

Design and development of a novel portable bench scale apparatus for measuring the thermal radiation from process industry fires

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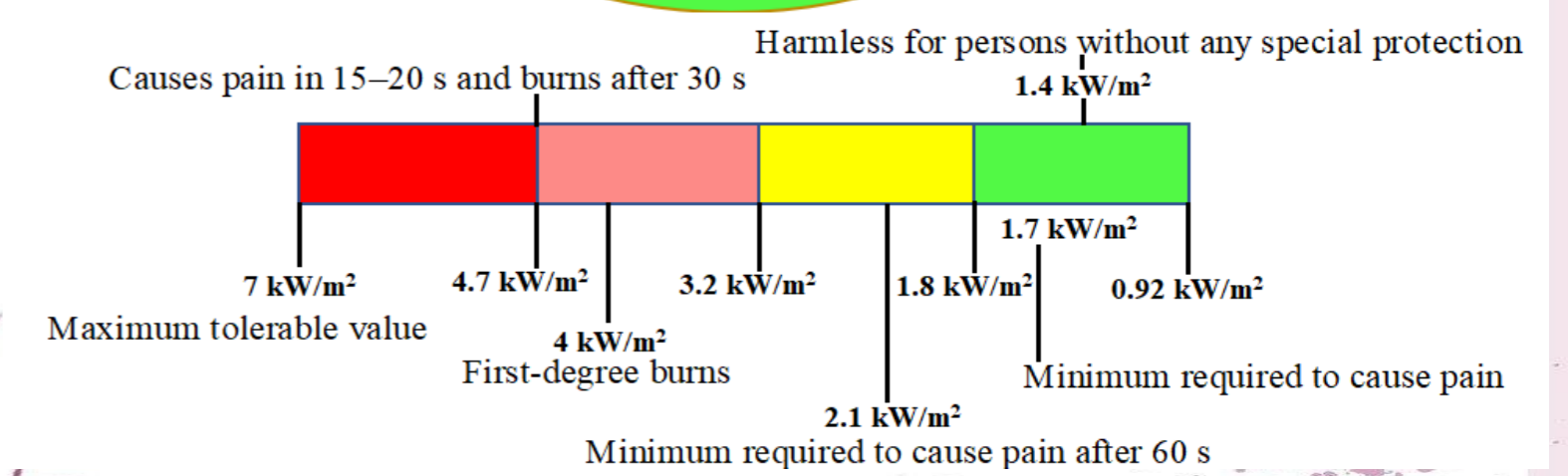
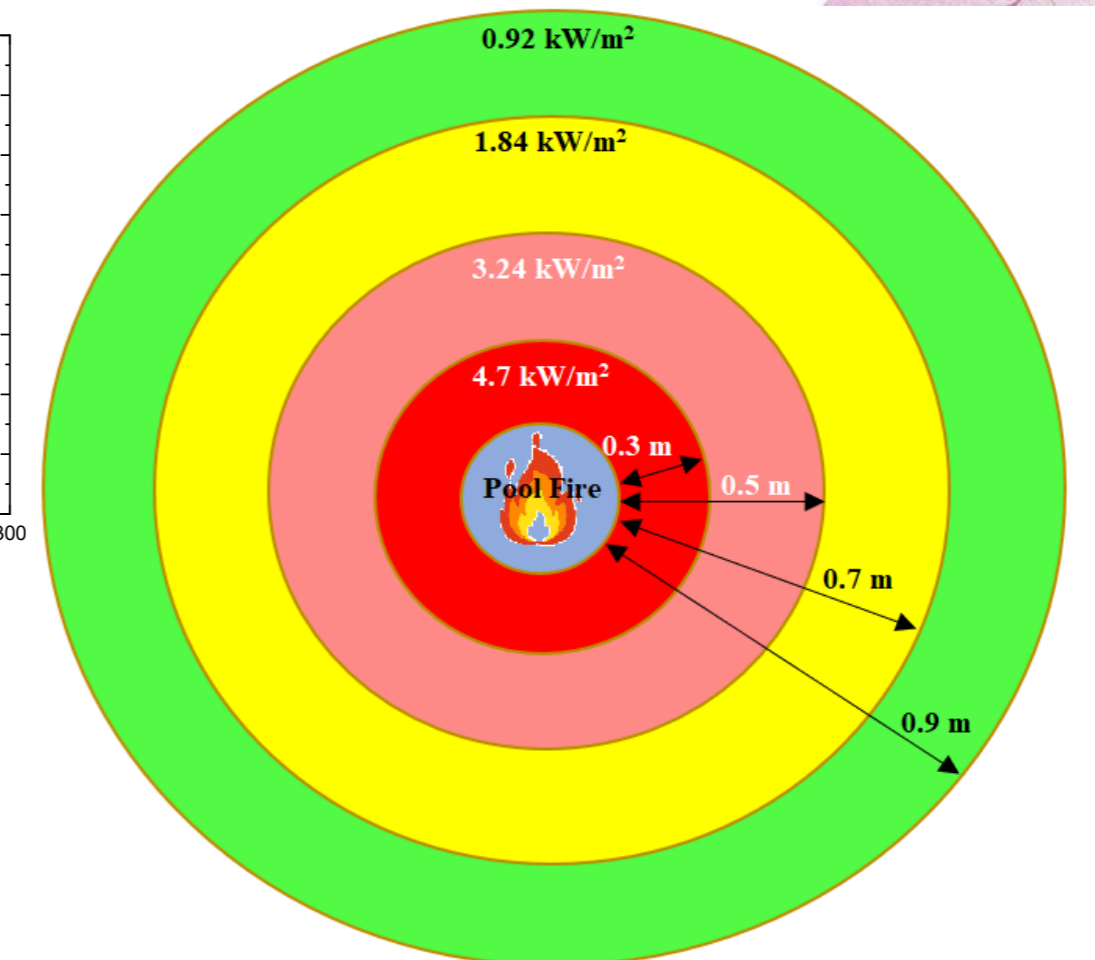
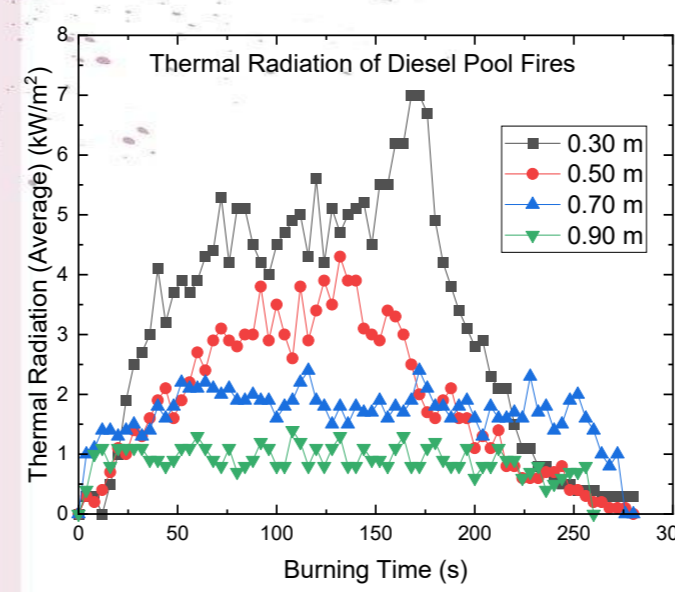
Abstract: Estimating the radiation flux from flames is critical because it serves as a foundation for determining firefighter and structure safe zones. The following objectives have been set for this work: to estimate the mass burning rate, flame temperature, and radiative heat flow from pool fires using a unique bench scale equipment. This unique apparatus is simple to use, and it is simple to compute the fire safety distance for a given fire scenario.

Introduction

Fire safety is becoming increasingly important in all aspects of our lives. Nowadays, industries focus on the fire safety of human lives, property, and the environment.

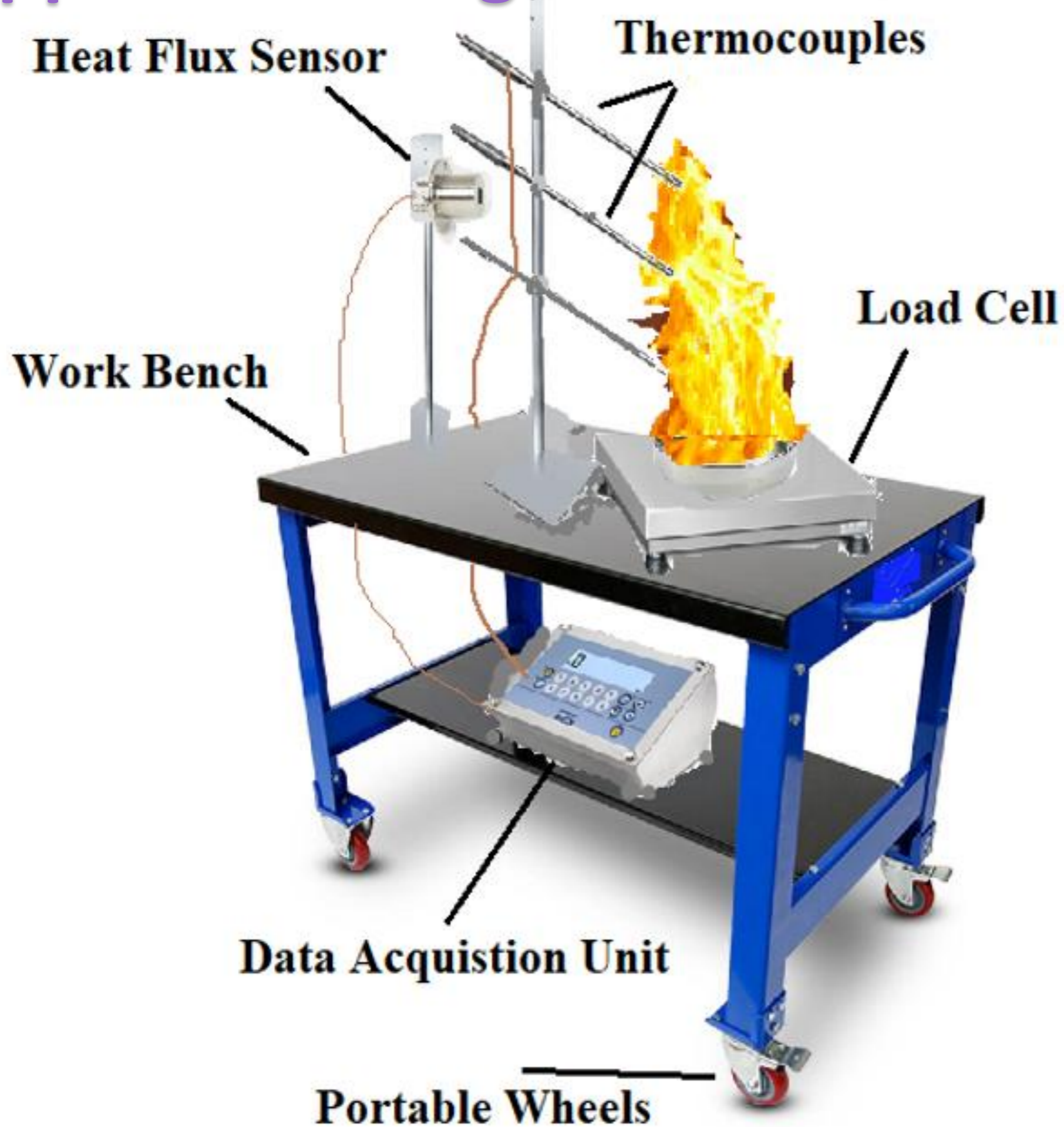
The safe distance from the fire can be determined by estimating critical combustion parameters such as heat radiation, mass burning rate, and flame height. In addition, an apparatus is required to determine the combustion parameters of burning fuels. This research aims to build and create small-scale portable equipment for testing combustible fuel-burning properties.

Thermal Threat Zone Mapping



Thermal radiation mapping of diesel pool fire

Apparatus Design



Significance & Deliverables

This study answers the questions like: the distance at which the controlling system has to be placed, nearest safe distance for an observer with and without protective clothes, establishing safe zones for fire fighters and structures. We can test the fire hazardous properties of different type's fuels, and newly developed fuels.

- Developed a Low cost portable bench scale apparatus for fire testing.
- Oman civil defense and fire service department can use this apparatus for various thermal tests.
- Knowledge transfer to the existing science community.

References

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