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ASBESTOS MINERAL IDENTIFICATION REPORT No. 99383-MIN-CV003

INTRODUCTION

A sample was received from Impartial Pty Ltd with a request for determination of the presence of any asbestiform minerals. It was reported to be disc pad material CV003

PROCEDURE

The brake pad was examined using a stereomicroscope. A portion was ashed at 470°C to remove binding resins and other organic substances (including organic fibre). The ash was re-examined using a stereomicroscope. A pulverized portion was examined using a polarized light microscope and, if necessary, a phase contrast microscope. Particular attention was given to particles that may be classed as asbestos fibres, using the classification of being less than 1 micrometer in width and at least 20 micrometers in length. The ash was pulverized then analyzed by X-ray diffraction to identify the minerals present.

RESULTS

Graphite occurs as ragged lumps less than 0.1mm in size. The iron is present as wire segments. The ash content is approximately 90%. The semi-quantitative mineralogy of the ash of the sample follows. Organic fibre was not detected by XRD but was included for convenience. **Asbestos-forming minerals (including tremolite) were not detected. Asbestos-sized fibres were not detected**

Mineral	Composition	Formula	Relative abundance
Barite	Barium sulphate	$BaSO_4$	D
Graphite	Carbon (elemental)	C	SD
Iron	Iron	Fe	A-SD
Vermiculite	Silicate	$(Mg,Fe,Al)_3(Si,Al)_4O_{10}(OH)_2.4H_2O$	A
Glass fibre	Silicate	unknown	Tr
Calcite	Calcium carbonate	$CaCO_3$	Tr
Magnetite	Iron oxide	Fe_3O_4	Tr
Organic fibre	Organic	unknown	Tr

Semiquantitative Abbreviations

D = Dominant. Used for the component apparently most abundant, regardless of its probable percentage level.
SD = Sub-dominant. The next most abundant component(s) providing its percentage level is judged above about 20.
A = Accessory. Components judged to be present between the levels of roughly 5 and 20%.
Tr = Trace. Components judged to be below about 5%.

TESTING OFFICER: Michael Till REPORT DATE: 27 July 2016

An asbestiform mineral is a mineral that has the potential to form asbestos-sized particles. An asbestiform mineral is not necessarily hazardous.

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ASBESTOS MINERAL IDENTIFICATION REPORT No. 99383-MIN-F5011

INTRODUCTION

A sample was received from Impartial Pty Ltd with a request for determination of the presence of any asbestiform minerals. It was reported to be brake lining material F5011.

PROCEDURE

The brake pad was examined using a stereomicroscope. A portion was ashed at 470°C to remove binding resins and other organic substances (including organic fibre). The ash was re-examined using a stereomicroscope. A pulverized portion was examined using a polarized light microscope and, if necessary, a phase contrast microscope. Particular attention was given to particles that may be classed as asbestos fibres, using the classification of being less than 1 micrometer in width and at least 20 micrometers in length. The ash was pulverized then analyzed by X-ray diffraction to identify the minerals present.

RESULTS

Graphite occurs as very fine flakes less than 0.1mm in size. The glass fibre occurs as bundles of fibres. The brake pad also contains black rubbery lumps. The ash content is approximately 75%. The semi-quantitative mineralogy of the ash of the sample follows. The glass fibre and the rubber lumps were not identified by XRD (because they are non-crystalline) but were included for convenience. **Asbestos-forming minerals (including tremolite) were not detected. Asbestos-sized fibres were not detected**

Mineral	Composition	Formula	Relative abundance
Calcite	Calcium carbonate	$CaCO_3$	D
Vermiculite	Silicate	$(Mg,Fe,Al)_3(Si,Al)_4O_{10}(OH)_2.4H_2O$	A
Graphite	Carbon (elemental)	C	A
Glass fibre	Silicate	unknown	A
Rubber	Organic substance	unknown	Tr
Quartz	Silica	SiO_2	Tr
Corundum	Aluminium oxide	Al_2O_3	Tr
Rutile	Titanium oxide	TiO_2	Tr

Semiquantitative Abbreviations

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A = Accessory. Components judged to be present between the levels of roughly 5 and 20%.
Tr = Trace. Components judged to be below about 5%.

TESTING OFFICER: Michael Till REPORT DATE: 27 July 2016

An asbestiform mineral is a mineral that has the potential to form asbestos-sized particles. An asbestiform mineral is not necessarily hazardous.