



## Chemical Evaluation Test Report

Link Test Report: 153896  
Test Description: SAE J2975:2011 Copper and other elements in brake friction materials  
Purpose of Test: To measure the content of CA & WA regulated chemical elements in friction materials  
Customer Reference: EDB924  
Test Date(s): 08/28/15 – 09/02/15

### Requested by:

**ECOBREX PARTS CANADA**  
ALI AHMADI  
907-1030 GEORGIA STREET  
VANCOUVER, BC V6E 2Y3  
CANADA

### Tested by:

Testing Coordination and Facility  
North America Laboratory Test Operations  
401 Southfield Road  
Dearborn, MI 48120  
[www.linkeng.com](http://www.linkeng.com)  
Phone: (313) 625-4000

Report Approved by:

A handwritten signature in black ink, appearing to read "Tessa Maynard".

Date: 09/10/15

Tessa Maynard, B.Sc.



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153896

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### SAE J2975:2011 Copper and other elements in brake friction materials

#### Test Information

Customer Name	ECOBREX PARTS CANADA
Requestor	ALI AHMADI
Test Procedure	SAE J2975:2011
Test Coordinator	MARKIEWICZ, RAD
Test Equipment	ICP-OES & PLM
Dataloggers	V2.7.0.87 & V4.0
Template Version	1.00

#### Setup Details

Sample Material	EDX PC09F
Sample Size	THREE (3)
Matrix	Friction material debris per SAE J2975:2011
Vehicle category	passenger car — PC
Vehicle mass below 10,000 lbs (4.5 tons)	yes
Product type	PC brake pad

Date sample(s) received	8/28/2015
Date of sample digestion	9/1/2015
Date of chemical analysis	9/1/2015
Date of test report	9/2/2015

#### Test method verification

Initial calibration criteria was met?	yes
Continuous calibration criteria was met?	yes
Initial calibration blank criteria was met?	yes
Continuous calibration blank criteria was met?	yes
Quality control parameters within limits?	yes

#### Comments (if any of the above answers is "no"):

<b>Prepared by:</b>	Radek Markiewicz Nathan Washington	<b>Title</b>	Chemical Technologist Chemical Technician	<b>Date</b>	9/10/2015
<b>Analyzed by:</b>	Radek Markiewicz	<b>Title</b>	Chemical Technologist	<b>Date</b>	9/10/2015
<b>Reported by:</b>	Nathan Washington	<b>Title</b>	Chemical Technician	<b>Date</b>	9/10/2015
<b>Approved by:</b>	Tessa Maynard (313) 625-4000	<b>Title</b>	Chemical Technologist	<b>Date</b>	9/10/2015

Data applicable to the materials tested or its equivalents as stated by the test requestor. **Valid if signed by the test engineer.** Report can be copied in full. Bilateral uncertainty of measurements 0.5% of FS. Coverage factor of 2. Confidence of 95%. Details available upon request.



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## Material Summary and Designation

Chemical analysis summary		Method	Average / %	Limit / %	Designation
Cadmium and its compounds	Cd	LINK-3051A/6010C	ND	0.01	B
Chromium (acid soluble)	Cr	LINK-3051A/6010C	0.014	note 1	n.a.
Chromium-VI salts	Cr <sup>+6</sup>	LINK-3060A/7196A	n.a.	0.1	B
Lead and its compounds	Pb	LINK-3051A/6010C	ND	0.1	B
Mercury and its compounds	Hg	LINK-3051A/6010C	ND	0.1	B
Asbestiform fibers	—	LINK-600/93/116/PLM	ND	note 2	B
Copper and its compounds	Cu	LINK-3051A/6010C	3.44	note 3	B
Antimony	Sb	LINK-3051A/6010C	ND	note 4	n.a.
Nickel	Ni	LINK-3051A/6010C	0.0060	note 4	n.a.
Zinc	Zn	LINK-3051A/6010C	2.26	note 4	n.a.

**SAE J866:2012 material designation:**

**B**

## Elemental Analysis with Individual Results

Chemical Analysis Summary		Detection limit		test 1 153896-1		test 2 153896-2		test 3 153896-3		average	
		mg/kg	%w/w	mg/kg	%w/w	mg/kg	%w/w	mg/kg	%w/w	mg/kg	%w/w
Cadmium and its compounds	Cd	4.0	0.0004	ND	ND	ND	ND	ND	ND	ND	ND
Chromium (acid soluble)	Cr	40.0	0.0040	137	0.0137	137	0.0137	135	0.0135	137	0.014
Chromium-VI salts	Cr <sup>+6</sup>	50.0	0.0050	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Lead and its compounds	Pb	400.0	0.0400	ND	ND	ND	ND	ND	ND	ND	ND
Mercury and its compounds	Hg	4.0	0.0004	ND	ND	ND	ND	ND	ND	ND	ND
Copper and its compounds	Cu	40.0	0.0040	33530	3.353	36293	3.629	33440	3.344	34421	3.44
Antimony	Sb	20.0	0.0020	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	Ni	4.0	0.0004	60	0.0060	60	0.0060	60	0.0060	60	0.0060
Zinc	Zn	20.0	0.0020	21260	2.126	25240	2.524	21192	2.119	22564	2.26

## Asbestos Detection with Individual Results

Asbestos Method Summary		Detection limit		test 1 153896-1		test 2 153896-2		test 3 153896-3		average	
		%	%	%	%	%	%	%	%		
Asbestiform fibers (PLM)	—	0.1		ND	ND	ND	ND	ND	ND	ND	ND
Asbestiform fibers (TEM)	—	n.a.		n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

### NOTES

- 1: no limit specified
- 2: 0.1% for PLM. If detected by PLM, the quantity is verified by TEM
- 3: A = n.a.; 0.5 < B ≤ 5; N ≤ 0.5
- 4: for reference only for WA

### LEGENDS:

- \*: marks an element with an average content above the stated limit
- n.a.: not applicable (or not measured) for the tested material
- ND: Non Detected. Actual value is below the measurable value
- %w/w: percent by weight per measurement method for a particular element

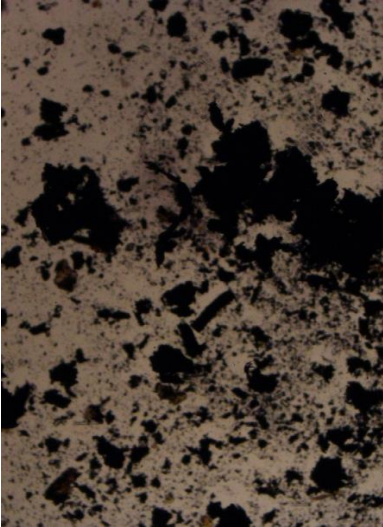
## Asbestos Detection

### Representative Images from Polarized Light Microscope

**test 1**  
153896-1

Surface debris

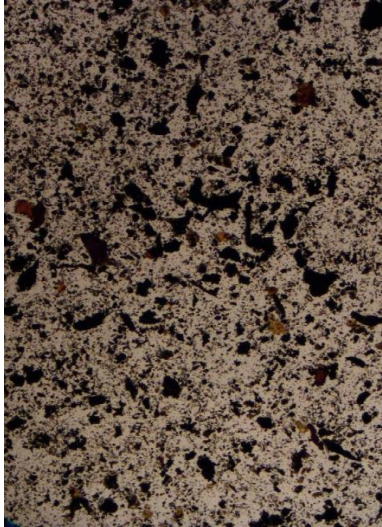
Plain microscopic view (40x)



**test 2**  
153896-2

Friction dust

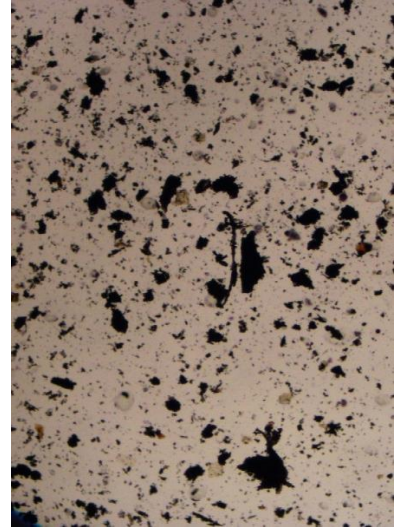
Plain microscopic view (40x)



**test 3**  
153896-3

Reduced friction material

Plain microscopic view (40x)



NOTE: *if no significant fibers are detected, ROI 1-3 are random across the microscopic slide with mounted sample*