



Pathways forward for biodiesel

Biodiesel and changes to UL Standards

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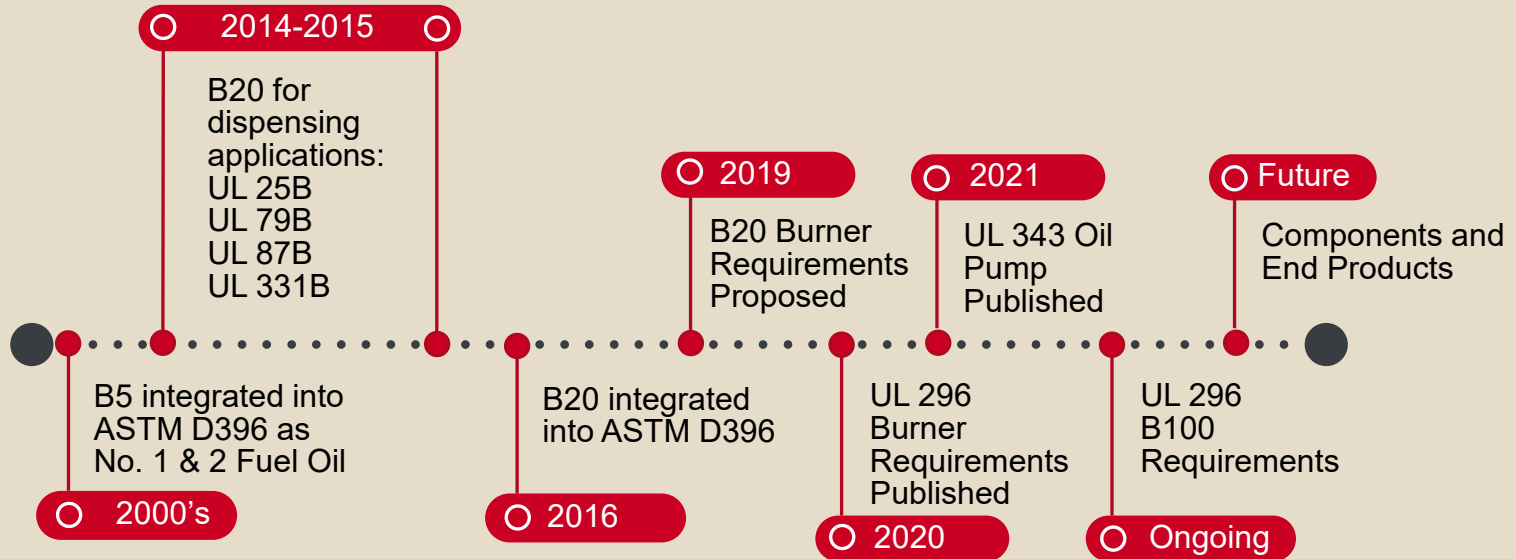
Who am I?



Mark Skierkiewicz

- Principal Engineer for Gas/Oil burners and Gas/Oil heating equipment
- 17 years at UL Solutions advancing safety and supporting the heating equipment industry
- Participates on numerous North American and international technical committees

Background

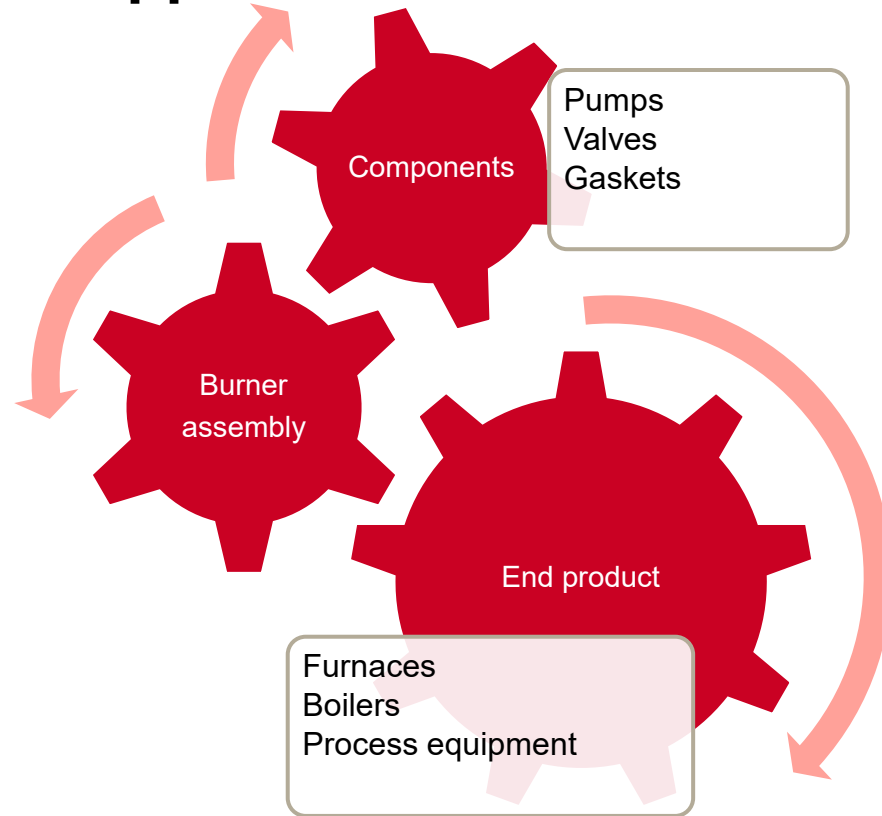


B5 biodiesel integration

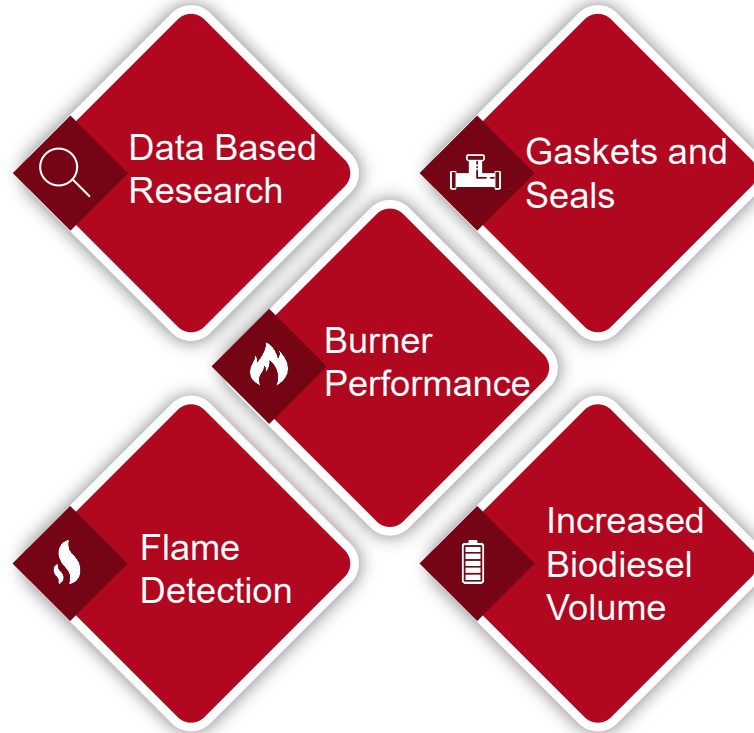
- 2007 – UL fact-finding investigation for NBB
- On Oct. 13, 2008, the ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants announced in a press release (<https://newsroom.astm.org/new-biodiesel-specifications-published-astm-international>) that ASTM D396-08b, Specification for Fuel Oils used for home heating and boiler applications, was revised to include an allowance for up to 5% biodiesel.
- By reference, UL 296, the Standard for Oil Burners, integrated B5 as an allowable oil burner fuel.



Oil-fired appliance approach



Key Proposed Requirements for Biodiesel blends



Standard developments

- Changes to burner standard for B20:
 - Markings – for each fuel that the burner is rated
 - B6-B20 specific annex
 - Component requirements
 - Gasket tests
 - Combustion tests
 - Ignition tests



B20 Combustion tests

- Testing conducted to ensure proper combustion with B20.
- Use of smoke spot test



B100 Combustion tests

- Testing conducted to ensure proper combustion with B100.
- Use of smoke spot test
- Range of fuels
 - Setup on B100
 - Burner is then transitioned to No. 2
 - Shall operate correctly
 - Ignite correctly, stable combustion, no soot on surfaces, and smoke spot



Ongoing Work – UL Standards

UL 296, the Standard for Oil Burners

- Current B100 proposal open for comment
 - UL's Collaborative Standards Development System (<https://csds.ul.com>)
 - Ballots and comments due Nov 14th

UL 343, the Standard for Pumps for Oil-Burning Appliances

- Will follow with gasket and seals requirements for B100
- Similar test program for B100

Ongoing Work – Canadian Standards

CSA B140 Series

- 4th edition published July 2022
- Includes requirements for:
 - Testing appliances burning up to 20% biodiesel
 - Gasket and seal requirements
 - Carbon monoxide not to exceed 400 ppm
 - May require testing

End Product Standards

- Standards refer to the fuel and rate in gallons
 - These requirements are dictated by the burner – should follow markings on burner
- When the same burner is used no additional testing should be required
 - This will need to be confirmed based on the components tested
 - End product retesting could be required if a different burner size/manufacturer is used
- Outdated references in Standards – to be cleared up
 - Standards proposals for new requirements/technologies can be done at the same time

Future Work

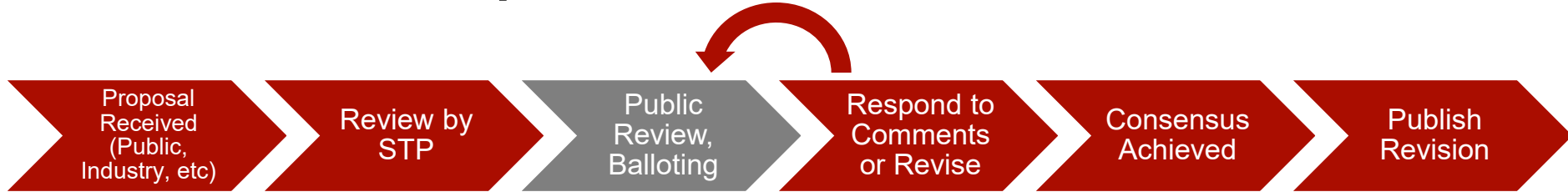
- Requirements in Canada
 - Higher Biodiesel blends – B100?
- Hydrogen Blending
- Biofuels
 - Locally sourced “byproduct” fuels
 - digester gas, landfill gases
- ASTM D02 Committee work
 - ASTM D396 – Fuel Oils includes up to 20% Biodiesel
 - ASTM D6751 – Blend Stock



Thank you

[UL.com/Solutions](https://www.ul.com/Solutions)

Standards Development Process



Key benefits of this process

- Anyone can propose a change
- Standards Technical Panel (STP) is made up of different parts of industry
- STP has an opportunity to revise and clarify during the process
- Feedback is solicited from users and public (30 days minimum)
- Consensus ballot process:
 - Majority have submitted ballot
 - 2/3 have approved
- Appeal process