

抗结渣生物质固体颗粒燃料燃烧器研究 Design and Experiment on Anti-slagging Biomass Pellet Fuel Burner

姚宗路 孟海波 田宜水 赵立欣 罗娟 孙丽英

农业部规划设计研究院

关键词: 生物质能 颗粒燃料 燃烧器 秸秆 设计 试验

摘要: 针对我国秸秆类生物质颗粒燃料灰含量高、灰熔点低而导致燃烧过程中易结渣、燃烧器易熄火、燃烧不稳定等问题,采用多级配风原理,设计出高效双层燃烧筒装置,实现三级配风,同时研究了螺旋清灰破渣机构,并在此基础上研制了生物质颗粒燃料燃烧器。采用玉米秸秆颗粒燃料和落叶松木质颗粒燃料进行了燃烧试验,试验结果表明,本燃烧器的多级配风结构和破渣清灰机构设计合理,燃烧效率达到91%,能够有效地将燃烧过程中产生的灰渣排出,结渣率明显下降,实现了连续稳定燃烧。与瑞典PX-20型燃烧器相比,以玉米秸秆颗粒为燃料时,本燃烧器燃烧效率提高了9%、结渣率降低了25.94%,燃料适应性广。A new burner, named PB-20 biomass pellet fuel burner, was developed at the Chinese Academy of Agricultural Engineering to solve the problem of easy flameout and slagging of burner during pellet combustion as there were higher ash and lower ash melting temperature in the pellet made of crop straw in China. The double combustion cylinder efficient device which adopted multi-level wind principles, a helix device breaking slagging and cleaning ash were designed. Combustion experiment with the corn straw pellet fuel and larch wood pellet was conducted after this pellet burner was made. The results showed the burner worked well and the ash and slagging were expelled because of double combustion cylinder efficient and helix device. The slagging rate is 23% and the combustion efficiency is up to 91%. The slagging rate of PB-20 biomass pellet fuel burner decreased by 25.94% and combustion efficiency increased by 9% compared with burner made from Sweden.

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