SELECT YOUR AA HOLLOW CATHODE LAMP BY ELEMENT

COLOR CODE LEGEND

FLAME TYPE

- Air/Acetylene
- N_2O/Acetylene
- Not detectable by AA

SPECTROSCOPY TECHNIQUE

FAAS	Flame Atomic Absorption Spectroscopy	MP	MP-AES
GFAA	Graphite Furnace Atomic Absorption Spectroscopy	ES	ICP-OES
VGA	Vapor Generation Atomic Absorption Spectroscopy	MS	ICP-MS

♦ Multi-Element Lamp (See ordering table on right)

1 H 1.008 hydrogen — MS																2 He 4.003 helium	
3 Li 6.941 lithium — Coded 5610103000; Uncoded 5610124900 — FAAS, GFAA, ES, MS	4 Be 9.012 beryllium — Coded 5610100500; Uncoded 5610122400 — FAAS, GFAA, MP, ES, MS											5 B 10.81 boron — Coded 5610100700; Uncoded 5610122600; UltrAA 5610135700 — FAAS, GFAA, MP, ES, MS	6 C 12.01 carbon — ES, MS	7 N 14.01 nitrogen — ES, MS	8 O 16.00 oxygen — MS	9 F 19.00 fluorine — MS	10 Ne 20.18 neon — MS
11 Na 22.99 sodium ♦ — Coded 5610105300; Uncoded 5610127300 — FAAS, GFAA, MP, ES, MS	12 Mg 24.31 magnesium ♦ — Coded 5610103200; Uncoded 5610125100 — FAAS, GFAA, MP, ES, MS											13 Al 26.98 aluminium ♦ — Coded 5610100100; Uncoded 5610122000 — FAAS, GFAA, MP, ES, MS	14 Si 28.09 silicon ♦ — Coded 5610105100; Uncoded 5610127100; UltrAA 5610133400 — FAAS, GFAA, MP, ES, MS	15 P 30.97 phosphorus — Coded 5610107700; Uncoded 5610126000 — FAAS, GFAA, MP, ES, MS	16 S 32.07 sulfur — MP, ES, MS	17 Cl 35.45 chlorine — ES, MS	18 Ar 39.95 argon — MS
19 K 39.10 potassium ♦ — Coded 5610104200; Uncoded 5610126200 — FAAS, GFAA, MP, ES, MS	20 Ca 40.08 calcium ♦ — Coded 5610101000; Uncoded 5610122900 — FAAS, GFAA, MP, ES, MS	21 Sc 44.96 scandium — Uncoded 5610126900 — FAAS, GFAA, MP, ES, MS	22 Ti 47.88 titanium — Coded 5610106200; Uncoded 5610128200 — FAAS, GFAA, MP, ES, MS	23 V 50.94 vanadium — Coded 5610106500; Uncoded 5610128500 — FAAS, GFAA, MP, ES, MS	24 Cr 52.00 chromium ♦ — Coded 5610101200; Uncoded 5610123100 — FAAS, GFAA, MP, ES, MS	25 Mn 54.94 manganese ♦ — Coded 5610103300; Uncoded 5610125200; UltrAA 5610133700 — FAAS, GFAA, MP, ES, MS	26 Fe 55.85 iron ♦ — Coded 5610102700; Uncoded 5610124600; UltrAA 5610108600 — FAAS, GFAA, MP, ES, MS	27 Co 58.93 cobalt ♦ — Coded 5610101300; Uncoded 5610123200; UltrAA 5610134100 — FAAS, GFAA, MP, ES, MS	28 Ni 58.69 nickel ♦ — Coded 5610103700; Uncoded 5610125600; UltrAA 5610108500 — FAAS, GFAA, MP, ES, MS	29 Cu 63.55 copper ♦ — Coded 5610101400; Uncoded 5610123300; UltrAA 5610109100 — FAAS, GFAA, MP, ES, MS	30 Zn 65.39 zinc ♦ — Coded 5610106800; Uncoded 5610128800 — FAAS, GFAA, MP, ES, MS	31 Ga 69.72 gallium — Uncoded 5610123800 — FAAS, GFAA, MP, ES, MS	32 Ge 72.64 germanium — Uncoded 5610123900; UltrAA 5610134300 — FAAS, GFAA, MP, ES, MS	33 As 74.92 arsenic ♦ — Coded 5610100300; Uncoded 5610122200; UltrAA 5610108100 — FAAS, GFAA, MP, ES, MS, VGA	34 Se 78.96 selenium ♦ — Coded 5610105000; Uncoded 5610127000; UltrAA 5610108300 — FAAS, GFAA, MP, ES, MS, VGA	35 Br 79.90 bromine — ES, MS	36 Kr 83.80 krypton — MS
37 Rb 85.47 rubidium — Uncoded 5610126600 — FAAS, GFAA, MP, ES, MS	38 Sr 87.62 strontium — Coded 5610105400; Uncoded 5610127400 — FAAS, GFAA, MP, ES, MS	39 Y 88.91 yttrium — Uncoded 5610128700 — FAAS, GFAA, MP, ES, MS	40 Zr 91.22 zirconium — Coded 5610106900; Uncoded 5610128900 — FAAS, GFAA, MP, ES, MS	41 Nb 92.91 niobium — Coded 5610103800; Uncoded 5610125700 — FAAS, GFAA, MP, ES, MS	42 Mo 95.94 molybdenum ♦ — Coded 5610103500; Uncoded 5610125400 — FAAS, GFAA, MP, ES, MS	43 Tc 9 technetium — MS	44 Ru 101.1 ruthenium — Uncoded 5610126700 — FAAS, GFAA, MP, ES, MS	45 Rh 102.9 rhodium — Coded 5610104500; Uncoded 5610126500 — FAAS, GFAA, MP, ES, MS	46 Pd 106.4 palladium — Coded 5610104000; Uncoded 5610125900; UltrAA 5610135800 — FAAS, GFAA, MP, ES, MS	47 Ag 107.9 silver ♦ — Coded 5610105200; Uncoded 5610127200 — FAAS, GFAA, MP, ES, MS	48 Cd 112.4 cadmium ♦ — Coded 5610100800; Uncoded 5610122700 — FAAS, GFAA, MP, ES, MS	49 In 114.8 indium — Uncoded 5610124400 — FAAS, GFAA, MP, ES, MS	50 Sn 118.7 tin — Coded 5610106100; Uncoded 5610128100; UltrAA 5610133900 — FAAS, GFAA, MP, ES, MS, VGA	51 Sb 121.8 antimony — Coded 5610100200; Uncoded 5610122100; UltrAA 5610108000 — FAAS, GFAA, MP, ES, MS, VGA	52 Te 127.6 tellurium — Coded 5610105600; Uncoded 5610127600; UltrAA 5610134000 — FAAS, GFAA, MP, ES, MS, VGA	53 I 126.9 iodine — ES, MS	54 Xe 131.3 xenon — MS
55 Cs 132.9 cesium — Uncoded 5610122800 — FAAS, GFAA, MP, ES, MS	56 Ba 137.3 barium — Coded 5610100400; Uncoded 5610122300 — FAAS, GFAA, MP, ES, MS	71 Lu 175.0 lutetium — FAAS, GFAA, MP, ES, MS	72 Hf 178.5 hafnium — Coded 5610102200; Uncoded 5610124100 — FAAS, GFAA, MP, ES, MS	73 Ta 180.9 tantalum — Coded 5610105500; Uncoded 5610127500 — FAAS, GFAA, MP, ES, MS	74 W 183.8 tungsten — Coded 5610106300; Uncoded 5610128300 — FAAS, GFAA, MP, ES, MS	75 Re 186.2 rhenium — Coded 5610104400; Uncoded 5610126400 — FAAS, GFAA, MP, ES, MS	76 Os 190.2 osmium — FAAS, GFAA, MP, ES, MS	77 Ir 192.2 iridium — Coded 5610102600; Uncoded 5610124500 — FAAS, GFAA, MP, ES, MS	78 Pt 195.1 platinum — Coded 5610104100; Uncoded 5610126100; UltrAA 5610135900 — FAAS, GFAA, MP, ES, MS	79 Au 197.0 gold — Coded 5610102100; Uncoded 5610124000; UltrAA 5610109000 — FAAS, GFAA, MP, ES, MS	80 Hg 200.6 mercury — Coded 5610103400; Uncoded 5610125300 — FAAS, GFAA, MP, ES, MS, VGA	81 Tl 204.4 thallium — Coded 5610105800; Uncoded 5610127800; UltrAA 5610108400 — FAAS, GFAA, MP, ES, MS	82 Pb 207.2 lead ♦ — Coded 5610102900; Uncoded 5610124800; UltrAA 5610108200 — FAAS, GFAA, MP, ES, MS, VGA	83 Bi 209.0 bismuth — Coded 5610100600; Uncoded 5610122500; UltrAA 5610134200 — FAAS, GFAA, MP, ES, MS, VGA	84 Po (210) polonium — MS	85 At (210) astatine — MS	86 Rn (222) radon — MS
87 Fr francium — MS	88 Ra radium — MS	103 Lr lawrencium	104 Rf rutherfordium	105 Db dubnium	106 Sg seaborgium	107 Bh bohrium	108 Hs hassium	109 Mt meitnerium	110 Ds darmstadtium	111 Rg roentgenium	112 Cn copernicium	113 Uut ununtrium	114 Fl flerovium	115 Uup ununpentium	116 Lv livermorium	117 Uus ununseptium (294)	118 Uuo ununoctium (294)

57 La 138.9 lanthanum — Uncoded 5610124700 — FAAS, GFAA, MP, ES, MS	58 Ce 140.1 cerium — Coded 5610101100; Uncoded 5610123000 — FAAS, GFAA, MP, ES, MS	59 Pr 140.9 praseodymium — FAAS, GFAA, MP, ES, MS	60 Nd 144.2 neodymium — Coded 5610103600; Uncoded 5610125500 — FAAS, GFAA, MP, ES, MS	61 Pm promethium	62 Sm 150.4 samarium — Uncoded 5610126800 — FAAS, GFAA, MP, ES, MS	63 Eu 152.0 europium — Uncoded 5610123600 — FAAS, GFAA, MP, ES, MS	64 Gd 157.3 gadolinium — Uncoded 5610123700 — FAAS, GFAA, MP, ES, MS	65 Tb 158.9 terbium — FAAS, GFAA, MP, ES, MS	66 Dy 162.5 dysprosium — FAAS, GFAA, MP, ES, MS	67 Ho 164.9 holmium — FAAS, GFAA, MP, ES, MS	68 Er 167.3 erbium — FAAS, GFAA, MP, ES, MS	69 Tm 168.9 thulium — FAAS, GFAA, MP, ES, MS	70 Yb 173.0 ytterbium — FAAS, GFAA, MP, ES, MS	71 Lu 175.0 lutetium — FAAS, GFAA, MP, ES, MS
89 Ac actinium — MS	90 Th thorium — MP, ES, MS	91 Pa protactinium	92 U uranium — MP, ES, MS	93 Np neptunium	94 Pu plutonium	95 Am americium	96 Cm curium	97 Bk berkelium	98 Cf californium	99 Es einsteinium	100 Fm fermium	101 Md mendelevium	102 No nobelium	103 Lr lawrencium

To order your AA hollow cathode lamps, visit www.agilent.com/chem/aalamps
To find a local Agilent representative, go to www.agilent.com/chem/contactus

ORDERING INFORMATION

WHAT MAKES AGILENT LAMPS DIFFERENT?

- **Optimum performance:** Proprietary cathode composition and unique lamp processing procedures ensure best long-term intensity, sensitivity, and stability.
- **Longer service life:** Typical lifetime for Agilent lamps exceeds 5,000 mA hours for a lower cost of ownership.
- **Better stability:** Agilent lamps feature an active "getter" spot that prolongs lamp life and improves stability.
- **High sensitivity:** Our proprietary cathode composition and optimized operating parameters deliver the best S/N performance extending detection capabilities, even at trace levels.
- **Lamps work right out of the box:** Prior to shipment, every Agilent lamp is analytically tested and conditioned to ensure that it meets demanding standards for intensity, noise, and stability.

Lamp selection guidelines

Coded lamps

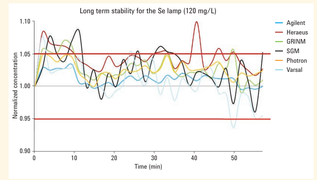
- Element coded for automatic recognition by the Agilent AA instrument
- Instrument automatically selects the right lamp for analysis—even if you've moved it
- Reduces operator error when working with multiple lamps

Uncoded lamps

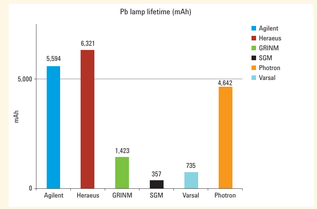
- The most economical choice
- Compatible with all Agilent and most other AA systems (except PerkinElmer and Shimadzu systems using SR correction)
- Same excellent performance provided by Agilent coded single-element lamps

Proof of long-term stability

Agilent lamps provide stable output after 10 minutes of warm-up, eliminating drift and reducing measurement errors.



Comparison of (Se) lamps for a 120 mg/L calibration standard. The average precision for the Agilent lamp was < 1% RSD over this 1-hour period, compared with < 3% RSD for the Varsal lamp.



Comparison of lead (Pb) lamp lifetimes. The Agilent lamp gave the second longest lifetime, even with this volatile element.

Get more from your elemental analysis:
www.agilent.com/chem/productivityspectro

AGILENT MULTI-ELEMENT HOLLOW CATHODE LAMPS

- Unique element combinations extend the versatility of any AA instrument
- Economical operation, since a single lamp covers multiple elements
- Save time by eliminating lamp warm-up when switching elements
- Same performance as Agilent single-element lamps (at suggested conditions)

Coded Multi-Element Lamps	Part No.
Aluminium/Calcium/Magnesium – Al/Ca/Mg	5610108800
Calcium/Magnesium – Ca/Mg	5610107100
Cobalt/Chromium/Copper/Iron/Manganese/Nickel – Co/Cr/Cu/Fe/Mn/Ni	5610107600
Copper/Iron/Manganese/Zinc – Cu/Fe/Mn/Zn	5610109600
Copper/Iron/Silicon/Zinc – Cu/Fe/Si/Zn	5610109700
Copper/Zinc – Cu/Zn	5610119200
Silver/Cadmium/Lead/Zinc – Ag/Cd/Pb/Zn	5610108700
Silver/Chromium/Copper/Iron/Nickel – Ag/Cr/Cu/Fe/Ni	5610109500
Sodium/Potassium – Na/K	5610107000

Uncoded Multi-Element Lamps	Part No.
Calcium/Magnesium – Ca/Mg	5610129100
Cobalt/Chromium/Copper/Iron/Manganese/Nickel – Co/Cr/Cu/Fe/Mn/Ni	5610129200
Copper/Zinc – Cu/Zn	5610129300
Sodium/Potassium – Na/K	5610129000

AGILENT HIGH INTENSITY ULTRAA LAMPS

UltrAA lamps are high-intensity, boosted discharge hollow cathode lamps for Agilent AA instruments that provide increased emission intensity, enhance sensitivity by up to 40%, and improve detection limits, allowing determinations at even lower levels.

Coded Multi-Element UltrAA Lamps	Part No.
Aluminium/Calcium/Magnesium – Al/Ca/Mg	5610133600
Cobalt/Chromium/Copper/Iron/Manganese/Nickel – Co/Cr/Cu/Fe/Mn/Ni	5610134500
Cobalt/Molybdenum/Lead/Zinc – Co/Mo/Pb/Zn	5610135200
Copper/Iron/Manganese/Zinc – Cu/Fe/Mn/Zn	5610135000
Copper/Iron/Silicon/Zinc – Cu/Fe/Si/Zn	5610135100
Copper/Zinc – Cu/Zn	5610134600
Silver/Cadmium/Lead/Zinc – Ag/Cd/Pb/Zn	5610108900
Silver/Chromium/Copper/Iron/Nickel – Ag/Cr/Cu/Fe/Ni	5610134900

Uncoded Multi-Element UltrAA Lamps	Part No.
Arsenic/Copper/Iron – As/Cu/Fe	5610135300
Nickel/Selenium – Ni/Se	5610135400

Background correction lamps	Part No.
Deuterium lamp for Agilent AA systems	G8431-800000

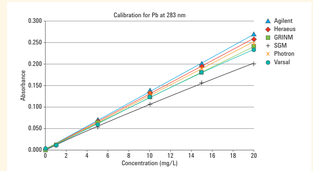
Lamps for PerkinElmer instruments

Agilent offers a range of single-element lamps that are equivalent in performance—and a suitable alternative—to PerkinElmer Lumina lamps used with PerkinElmer AA systems.

For more details, see: **www.agilent.com/chem/pelamps**

Reduce troubleshooting by choosing Agilent AA lamps

High-quality Agilent lamps generate a narrow, interference-free emission line, with good intensity and signal-to-noise to ensure proper calibration. Lamps from alternate suppliers can show inconsistent performance, which affects the accuracy and reliability of your results.



Calibration curves for lead lamps: The Agilent lamp provides the best sensitivity and linearity.

To learn more about the advantages of Agilent lamps and testing methodologies, see: **www.agilent.com/chem/aalampcomparison**
Protect our environment by recycling your used lamps. Learn more at: **www.agilent.com/chem/aarecycle**


4210 MP-AES


200 Series AA


5110 Series ICP-OES


7900 ICP-MS and 8900 QQQ ICP-MS

Agilent Technologies

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