Combustion Research Center
HOERBIGER Safety Solutions

Combustion Research Center (CRC)

Combustion Hazard Testing Request Form

A. CRC Information. The Combustion Research Center (CRC) is an independent test laboratory specializing in the combustion hazards testing of dusts, liquids, and gases. The CRC has been providing combustion test services in accordance with the requirements of recognized standards (including ASTM, OSHA, US DOT, UN) for over 35 years. CRC clients represent a wide range of business and industry sectors including, but not limited to:

Mining	Wood Products	Industrial Hygiene
Petrochemical	Fine Chemicals	Environmental/State Agencies
Plastics	Metals Processing	Federal Agencies
Pharmaceutical	Environmental	Universities
Food Products		

Many dusts, liquids and gases pose fire and explosion risks in the workplace. Common materials of commerce are subject to ignition by various means. Fires can occur in unsuspecting ways due to exposure of materials to elevated temperatures. An explosion can result from ignition of a flammable atmosphere created by suspended dust (dust cloud), vapor clouds and gases that may exist in closed or semi-enclosed process spaces.

Combustion hazards testing can reveal the sensitivity of materials to ignition and the explosion characteristics of flammable atmospheres. Preventing explosions and fires in industrial settings involves many considerations. Central to any process safety analysis is accurate data that represents the ignition and combustion properties of materials used in the workplace.

The CRC will be pleased to provide you with a proposal for your material testing requirements. Simply complete the sections below and either send this form to the CRC or e-mail it to info.CRC.us@Hoerbiger.com. Once the CRC receives the completed form, we will issue a formal proposal which details the scope or work, pricing, terms and conditions, and payment information. Upon acceptance of the proposal, the dust sample(s) can be packaged and sent to the CRC per the instructions included in this document using the Sample Collection Kit(s). Testing will begin upon receipt of a signed proposal along with the signed terms and conditions and MSDS from the customer. Upon completion of the test program, the test results will be provided electronically in the form of a test report.

Combustion Research Center
417-1 South Street, Marlborough, MA, 01752
ph 508.429.3190 fax 508.485.3115
www.CombustionResearchCenter.com

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Customer Information			
Company		**Telephone**	
Contact Name		**E-mail Address**	
Address		**Representative Name & Company**	

B. Material Description. Provide a brief description of your material in the boxes below.

Material Name	
Material Description	

C. Test Selection. Select the desired test(s) by placing a "check" mark in the appropriate row(s).

Test Description	Sample Amount Required	Standard	Check Box
Particle Size Analysis – This test determines the size of the sample. Combustibility and reactivity of the material increases with decreasing particle size.		CRC SD-3	
Moisture Content – The higher the moisture content of a sample, the less explosive it is. The moisture content of a sample is determined prior to testing.		CRC SD-5	
Percent Combustible Material/Ash – This test determine the percent of combustible material in a sample when heated to 600°C for one hour.	50 g	OSHA CPL 03-00-008	
Explosibility of Combustible Dusts (P_{MAX} and K_{ST}) - This test is performed to determine whether a dust is combustible and indicates the degree of explosion hazard. The K_{ST} value derived from the test is used as a design parameter for your explosion protection system.	1000 g	ASTM E1226	
Go/No Go (Screening) Test for Dust Combustibility – This is a screening test to determine whether a dust is explosible. It is typically performed on "as-received" material. Dusts found to be combustible should be characterized by additional testing.	200 g	ASTM E1226	
Dust Classification by Explosion Severity (OSHA Class II) – Determines whether a combustible dust meets the criteria of a Class II dust as defined by OSHA Explosion Severity criteria.	200 g	OSHA CPL 03-00-008	
Minimum Explosible Concentration of Dust (MEC) - This test determines the minimum concentration of a dust cloud that may cause an explosion.	500 g	ASTM E1515	
Minimum Ignition Energy of a Dust Cloud in Air (MIE) - This test determines the lowest electrostatic spark energy capable of igniting a dust cloud. A dust having a very low MIE requires special attention to process conditions to avoid ignition. MIE less than 100mJ indicates a potential for ignition from static discharges from personnel, MIE<25mJ, from static discharges from movement and bulk handling of powders. If MIE is less than 25mJ, resistivity testing is important to determine the ability of the material itself to generate electrostatic charges.	500 g	ASTM E2019	
Limiting Oxygen Concentration, dusts (LOC) - This test determines the lowest concentration of oxygen at which a particular dust is combustible. LOC is needed if inerting is used as a basis of safety for explosion protection	500 g	ASTM E2931	
Min Auto-Ignition Temperature of Dust Cloud (T_C) - This test determines the sensitivity of a dust cloud to a hot environment.	100 g	ASTM E1491	
Hot-Surface Ignition Temperature of Dust Layer (T_S) - This test determines the sensitivity of a dust to hot surfaces. It measures the minimum temperature at which a dust layer will ignite.	500 g	ASTM E2021	
Auto-Ignition Temperature of a Dust Layer (T_L) - This test determines the minimum temperature at which a dust layer in a hot environment will ignite.	100 g	Bur Mi RI5624	
DOT Packing Classification & Self Heating Test - Substances Liable to Spontaneous Combustion. This test evaluates the tendency for a packaged dust to spontaneously ignite upon exposure to a temperature of 140°C for up to 24 hours. Data is used to classify materials with respect to packaging class.	2000 g	49 CFR 173	
Powder Burning Rate – The ability of a dust to propagate combustion is tested by igniting it and determining the burning time.	1000 g	UN Test N.1	
Powder Resistivity – This test determines the volume resistivity of a dust sample and is used to describe its conductive, dissipative, or insulative range.	50 g	ASTM D257	

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D. Sample Size and Particle Size. Please provide a sample size of 1200g for P_{MAX}/K_{ST} test and an additional 300g per each additional test that is desired. ASTM test standards typically require that the dust particle size to be tested is smaller than 74 µm (passes through a 200 mesh screen) due to the possible accumulation of fines at some locations in a processing system. Make every effort to obtain the finest dust possible from your process in order to expedite testing. Consider pre-screening dusts that contain coarse particles. A household flour sifter or a similar device can be used to separate coarse materials from fine materials. Additional charges must be applied for samples requiring particle size reduction in order to make them ready-to-test. Dust samples may be tested in the "as-received" form upon request by the customer.

Left. Fine dust. d < 74 µm. Ready for testing.

Right. This sample contains very little dust. Not testable for dust combustion hazard properties without extensive processing.

E. Dust Sample Moisture. ASTM test standards require that dusts be dry with less than 5% moisture. Unless otherwise instructed, samples provided with a moisture content greater than 5% will be heated to ensure moisture content is within acceptable limits.

F. Hazard communication. A Material Safety Data Sheet (MSDS) **must be included** along with each dust sample. If the material is classified "hazardous" as defined by the Department of Transportation, please contact the CRC prior to sending in the sample. Any dust samples received without an MSDS and without prior approval by the CRC will be returned to the customer immediately upon receipt. If an MSDS is not available, please contact the CRC prior to shipping the sample.

G. Distribution. By initialing here, I authorize the CRC to release the test results to my representative. _____

H. Material Disposal. Upon completion of test program, all materials will be disposed of unless otherwise noted.

I. Material Packaging. Collect the dust sample and place it in the plastic bag. Label the plastic bag with the dust sample name. Seal the bag using the tie wrap and place it in the box provided. Fill out the box label and place it over the box opening as shown. For larger samples, use a larger box. For multiple samples, use additional boxes. Each box should contain only one dust sample.

Metal dusts should be collected and promptly submitted for testing as they tend to oxidize over time. Contact the CRC prior to sending in metal dusts for additional packaging instructions.

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