

**NUMERICAL SIMULATION OF TUBULAR TYPE  
COMBUSTION CHAMBER WITH HYDROGEN, METHANE  
AND SYNGAS**

**M Tech Dissertation**

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by

**AKSHAY SURENDRASINGH THAKUR**

**150303210011**

Under the supervision of

**Asst. Prof. SWATI PRAJAPATI**



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**DEPARTMENT OF MECHANICAL ENGINEERING  
PARUL INSTITUTE OF ENGINEERING & TECHNOLOGY  
FACULTY OF ENGINEERING & TECHNOLOGY  
PARUL UNIVERSITY  
P.O. Limda – 391 760, GUJARAT, INDIA**

## ABSTRACT

The combustion chamber of gas turbine unit is one of the most critical components to be designed. Scanning through literature reveals that the design methodologies for combustion chamber are available in a discrete manner and there exist a need to compile this information and evolve a systematic design procedure for combustion chamber. Moreover in combustion process nitrogen in fuel and in the air reacts with oxygen at high temperatures to form various oxides of nitrogen collectively called  $\text{NO}_x$ . Fossil fuel power plants are the second largest emitter of  $\text{NO}_x$ .

This is a hazardous pollutant creating visual and respiratory problems. Also  $\text{NO}_x$  combines with water to form acid rain, smog, and ground ozone. The present work is an attempt towards obtaining such gas combustion chamber running on different fuel proportion to obtain minimum  $\text{NO}_x$ . In this project numerical simulation of micro-gas turbine with hydrogen, methane (CNG) and syngas yielding change in output of emission and to obtained change in exit flue gas temperature at equivalence ratio 0.3, 0.5, 0.7, and 0.9.