Publications by Marco A.F. Derksen Related to Flameless (MILD/HiTAC) Combustion

Below is an overview of the main publications and patents by Marco Anton Frederik Derksen that are relevant to flameless oxidation, MILD combustion, and HiTAC (High Temperature Air Combustion) processes. These works primarily address NO_x reduction, air dilution, flue gas recirculation, and numerical modeling of low-emission combustion systems.

Key Publications

- Derksen, M.A.F. (2005). On the influence of steam on combustion (PhD Thesis, University of Twente).
  Contains chapters on dilution with steam/flue gas and its impact on NO_x formation; references 'flameless combustion'.
  Link: https://research.utwente.nl/en/publications/on-the-influence-of-steam-on-combustion
- Landman, M.J.; Derksen, M.A.F.; Kok, J.B.W. (2006). Effect of Combustion Air Dilution by Water Vapor or Nitrogen on NOx Emission in a Premixed Turbulent Natural Gas Flame: An Experimental Study. Combustion Science and Technology, 178(4), 623–634.
  Experimental results demonstrating NO_x reduction through air dilution — a key principle behind flameless/MILD combustion.
  Link: https://www.tandfonline.com/doi/full/10.1080/00102200500240829
- Derksen, M.A.F. (2005). Numerical investigation of methane combustion under mixed air–steam turbine conditions (FLAMESEEK project).
  Numerical modeling of methane combustion under high-dilution conditions relevant to MILD/HiTAC regimes.
  Link:
  https://www.researchgate.net/publication/222900488_Numerical_investigation_of_methane_combustion_under_mixed_air-steam_turbine_conditions
- Derksen, M.A.F.; Roekaerts, D.J.E.M.; Tummers, M.J. (2010–2013). Heavy Fuel-Oil Combustion in a HiTAC Boiler. Combura Symposium, The Netherlands.
  Conference presentation on high-temperature air combustion (HiTAC), an industrial variant of flameless oxidation.
  Link: https://www.utwente.nl/en/eemcs/et/news/2010/10/37658/combura-symposium-2010
- Derksen, M.A.F. (2024). Hydrogen for industrial high-temperature processes — opportunities and challenges. INFUB (Burners, Combustion & Heat Transfer).
  Explores hydrogen combustion and low-NOx design principles applicable to MILD regimes.
  Link: https://www.infub.pt/

Patents

- Derksen, M.A.F. (Co-inventor). Gas burner with low NOx emission. EP 4253838 A1, published 4 Oct 2023.
  Low-NOx burner design using internal flue gas recirculation and staged fuel injection — core concepts of flameless combustion.
  Link: https://patents.google.com/patent/EP4253838A1
- Derksen, M.A.F. (Co-inventor). Burner process for iron fuel combustion arrangement. NL2031419 (2022).
  Industrial burner concept incorporating flue gas recirculation and staged combustion for NO_x reduction.
  Link: https://patents.google.com/patent/NL2031419B1

Summary

Marco Derksen's work spans experimental, numerical, and applied research on combustion systems that operate under diluted and high-temperature conditions — the physical foundation of flameless/MILD combustion. His doctoral and journal work focuses on air and steam dilution for NO_x mitigation, while his patents and later projects translate these insights into industrial burner technology and low-emission hydrogen applications.