L	5 L
Water Hardness Standard as $CaCO_3$ (v.soft)	10-13	250-310-840	250-310-841	250-310-842
Water Hardness Standard as $CaCO_3$ (soft)	40-48	250-310-860	250-310-861	250-310-862
Water Hardness Standard as $CaCO_3$ (m.hard)	80-100	250-310-880	250-310-881	250-310-882
Water Hardness Standard as $CaCO_3$ (hard)	160-180	250-310-900	250-310-901	250-310-902
Water Hardness Standard as $CaCO_3$ (v.hard)	280-320	250-310-920	250-310-921	250-310-922

Conductivity

Standard Method # 2510. As the term implies, conductivity is the degree to which a water sample can carry an electric current. The magnitude of the conductivity of a sample is a function of the amount of ions present in the sample. High conductivity can be an indicator of excessive mineralization from either natural or industrial sources. The measure of conductivity is also a good "screening" test which helps determine which additional testing is required. Conductivity is measured using a conductivity cell. It is necessary to determine the "cell constant" using a conductivity standard prior to analyzing samples.

*Accu***SPEC** *Conductivity standards respond to the need for the accurate measurement of conductivity in laboratory, process, & environmental water samples. All standards are certified at 25 ºC.*

Standards (All standards certified at 25 ºC)	Conductivity µmhos/cm (µS)	Catalog Number 500 ml	1 L
Conductivity Standards (KCl)	12.9	250-160-700	250-160-701
Conductivity Standards (KCl)	500	250-160-230	250-160-231
Conductivity Standards (KCl)	1000	250-160-780	250-160-781
Conductivity Standards (KCl)	5,000	250-160-350	250-160-351
Conductivity Standards (KCl)	111,342	250-160-900	250-160-901

Total Phosphorus

Standard Method Series # 4500-P. Phosphorus is present in nature and in wastewaters as either ortho-phosphates, poly-phosphates, or organically bound phosphates. Phosphorus is an important nutrient in the biosphere. However, an excess caused by industrial or municipal discharge can result in nuisance quantities of biota (algae) being created. Due to the different forms of phosphorus, it is important to perform a "Total" digestion before analysis.

SCP SCIENCE *provides a number of products to assist in your Total Phosphorus Analysis. The Digi***PREP** *family of Digestion Systems can be utilized for the digestion procedure. A variety of Accu***SPEC** *reagents and standards are available for the various phosphate methods.*

Reagents	Concentration	Catalog Number 125 ml	500 ml	1 L	5 L
Ammonium Molybdate I			250-260-250	250-260-251	
Ammonium Molybdate II			250-260-275	250-260-276	
Ascorbic Acid Solution	8.8 %		250-010-100	250-010-101	250-010-102
Phenophthalein (aqueous)	0.5 %	250-120-551	250-120-552	250-120-553	
Phosphate Standard Solution	1000 µg/ml	250-220-595	250-220-596		
Phosphate Standard Solution	10 000 µg/ml	250-221-595	250-221-596		
Phosphate-Phosphorus Standard Solution	1000 µg/ml	250-220-610	250-220-611		
Sodium Hydroxide, NaOH	1.0 N		250-108-400	250-108-401	250-108-402
Stannous Chloride I			250-260-925		
Stannous Chloride II			250-260-950		
Sulfuric Acid, H_2SO_4	5.0 N		250-060-400	250-060-401	250-060-402
Sulfuric Acid, H_2SO_4	50% v/v		250-060-520	250-060-521	250-060-522
Vanadate-Molybdate Solution			250-260-970	250-260-971	250-260-972

Total Kjeldahl Nitrogen (TKN)

Standard Method # 4500-N_{org}. Nitrogen is a very important element in water analysis. Very different treatment methods may be required based on not only the concentration of nitrogen present, but also on the predominate species (or type) of nitrogen. Although the NO_3^-, NO_2 and NH_3 forms of nitrogen can be determined directly, the organic form must be digested or converted to a 'common' form before analysis can be undertaken. The Kjeldahl digestion converts all forms of nitrogen to ammonia nitrogen, which is then titrated against a known acid standard.

SCP SCIENCE *provides a number of products to assist in your Total Kjeldahl Analyses. In addition to Accu***SPEC** *Reagents, use the Digi***PREP HT** *Digestion System to prepare your samples for titration.*

Reagents	Concentration	Catalog Number			
		500 ml	1 L	5 L	10 L
Boric Acid w/ Methyl Red-Methylene Blue	2% w/v		250-210-745	250-210-746	250-210-747
Mercuric Sulphate Reagent		250-260-725	250-260-726		
Sodium Hydroxide	6.0 N	250-108-550	250-108-551	250-108-552	250-108-553
Sodium Hydroxide	10.0 N	250-108-580	250-108-581	250-108-582	250-190-150(20L)
Sulfuric Acid, H_2SO_4	0.02 N	250-060-100	250-060-101	250-060-102	250-060-103

*Digi***PREP HT** *Digestion System*

*Digi***PREP HT** *incorporates many state-of-the-art design features in an affordable package. A versatile heating system provides a temperature range up to 450°C. Available in two models: Digi***PREP HT 100** *with a capacity of 40 / 100 ml tubes and Digi***PREP HT 250** *with a capacity of 20 / 250 ml tubes. Choose between 2 controllers: an economical KeyPad Controller or a more versatile Touch Screen Controller. The Touch Screen Controller may store up to 10 unique methods with each method offering 3 programmable levels of "Time to temperature" and "Time at temperature". Reduce corrosive gas emissions with the optional fume scrubbing system.*

Ordering Information & Specifications

	*Digi***PREP HT 100**	*Digi***PREP HT 250**
Catalog Number	010-520-002 (230V)	010-520-022 (230V)
Capacity	40 Samples	20 samples
Tube Volume	100 ml	250 ml
Temperature (Max.)	450 °C	450 °C
Temperature Control	+/- 1 °C	+/- 1 °C
Over-Temp Protection	Yes	Yes
Heating Block	Coated Graphite	Coated Graphite
Fume Scrubber	Optional	Optional
Power	1800 W	1800 W
Size (in)	17W x 17.5D x 27H	17W x 17.5D x 27H
Size (cm)	43.5W x 44.5D x 68H	43.5W x 44.5D x 68H
Weight (lb/kg)	22/49	21/46
Certification	CSA, CE, UL	CSA, CE, UL

Systems Include:
Tube Insert Rack
Digestion Tubes
Exhaust Manifold
Viton Exhaust Hose
Water Jet

Options and Accessories

Description	Quantity	Catalog Number
Fume Scrubbing System	1	010-520-060
*Digi***PREP HT 100** Insert Rack, Extra	1	010-520-010
*Digi***PREP HT 250** Insert Rack, Extra	1	010-520-030
100 ml Digestion Tube, Extra	1	010-520-011
250 ml Digestion Tube, Extra	1	010-520-031

Performance Evaluation Standards

*pe***CHECK** Standards are cost effective, performance evaluation standards for routine analysis compliance testing. Available for mineral, nutrient, and solids testing in water/wastewater matrices to help you evaluate your lab performance. *pe***CHECK** standards are certified through a comprehensive round-robin study providing independent verification from multiple laboratories.

*pe***CHECK** *Standards offer 3 different ranges of concentration to provide the levels required. No pipetting is needed, simply dilute each standard to 1L volume. A Certificate of Analysis listing consensus values as well as confidence and tolerance intervals is included with each standard.*

Mineral Standards		Consensus Values		
		Level 1	Level 2	Level 3
Parameter	Unit	140-704-101	140-704-102	140-704-103
Conductivity	µmhos/cm	188	1980	5803
Total Hardness ($CaCO_3$)	mg/l	11.6	221	531
Total Dissolved Solids	mg/l	102	998	3051
Calcium (Ca)	mg/l	2.62	62.0	136
Potassium (K)	mg/l	8.77	164	466
Magnesium (Mg)	mg/l	1.22	15.3	45.4
Sodium (Na)	mg/l	18.1	90.9	342
Chloride (Cl)	mg/l	19.7	95.7	430
Fluoride (F)	mg/l	0.50	4.20	12.3
Sulfate (SO_4)	mg/l	8.41	150	397

Nutrient Standards		Consensus Values		
		Level 1	Level 2	Level 3
Parameter	Unit	140-701-101	140-701-102	140-701-103
Ammonia (as N)	mg/l	0.97	8.59	14.7
Nitrate (as N)	mg/l	1.40	13.3	26.5
O-Phosphate (as P)	mg/l	0.74	4.42	9.33
Total Kjeldahl Nitrogen	mg/l	1.04	20.2	45.3
Total Phosphorus (as P)	mg/l	0.79	4.64	9.76

Solids Standards		Consensus Values		
		Level 1	Level 2	Level 3
Parameter	Unit	140-702-101	140-702-102	140-702-103
Suspended Solids	mg/l	238	380	1928
Dissolved Solids	mg/l	33.0	44.8	46.0
Total Solids	mg/l	254	400	1970

A sample of the detailed Certificate of Analysis is available in our "Standards and Reagents" Catalog.

*Enviro***MAT**

Certified Reference Materials

*Enviro***MAT** Certified Reference Materials can be invaluable components of any laboratory quality control program. Consensus certification removes any chance of analytical bias. A wide range of matrices are available.

Each CRM is certified through a round-robin study for specific methods of analysis allowing independent verification from multiple laboratories. Complete documentation is available for audit purposes including a Certificate of Analysis listing consensus values, confidence and tolerance intervals, together wih complete instructions for use. Each **SCP SCIENCE** CRM *is priced economically making it affordable for long term in-house QC studies.*

MAT Standards	Quantity	Catalog Number
Soil, Contaminated, SS-1	100 g	140-025-001
Soil, Contaminated, SS-2	100 g	140-025-002
Sludge, Sewage, BE-1	50 g	140-025-011
Water, Drinking, Low Level, Concentrate, EP-L-1	250 ml	140-025-031
Water, Drinking, High Level, Concentrate, EP-H-1	250 ml	140-025-032
Water, Drinking, High & Low Set	250 ml	140-025-030
Water, Ground, Low Level, Concentrate, ES-L-1	250 ml	140-025-034
Water, Ground, High Level, Concentrate, ES-H-1	250 ml	140-025-035
Water, Ground, High & Low Set	250 ml	140-025-033
Water, Waste, Low Level, Concentrate, EU-L-1	250 ml	140-025-037
Water, Waste, High Level, Concentrate, EU-H-1	250 ml	140-025-038
Water, Waste, High & Low Set	250 ml	140-025-036
Oil, Used, HU-1	125 ml	140-025-041

*Digi***PREP HP**

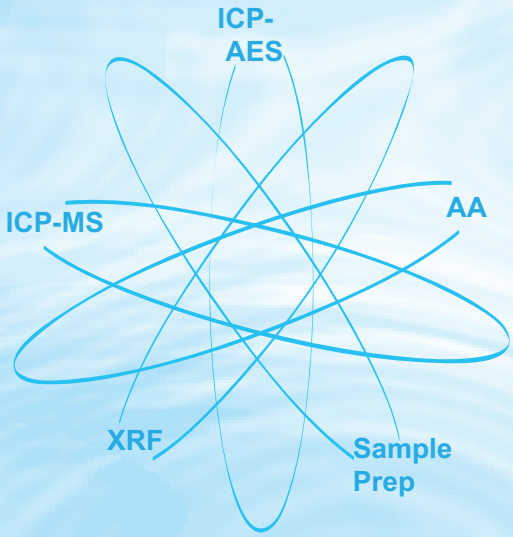
*Digi***PREP HP** *design eliminates "hot spots" from the heating surface. The system incorporates a custom software package that guarantees consistent heating across the entire surface area. The system operates with the Digi***PREP** *KeyPad or Touch Screen Controller.*

Teflon Coated Graphite Block
resists aggresive corrosive attack guaranteed for long life

Plus
Add a *Digi***PROBE** to provide direct control and monitoring of actual sample temperature

Ordering Information & Specifications

Catalog Number	010-505-030 (115V/230V)	**Heating Block**	Teflon Coated Graphite
Temperature	Ambient - 180 ˚C	**Stability**	+/- 0.5 ˚C
Uniformity	+/- 1.0 ˚C	**Power**	925W
Over-Temp Protection	yes	**Size - Block**	19"W x 15"D x 3"H
Time to Temperature	25 min. Ambient to 95 ˚C	**Certification**	CE/UL/CSA
Heating Surface Area	214 sq. in.		



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