

# Performance Study

Ref. No.: 22-001G

Commodity  
**Copper**

Technology  
**Low-Drag Rake Arms**

Application  
**Tailings Thickener Upgrade**

Study type  
**Customer Story**

Country  
**Chile**

## How a thickener rake upgrade at a Chilean copper mine reduced water losses to tailings

A large Chilean copper mine improved its underflow density by upgrading its rake system, reducing the volume of water sent to tailings. The new rake also generates lower torque, and this provides a range of additional operating benefits.

The original 60 m diameter thickener was installed in 2007 with a standard box truss rake system. We upgraded the rake system in 2012 with a new low-drag rake system. Developed by FLSmidth, using high strength steel and tubular members to minimise drag when moving through thick mud, the new rake design results in lower torque – in this case, 10% less.

Lower torque is associated with reduced rotation of the mud bed, fewer issues with islands, and higher underflow density. After the upgrade, tailings thickener underflow density increased from 62-63% solids (w/w) to 64-65% solids (w/w). 8% less water report to tailings as a result, which generates savings in water pumping and energy consumption. It also improves overflow clarity.

As a result of the rake upgrade, the mine benefits from lower water draw and lower energy consumption – both key sustainability goals – as well as improved operational flexibility.



**8%**  
Reduction in  
water to tailings



**2% w/w**  
Increase in  
underflow density



**10%**  
Reduction  
in torque

Copyright © 2022 FLSmidth A/S. All Rights Reserved. FLSmidth is a registered trademark of FLSmidth A/S. This study makes no offers, representations or warranties of any kind (express or implied), and information and data contained in this study are for general reference only and may change at any time. FLSmidth does not guarantee or make any representation regarding the use or the results of the information or the data provided in the study in terms of its correctness, accuracy, reliability or otherwise, and shall not be liable for any loss or damage of any kind incurred as a result of the use of the information or data provided.

FLSmidth A/S  
[www.flsmidth.com](http://www.flsmidth.com)