

Leave Behind a Robust Category for 500 ppm Sulfur: API CI-4 2004

Existing Engines On and Off Highway



Test on 500 ppm Fuel Sulfur

EMA Proposal: Changes to API CI-4 Require New Oil Category

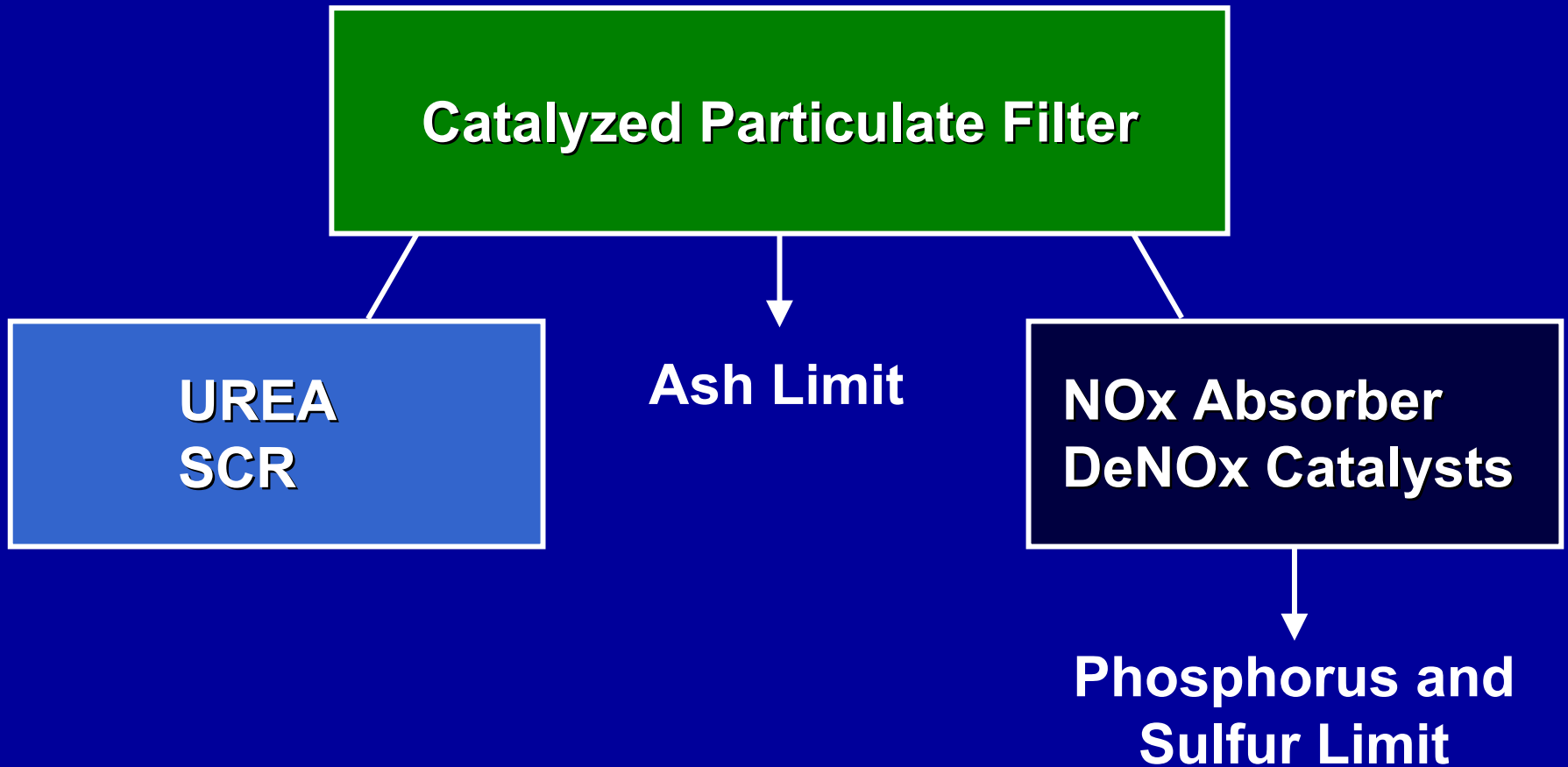
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|------------------------------------|----------------------------------|-----------------------------------------------|
| Mack T-8E → | Mack T-11 | Task Force in Place |
| Caterpillar 1R → | Caterpillar C-12 | |
| Cummins M11 EGR → | Cummins ISM | Surveillance Panel Hardware Change |
| Kurt Crbahn → 30 Cycles | Kurt Crbahn 90 Cycles | Task Force in Place |



80/20 EPA Fuel Rule for 2006

- **80% Market on 15 ppm Maximum**
- **20% Market on 500 ppm Maximum**

Chemical Limits Required for PC-10



Tests on 15 ppm Fuel Sulfur

Matrix Required for PC-10 Multicylinder Chemical Limits

| | |
|--------------------|-----------------------------------|
| • Caterpillar C-13 | Oil Consumption/Blow-By |
| • Cummins ISB | VTW |
| • Mack T-12 | Power-Cylinder Wear/ Oxidation |

Acceptable Funding With BOI-VGRA



Possible Timeline for U.S. Lubricants

