

## THE CHALLENGE

### Conversion of waste materials into reusable products

Onsite sanitation technologies, particularly portable toilets, pit latrines, septic tanks are common and highly used in densely populated areas. Conventional wastewater treatment plants (WWTP) are also sources of high sludge quantities. These large volumes of sludge attract a large number of pathogens and vector attraction, which is a major concern as it can lead to disease outbreaks.

Rapid sludge generation limits the application of traditional alternatives for sludge treatment and/or disposal. Other alternatives for sewage sludge treatment and/or disposal, such as anaerobic digestion, composting, etc. with relatively low conversion rates may not be viable for rapid sludge processing.

Therefore, CDD Society set up a laboratory to do research on the value of waste and how it can be utilized further.

In order to get reproducible and reliable measurement results, sample preparation is most important. Sludge is an inhomogeneous mixture of solid and liquid waste, containing mostly excreta and water in combination with sand, grit, metals, trash and/or various chemical compounds. Therefore, samples have to be thoroughly mixed and weighted into batches. Furthermore, it is important to reduce the moisture level by using a drying oven before testing the sample in the calorimeter. Post the drying procedure, the sample needs to be pelletized in order to facilitate the measurement process.

Trial No.	Sample name	Weight (g)	Sample form	Temp. rise (K)	Result (J/g)	Remarks
1	Benzoic acid	1.0082	Pellet	2.9442	26461	Complete combustion
2	Final compost	1.0762	Pellet	1.3522	11325	Complete combustion
3	SBD sludge	1.0188	Pellet	1.5216	13476	Complete combustion

The below pictures show the final compost and Sludge Belt Dryer (SBD) sludge.



Final Compost



SBD Sludge

## THE SOLUTION

### Reproducible and reliable gross calorific value determination

CDD Society uses an IKA calorimeter (model C 200) to determine the gross calorific value of waste samples.

*The ultimate goal of measuring the gross calorific value of the waste samples is the conversion of waste materials into reusable products (e.g. vermicomposting, organic manures or alternate fuels) that finally lead to a healthier and more hygienic environment.*

Before starting the measurements, the calorimeter has to be calibrated. CDD society calibrated its C 200 with C 723 benzoic acid using the operation mode 'dynamic' at 25 °C and achieved the following results: C-value of 9102 J/K; reference gross calorific value (GCV): 26,460 J/g.

Afterwards sample measurements can be started. Some exemplary results are shown in the table below.

### IKA India Private Limited

814 / 475, Survey No. 129 / 1 Mysuru Road,  
Kengeri, Bengaluru 560060, Karnataka, India  
Phone: +91 80 26253 900, Fax: +91 80 26253 901  
Free Hotline: 1800-42-555-444, e-Mail: info@ika.in



www.ika.com



IKAworldwide // #lookattheblue