U.S. Department
of Transportation

**Pipeline and Hazardous
Materials Safety
Administration**

1200 New Jersey Avenue, SE
Washington, D.C. 20590

JUN 25 2014

Ms. Tesa Bell
Production Manager
UTRON Kinetics, LLC
9441 Innovation Drive
Manassas, VA 20110

Ref. No.: 14-0105

Dear Ms. Bell,

This is in response to your May 27, 2014 letter requesting clarification on the proper classification of a fabricated product containing zinc, zirconium and tungsten under the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180).

According to your letter, zirconium is a Class 4 reactive material when in a powder form. However, the process of fabricating the product into a solid state renders the material safe for handling. You have provided laboratory test results that indicate the fabricated product does not meet the definition of a Class 4 material. Specifically, you are requesting confirmation that your product is not subject to the requirements of the HMR when in a solid, compact state.

In accordance with § 173.22, it is the shipper's responsibility to properly classify a hazardous material. This Office generally does not perform this function. However, based on the test data you provided, we agree that your fabricated product does not meet the definition of a Class 4 material. Therefore, if your company's product does not meet any other hazard class definition in Part 173, and is not a hazardous substance, hazardous waste, or marine pollutant, it is not subject to the HMR.

I trust this information is helpful. If you have further questions, please do not hesitate to contact this office.

Sincerely,

for

Shane C. Kelley
Acting International Standards Coordinator
Standards and Rulemaking Division

UTRON

Wiener
§171.1
§172.101
Applicability
14-0105

May 27, 2014

U.S. Department of Transportation
Pipeline and Hazardous Materials Safety Administration
Office of Hazardous Material Safety
1200 New Jersey Avenue, SE.
Washington, DC 20590

Re: Request for Interpretation Letter

Dear Sir:

UTRON Kinetics, LLC ("UTRON") is a compacted-powder parts manufacturing company that specializes in parts that have specific, and often unique, characteristics. UTRON has developed a product for use in Department of Defense Applications that is a combination of three materials: zinc, zirconium and tungsten. While the zirconium is a reactive material in its powder form, the process of fabricating this part into a solid state renders the material safe for handling.

At the advice of the Department of Transportation: Office of Hazardous Material Safety, UTRON conducted the tests listed in the table below to determine if the Hazardous Materials Regulations contained in HMR: 49 CFR Parts 171-180 are applicable to this product. Complete test results are attached for review and consideration.

Test / Parameter	**Result**
Burn Rate Test (DOT/UN Test N.1)	Not a readily combustible substance of Division 4.1
Self-Heating Substances Test (DOT/UN Test N.4)	Not a self-heating substance of Division 4.2
Dangerous When Wet – Hazmat Label	Substance is not dangerous when wet

All tests returned a result indicative of material not subject to the Hazardous Materials Regulations referenced above. Accordingly, UTRON respectfully requests an interpretation that the Hazardous Materials Regulations do not apply to the packaging and transportation of this product when in a solid, compacted state.

If you require any additional information to process this request, please contact Tesa Bell (tesab@utronkinetics.com) or Kevin McMahon (kevinm@utronkinetics.com) at (703) 369-5552.

Respectfully submitted,

Tesa Bell

Tesa Bell
Production Manager
UTRON Kinetics, LLC

9441 Innovation Drive Manassas, VA 20110
Phone: (703) 369-5552 Fax: (703) 369-5298

Drakeford, Carolyn (PHMSA)

From: Dodd, Alice (PHMSA)
Sent: Wednesday, May 28, 2014 11:49 AM
To: Drakeford, Carolyn (PHMSA)
Subject: FW: Request for Written Interpretation
Attachments: How to UNZIP.html; SecureZIP Attachments.zip

Carolyn can you assign this pls

From: Tesa Bell [mailto:tesab@utronkinetics.com]
Sent: Wednesday, May 28, 2014 9:55 AM
To: Hazmat Interps
Cc: kevinm@utronkinetics.com
Subject: Request for Written Interpretation

Dear Sirs:

Attached for your review is a request for written interpretation of the applicability of Hazardous Materials Regulations to the packaging and shipping of our product. We thank you in advance for your consideration of this request.

Regards,
Tesa Bell

Tesa Bell
Production Manager
UTRON Kinetics, LLC
(703) 369-5552

UTRON

9441 Innovation Drive
Manassas, VA 20110
(703) 369-5552

Summary of Hazmat Testing of TZZ Cubes
Testing conducted by:
DEKRA / Chilworth Technology, Inc. and
UTRON Kinetics, LLC

Burning Rate Test Results – Fire Train Test Data (Conducted by Chilworth 4/5/14)

Test Purpose:	To determine the burning rate of any substance that can be ignited.
Ignition Source:	Flame or hot wire (above 1000°C)
Results:	**Not** a readily combustible substance of Division 4.1.

Six separate trials all yielded the result of "sample did not ignite upon application of ignition source"

Self-Heating Solids Testing (U.N. Division 4.2) - 140°C Temperature (Conducted by Chilworth 4/5/14)

Test Purpose:	U.N./DOT Classification for transport purposes with respect to self-heating solids.
Sample size:	4100 grams
Temperature:	140°C
Results:	**Not** self-heating substance of Division 4.2. No exothermic reaction was observed during the test.

Dangerous When Wet – Hazmat label (Conducted by Utron Kinetics, 5/13/14-5/15/14)

Test Purpose:	To determine the consequences of a substance submersed in water over time.
Sample:	Three 8mm cubes submersed in a medium.
Medium:	500 mls of tap water
Results:	Substance is **NOT** dangerous when wet. **No** change in cubes geometry, appearance or color. No change in temperature of the water over the course of the 48 hour test.

TZZ cube components: tungsten, zinc and zirconium

TZZ Cubes Other Properties:

Non Radioactive
Not an Oxidizer
Not Toxic
Not Liquid
Not a Gas

UTRON Kinetics, LLC

5/27/14
Date

Attachments: Test Results from Chilworth Technology and UTRON Kinetics,LLC

DEKRA

Client	**Utron Kinetics, LLC**
Contact	**Mr. Kevin R. McMahon**
Report issue date	**April 18, 2014**
Report number	**UT14978RP**

TZZ 8mm CUBES

DOT/UN Department of Transportation Flammability Testing

Reviewed By ..... Yuan Dai

Yuan Dai
Senior Laboratory Specialist

Approved By ..... Victor Churchwell for

Don B. Churchwell
Laboratory Manager

Quote / Job Numbers: 23030 / 14978

Report prepared by R. Hammer

The Global Experts in Explosion & Process Safety

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Chilworth
a DEKRA company

CONTENTS

INTRODUCTION

This report presents the results of DOT/UN Department of Transportation flammability measurements performed on your **TZZ 8mm CUBES** sample. The results are summarized in Table 1 on the following page. The report includes a description of the test procedures and an interpretation of the results.

Chilworth Technology is experienced in providing specific advice in the areas of dust explosion prevention and control, electrostatics, thermal stability and chemical reaction hazards. Site visits to discuss operational safety or to perform plant inspection and measurements can be arranged.

Name and address of client:
Mr. Kevin R. McMahon
Utron Kinetics, LLC
9441 Innovation Drive
Manassas, VA 20110

DEKRA

TABLE 1

SUMMARY OF TEST RESULTS

For Test Sample: **TZZ 8mm CUBES**

Parameter	Test Results
Burn Rate Test (DOT/UN Test N.1)	**Not** a readily combustible substance of Division 4.1
Self-Heating Substances Test – (DOT/UN Test N.4)	**Not** classified as a self-heating substance of Division 4.2

Note: The results given in this report apply to the sample tested. Changes in composition, particle size, and moisture content may affect the results.

BURNING RATE TEST

MEASUREMENT RESULTS AND INTERPRETATION

FOR

TZZ 8mm CUBES

FOR AND ON BEHALF OF CHILWORTH TECHNOLOGY, INC.

FLAMMABILITY OF SOLIDS
BURNING RATE TEST
(FIRE TRAIN TEST)

Test Method

This test is designed to meet the specification of the following documents:

1. EEC Directive 79/831 ANNEX Part A. Methods for the Determination of Physico-Chemical Properties 3.10 Flammability of Solids.

2. The United Nations Document, Recommendations on the Transport of Dangerous Goods (in part only).

3. HSE Code of Physico-Chemical Properties 1982.

4. D.O.T. ref 49CFR, Section 173, App. E

Purpose

The Fire Train Test is designed to measure the rate at which combustion moves away from an ignition source, along a 250mm train of powder. Fire or combustion properties are required to assess the type and magnitude of any fire risk associated with a powder.

Measurement Method for the Fire Train Test

The fundamental chemical mechanisms of combustion are complex and furthermore chemical mechanisms can be markedly affected by physical characteristics (e.g. particle size and packing density).

The powder as supplied is filled into a mould 250mm long with a triangular cross section of height 10mm and width 20mm.

After tapping the mould, to settle down the powder, it is inverted onto an impervious non-combustible plate of low thermal conductivity. The mould is removed and the ignition source (flame or hot wire above 1000°C) is placed at one end of the powder train for 2 minutes (5 minutes for powders of metals or metal alloy) or until the powder ignites. When the sample has burned a distance of 80mm the rate of burning over the next 100mm is measured. The test is repeated six times using a cool clean plate each time unless a positive result is obtained earlier.

If a positive result is obtained with non-metallic powders, one ml of a wetting solution is applied to the train beyond the timed zone. Whether or not the wetted zone stops the propagation of the flame determines the packing group of the material.

BURNING RATE TEST RESULTS
FIRE TRAIN TEST DATA

Powder Information

Company Name	:	**UTRON KINETICS, LLC**
Test Sample	:	**TZZ 8mm CUBES**
Ref. No.	:	N/A
Origin of the Sample	:	N/A
Size Information	:	Sample tested as received.
Comment	:	Gray metal square

Test Information

Test Purpose	:	To determine the burning rate of any substance that can be ignited.
Apparatus	:	Fire train mould (250mm long) with triangular cross section (20mm wide x 10mm high).
Ignition Source	:	Flame or hot wire (above 1000°C).
Date of Test	:	04.05.14
Operator	:	A. Gangu

Results

Classification of Substance	:	**Not a readily combustible substance of Division 4.1.**
Rate of Burning (over 100mm)	:	N/A

Trial No.	Burning Time (seconds)	Comments
1	N/A	Sample did not ignite upon application of ignition source
2	N/A	Sample did not ignite upon application of ignition source
3	N/A	Sample did not ignite upon application of ignition source
4	N/A	Sample did not ignite upon application of ignition source
5	N/A	Sample did not ignite upon application of ignition source
6	N/A	Sample did not ignite upon application of ignition source

DEKRA

SELF-HEATING SOLIDS

MEASUREMENT RESULTS AND INTERPRETATION

FOR

TZZ 8mm CUBES

FOR AND ON BEHALF OF CHILWORTH TECHNOLOGY, INC.

SELF-HEATING SOLIDS

Test Standard

Test performed according to section 14.5.5 United Nations Recommendations on the Transportation of Dangerous Goods test method for self-heating solids.

Test Method

A hot air circulating oven with a volume of greater than 9 liters is used.

Cubic sample containers of 25 mm and 100 mm side made of stainless steel 0.053 mm mesh is used. Each container is housed in a cubic container cover made from stainless steel 0.595 mm mesh and slightly larger than the sample container, so that the container fits in this cover. In order to avoid the effect of air circulation, another stainless steel cage, made from 0.595 mm mesh and 150 x 150 x 250 mm in size, is further installed to house the cover.

Continuous temperature measurement is made using Chromel-Alumel thermocouples. The oven temperature is raised to 140°C and kept there for 24 hours. The first test is conducted with a 100mm cube sample. Observations are made to determine if spontaneous ignition occurs or if the temperature of the sample exceeds 200°C. If negative results are obtained no further test is necessary. If positive results are obtained a second test should be conducted with a 25 mm cube. If the test is negative in the 25mm cube, another test is performed in the 100mm cube at 120°C if the material is to be transported in packagings of more than 450 liter volume and less than 3 m^3, or tested in a 100 mm cube at 100°C if the material is to be transported in packagings of less than 450 liter volume.

Criterion for classification

A substance should not be classified in Division 4.2 if:

(a) A negative result is obtained in a test using a 100 mm cube sample at 140°C.

(b) A positive result is obtained in a test using a 100 mm sample cube at 140°C and a negative result is obtained in a test using 25 mm cube sample at 140°, a negative result is obtained in a test using a 100 mm cube sample at 120°C and the substance is to be transported in packages with a volume not more than 3 m^3.

(c) A positive result is obtained in a test using a 100 mm sample cube at 140°C and a negative result is obtained in a test using a 25 mm cube sample at 140°C, a negative result is obtained in a test using a 100 mm cube sample at 100°C and the substance is to be transported in packages with a volume not more than 450 liters.

Packing Group II should be assigned to self-heating substances, which give a positive result in a test using a 25 mm sample cube at 140°C.

Packing Group III should be assigned to self-heating substances if:

(a) A positive result is obtained in a test using a 100 mm cube at 140°C and a negative result is obtained in a test using a 25 mm cube sample at 140°C and the substance is to be transported in packages with a volume of more than 3 m^3.

(b) A positive result is obtained in a test using a 100 mm sample cube at 140°C and a negative result is obtained in a test using a 25 mm cube sample at 140°, a positive results obtained in a test using a 100 mm cube sample at 120°C and the substance is to be transported in packages with a volume of more than 450 liters.

(c) A positive result is obtained in a test using a 100mm sample cube at 140°C and a negative result is obtained in a test using a 25 mm cube sample at 140°C and a positive result is obtained in a test using a 100 mm cube sample at 100°C.

Results

The results follow on the next page.

SELF-HEATING SOLIDS TESTING (U.N. Division 4.2) – AT 140°C TEMPERATURE

Sample Information

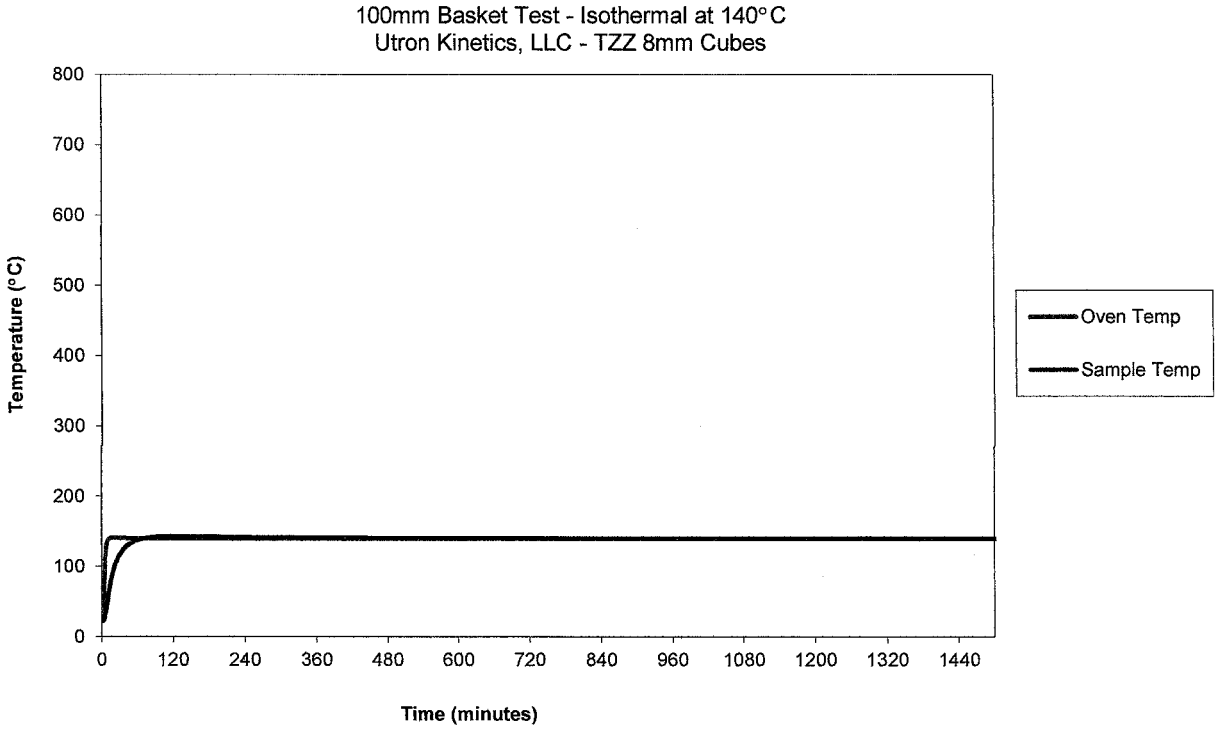
Company Name	:	**UTRON KINETICS, LLC**
Test Sample	:	**TZZ 8mm CUBES**
Ref. No.	:	N/A
Origin of the Sample	:	N/A
Size Information	:	Sample tested as received
Comment	:	Gray metal square

Test information

Test purpose	:	U.N./DOT Classification for transport purposes with respect to self-heating solids.
Apparatus Type	:	Hot air circulation oven with an inner volume of >9 liters, Cubic stainless steel mesh containers
Sample Mass	:	4100.0 g
Basket Size	:	100 mm at 140°C
Date of Test	:	04.15.14
Operator	:	Y. Dai

Results: **Not self-heating substance of Division 4.2**

Comment: No exothermic reaction was observed during the test.


100mm Basket Test - Isothermal at 140°C
Utron Kinetics, LLC - TZZ 8mm Cubes
Temperature (°C)
800
700
600
500
400
300
200
100
0
0
120
240
360
480
600
720
840
960
1080
1200
1320
1440
Time (minutes)
Oven Temp
Sample Temp

APPENDIX

Legal Disclaimer and Liability

(a) Limitation of Liability. The test procedures and/or consulting services conducted by Chilworth Technology (the "Company") were performed under controlled laboratory conditions, which the Company considers reliable. Although the Company performed its testing services pursuant to reliable and generally accepted testing procedures in the industry, the Company does not guarantee or provide any representations or warranties with respect to Client's use, interpretation or application of the test results and/or consulting services provided by the Company. Moreover, the results of the testing procedures are based upon certain assumptions, information, documents, and procedures provided by the Customer. AS SUCH, IN NO EVENT AND UNDER NO CIRCUMSTANCE SHALL THE COMPANY BE LIABLE FOR SPECIAL, INDIRECT, PUNITIVE OR CONSEQUENTIAL DAMAGES OF ANY NATURE WHATSOEVER, INCLUDING WITHOUT LIMITATION, ANY LOST REVENUE OR PROFITS OF THE CUSTOMER OR ITS CUSTOMERS, AGENTS AND DISTRIBUTORS, RESULTING FROM, ARISING OUT OF OR IN CONNECTION WITH, THE SERVICES PROVIDED BY THE COMPANY OR THE RESULTS OF ANY TESTS PERFORMED BY THE COMPANY. The Customer agrees that the Company shall have no liability for damages, which may result from Client's use, interpretation or application of the test results and/or consulting services provided by the Company.

(b) The Company's pricing of the testing services provided does not contemplate that the Company shall have any liability resulting from its performance of the testing procedures, except as otherwise set forth in the Quotation from the Company. Accordingly, the Customer shall indemnify and hold harmless the Company, its shareholders, directors, officers, employees and agents (the "*Indemnified Parties*") from and against any and all loss, cost, liability and expense, including reasonable attorney's fees and costs, which any of the Indemnified Parties may incur, sustain or be subject to, as a result of any claim, demand, action, investigation or proceeding arising out of or relating to either: (a) the testing services provided by the Company; or (b) any material, equipment, specifications or safety information (or lack thereof) supplied to the Company (or which should have been supplied to the Company) by Customer and/or any failure of such materials, equipment, specifications and safety information to comply with any federal, state or local law or safety standard.

(c) For additional terms and conditions, which apply with respect to the provision of this report, see the Quotation provided by the Company and executed by Customer. If any terms set forth in the Quotation conflict with the terms set forth herein, the terms set forth herein shall apply.

TZZ DTRA Cubes in Water

UTRON Kinetics

Record of Observations and water temperature for three 8mm TZZ cubes in 500 mls of water over 48 hour period.

Date of Test: May 13 - 15, 2014
Test Location: UTRON Kinetics VA Facility, Manassas, VA 20110
Test Technician: Kevin McMahon

Time of Day	*Technician Initials*	*Test Date*	*Observation*	*Water Temperature (°F)*
1:50 PM	KRM	05/13/14	First submersed - no reaction - 2 small bubbles (probably porosity)	77
2:00 PM	KRM	05/13/14	no reaction	76
2:20 PM	KRM	05/13/14	no reaction	76
2:40 PM	KRM	05/13/14	no reaction	77
3:15 PM	KRM	05/13/14	no reaction	77
3:37 PM	KRM	05/13/14	no reaction	76
4:20 PM	CA	05/13/14	no reaction	78
5:00 PM	CA	05/13/14	no reaction	79
5:55 PM	CA	05/13/14	no reaction	79
6:36 AM	KRM	05/14/14	no reaction	71
7:23 AM	KRM	05/14/14	no reaction, cubes are intact	71
8:31 AM	KRM	05/14/14	no reaction	72
9:12 AM	KRM	05/14/14	no reaction, cubes look the same as start of test	72
10:06 AM	KRM	05/14/14	no reaction	72
10:37 AM	KRM	05/14/14	no reaction	72
12:00 PM	CA	05/14/14	no reaction	72
1:22 PM	KRM	05/14/14	no reaction	72
2:14 PM	KRM	05/14/14	no reaction	72
2:40 PM	KRM	05/14/14	no reaction	72
3:25 PM	CA	05/14/14	no reaction	72

TZZ DTRA Cubes in Water

UTRON Kinetics

Record of Observations and water temperature for three 8mm TZZ cubes in 500 mls of water over 48 hour period.

Date of Test: May 13 - 15, 2014
Test Location: UTRON Kinetics VA Facility, Manassas, VA 20110
Test Technician: Kevin McMahon

Time of Day	*Technician Initials*	*Test Date*	*Observation*	*Water Temperature (°F)*
4:20 PM	CA	05/14/14	no reaction	74
5:20 PM	CA	05/14/14	no reaction	74
6:10 PM	CA	05/14/14	no reaction	72
6:33 AM	KRM	05/15/14	no reaction	70
7:45 AM	KRM	05/15/14	no reaction	70
10:25 AM	KRM	05/15/14	no reaction	74
11:15 AM	KRM	05/15/14	no reaction	74
12:05 PM	CA	05/15/14	no reaction	74
1:05 PM	CA	05/15/14	no reaction	74
1:10 PM	KRM	05/15/14	no reaction	75
2:05 PM	KRM	05/15/14	no reaction	75