

# Contract Laboratory Program (CLP) for ICP



## Calibration Check Standards

### Calibration Standard #1

CLP-CAL-01-1 100 mL  
4 components in 5% HNO<sub>3</sub>

Element	µg/mL	λ (nm)
Ca (Calcium)	5000	317.933
Mg (Magnesium)	5000	279.553
K (Potassium)	5000	766.490
Na (Sodium)	5000	589.592

### Calibration Standard #2

CLP-CAL-02-1 100 mL  
5 components in 5% HNO<sub>3</sub>

Element	µg/mL	λ (nm)
Cr (Chromium)	100	205.552
Mn (Manganese)	150	257.610
Ni (Nickel)	400	231.604
Ag (Silver)	100	328.068
Zn (Zinc)	200	213.856

### Calibration Standard #3

CLP-CAL-03-1 100 mL  
7 components in 5% HNO<sub>3</sub>

Element	µg/mL	λ (nm)
Al (Aluminium)	2000	396.152
Ba (Barium)	2000	233.527
Be (Beryllium)	50	313.042
Co (Cobalt)	500	228.616
Cu (Copper)	250	324.754
Fe (Iron)	1000	259.940
V (Vanadium)	500	292.402

### Calibration Standard #4

CLP-CAL-04-1 100 mL  
5 components in 5% HNO<sub>3</sub>

Element	µg/mL	λ (nm)
As (Arsenic)	100	189.042
Cd (Cadmium)	50	214.438
Pb (Lead)	50	220.353
Se (Selenium)	50	196.090
Tl (Thallium)	100	351.924

### Calibration Standard #5

CLP-CAL-05-1 100 mL  
1 component in 2% HNO<sub>3</sub>

Element	µg/mL	λ (nm)
Sb (Antimony)	600	217.581

### Calibration Standard #6

CLP-CAL-06-1 100 mL  
1 component in 5% HNO<sub>3</sub>

Element	µg/mL	λ (nm)
Hg (Mercury)	100	194.232

### Calibration Standard #7

CLP-CAL-07-1 \* 100 mL  
3 components in H<sub>2</sub>O tr. HF

Element	µg/mL	λ (nm)
B (Boron)	500	249.773
Mo (Molybdenum)	500	202.030
Si (Silicon)	500	251.611

CLP

### Set of 7 Calibration Standards

CLP-CAL-1-SET	7 x 100 mL
CLP-CAL-01	CLP-CAL-05
CLP-CAL-02	CLP-CAL-06
CLP-CAL-03	CLP-CAL-07
CLP-CAL-04	

## Calibration and Matrix Blanks

### Nitric Acid Blank

CLP-BLN-5 500 mL  
CLP-BLN-L-SET L (2 x 500 mL)

5% HNO<sub>3</sub> in ASTM Type I Water

### Water Blank

CLP-BLW-5 \* 500 mL  
CLP-BLW-L-SET \* L (2 x 500 mL)

ASTM Type I Water

### Hydrochloric Acid Blank

CLP-BLH-5 500 mL  
CLP-BLH-L-SET L (2 x 500 mL)

5% HCl in ASTM Type I Water

### Mixed Acid Blank

CLP-BLMA-5 500 mL  
CLP-BLMA-L-SET L (2 x 500 mL)

5% HCl + 1% HNO<sub>3</sub> in ASTM Type I Water



## Custom Standards

When you have a need for unique Analytical Standards, let the experts at AccuStandard assist in designing your formulation. Our technical group, with over 80 years of combined analytical experience, will review your request, suggest the most economical and stable formulation, and provide pricing all within 24 hours.

For a Quick Quote, copy the custom quote form in the back of catalog and fax it back. We will get right back to you.

Plus we typically ship within one week after order receipt.





# Contract Laboratory Program (CLP) for ICP

## Verification Standards

### Initial Calibration Verification

CLP-ICV-01-1	100 mL		
CLP-ICV-01-5	500 mL		
22 components in 5% HNO <sub>3</sub>			
Element	µg/mL	λ (nm)	
Al (Aluminum)	200	396.152	
Sb (Antimony)	60	217.581	
As (Arsenic)	10	189.042	
Ba (Barium)	200	233.527	
Be (Beryllium)	5	313.042	
Cd (Cadmium)	5	214.438	
Ca (Calcium)	5000	317.933	
Cr (Chromium)	10	205.552	
Co (Cobalt)	50	228.616	
Cu (Copper)	25	324.754	
Fe (Iron)	100	259.940	
Pb (Lead)	5	220.353	
Mg (Magnesium)	5000	297.553	
Mn (Manganese)	15	257.610	
Ni (Nickel)	40	231.604	
K (Potassium)	5000	766.490	
Se (Selenium)	5	196.090	
Ag (Silver)	10	328.068	
Na (Sodium)	5000	589.592	
Tl (Thallium)	10	351.924	
V (Vanadium)	50	292.402	
Zn (Zinc)	20	213.856	

### Initial Calibration Verification

CLP-ICV-01-R-1	100 mL		
CLP-ICV-01-R-5	500 mL		
22 components in 5% HNO <sub>3</sub>			
Element	µg/mL	λ (nm)	
Al (Aluminum)	200	396.152	
Sb (Antimony)	60	217.581	
As (Arsenic)	10	189.042	
Ba (Barium)	200	233.527	
Be (Beryllium)	5	313.042	
Cd (Cadmium)	5	214.438	
Ca (Calcium)	500	317.933	
Cr (Chromium)	10	205.552	
Co (Cobalt)	50	228.616	
Cu (Copper)	25	324.754	
Fe (Iron)	100	259.940	
Pb (Lead)	5	220.353	
Mg (Magnesium)	500	297.553	
Mn (Manganese)	15	257.610	
Ni (Nickel)	40	231.604	
K (Potassium)	500	766.490	
Se (Selenium)	5	196.090	
Ag (Silver)	10	328.068	
Na (Sodium)	500	589.592	
Tl (Thallium)	10	351.924	
V (Vanadium)	50	292.402	
Zn (Zinc)	20	213.856	

### Continuing Calibration Verification

(Meets CLP QA Second Source Requirements)		
CLP-CCV-01-1	100 mL	
CLP-CCV-01-5	500 mL	
16 components in 5% HNO <sub>3</sub>		
Element	µg/mL	λ (nm)
Al (Aluminum)	1000	396.152
Ba (Barium)	1000	233.527
Be (Beryllium)	25	313.042
Ca (Calcium)	2500	317.933
Cr (Chromium)	50	205.552
Co (Cobalt)	250	228.616
Cu (Copper)	125	324.754
Fe (Iron)	500	259.940
Mg (Magnesium)	2500	297.553
Mn (Manganese)	75	257.610
Ni (Nickel)	200	231.604
K (Potassium)	2500	766.490
Ag (Silver)	50	328.068
Na (Sodium)	2500	589.592
V (Vanadium)	250	292.402
Zn (Zinc)	100	213.856

CLP

### Complete Verification Set: Initial & Continuing Calibration

CLP-VER-1-SET	4 x 100 mL
CLP-ICV-01-1	CLP-CCV-02-1
CLP-CCV-01-1	CLP-CCV-03-1

  

CLP-VER-5-SET	4 x 500 mL
CLP-ICV-01-5	CLP-CCV-02-5
CLP-CCV-01-5	CLP-CCV-03-5

### Technical Note

CLP-ICV-01-R has the Ca, Mg, K & Na at 1/10 the concentration of CLP-ICV-01. This improves plasma robustness and often results in superior recoveries.

### Revised Verification Set: Initial & Continuing Calibration

CLP-VER-R-1-SET	4 x 100 mL
CLP-ICV-01-R-1	CLP-CCV-02-1
CLP-CCV-01-1	CLP-CCV-03-1

  

CLP-VER-R-5-SET	4 x 500 mL
CLP-ICV-01-R-5	CLP-CCV-02-5
CLP-CCV-01-5	CLP-CCV-03-5

### CLP-CCV-02-1

CLP-CCV-02-5	100 mL
5 components in 5% HNO <sub>3</sub>	
Element	µg/mL
As (Arsenic)	50
Cd (Cadmium)	25
Pb (Lead)	25
Se (Selenium)	25
Tl (Thallium)	50

### CLP-CCV-03-1

CLP-CCV-03-5	100 mL
1 component in 2% HNO <sub>3</sub>	
Element	µg/mL
Sb (Antimony)	300

### Continuing Calibration Verification Standards Sets

CLP-CCV-1-SET	3 x 100 mL
CLP-CCV-01-1	CLP-CCV-03-1
CLP-CCV-02-1	

  

CLP-CCV-5-SET	3 x 500 mL
CLP-CCV-01-5	CLP-CCV-03-5
CLP-CCV-02-5	

## Spiking Standards

### Spiking Solution

CLP-SPS-01-1	100 mL		
18 components in 5% HNO <sub>3</sub>			
Element	µg/mL	λ (nm)	
Al (Aluminum)	200	396.152	
Sb (Antimony)	50	217.581	
As (Arsenic)	200	189.042	
Ba (Barium)	200	233.527	
Be (Beryllium)	5	313.042	
Cd (Cadmium)	5	214.438	
Cr (Chromium)	20	205.552	
Co (Cobalt)	50	228.616	
Cu (Copper)	25	324.754	
Fe (Iron)	100	259.940	
Pb (Lead)	50	220.353	
Mn (Manganese)	50	257.610	
Ni (Nickel)	50	231.604	
Se (Selenium)	200	196.090	
Ag (Silver)	5	328.068	
Tl (Thallium)	200	351.924	
V (Vanadium)	50	292.402	
Zn (Zinc)	50	213.856	

### CLP Soil Spiking Solution

CLP-SPS-02-1	100 mL		
16 components in 5% HNO <sub>3</sub>			
Element	µg/mL	λ (nm)	
Sb (Antimony)	100	217.581	
As (Arsenic)	400	189.042	
Ba (Barium)	400	233.527	
Be (Beryllium)	10	313.042	
Cd (Cadmium)	10	214.438	
Cr (Chromium)	40	205.552	
Co (Cobalt)	100	228.616	
Cu (Copper)	50	324.754	
Pb (Lead)	100	220.353	
Mn (Manganese)	100	257.610	
Ni (Nickel)	100	231.604	
Se (Selenium)	400	196.090	
Ag (Silver)	10	328.068	
Tl (Thallium)	400	351.924	
V (Vanadium)	100	292.402	
Zn (Zinc)	100	213.856	

### Technical Note

Spiking solution CLP-SPS-01 can be used for both aqueous and solid samples. An additional spiking solution for soil as outlined in CLP SOW ILM03.0 is also available, CLP-SPS-02.

### CLP Spiking Set

CLP-SPS-1-SET	2 x 100 mL
CLP-SPS-01-1	
CLP-SPS-02-1	

# Contract Laboratory Program (CLP) for ICP



CLP

## Detection Limit Standards

Contract Required Detection Limits (CRDL) Standard Solutions. We offer the flexibility of two convenient solutions:

### CLP Detection Limits Standard #1

Element	µg/mL	λ (nm)
Sb ( <i>Antimony</i> )	120	217.581
As ( <i>Arsenic</i> )	120	189.042
Be ( <i>Beryllium</i> )	10	313.042
Cd ( <i>Cadmium</i> )	10	214.438
Cr ( <i>Chromium</i> )	20	205.552
Co ( <i>Cobalt</i> )	100	228.616
Cu ( <i>Copper</i> )	50	324.754
Pb ( <i>Lead</i> )	120	220.353
Mn ( <i>Manganese</i> )	30	257.610
Ni ( <i>Nickel</i> )	80	231.604
Se ( <i>Selenium</i> )	120	196.090
Ag ( <i>Silver</i> )	20	328.068
Tl ( <i>Thallium</i> )	120	351.924
V ( <i>Vanadium</i> )	100	292.402
Zn ( <i>Zinc</i> )	40	213.856

### CLP Detection Limits Standard #2

Element	µg/mL	λ (nm)
Sb ( <i>Antimony</i> )	120	217.581
As ( <i>Arsenic</i> )	20	189.042
Be ( <i>Beryllium</i> )	10	313.042
Cd ( <i>Cadmium</i> )	10	214.438
Cr ( <i>Chromium</i> )	20	205.552
Co ( <i>Cobalt</i> )	100	228.616
Cu ( <i>Copper</i> )	50	324.754
Pb ( <i>Lead</i> )	6	220.353
Mn ( <i>Manganese</i> )	30	257.610
Ni ( <i>Nickel</i> )	80	231.604
Se ( <i>Selenium</i> )	10	196.090
Ag ( <i>Silver</i> )	20	328.068
Tl ( <i>Thallium</i> )	20	351.924
V ( <i>Vanadium</i> )	100	292.402
Zn ( <i>Zinc</i> )	40	213.856

### Contract Required Detection Limits (CRDL) Set

CLP-CRDL-1-SET	2 x 100 mL
CLP-CRDL-01	
CLP-CRDL-02	



#### Technical Note

Prepared to meet the requirements of the CLP protocol; Arsenic (As), Lead (Pb), Selenium (Se) and Thallium (Tl) are at a concentration of two times the instrument detection limit (IDL) while the remaining elements are at two times the CRDL.

#### Technical Note

Designed for ICPs equipped with ultrasonic nebulizers and offers the elements of interest at two times the CRDL level.

## Interference Check & Analyte Solutions

The common interferences checked for by CLP requirements and their associated analytes are listed in our primary interferent analyte solutions. Occasionally, additional interferences may cause other analytical problems according to CLP SOW ILM03.0. These additional six elements are available with their respective analytes in the alternate interferent/analyte solutions.

### Primary Analytes

Element	µg/mL	λ (nm)
Ag ( <i>Silver</i> )	100	328.068
Ba ( <i>Barium</i> )	50	233.527
Be ( <i>Beryllium</i> )	50	313.042
Cd ( <i>Cadmium</i> )	100	214.438
Co ( <i>Cobalt</i> )	50	228.616
Cr ( <i>Chromium</i> )	50	205.552
Cu ( <i>Copper</i> )	50	324.754
Mn ( <i>Manganese</i> )	50	257.610
Ni ( <i>Nickel</i> )	100	231.604
Pb ( <i>Lead</i> )	100	220.353
V ( <i>Vanadium</i> )	50	292.402
Zn ( <i>Zinc</i> )	100	213.856

### Alternate Interferents

Element	µg/mL	λ (nm)
Cr ( <i>Chromium</i> )	1000	205.552
Cu ( <i>Copper</i> )	1000	324.754
Mn ( <i>Manganese</i> )	1000	257.610
Ni ( <i>Nickel</i> )	1000	231.604
Ti ( <i>Titanium</i> )	1000	334.941
V ( <i>Vanadium</i> )	1000	292.402

### Alternate Analytes

Element	µg/mL	λ (nm)
Al ( <i>Aluminum</i> )	100	396.152
Sb ( <i>Antimony</i> )	100	217.581
As ( <i>Arsenic</i> )	100	189.042
B ( <i>Boron</i> )	100	249.773
Ca ( <i>Calcium</i> )	10	317.933
Fe ( <i>Iron</i> )	10	259.940
Mg ( <i>Magnesium</i> )	10	297.553
Mo ( <i>Molybdenum</i> )	100	202.030
Se ( <i>Selenium</i> )	100	196.090
Si ( <i>Silicon</i> )	10	251.611
Na ( <i>Sodium</i> )	100	589.592
Tl ( <i>Thallium</i> )	100	351.924

### Primary Interferents

Element	µg/mL	λ (nm)
Al ( <i>Aluminum</i> )	5000	396.152
Ca ( <i>Calcium</i> )	5000	317.933
Fe ( <i>Iron</i> )	2000	259.940
Mg ( <i>Magnesium</i> )	5000	297.553

### Interferent / Analyte Sets

CLP-IA-1-SET	4 x 100 mL	CLP-IA-5-SET	4 x 500 mL
CLP-PIN-01-1	CLP-PIN-02-1	CLP-PIN-01-5	CLP-PIN-02-5
CLP-PAN-01-1	CLP-PAN-02-1	CLP-PAN-01-5	CLP-PAN-02-5

These products require a Hazardous Shipping Fee except products marked with an asterisk \*



# Contract Laboratory Program (CLP) for ICP

## Multi-Element Graphite Furnace AA Calibration & Spiking Standards

### GFAA Instrument Calibration Standard

CLP-CAL-AA		
6 components in 5% HNO <sub>3</sub>		
	50 mL	
Element	µg/mL	λ (nm)
Sb ( <i>Antimony</i> )	100	217.581
As ( <i>Arsenic</i> )	50	189.042
Cd ( <i>Cadmium</i> )	10	214.438
Pb ( <i>Lead</i> )	50	220.353
Se ( <i>Selenium</i> )	100	196.090
Tl ( <i>Thallium</i> )	50	351.924

### GFAA Predigestion Spike Solution

CLP-SP1-AA		
6 components in 5% HNO <sub>3</sub>		
	50 mL	
Element	µg/mL	λ (nm)
Sb ( <i>Antimony</i> )	100	217.581
As ( <i>Arsenic</i> )	40	189.042
Cd ( <i>Cadmium</i> )	5	214.438
Pb ( <i>Lead</i> )	20	220.353
Se ( <i>Selenium</i> )	10	196.090
Tl ( <i>Thallium</i> )	50	351.924

### GFAA Initial Calibration Verification (Meets CLP Second Source Requirements)

CLP-ICV-AA		
6 components in 5% HNO <sub>3</sub>		
	50 mL	
Element	µg/mL	λ (nm)
Sb ( <i>Antimony</i> )	50	217.581
As ( <i>Arsenic</i> )	25	189.042
Cd ( <i>Cadmium</i> )	5	214.438
Pb ( <i>Lead</i> )	25	220.353
Se ( <i>Selenium</i> )	50	196.090
Tl ( <i>Thallium</i> )	25	351.924

### GFAA Mercury Standard for Calibration or Spiking

CLP-HG-AA		
1 component in 5% HNO <sub>3</sub>		
	50 mL	
Element	µg/mL	λ (nm)
Hg ( <i>Mercury</i> )	100	194.232

### GFAA Postdigestion Spike Solution (2 x CRDL except for Lead)

CLP-SP2-AA		
6 component in 5% HNO <sub>3</sub>		
	50 mL	
Element	µg/mL	λ (nm)
Sb ( <i>Antimony</i> )	120	217.581
As ( <i>Arsenic</i> )	20	189.042
Cd ( <i>Cadmium</i> )	10	214.438
Pb ( <i>Lead</i> )	20	220.353
Se ( <i>Selenium</i> )	10	196.090
Tl ( <i>Thallium</i> )	20	351.924

### GFAA Set

CLP-AA-SET		5 x 50 mL
CLP-CAL-AA	CLP-HG-AA	
CLP-SPI-AA	CLP-SP2-AA	
CLP-ICV-AA		

## CLP Complete Sets

All our CLP Solutions are available in One Convenient Cost Saving Kit

### Contract Laboratory Standards Available in Sets or One Complete Kit

CLP-KIT	6 CLP Sets listed below 24 standard solutions
CLP-CAL-1-SET	7 x 100 mL (contains CLP-CAL-01, 02, 03, 04, 05, 06, 07)
CLP-VER-1-SET	4 x 100 mL (contains CLP-ICV-01, CLP-CCV-01, 02, 03)
CLP-CRDL-1-SET	2 x 100 mL (contains CLP-CRDL-01, 02)
CLP-IA-1-SET	4 x 100 mL (contains CLP-PIN-01, 02, & CLP-PAN-01, 02)
CLP-SPS-1-SET	2 x 100 mL (contains CLP-SPS-01, 02)
CLP-AA-SET	5 x 50 mL (contains CLP-CAL-AA, CLP-ICV-AA, CLP-SPI-AA, CLP-SP2-AA, & CLP-HG-AA)

You can customize a kit to your lab's specific needs for comparable savings. Call our Technical Service Dept. for more information.



These products require a Hazardous Shipping Fee except products marked with an asterisk \*

CLP-AA-SET:32  
CLP-BLH-5:29  
CLP-BLH-L-SET:29  
CLP-BLMA-5:29  
CLP-BLMA-L-SET:29  
CLP-BLN-5:29  
CLP-BLN-L-SET:29  
CLP-BLW-5:29  
CLP-BLW-L-SET:29  
CLP-CAL-01-1:29  
CLP-CAL-02-1:29  
CLP-CAL-03-1:29  
CLP-CAL-04-1:29  
CLP-CAL-04-5:29  
CLP-CAL-05-1:29  
CLP-CAL-05-5:29  
CLP-CAL-06-1:29  
CLP-CAL-06-5:29  
CLP-CAL-07-1:29  
CLP-CAL-1-SET:29, 32  
CLP-CAL-AA:32  
CLP-CCV-01-1:30  
CLP-CCV-01-5:30  
CLP-CCV-02-1:30  
CLP-CCV-02-5:30  
CLP-CCV-03-1:30  
CLP-CCV-03-5:30  
CLP-CCV-1-SET:30  
CLP-CCV-5-SET:30  
CLP-CRDL-01-1:31  
CLP-CRDL-02-1:31  
CLP-CRDL-1-SET:31, 32  
CLP-HG-AA:32  
CLP-IA-1-SET:31, 32  
CLP-IA-5-SET:31  
CLP-ICV-01-1:30  
CLP-ICV-01-5:30  
CLP-ICV-01-R-1:30  
CLP-ICV-01-R-5:30  
CLP-ICV-AA:32  
CLP-KIT:32  
CLP-PAN-01-1:31  
CLP-PAN-01-5:31  
CLP-PAN-02-1:31  
CLP-PAN-02-5:31  
CLP-PIN-01-1:31  
CLP-PIN-01-5:31  
CLP-PIN-02-1:31  
CLP-PIN-02-5:31  
CLP-SP1-AA:32  
CLP-SP2-AA:32  
CLP-SPS-01-1:30  
CLP-SPS-02-1:30  
CLP-SPS-1-SET:30, 32  
CLP-VER-1-SET:30, 32  
CLP-VER-5-SET:30  
CLP-VER-R-1-SET:30  
CLP-VER-R-5-SET:30