CESTOIL CHEMICAL INC

Expanding Possibilities

Refinery Process Solutions > FCC Slurry Settling Aids

Northshore™ CES1490

Cuts FCC Slurry Ash from 0.30% to Below 0.05% in 24 Hours and Keeps Flue-Gas Emissions Compliant

Key results

0.30% → <0.05%
ash in FCC slurry within 24 h of settling — the plant's acceptance limit, met at top, middle and bottom

50 mg/kg
ash after 72 h — one-tenth of the 500 mg/kg target

342 mg/kg
average dose, well under the 500 mg/kg cap in the technical agreement

Benefits

- **Spec met in 24 hours** — ash ≤ 500 mg/kg at every sampled tank level; 50–80 mg/kg after 72 h
- **Compliance secured** — de-ashed slurry returned to the FCC with flue-gas particulates within limits
- **Low dose** — 241–416 mg/kg on slurry, Q4 average 342 mg/kg
- **Built for upsets** — sized for catalyst solids up to 6,000 mg/kg, twice the normal 3,000 mg/kg
- **Drop-in** — metered through the existing slurry additive system into the receiving line; no tankage changes
- **Plant-approved** — non-hazardous product; operations department report concludes it "can continue to be used"

Challenge

A large refinery in North China collects the slurry oil from two of its FCC units in a receiving tank and returns it to catalytic cracking. Slurry carries catalyst fines — normally about **3,000 mg/kg**, up to **6,000 mg/kg** in upsets — and the ash they leave behind ran at **0.26–0.30%**. Fed back to the FCC, those fines end up in the regenerator flue gas and push particulate emissions toward the statutory limit. The oil-products operations department needed the slurry brought below **0.05% ash (500 mg/kg)** within 24–72 hours of settling, measured as the average of top, middle and bottom samples above the high draw-off nozzle, with no mechanical changes — and wrote exactly that acceptance test into the technical agreement.

Analysis

Catalyst fines in slurry are so small that gravity alone settles them too slowly for a working tank. **CES1490** is a slurry settling aid that enhances agglomeration of the fines into fast-settling flocs, so clarified oil can be drawn from above the sludge layer while the solids concentrate at the bottom for periodic removal. Cestoil sized the program to the agreed solids window (≤ 6,000 mg/kg) under a 500 mg/kg dose cap, and the plant set the bar deliberately high: not a clean top draw, but the average ash across three tank levels within 24–72 hours, checked on every batch by its own laboratory.

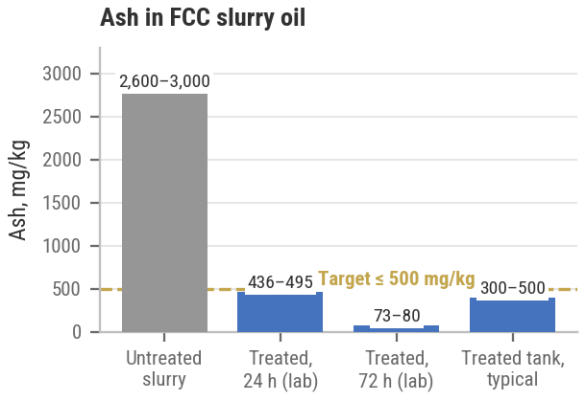

Figure 1: Ash in slurry before treatment (plant range), in the plant's lab settling test with CES1490 (20–23 Dec 2019, top and bottom samples) and in the receiving tank after treatment (top / middle / bottom). Bars show mid-points of the reported ranges.

Source: Customer usage report (oil-products operations department), FCC slurry receiving tank of a large refinery in North China, October 2019 – March 2020. All figures as reported by the customer. · CS-FCC-CES1490-2026B · v1.0 · 2026-09

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Solution

CES1490 was metered through the plant's existing slurry-solids additive system into the slurry receiving line, blended in-line and settled in the receiving tank. Dosing followed the technical agreement — **≤ 500 mg/kg on slurry**, adjusted to incoming solids: 416 mg/kg average in November on 4,662 t of slurry, 241 mg/kg in December on 3,486 t, a fourth-quarter average of **342 mg/kg**. When the first delivery's November tank results did not reach the target, Cestoil replaced the batch on 11 December and ran lab settling tests with the plant on 20–23 December to confirm the dose before dosing resumed; a further 11 t carried the program from December 2019 to March 2020.

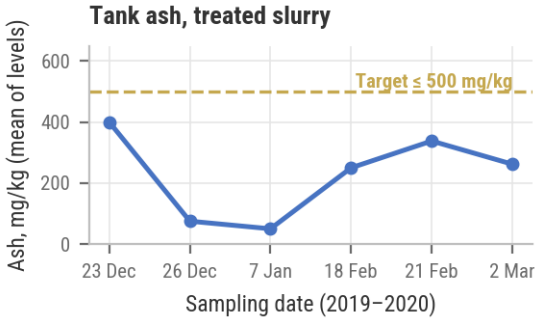

Figure 2: Ash of receiving-tank samples after the December batch, mean of the sampled levels (top/middle/bottom or top/middle). All six results are within the 500 mg/kg acceptance limit. Plant laboratory data.

Result*

- **Below 0.05% ash within 24 hours.** In the lab confirmation ash fell to 0.044–0.050% at 24 h and 0.007–0.008% at 72 h. In the tank, slurry ash of 0.26–0.30% before treatment dropped to 0.03% (top), 0.04% (middle) and 0.05% (bottom) — the < 0.05% requirement met at every level (Figure 1).
- **One-tenth of the target after 72 hours.** Tank samples read 70–80 mg/kg on 26 December and 50 mg/kg at top, middle and bottom alike on 7 January — clarity through the whole draw-off zone, not just a clean top layer.
- **Sustained through the winter.** Every tank result from late December to 2 March stayed within the 500 mg/kg limit (Figure 2), with solids in the clarified oil at 0.03–0.08%.
- **Emissions compliant.** De-solidified slurry went back to the FCC with flue-gas particulate emissions within limits — the reason the program was started. The operations department's report concludes the product "can continue to be used".

Value delivered

Ash in FCC slurry	0.26–0.30% → ≤ 0.05% in 24 h; 0.005–0.008% in 72 h
Time to specification	24 h (agreement allowed 24–72 h)
Chemical intensity	0.24–0.42 kg per tonne of slurry (Q4 average 0.34 kg/t)
Operating outcome	Slurry recycle to the FCC maintained with compliant flue-gas particulates; no mechanical modification
Economic reference (separate Cestoil case)	In a carbon-black application CES1490 lifted slurry value by USD 2–4/bbl at ~USD 60,000/yr chemical cost

About Northshore™ CES1490

Northshore™ CES1490 is a proprietary FCC slurry settling aid developed by Cestoil for high-particulate slurry oil streams. It promotes rapid, efficient settling of catalyst fines in tankage — typically within a 24-hour cycle — so that clarified slurry can be recycled, upgraded or sold to specification without mechanical changes to the FCC or its tank farm.

It is effective on heavy slurry at high temperatures, compatible with refinery process streams and materials, and dosed at low ppm levels through a simple injection quill or existing additive system. Cestoil supports dose selection with laboratory settling tests on the customer's own slurry.

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Discuss a similar application

Send us your slurry solids and ash data, tank settling time and draw-off arrangement — we will run a settling test on your slurry and propose a dose.

About Cestoil Chemical

Cestoil Chemical is a global provider of specialty chemicals — fuel additives, process additives and advanced materials — headquartered in Ontario, Canada, with operations in North America and Asia. For over 20 years we have combined disruptive technology with hands-on technical service to deliver bottom-line results for refiners, petrochemical producers and pipeline operators.