

Profile

A Doctoral Researcher at IISc, Bangalore, having experience in following areas:

1. Conducting **fundamental experiments** for understanding behaviours of **solid fuel combustion/gasification** and **flow visualization** in the reactor.
2. **Numerical simulation of two-phase flow** to predict fluid-particle interactions and behaviour in the gasifier.
3. Designing **1 tpd torrefaction facility** of bulk agro residue like rice straw.
4. Design, development, and operational optimization of **Pilot scale 150 kW_{th} high ash coal gasifier** and **associated flow & thermal component** like condenser, venturi meter, flow connections, valves, fuel feeding, ash extraction system, etc.

Education

B.E. Mechanical Engineering, RGPV Bhopal

August 2009- Jun 2013 (76.6/100)

MTech, Thermal Sciences, NIT Calicut

August 2014- July 2016 (7.85/10)

PhD, High Ash Coal Gasification, IISc, Bengaluru

August 2017- Present (8/10)

Projects

1. **Zero-dimensional simulation of water injection in Compression ignition engine.** August 2015- December 2016
2. **Design of one ton/day torrefaction and palletization system for the bulk agro residue to replace coal from torrefied biomass in power plants.** September 2020- December 2020
3. **Design and development of 150 kW_{th} two-stage cyclone gasification for high ash coal.** August 2018- Present

Publication

1. **Shirish Kumar Sharma**, Anand Shivapuji, S. Dasappa, A novel two stage gasification reactor for generating H₂-rich high calorific value gas by low grade coals. **39th Pittsburgh Coal conference 2022, Pittsburgh, USA.**
2. **Shirish Kumar Sharma**, Anand Shivapuji, S. Dasappa, Char reactivity assessment of high ash coal in packed bed environments - Experimental investigations. **16th International Combustion Symposium 2022, Aydin, Turkey.**
3. **Shirish Kumar Sharma**, Anand Shivapuji, S. Dasappa, Characterization of novel two stage gasification to produce high calorific value gas: equilibrium analysis and experimentation. (Under review)
4. **Shirish Kumar Sharma**, Anand Shivapuji, S. Dasappa, Gas quality assessment of a novel two stage gasifier (Under review)

Shirish Kumar Sharma

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Skills

Ansys Fluent

MATLAB

Image processing

NASA CEA

Spaceclaim

Gas Chromatography

Tar Analysis

Interests

Two-phase flow modelling

Solid fuel to gaseous fuel

Solid fuel to liquid fuel

Design of experiments

Hydrogen generation

Torrefactions

Waste to energy

Patents

1. A System for Processing Biomass and a method Thereof
2. High ash coal gasification by two-stage gasifier (under review)

Employment history

Assistant Professor (contract), University Institute of Technology, Shahdol (M.P.)

August 2016- December 2016

Teaching Thermodynamics and Theory of Machines, to undergraduate engineering students

Teaching Assistant, NIT Calicut

August 2014-June 2016

Taking lab course as a part of Fluid machinery and Internal Combustion engines

Extracurricular activity

Chief Event co-ordinator, College level Tech fest

March 2011

Volunteer Notebook Drive

August 2017-December 2017

The work was related to teaching underprivileged school kids near IISc Campus

Volunteer, Open Day

March 2018 and April 2019

Designing and performing experiments to explain complex science in an effortless way to school kids.

Reference

Prof. S. Dasappa

Professor and Chairman, Interdisciplinary Centre for Energy Research
Combustion Gasification and Propulsion Laboratory,
Indian Institute of Science, Bangalore-560012

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Hobbies

Singing

Playing Tabla

Playing Badminton