

INVESTIGATIONS ON TWO STROKE SPARK IGNITION ENGINE WITH COPPER COATED COMBUSTION CHAMBER WITH ALCOHOL BLENDED GASOLINE

S. NARASIMHA KUMA¹, M. V. S. MURALI KRISHNA² & P. V. K MURTHY³

^{1,2}Department of Mechanical Engineering, Chaitanya Bharathi Institute of Technology, Gandipet, Hyderabad,
Andhra Pradesh, India

³Jaya Prakash Narayan Educational Society Group of Institutions, Mahabubnagar, Andhra Pradesh, India

ABSTRACT

Experiments were conducted on single cylinder, two-stroke, spark ignition (SI) engine with copper coated combustion chamber with alcohol blended (80% gasoline blended with 10% ethanol and 10% methanol). Performance parameters and combustion parameters were determined at full load operation of the engine with alcohol blended gasoline. These parameters were compared with conventional engine operated with pure gasoline. Performance parameters and combustion characteristics improved with alcohol blended gasoline operation on copper coated combustion chamber in comparison with conventional engine operated with pure gasoline.

Nomenclature

ρ_a	=	Density of air, kg/m ³
ρ_d	=	Density of fuel, gm/cc
η_d	=	Efficiency of dynamometer, 0.85
a	=	Area of the orifice flow meter in square metre, $\frac{\pi \times d^2}{4}$
BP	=	Brake power of the engine, kW
C_d	=	Coefficient of discharge, 0.65
D	=	Bore of the cylinder, 57 mm
D	=	Diameter of the orifice flow meter, 20 mm
I	=	Ammeter reading, ampere,
H	=	Difference of water level in U-tube water manometer in cm of water column.
IT	=	Injection timing, degree bTDC
K	=	Number of cylinders, 01
L	=	Stroke of the engine, 57 mm
m_a	=	Mass of air inducted in engine, kg/h
m_f	=	Mass of fuel in kg/h,

n	=	Power cycles per minute, N,
N	=	Speed of the engine, 3000 rpm
P_a	=	Atmosphere pressure in mm of mercury,
R	=	Gas constant for air, 287 J/kg-K
T	=	Time taken for collecting 10 cc of fuel, second
T_a	=	Room temperature, degree centigrade
T_i	=	Inlet temperature of water, degree centigrade
T_o	=	Outlet temperature of water, degree centigrade
V	=	Voltmeter reading, Volts
V_s	=	Stroke volume, m^3

KEYWORDS: Alternative Fuels for Gasoline, Change of Fuel Composition, Change of Engine Design, Combustion Parameters, Performance Parameters