



LUCAS

Lakehead University Center for
Analytical Services

Extension Bulletin



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Canadian Diamonds

By Shannon Zurevinski, PhD, Materials Scientist

Many people don't realize that Canada is the world's third largest diamond supplier, next to Russia and Botswana. Diamonds are currently mined from four active mines in Canada: Diavik Diamond Mines Inc (N.W.T); Ekati Diamond Mine (N.W.T); Snap Lake (N.W.T.) and Victor (ON). Canadian diamonds are mined in accordance with the principles of sustainable development, and the mines follow very strict environmental regulations.

Canadian diamonds are sold with certificates showing:

1. the serial number or a "Canadian Product" notation,
2. the rough weight of the diamond and,
3. the cut weight of the diamond. This allows many of the diamonds to be traced back to the mine of origin.

In addition to the certificate, many of the diamonds are laser inscribed on the stone's girdle. The girdle is the rim between the flatter top and the pointed bottom of the diamond. This laser inscription cannot be seen with the naked eye, and can only be viewed through either a 20x magnification hand lens or a microscope.

Laser inscription technology is a "cold laser" process that utilizes the short wave length of light and therefore has no thermal effect on the diamond. In other words, laser inscribing a diamond does not chip, fracture, weaken, or damage the diamond. Many companies have a signature logo that is inscribed on their diamonds, such as a polar bear or a maple leaf.

Some companies have taken laser etching a step further and now offer personal message inscription on a diamond. The benefits of the laser inscriptions is that the serial number can be traced back to the mine, which insures to the customer that the diamond is truly Canadian.

LUCAS now offers a diamond imaging service, where an image is taken of a diamond ring. Under high power you can see characteristics that make your diamond unique (i.e. inclusions, fractures or the laser inscription). The images are delivered to the client as a computer image file (.jpg or .bmp).

Contact LUCAS at 807-343-8590 for more information about this service.



Many diamonds mined in Canada are laser inscribed.

LUCAS provides various analytical services.

At Lakehead University's Centre for Analytical Services we meet your analytical needs with accurate and fast service. The broad multi-disciplinary expertise and state of the art analytical equipment at Lakehead can provide you with many testing services, all under one roof. The list below includes many of the services we provide.

Biomass Characterization

- Biofuels calorie testing
- Biomass Chemical Characteristics
- Biomass Physical Characteristics

Customized Analytical Services

DNA testing

- Ancestry
- Archaeological
- Forensic human genetic identification
- Paternity and relationship
- Plant and animal
- Training

Environmental testing

- Aquatic sediments
- Aquatic toxicity (LC 50)
- Barrier remediation technologies testing
- Contaminant sources tracing
- Experimental and computer modeling of water-rock reactions
- Heavy metal contaminants in soils
- Inorganic contaminants in soils
- Piezometers (Installation and monitoring)
- Plant or animal tissue toxicity (mercury, etc.)
- Precipitates
- Mercury and methylmercury (total) in water, tissue, soil, sediment
- Mineralogical and geochemical characterization of mine waste materials
- Water sample (nutrients, metals, pH, conductivity, etc.)

Fuels Characterization

- Biofuels calorie testing
- Fuel oil calorie testing
- Fuel oil specifications

Materials Testing (Construction)

- Chloride in concrete
- Building materials

Materials Characterization

- Air Sensitive Samples (X-ray diffraction)
- Contaminants & corrosion detection
- Crystalline inorganic solids (granular, fine-crystalline, microcrystalline)
- Particle sizing and elemental composition
- Polymers
- Metallurgical products and by-products
- Non-crystalline inorganic solids
- High tech and strategic metals

Mineralogical Services

- Assessment of geological samples
- Clay and zeolite analysis
- Experimental Services
- Fluid inclusion analysis
- Particle characterization of assay grinds using digital image analysis.
- Separations (e.g., heavy liquids)
- Thin section preparation

Molecular synthesis and Analysis

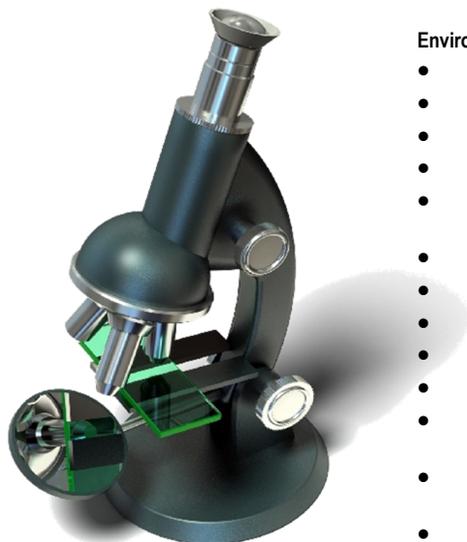
- Aqueous silicon chemistry
- Chemical characterization
- Fabrication of thin films
- Molecular modeling
- Nanostructured materials synthesis

Soils Testing

- Agricultural soils testing with OMAFRA nutrient recommendations
- Forest nutrient analysis
- Garden soils testing with OMAFRA nutrient recommendations
- Heavy metal contaminants in soils
- Industrial contaminants and deposits
- Inorganic contaminants in soils
- Soils mineralogy

Wood Science Testing

- Abrasion testing of flooring and other surfaces
- Wood structural mapping (X-ray)
- Wood chip analysis
- Wood mechanical and physical properties



For more information about technical expertise and services available through LUCAS, contact:

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