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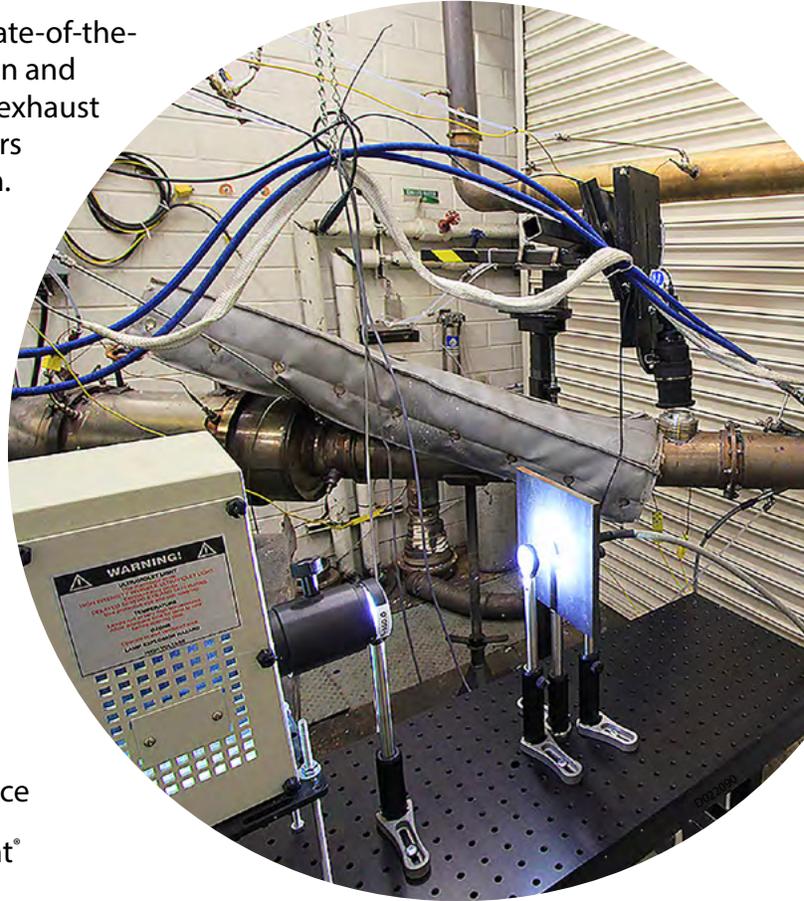


## Urea Deposit Imaging Laboratory

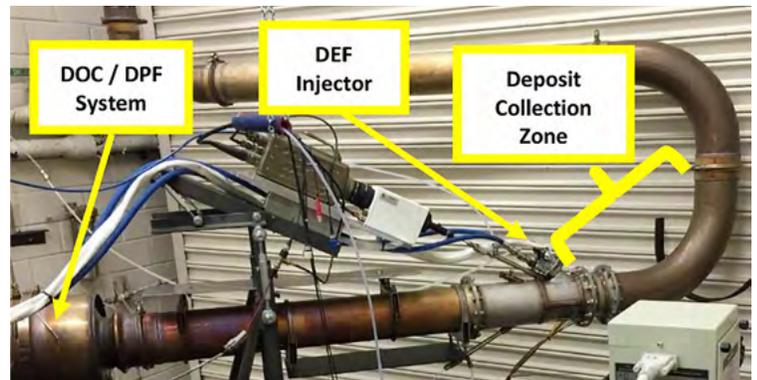
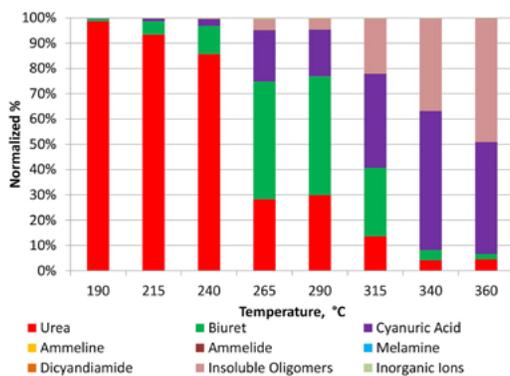
Southwest Research Institute® (SwRI®) has developed a state-of-the-art imaging lab to study urea deposits and their formation and decomposition. A urea water solution is injected into an exhaust system to reduce NO<sub>x</sub> emissions. Deposit formation occurs during decomposition during transient engine operation. These solid polymers (deposits) that form on pipe walls, injectors, and SCR surfaces cause loss of NO<sub>x</sub> conversion efficiency, making the system less effective. Deposit formation in the decomposition reactor remains a significant challenge to aftertreatment system designers due to the complexity of the contributing factors such as temperature, flow rate, flow distribution, dosing rate, wall or mixer surfaces, droplet size, and number distribution.

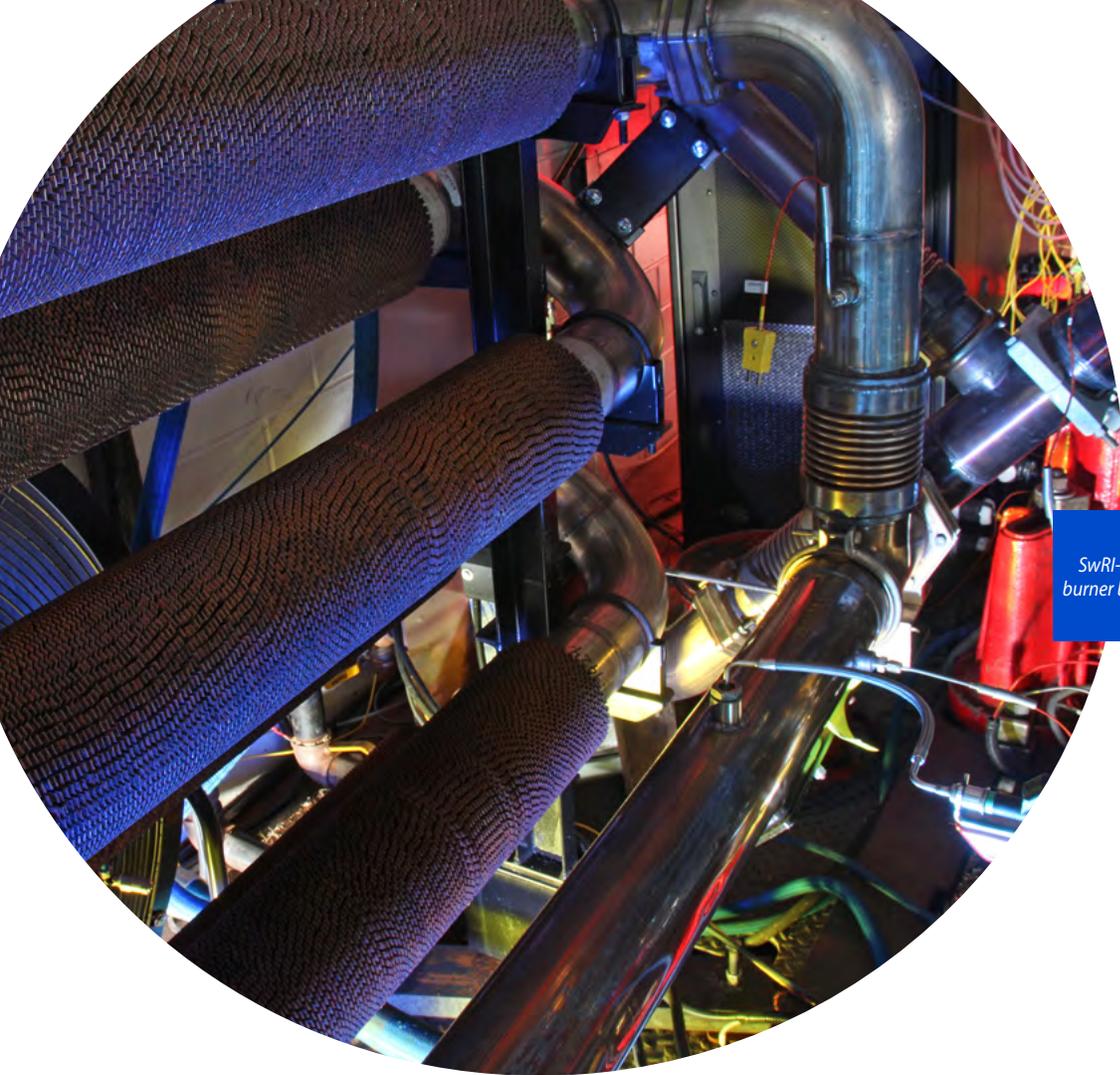
### Instrumentation and Methods include:

- Analyses performed using an Agilent 1290 Infinity HPLC system
- Agilent 6460 triple quadrupole mass spectrometer
- Agilent Jet Stream electrospray ionization (ESI) interface
- Chromatographic separation, Merck Millipore SeQuant® ZIC-HILIC column



SwRI's analytical capability for urea-derived deposit characterization can assist the automotive industry in detecting potential problems relating to the formation of extremely stable polymers inside decomposition reactors as well as optimizing current aftertreatment strategies.





SwRI-developed engine and FOCAS<sup>®</sup> burner based aftertreatment test stands



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### SOUTHWEST RESEARCH INSTITUTE

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