Client: Alex Kang
Fullerton Joint Union High School District
1051 West Bastanchury Road Fullerton, WA 92833
Phone: (714) 870-2908
Email: akang@fjuhsd.org

Approval Date	:	October 13, 2017	**Labeled Age Grade/Size**	:	NA
Date of Receipt	:	October 11, 2017	**Tested Age Grade**	:	NA
Retest	:	No			
# of Samples Submitted	:	2			
Manufacturer's Name	:	NA			
Item Description	:	Rubber Pieces			
Item Number	:	NA			
Country of Origin	:	NA			
Country of Import	:	NA			
Delivery Conditions	:	Satisfactory, Samples tested as received			

The following test item(s) was/were performed on submitted sample(s) and/or component(s) confirmed by applicant

TEST REQUESTED	RESULT
ASTM D6370 test Method for Rubber - Compositional Analysis by Thermogravimetry ()**	See Attachment
QT6O20170017-01 Ashing, Acid Digestion, Calculation of Zinc Oxide, and Carbon Oxide ()**	See Attachment

** Analysis completed by Eurofins Subcontract Laboratory

Signed for and on behalf of
Eurofins Product Testing US Inc.

Drew Dumas / Technical Director

Signed for and on behalf of
Eurofins Product Testing US Inc.

Mitchell VandenBerg / Project Coordinator

ATTACHMENT

TEST REPORT

To : **EUROFINS PRODUCT TESTING US INC**
11720 North Creek Pkwy Suite 400,
98011 Bothell,
WA, United States.

Attn: Ms. Cristina Marquez

Report No. : FA1710-0064

Page No. : 1 of 3

Date of Issue : 30/10/2017

The following sample(s) was(were) identified by the customer as :
U710036-01 SAMPLE 1 (SHREDDED RUBBER PIECES)

Date of Sample Received : 20/10/2017
Date of Testing : 20/10/2017 to 30/10/2017

Objective(s)

1. To determine the chemical composition of sample received using Thermogravimetry Analysis (TGA).
2. To measure the concentrations of Zinc (Zn) and Calcium (Ca) from sample received using Inductively Coupled Plasma-Optical Emission Spectrometry (ICP-OES) followed by calculation of Zinc Oxide (ZnO) and Calcium Oxide (CaO) contents.

Test Procedure(s)

TGA. The sample was cut into small pieces before conditioned at 23±2°C and 50±5% Relative Humidity for 3 hours prior to analysis. Sample was then analysed as per ASTM D 6370-99.
ICP-OES. Ashing and acid digestion using aqua regia were performed on the sample prior to analysis using Inductively Coupled Plasma – Optical Emission Spectrometry (ICP – OES).

Conclusion(s)

The measured content of Carbon Black and Zinc Oxide (ZnO) in U710036-01 Sample 1 (Shredded Rubber Pieces) complied with their specification limits of 40-70 %wt and 1-5 %wt respectively. However, the measured content of Calcium Oxide (CaO) exceeded its specification limit of 1-5 %wt.

Remark : Sampled and submitted by EUROFINS PRODUCT TESTING US INC.

Signed for and on behalf of
EUROFINS NM LABORATORY SDN. BHD.

Liang Mei Keat, Ph.D., MMIC
Consulting Chemist
IKM No. M3154/5957/11

NOTE : ND(<MDL) denotes not detected for value obtained is less than the Method Detection Limit (MDL) stated.

Sample Photograph(s)

U710036-01 Sample 1 (Shredded Rubber Pieces)

Note: Sample image is as received.

The space below is intentionally left blank.

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Test Result(s)

Table 1: The chemical composition of U710036-01 Sample 1 (Shredded Rubber Pieces) by TGA.

Sample ID	Sample Components / Parameter	Organics 50-550°C (in Nitrogen)	Carbon Black 310-790°C (in Oxygen)	Ash @ 790°C
Sample 1	Composition (weight %)	49.717	39.637	10.646

Table 2: Zinc and Calcium content in U710036-01 Sample 1 (Shredded Rubber Pieces) by Ashing, Acid Digestion followed by ICP-OES. Zinc Oxide and Calcium Oxide contents are calculated values.

Parameter	Results	Unit
Zinc (as Zn)	1.46	%wt
Zinc Oxide (as ZnO)	1.82	%wt
Calcium (as Ca)	4.99	%wt
Calcium Oxide (as CaO)	6.98	%wt

Comment(s)

1. The measured content of Carbon Black and Zinc Oxide in U710036-01 Sample 1 (Shredded Rubber Pieces) complied with the specification limits stated in the MSDS of EPDM-Dense (Published by Ecore International) but not for the measured content of Calcium Oxide (CaO).

Component	*Spec. Limit (%wt)	Measured Value (%wt)	Comment
Carbon Black	40-70 %wt	39.6 %wt	Complied
Calcium Oxide (CaO)	1-5 %wt	6.98 %wt	Not Complied
Zinc Oxide (ZnO)	1-5 %wt	1.82 %wt	Complied
Organic Materials	-	49.7 %wt	Not relevant

* Based on MSDS provided by Eurofins Product Testing US Inc.

2. The Ash content of 10.6 %wt is higher than the sum of Zinc Oxide (ZnO) and Calcium Oxide (CaO) which is 8.80 %wt; suggesting there is/are other thermally stable component(s) in EPDM-Dense besides ZnO and CaO.

Note: This report comes with an attachment.

- End of Report -

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ATTACHMENT

Report No. : FA1710-0064 **Page No.** : 1 of 1

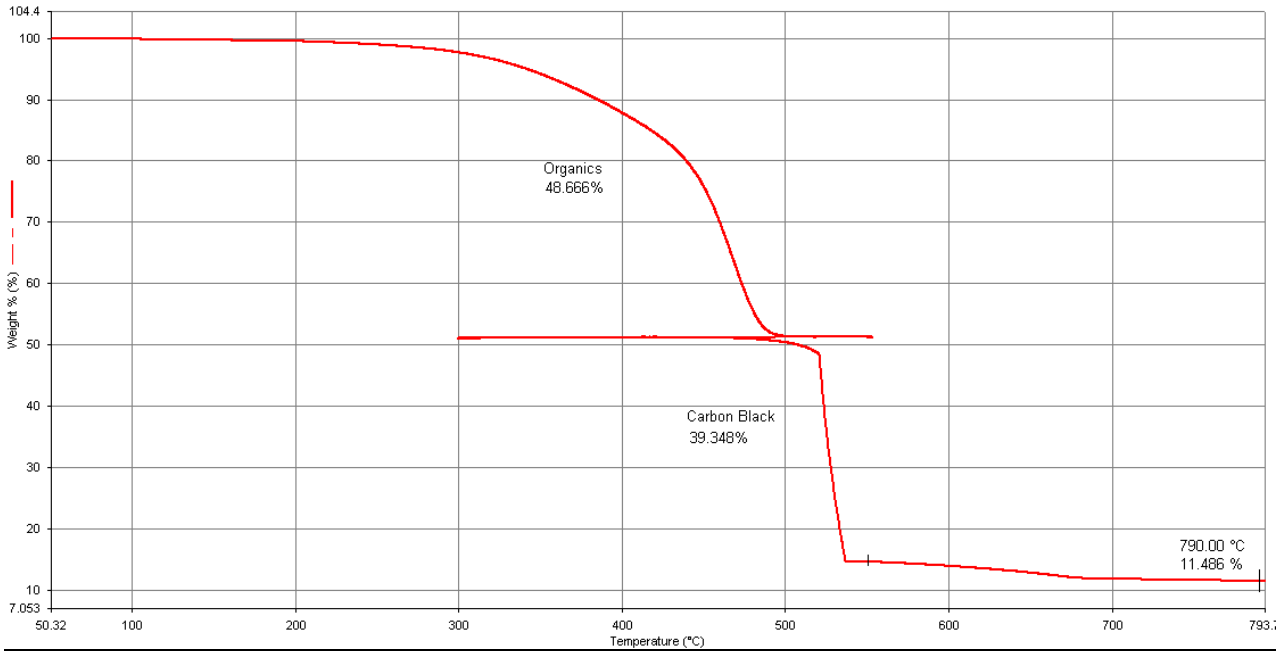

Figure 1: TGA Thermogram of U710036-01 Sample 1 (Shredded Rubber Pieces)

- End of Attachment -

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1. The sample(s) submitted by the customer shall be tested / analysed according to any published standard method or non-published method as discussed and agreed upon by the customer and Eurofins NML. In the absence of any written instruction, the customer is deemed to have agreed and accepted the standard method or technique used by Eurofins NML in the testing / analysis of sample(s). However, Eurofins NML shall state in the report / certificate the standard method or technique used, where appropriate.

2. The integrity of the sample(s) and result(s) are dependent on the quality of sampling. The result(s) of testing / analysis performed by Eurofins NML is / are only applicable to the particular sample(s) received at the time of testing / analysis.

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8. Presentation of test / analysis result(s) for method detection limit and unit of measurement shall be agreed by Eurofins NML and customers, normally decided by Eurofins NML for technical reasons and good practice in analytical measurement.

9. Where relevant, a statement of compliance / non-compliance with requirement and / or specifications shall be presented only when requested by customers. The statement shall be appropriate and needed for interpretation and guidance only.

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TEST REPORT

To : **EUROFINS PRODUCT TESTING US INC**
11720 North Creek Pkwy Suite 400,
98011 Bothell,
WA, United States.

Attn: Ms. Cristina Marquez

Report No. : FA1710-0065

Date of Issue : 30/10/2017

The following sample(s) was(were) identified by the customer as :
U710036-02 SAMPLE 2 (SHREDDED RUBBER PIECES)

Date of Sample Received : 20/10/2017
Date of Testing : 20/10/2017 to 30/10/2017

Objective(s)

1. To determine the chemical composition of sample received using Thermogravimetry Analysis (TGA).
2. To measure the concentrations of Zinc (Zn) and Calcium (Ca) from sample received using Inductively Coupled Plasma-Optical Emission Spectrometry (ICP-OES) followed by calculation of Zinc Oxide (ZnO) and Calcium Oxide (CaO) contents.

Test Procedure(s)

TGA. The sample was cut into small pieces before conditioned at 23±2°C and 50±5% Relative Humidity for 3 hours prior to analysis. Sample was then analysed as per ASTM D 6370-99.
ICP-OES. Ashing and acid digestion using aqua regia were performed on the sample prior to analysis using Inductively Coupled Plasma – Optical Emission Spectrometry (ICP – OES).

Conclusion(s)

The measured content of Carbon Black and Zinc Oxide (ZnO) in U710036-02 Sample 2 (Shreaded Rubber Pieces) complied with their specification limits of 40-70 %wt and 1-5 %wt respectively. However, the measured content of Calcium Oxide (CaO) exceeded its specification limit of 1-5 %wt.

Remark : Sampled and submitted by EUROFINS PRODUCT TESTING US INC.

Signed for and on behalf of
EUROFINS NM LABORATORY SDN. BHD.

Liang Mei Keat, Ph.D., MMIC
Consulting Chemist
IKM No. M3154/5957/11

NOTE : ND(<MDL) denotes not detected for value obtained is less than the Method Detection Limit (MDL) stated.

Sample Photograph(s)

U710036-02 Sample 2 (Shreaded Rubber Pieces)

Note: Sample image is as received.

The space below is intentionally left blank.

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Test Result(s)

Table 1: The chemical composition of U710036-02 Sample 2 (Shreaded Rubber Pieces) by TGA.

Sample ID	Sample Components / Parameter	Organics 50-550°C (in Nitrogen)	Carbon Black 310-790°C (in Oxygen)	Ash @ 790°C
Sample 2	Composition (weight %)	48.666	39.848	11.486

Table 2: Zinc and Calcium content in U710036-02 Sample 2 (Shreded Rubber Pieces) by Ashing, Acid Digestion followed by ICP-OES. Zinc Oxide and Calcium Oxide contents are calculated values.

Parameter	Results	Unit
Zinc (as Zn)	1.43	%wt
Zinc Oxide (as ZnO)	1.78	%wt
Calcium (as Ca)	5.70	%wt
Calcium Oxide (as CaO)	7.98	%wt

Comment(s)

1. The measured content of Carbon Black and Zinc Oxide in U710036-02 Sample 2 (Shreaded Rubber Pieces) complied with the specification limits stated in the MSDS of EPDM-Dense (Published by Ecore International) but not for the measured content of Calcium Oxide (CaO).

Component	*Spec. Limit (%wt)	Measured Value (%wt)	Comment
Carbon Black	40-70 %wt	39.8 %wt	Complied
Calcium Oxide (CaO)	1-5 %wt	7.98 %wt	Not Complied
Zinc Oxide (ZnO)	1-5 %wt	1.78 %wt	Complied
Organic Materials	-	48.7 %wt	Not relevant

* Based on MSDS provided by Eurofins Product Testing US Inc.

2. The Ash content of 11.5 %wt is higher than the sum of Zinc Oxide (ZnO) and Calcium Oxide (CaO) which is 9.76 %wt; suggesting there is/are other thermally stable component(s) in EPDM-Dense besides ZnO and CaO.

Note: This report comes with an attachment.

- End of Report -

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Report No. : FA1710-0065 **Page No.** : 1 of 1

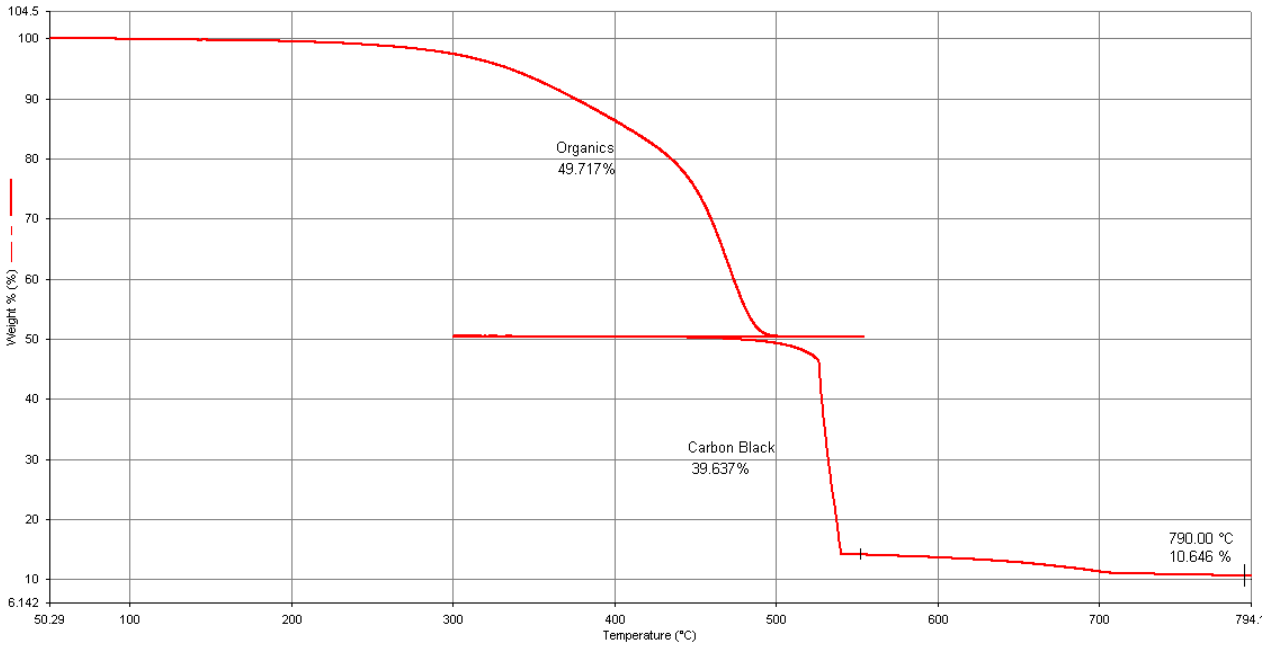

Figure 1: TGA Thermogram of U710036-02 SAMPLE 2 (SHREDDED RUBBER PIECES)

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