Development and Applications of Catalyzed Diesel Particulate Filter

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Development of Catalyzed Diesel Particulate Filter

- Substrate: Cordierite Wall Flow Filter
- Catalyst: PGM/Base Metal Combination
- Targets:
  - High CO and HC Oxidation Activity
  - High PM combustion activity
  - Low sulfate make
  - Low Pressure Drop
  - High Stability
Süd-Chemie c-DPF Performances on Bench Reactor

700ppm CO, 300ppm C₃H₆, 100ppm SO₂, 4% H₂O, 30,000/h
Süd-Chemie c-DPF Performance on LPW4 GenSet

17KW, 1.86L, 1800rpm, Federal Fuel-Max 500ppm Sulfur, 5.66”x6” DPF, 285°C

![Graph showing comparison between Raw DPF and SC-cDPF performance over time. The x-axis represents time in hours, and the y-axis represents Delta P (psi). The graph demonstrates the effectiveness of the SC-cDPF solution in maintaining lower Delta P compared to the Raw DPF.](image-url)
Süd-Chemie c-DPF Performance on LPW4 GenSet With Federal Fuel

![Graph showing pressure drop vs. temperature with labels for Pristine and Aged 650°C, 48h]
Süd-Chemie c-DPF Performance On C12 Engine

- **Comparison Against Reference c-DPF**
  - Engine: Caterpillar Euro C-12
  - C-DPF Size: 11.25”D x 14”L
  - Diesel Fuel: Ultra Low Sulfur

- **Balance Point Temperature**

<table>
<thead>
<tr>
<th>RPM</th>
<th>SC-cDPF</th>
<th>Ref.-cDPF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1200rpm</td>
<td>275°C</td>
<td>275°C</td>
</tr>
<tr>
<td>1500rpm</td>
<td>375°C</td>
<td>320°C</td>
</tr>
<tr>
<td>1800rpm</td>
<td>425°C</td>
<td>420°C</td>
</tr>
</tbody>
</table>

- **Complete ESC Emission Results**

<table>
<thead>
<tr>
<th></th>
<th>SC-cDPF</th>
<th>Ref.-cDPF</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMHC</td>
<td>92%</td>
<td>90%</td>
</tr>
<tr>
<td>CO</td>
<td>98%</td>
<td>98%</td>
</tr>
<tr>
<td>PM</td>
<td>86%</td>
<td>88%</td>
</tr>
</tbody>
</table>
Verification Testing of Süd-Chemie c-DPF
For BUG Emission Reduction at Ce-Cert
Verification Testing of Süd-Chemie c-DPF
For BUG Emission Reduction

• Test Cycle: ISO 8178 D2 Five Model

• Diesel Engine: Cat 3406C, 350KW, 14liter, 1800rpm

• Test Fuel: CARB #2 Diesel Fuel

• 0 Hour Emission Results

<table>
<thead>
<tr>
<th>THC</th>
<th>CO</th>
<th>PM2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>82%</td>
<td>98%</td>
<td>98%</td>
</tr>
</tbody>
</table>

• Durability Testing – In smooth progress!
Conclusions

1. SC c-DPF has low pressure drop increase due to catalyst deposition.
2. SC c-DPF has high activity for carbon monoxide and hydrocarbon oxidation.
3. SC c-DPF has high activity for the oxidation of particulate matters.
4. SC c-DPF has high thermal stability.
Acknowledgment

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