

SELECTION LIST

ACCREDITATION PROGRAM FOR REFERENCE MATERIAL PRODUCERS

(Issued on 01-11-2001)

A2LA offers accreditation for the following principal categories of reference materials. These principal categories are subdivided into sub-categories as noted on the following pages. **Other sub-categories can be added at any time to address the needs of applicants seeking recognition of competence in producing types of reference materials not currently listed.**

PRINCIPAL CATEGORIES

Category A: Chemical Composition

Reference materials, being either pure chemical compounds or representative sample matrices, either natural or with added analytes (e.g. animal fats spiked with pesticides for residues analysis), characterized for one or more chemical or physicochemical property values.

Category B: Biological and Clinical Properties

Materials similar to Category A, but characterized for one or more biochemical or clinical property values.

Category C: Physical Properties

Materials characterized for one or more physical property values (e.g. melting point, viscosity, density).

Category D: Engineering Properties

Materials characterized for one or more engineering property values (e.g. hardness, tensile strength, surface characteristics, etc.)

Category E: Miscellaneous

SUB-CATEGORIES

CATEGORY A : CHEMICAL COMPOSTION

A1: Metals

- | | | |
|------|------------------------------|---|
| A1.1 | Ferrous | <u>Steels</u>
Carbon steels
Low alloy steels
High alloy steels
Cast steels
Specialty steels

<u>Irons</u>
White cast irons
Ductile irons

<u>Gases in metals</u> |
| A1.2 | Nonferrous | Aluminum alloys
Copper base alloys
Lead base alloys
Tin base alloys
Brasses
Bearing alloys
Titanium base alloys
Zirconium base alloys
Gases in metals |
| A1.3 | Special alloys | |
| A1.4 | Refractory metals and alloys | |
| A1.5 | Rare earth metals | |
| A1.6 | High purity metals | Solid forms
Spectrochemical materials
Spectrochemical solutions |

A2: Inorganic Reference Materials

- | | | |
|------|---|---------------------|
| A2.1 | Ores and minerals | |
| A2.2 | Cements, clays and related products | |
| A2.3 | Ceramics, glasses and refractory oxides | Carbides
Glasses |
| A2.4 | Agricultural chemicals and fertilizers | |

A2: Inorganic Reference Materials (continued)

A2.5 Solid fuels

Coal and coke
Mineral content
Major elements
Trace elements

A2.6 Pure chemicals

Stoichiometry standards
Primary standards
Working standards
Secondary standards

Chromatography standards
Pharmaceutical materials
Cosmetic materials

A2.7 Stable isotope materials

A3: Organic Reference Materials

A3.1 Pure organic Compounds

Compounds for elemental analysis
Compounds for molecular weight
Chromatography standards
Illicit drugs and their metabolites (See also A8)

Illicit drugs

Delta-9-THC and other cannabinoids
Amphetamine
Methylamphetamine
3,4-methylenedioxyamphetamine
3,4-methylenedioxy-methylamphetamine
3,4-methylenedioxyethylamphetamine
diacetylmorphine
morphine
cocaine
lysergic acid diethylamide and isomers

Therapeutic drugs
Veterinary drugs
Steroids
Pesticides, herbicides, acaricides, etc.
Metabolites of any of the above

Priority Pollutants

PCBs
PAHs

Fine chemicals
Pharmaceutical materials
Cosmetic materials
Isotopically labelled compounds

- A5.1 Agricultural materials, fertilisers

- A5.2 Foodstuffs
 - Proximate analysis
 - Nutritional properties
 - Vitamins

 - Other food additives
 - Antioxidants
 - Emulsifiers

 - Toxins
 - Animal origin
 - Plant origin
 - Other biological origin

 - Trace elements

 - Trace organics
 - Pesticide residues
 - Other organic contaminants

- A5.3 Plastics and rubbers
 - Hardness
 - Natural rubber content

 - Identity
 - Copolymers
 - Plasticisers
 - Vulcanising agents
 - Blowing agents
 - Antioxidants
 - Fillers

- A5.4 Petroleum products
 - Fuels and lubricants
 - Lead
 - Vanadium
 - Nickel

 - Transformer oils
 - Moisture
 - PCBs

 - Heat exchange fluids
 - Moisture
 - PCBs

A5.5 Vegetable oils and fats
Fatty acid profile
Triglyceride composition

A4: Environmental Reference Materials

A5.1 Soils and sludges
Trace elements
Mineral content
Trace organics
TCLP leachate

A5.2 Ashes
Fly ash from coal and coke
Incinerator ash

A5.3 Waters
Portable water
Routine analytes
Trace elements
Organic pollutants
Other analytes

Fresh water
Major elements
Trace elements
Other analytes

Sea water
Major elements
Trace elements
Other analytes

Industrial waste water
Routine analytes
Trace elements
Organic pollutants
Other analytes

Treated sewage
Routine analytes

A5.4 Plant material
Trace elements
Mineral content

A5.5 Marine
Fish
Trace elements
Mineral content

Organics

Molluscs

Trace elements

Mineral content

Organics

Plankton

Trace elements

Mineral content

Organics

A5.6 BOD reference compounds

A5.7 Miscellaneous biological materials
(e.g. Human hair)

A5: Health and Industrial Hygiene

A5.1 Clinical laboratory materials

A5.2 Ethanol solutions

A5.3 Toxic substances in urine
Toxic metals
Fluoride
Mercury

A5.4 Drugs of abuse in urine

A5.5 Drugs of abuse in hair

A5.6 Materials on filter media

A5.7 Trace elements in blank filters

A5.8 Lead in paint (powder and sheet forms)

A5.9 Respirable silica

A6: Engine Wear Materials

A6.1 Metallo-organic compounds

A6.2 Wear metals in oil

A7: Analysed Gases

A7.1 Gas mixtures

A7.2 Trace volatile organic compounds

A8: Forensic Reference Materials

- A8.1 Ethanol reference standards
 - Ethanol
 - Ethanol, aqueous solutions containing 0.50, 0.150, 0.250 g/100mL
- A8.2 Drugs (individually named) and metabolites*
 - In whole human blood and urine (*metabolites to include glucuronides).
 - See also A3.1 Pure Organic Compounds.
- A8.3 Glasses
 - Bottle
 - Window
 - Automotive
 - Spectacle
- A8.4 Paints
 - Automotive
 - Architectural
- A8.5 Accelerants
 - Flammable liquids and residues thereof
- A8.6 Explosives
- A8.7 Gunshot residues
- A8.8 Noxious substances
 - Crowd control agents
 - Capsaicin
 - O-chlorobenzalmalononitrile (CS)
 - Chloroacetophenone (CN)
- A8.9 Document examination

A9: Ion Activity

- A9.1 pH standards
- A9.2 Ion selective electrode calibrants
- A9.3 Conductivity standards
- A9.4 Buffer systems

CATEGORY B : BIOLOGICAL AND CLINICAL PROPERTIES

B1: General medicine

- B1.1 Human serum materials (powder and solution forms)

B2: Clinical Chemistry

- B2.1 Proteins
- B2.2 Apolipoproteins
- B2.3 Enzymes
- B2.4 Hormones
- B2.5 Trace elements
 - Lead and cadmium

- B3: Tissue Pathology**
- B4: Haematology and Cytology**
 - B4.1 Blood serum
- B5: Immunohaematology**
- B6: Immunology**
- B7: Parasitology**
- B8: Bacteriology and Mycology**
 - B8.1 Reference cultures
 - B8.2 Antibiotics
- B9: Virology**
- B10: Other biological and clinical reference materials**
- B11: Forensic Reference Materials**
 - Purified DNA of known and continuing genetic composition
 - Human, primate and animal blood
 - Animal hairs
 - Fibres (see also C7.1 to C7.3)

CATEGORY C : PHYSICAL PROPERTIES

- C1: Reference Materials with Optical Properties**
 - C1.1 Optical rotation
 - C1.2 Reference index
 - C1.3 Spectral absorbance
 - Visible
 - Ultraviolet
 - Infrared
 - C1.4 Specular reflectance
 - C1.5 Colour
 - White reference material (opal glass)
 - Ceramic tiles
- C2: Reference Materials with Electrical and Magnetic Properties**
 - C2.1 Dielectric strength
 - C2.2 Resistivity
 - C2.3 Magnetic susceptibility
- C3: Reference Materials for Frequency Measurements**
- C4: Reference Materials for Radioactivity**
 - C4.1 Radiation dosimetry
 - C4.2 Radiopharmaceuticals
 - C4.3 Labelled compounds
 - C4.4 Carbon-14 dating

C5: Reference Materials for Thermodynamic Properties

- C5.1 Calorimetry
- C5.2 Thermal Conductivity
 - Metals
 - Pyrex glass
 - Resin-bonded fibre board
- C5.3 Vapour pressure
- C5.4 Thermal expansion
- C5.5 Thermal resistance
- C5.6 ITS-90 temperature fixed point
- C5.7 Curie point
- C5.8 Boiling point
- C5.9 Melting point
- C5.10 Thermal analysis

C6: Reference Materials for Physicochemical Properties

- C6.1 Density
- C6.2 Viscosity
- C6.3 Surface tension
- C6.4 Molecular weight

C7: Reference Materials for Fibre Identification

- C7.1 Natural fibres
 - Animal hairs
 - Plant fibres
- C7.2 Synthetic fibres
 - Organic polymers
 - Inorganic
- C7.3 Asbestos fibres
 - Crude fibres
 - Mounted specimens for fibre counting

C8: Reference Materials for other properties

- C8.1 Shear testing of powders
- C8.2 Minerals for x-ray diffraction

CATEGORY D : ENGINEERING PROPERTIES

D1: Surface Finish

- D1.1 Surface roughness
- D1.2 Corrosion
- D1.3 Microhardness
- D1.4 Abrasive wear
- D1.5 Properties of films and surfaces
 - Nominal thickness
 - x-ray fluorescence
 - B particle backscattering
 - Ion beam sputtering

D2: Sizing

- D2.1 Particle size
 - Particulate materials
 - Latex sphere suspensions
- D2.2 Surface area

D3: Nondestructive Testing

- D3.1 Dye penetrant test blocks
- D3.2 Artificial flaw for eddy current
- D3.3 Magnetic particle inspection

D4: Hardness

- D4.1 Rockwell hardness
- D4.2 Izod hardness

D5: Impact Toughness

- D5.1 Charpy V-notch test blocks

D6: Tensile Strength

D7: Elasticity

D8: Creep

D9: Fire Research

- D9.1 Surface flammability
- D9.2 Smoke density

CATEGORY E : MISCELLANEOUS PROPERTIES

(Sub-categories to be developed as required).

