O, Fiig Bael Plaig: H H bbad-Hall' E , FeieE hace Pef acead Red ce C

The Challenge

Ma c , raie e gagei acka d ba el rilaig eek a b , r d ci , e ha ce re f a ce, a d ed ce re ai al c . H e e, e , ril ee fe lack hei -h ee re i e i e c d c h gh r ce a di a da al e e l . Thi lead c i e i ba el rilaig, ch a chir ri g ra i hi he ba el chl ide i cli e a d l e h gh r ha e reced. Ş reci c challe ge i cl de:

High Current Density Concerns:

I cie id h f he high c e de i ca ca e a b . Adhe i a ce he i cede i cea, like he head f a ce he a i cede, e li gi chja i ga d taki g.

Additives and Quality Issues:

E ce i e addii e i he che i ca c \mathbf{r} \mathbf{r} i e alica d \mathbf{r} \mathbf{d} h \mathbf{r} \mathbf{gh} .

O e i e, hi a a ach bec e c . A hibi i e.

The Approach

H bba d-Hall'ech ical ea friaigche i e re c'd ced e e i e lab e i g'add e he ei e. The f c ed ri i g he acid chl'ide c'ri ii i re e i c di ib i a d e ha ce e alle cie c. Ke eri i cl ded he ri i ai f Acid Chl'ide C'ri ii Achie i g a bala ced 2:1 i c di ib i

Executive Summary

Hubbard-Hall optimized barrel plating processes through acid chloride composition testing, achieving better zinc distribution, higher throughput, lower costs, and improved wastewater treatment.

> Balanced 2:1 zinc distribution between high and low current density areas, reducing chipping and flaking

50% reduction in processing time, increasing throughput be ee high a dl, c, e de i, a ea, c, , a able alkali e i c. A de , i g he acid chl, ide f, la i, , a e e cie l e e a high e , e a, e i h, c, , i i g, e e cie cie.

The Outcome

The fii i ed and ach ielded i fie e i e e l, de aig ig i ca i fie e i b h fi d ci e cie cad c aig.

Improved Zinc Distribution:

Bala ced 2:1 i c di ib, i be ee high a d c e de i. a ea , leadi g e ha ced ali. a d ed ced chieri g.

Increased Throughput:

Teigihç e 🔎 d ci 🔎 a h edae akable 50% ed ci i 🔎 ceigie.

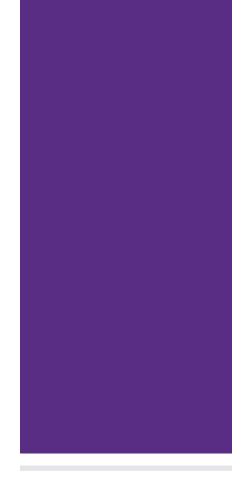
Cost Savings:

The e che i , ed a i a el 80% le i d c a d ai e a ce che i . Sig i ca ed c i i che ical ci a d ai e a ce e i e e .

Enhanced Wastewater Treatment:

The a e a e ea e , e be e edf fe e b \neq d c eedig ea e , f he ed cig \neq e a i al c .

E al aigc g e be d he ice e gall fa a ic la che i ... Fac like ejec a e , de i ed h gh , a d , ea / d ea ce e ila a c cial le. H bba d-Hall' echl h, lik [] [] cie k hieg Od cii T, f ca]] e O he O e [] a lhe O he O e , d c Exper



Oppl. ⁷pl

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