

## ASBESTOS TESTING

Maxxam has extensive experience in the analysis of asbestos using microscopy techniques such as PLM, PCM, and TEM. Our laboratories are accredited by NVLAP and AIHA.

We routinely performs asbestos analyses using ASTM, EPA, AHERA, ISO, and NIOSH methods.



Asbestos is a general term used for a group of six naturally occurring silicate minerals: chrysotile, amosite, crocidolite, anthophyllite, tremolite and actinolite. Mined since the mid-1800s, asbestos was valued for its tensile strength and its fire and chemical resistive properties.

Once called the “miracle mineral”, asbestos was used in a wide variety of everyday products, including floor tiles, ceiling tiles, roofing, and insulation for attics, walls and pipes.

Asbestos is commonly found in commercial, industrial and residential structures constructed before the 1990s. Once the health risks due to asbestos exposure were recognized, its use declined.

### EXPOSURE AND HEALTH RISKS

Prolonged inhalation of airborne asbestos fibres can lead to health problems including asbestosis, mesothelioma and lung cancer. Asbestos-related diseases can arise many years after the initial exposure.

Exposure can occur when asbestos-containing material is disturbed during product use, demolition, construction, renovation or maintenance and repair activities that release asbestos fibers into the air.

### REGULATED SUBSTANCE

Asbestos is defined as a hazardous material under provincial and territorial laws. As such, provincial regulations exist for the production, handling and safe disposal of asbestos to protect the health of humans and the environment.

To comply with laws and regulations, suspected Asbestos-Containing Material (ACM) must be tested at a laboratory and subsequently handled and disposed of properly.

### TESTING FOR ASBESTOS

Inspection by the naked eye is insufficient to determine if a material contains asbestos. Samples suspected of containing asbestos should be sent to a laboratory that is accredited for testing asbestos.

Maxxam’s accredited Asbestos Testing Laboratories have the instrumentation, expertise and experience to test for asbestos in air, bulk, soil, dust and water samples.

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## BULK BUILDING MATERIALS

Maxxam's Detection Limits (DL) are established using U.S. EPA protocols.

- **Polarized Light Microscopy (PLM)** is the primary and most economical technique used to identify asbestos in building materials. Samples are analyzed in accordance with U.S. EPA 600/R-93/116 Method for the Determination of Asbestos in Bulk Building Materials, which complies with all provincial regulatory requirements including NIOSH 9002 and IRSST Analytical Method 244. Results are reported as a visual estimation of asbestos and non-asbestos fibres, by-layer.
- **Point counting** is an optional technique for samples with low concentrations of asbestos. Point counting provides a more accurate determination of the area percent asbestos in a sample versus PLM. Reporting limits are based on the number of points counted: 200 point count provides a 0.5% DL; 400 point count provides a 0.25% DL; 1000 point count provides a 0.1% DL.
- **Transmission Electron Microscopy (TEM)** is used in conjunction with PCM or PLM. It works by transmitting a beam of electrons through a sample to display a highly magnified image onto a screen. TEM uses energy dispersive x-ray analysis and selected area electron diffraction to identify asbestos based on morphology, crystalline structure, and elemental identification.
- **Gravimetry** is used for the analysis of asbestos in non-friable, organically-bound materials, for example floor tile, asphalt shingles, caulking and mastic. Samples are prepared using a combination of ashing and acid treatment. Gravimetric reduction may be used in conjunction with PLM and/or Transmission Electron Microscopy (TEM). Results are reported as percent asbestos, calculated by weight.

Provincial / Territorial Definition of an Asbestos Containing Material (ACM)
Alberta: >0.1% Material Amount Exceeding 10kg <sup>1</sup> >1% Waste Material <sup>2</sup>
British Columbia: ≥0.5% Vermiculite >0% <sup>3</sup>
Manitoba: ≥0.1% Friable Materials ≥1% Non-friable Materials <sup>4</sup>
New Brunswick: ≥1% <sup>5</sup>
Newfoundland and Labrador: >1% <sup>6</sup>
Northwest Territories: >1% <sup>7</sup>
Nova Scotia: 0.5% <sup>8</sup> >1% Friable Waste Material <sup>9</sup>
Nunavut: >1% <sup>10</sup>
Ontario: ≥0.5% <sup>11</sup>
Prince Edward Island: >1% <sup>12</sup>
Quebec: ≥0.1% <sup>13</sup>
Saskatchewan: >0.5% Friable Materials 1% Non-Friable Materials >0% Vermiculite <sup>14</sup>
Yukon: ≥1% <sup>15</sup>

<sup>1</sup>Occupational Code of Practice, Alberta Asbestos Abatement Manual

<sup>2</sup>Guidelines for the Disposal of Asbestos Waste – Environmental Protection Services Alberta Environment, August, 1989

<sup>3</sup>B.C. Regulation 296/97: Workers Compensation Act – Occupational Health and Safety, Regulation Part 6 - Substance Specific Requirements: Asbestos

<sup>4</sup>Manitoba Workplace Safety and Health Act and Regulation 2016 – Chapter W210 10/02 The Workplace Safety and Health Act

<sup>5</sup>New Brunswick Regulation 92-106 under the Occupational Health and Safety Act

<sup>6</sup>Newfoundland and Labrador Regulation 111/98: Asbestos Abatement Regulations, 1998 under the Occupational Health and Safety Act (O.C. 98-730)

<sup>7</sup>Occupational Health and Safety Regulations, NWT Regulation 039-2015

<sup>8</sup>Nova Scotia Department of Labour and Advanced Education, Asbestos in the Workplace: A Guide to Assessment & Management of Asbestos in the Workplace

<sup>9</sup>Asbestos Waste Management Regulations: made under Section 84 of the Environment Act S.N.S 1994-95, N.S. Regulation 53/95

<sup>10</sup>Department of Environment, Government of Nunavut, Environmental Guideline for Waste Asbestos

<sup>11</sup>Ontario Occupational Health and Safety Act, O. Reg. 278/05: Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations

<sup>12</sup>Chapter O-1: Occupational Health and Safety Act General Regulations, Government of Prince Edward Island

<sup>13</sup>L'Égés Québec, Regulation respecting occupational health and safety [Chapter s-2.1, r.13]

<sup>14</sup>Saskatchewan Regulations, The Occupational Health and Safety Regulations, 1996

<sup>15</sup>Yukon Workers' Compensation Health and Safety Board, Occupational Health and Safety Act and Regulations

# ASBESTOS TESTING



Maxxam is a North American leader in analytical services and solutions to the energy, environmental, industrial hygiene, food and DNA industries.

We are a member of the Bureau Veritas Group of companies – a world leader in testing, inspection and certification services.

Maxxam supports critical decisions made by our customers through the application of rigorous science and the knowledge and expertise of our over 2,500 employees.

## SOIL

Asbestos in soil can represent health risks if fibres become airborne. Sources of exposure include deposits of Naturally Occurring Asbestos (NOA), contamination from improper building demolition and illegal construction waste dumping. Depending on provincial legal requirements, supply, storage, transport, sale, use and re-use of asbestos-contaminated soil is prohibited. Maxxam recommends analysis of soils using ASTM method D7521-16, which estimates asbestos concentration by PLM and, optionally, provides a TEM concentration of asbestos in weight percent.

## WATER

Asbestos can be introduced into water from natural sources, such as erosion of asbestos-containing ores; or released from asbestos-containing products, such as asbestos-cement pipes during breakdown or wear.

The Health Canada Guidelines for Canadian Drinking Water Quality has not established a maximum acceptable concentration (MAC) for asbestos in water, however the method of choice for the determination of asbestos in water is [TEM](#).

## VERMICULITE

Vermiculite is a naturally occurring mineral that undergoes significant expansion when heated to high temperatures. In this expanded form, vermiculite is lightweight and fire-resistant, which makes it suitable for use as insulation or as a soil amendment. The most vermiculite was extracted from a mine near Libby, Montana from 1919-1990. Trademarked as Zonolite, the vermiculite from this mine was contaminated with amphibole asbestos and non-regulated winchite and richterite.

To meet provincial regulatory requirements, vermiculite insulation can be analyzed according to EPA 600/R-93/116, or EPA/600/R-04. To confirm the presence of non-regulated asbestos, Maxxam recommends analysis according to ASTM D7521-16 by PLM and TEM.

## TESTING AIR FIBRE CONTENT

Phase Contrast Microscopy (PCM) is used to measure fibre concentrations in air samples. PCM does not differentiate between asbestos and other fibres, but may be used in conjunction with TEM (NIOSH Method 7402) as an aid for fibre identification. Fibre counts meet NIOSH 7400 (Asbestos and Other Fibres by PCM) method criteria for fibre determination. Results are reported as fibres per cubic centimeter.

For more information, contact your account manager or call:

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