Title (en)

METHOD OF THERMAL NOX REDUCTION IN CATALYTIC COMBUSTION SYSTEMS

Title (de)

VERFAHREN ZUR REDUZIERUNG VON THERMISCHEM NOx IN KATALYTISCHEN VERBRENNUNGSSYSTEMEN

Title (fr)

PROCEDE DE REDUCTION DE NOX THERMIQUE DANS DES SYSTEMES DE COMBUSTION CATALYTIQUE

Publication

EP 1334307 A4 20070704 (EN)

Application

EP 01273066 A 20011026

Priority

- US 0150466 W 20011026
- US 24401900 P 20001027
- US 94297601 A 20010829

Abstract (en)

[origin: WO02073090A2] Methods and apparatus, both devices and systems, for control of Zeldovich (thermal) Nox production in catalytic combustion systems during combustion of liquid or gaseous fuels in the post catalytic sections of gas turbines by reducing combustion residence time in the HC zone through control of the HC Wave, principally by adjusting the catalyst inlet temperature. As the fuel/air mixture inlet temperature (to the catalyst) is reduced, the HC Wave moves downstream (longer ignition delay time), shortens the residence time at high temperature, thereby reducing thermal Nox production. The countervailing increase in CO production by longer ignition delay times can be limited by selectively locating the HC Wave so that thermal Nox is reduced while power output and low CO production is maintained. Nox is reduced to on the order of <3 ppm, and preferably <2 ppm, while CO is maintained <100 ppm, typically <50 ppm, and preferably <5-10 ppm.
[origin: WO02073090A2] Method and apparatus for control of Zeldovich (thermal) NOx production in catalytic combustion systems during combustion of liquid or gaseous fuels in the post catalytic sections (14) of gas-turbine combustors by reducing combustion residence time in the Homogeneous Combustion (HC) zone through control of the HC Wave position, principally by adjusting the catalyst (13) inlet temperature. As the fuel/air mixture inlet temperature to the catalyst is reduced, the HC Wave moves downstream, extends the ignition delay, shortens the residence time at high temperature, thereby reducing the thermal Nox production. The countervailing increase in CO production by longer ignition delay can be limited by actively positioning the HC Wave so that thermal Nox is reduced while power output and low CO is maintained. Nox is reduced to on the order of <3ppm, and preferably <2ppm, while CO is maintained <100ppm, typically <50ppm, and preferably <5-10ppm.

IPC 8 full level

F02C 3/30 (2006.01); **F02C 9/00** (2006.01); **F02C 9/28** (2006.01); **F23C 13/00** (2006.01); **F23D 3/40** (2006.01); **F23L 15/04** (2006.01); **F23R 3/34** (2006.01); **F23R 3/40** (2006.01); **G05B 13/04** (2006.01)

CPC (source: EP)

F23C 13/00 (2013.01); **F23L 15/04** (2013.01); **F23R 3/40** (2013.01); F23C 2900/13002 (2013.01); F23D 2208/10 (2013.01); Y02E 20/34 (2013.01)

Citation (search report)

- [XA] DE 4202018 C1 19930429
- [XA] US 5601426 A 19970211 - PFEFFERLE WILLIAM C [US]
- [XA] US 6109018 A 20000829 - ROSTRUP-NIELSEN THOMAS [US], et al
- [XA] US 6095793 A 20000801 - GREEB KEVIN [US]
- [A] US 5235804 A 19930817 - COLKET III MEREDITH B [US], et al
- [A] US 5729967 A 19980324 - JOOS FRANZ [DE], et al
- [A] PATENT ABSTRACTS OF JAPAN vol. 014, no. 556 (M - 1057) 11 December 1990 (1990-12-11)
- See references of WO 02073090A2

Designated contracting state (EPC)

AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR

DOCDB simple family (publication)

WO 02073090 A2 20020919; **WO 02073090 A3 20030213**; EP 1334307 A2 20030813; EP 1334307 A4 20070704; JP 2004519651 A 20040702

DOCDB simple family (application)

US 0150466 W 20011026; EP 01273066 A 20011026; JP 2002572313 A 20011026