

COMPREHENSIVE INDUSTRIAL DOCUMENTS FOR PRODUCER GAS PLANTS AND BIOMASS GASIFIERS



Central Pollution Control Board

(Ministry of Environment & Forests, Govt. of India)
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FOREWORD

Producer gas is a derived gaseous fuel, which is obtained by gasification of various primary fuels like coal, lignite, charcoal, and biomass. In particular, biomass fuels conducive to gasification are wood, rice husk and coconut shell. The principal advantage of gasification technology is that it enables the substitution of expensive fossil fuels with cheaper biomass. The adoption of gasifier technology in many of the processes can lead to improved productivity and better quality of the end product, because of better process control.

The heating value of the producer gas varies between 4.0–6.0 MJ/Nm³, which is about 10-15% of the heating value of natural gas. Producer gases from different fuels and different gasifier types vary in composition, but consist of a mixture of the combustible gases, hydrogen, carbon monoxide, and methane, and the incombustible gases, carbon dioxide and nitrogen. Although producer gas plants and biomass gasifiers are energy efficient and environment friendly, yet, during gas manufacturing, tar which is non-aqueous in nature is generated and discharged into the environment. Gaseous emissions generated during gasification also contain volatile organic compounds along with other gaseous pollutants such as CO, NO_x and SO₂.

Since the local environmental benefits, such as reduction in emission of particulate, CO, SO₂ and NO_x have not so far been studied, the Central Pollution Control Board instituted a study on the characterization of gaseous emissions and liquid effluents from producer gas plants & biomass gasifiers including recommendation for pollution control measures. The study was initiated through The Energy & Resources Institute (TERI), New Delhi. The study is completed and covered various other environmental aspects of gasifiers such as dust, wastewater generation, fly ash and hazards in operation of gasifier etc. The pollution control measures and Good Operational Practices for producer gas plant and biomass gasifiers have also been highlighted. It has been suggested that by adopting good practices relating to process controls can effectively minimize the gaseous emissions, thereby reducing environmental pollution from such plants.

I am thankful to my colleagues Dr. A.B.Akolkar, Additional Director, Shri R.C.Saxena, Sr. Env. Engineer and Ms. Alka Srivastava, Sr. Research Fellow for bringing out this Comprehensive Industrial Document under the guidance of Dr. B.Sengupta, Member Secretary. I hope that this Document will be useful to the Industry, Regulatory Agencies, and all concerned with the Environmental Management.

(J. M. Mauskar)

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