

FGD (SYNTHETIC) GYPSUM STORAGE AND FEED (2013)

Fort McMurray, Alberta, Canada



SUMMARY

KAMENGO FEEDERS:	(1) Kamengo Feeder
BIN STORAGE:	525 cu-ft bin
POWER:	30HP motor
CAPACITY:	50 t/hr

SIMILAR PROJECTS

Recycled Gypsum Storage and Feed (1994)
Vancouver, British Columbia, Canada

Recycled Gypsum Storage and Feed (1996)
Winnipeg, Manitoba, Canada

Rock Phosphate Storage and Feed
Edmonton, Alberta, Canada

Synthetic Gypsum Storage and Feed (2009)
Fort McMurray, Alberta, Canada

SYSTEM OVERVIEW

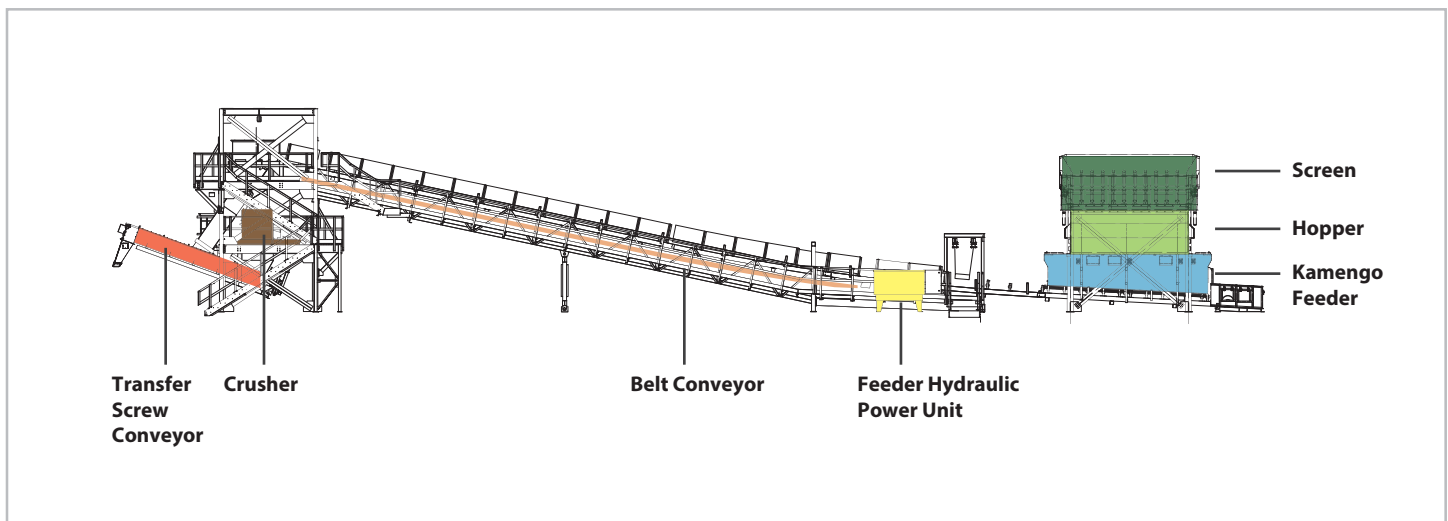
Kamengo's engagement in the oil sands, and specifically supplying equipment to handle gypsum to be used to settle tailings, began in the late 1990s. In 1997 Kamengo was approached to do flow characterization of synthetic gypsum to determine critical bin and chute parameters for a bin and feeder to be used in outdoor arctic conditions. Kamengo proposed an automated gypsum truck dump unloading and metering system based on its experience handling and metering synthetic gypsum, recycled raw gypsum and rock phosphate – all of which are very difficult flowing materials. In 2009, Kamengo supplied the feeders for Suncor's pilot gypsum handling system.

In 2012, Kamengo was selected to deliver this installation, which included a feeder, hopper and screen, 140-foot belt conveyor, crusher, transfer tower, and screw conveyor.

The 550 cu-ft storage bin receives gypsum via a front-end loader through the bin's screen. Applying Kamengo's design for the material approach, the bin and its liner are designed to promote mass flow. A Kamengo Feeder discharges the gypsum at a rate of up to 50 tons per hour onto a conveyor belt which carries the material into a tower where the material can be fed into a crusher, or by-passed directly to a screw conveyor. The screw conveyor then feeds the gypsum into a tank where it enters into the gypsum remediation process.

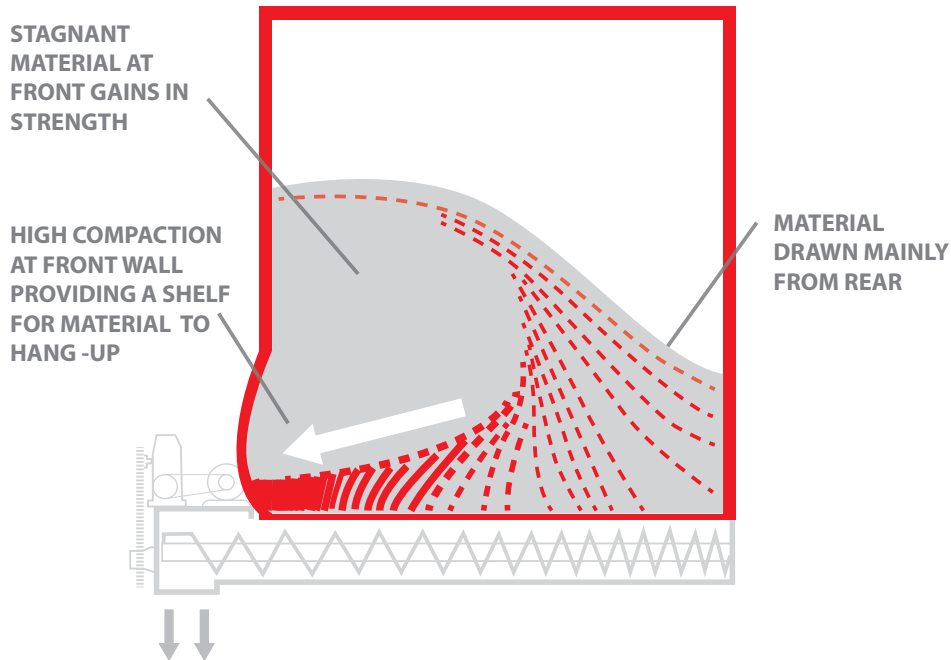
Kamengo has also supplied a similar set-up of equipment for a sister plant in Fort McMurray. The sister plant is expected to start up in 2014 and is capable of storing and metering more than 1,000 cu-ft of gypsum.

SYSTEM LAYOUT



WHY DO CONVENTIONAL FEEDERS PLUG?

FLOW PATTERN WITH A CONVENTIONAL FEEDER



WHAT IS HAPPENING INSIDE THE BIN?

Most feeders draw material primarily from the rear of the bin, with little material drawn from the front. This problem is particularly severe when handling low bulk density fibrous materials. With fibrous materials, the pulling action of the feeder is felt well above in the bin, resulting in severe compaction, and in extreme cases, distortion of the front bin wall.

POOR FLOW PATTERN RESULTS IN HANG-UPS

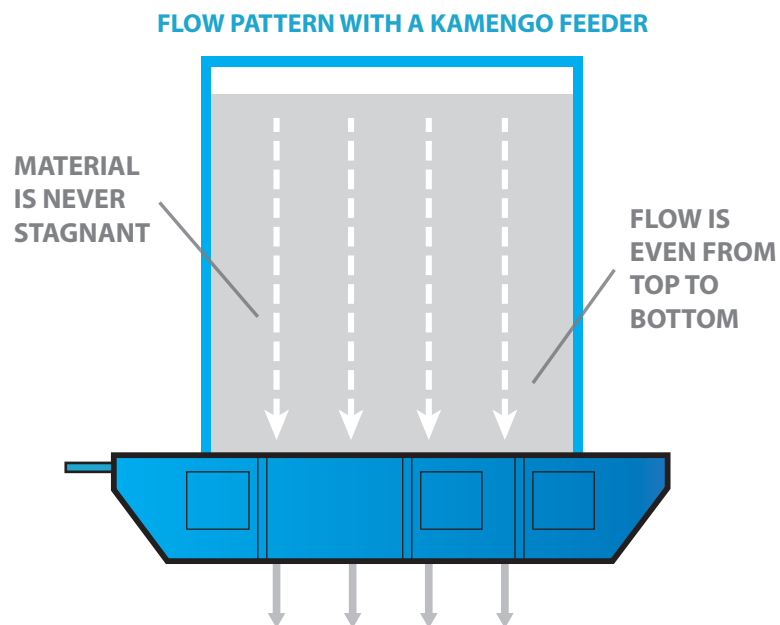
The compacted and stagnant material at the front of the bin is a major cause of bridging and hang-ups. Also, with material drawn mainly from a small section at the rear of the bin, live storage is greatly reduced, and stable rat-holes are permitted to form, resulting in dangerous bin hang-ups.

PUTTING ENERGY TOWARDS THE WRONG PURPOSES

Most feeders withdraw material by developing a shear line at the hopper/feeder interface. This shearing action not only contributes to compaction of the stored material, but also results in excessive wear of mechanical parts.

To learn more about reliable bin and feeder design, visit our website at www.kamengo.com.

HOW IS THE KAMENGO FEEDER DIFFERENT?

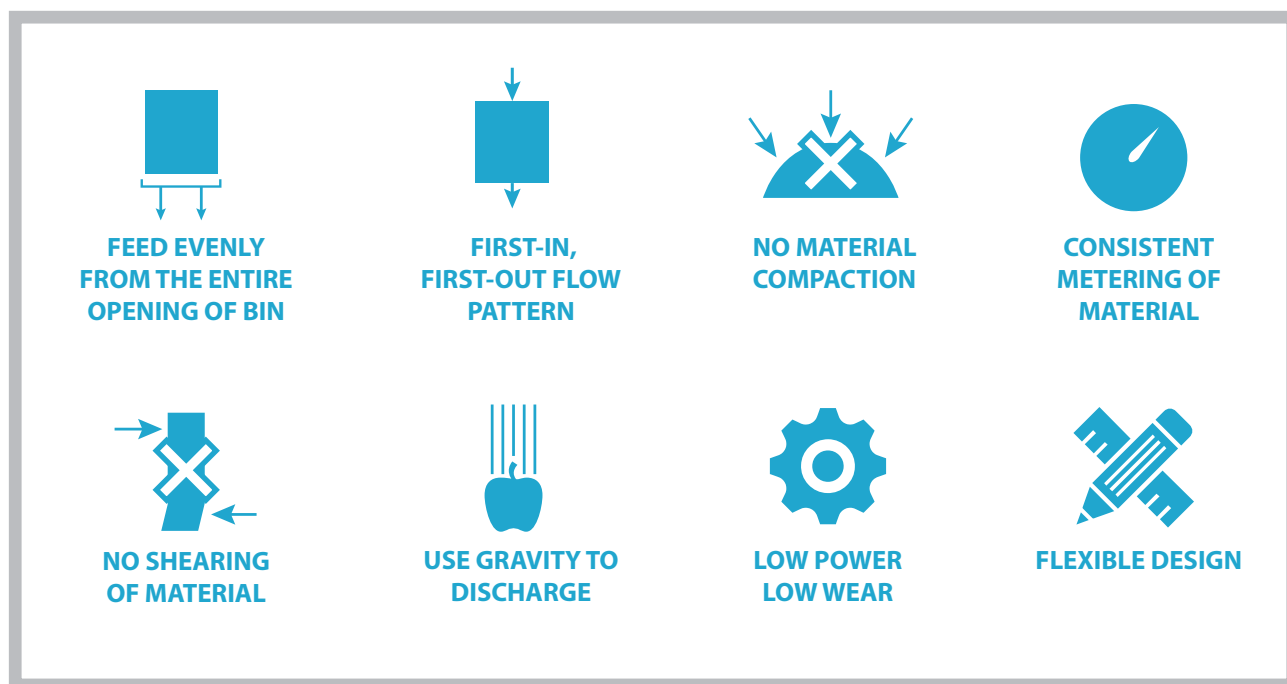


The Kamengo Feeder is different because it meters material evenly from the entire hopper outlet. With no stagnant pockets, the stored material is not afforded an opportunity to hang up.

Also, the Kamengo Feeder does not use brute force to extract material out of storage. Instead the Feeder relies on gravity and good bin geometry to reliably discharge the stored material. As such, the Feeder does not compact material, and thus allow it to gain strength and hang up. Also, because the Feeder does not put energy into shearing the material out of the bin, it requires far less power than a conventional feeder, saving energy and minimizing wear.

To learn more about the Kamengo Feeder visit our website at www.kamengo.com.

KEY FEATURES OF THE KAMENGO FEEDER



KAMENGO SPECIALIZES IN THE STORAGE AND FEED OF DIFFICULT FLOWING BULK MATERIALS

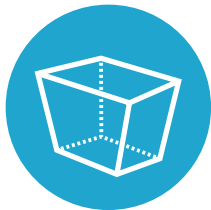


What makes Kamengo different is the tool kit we use to solve complex materials handling challenges:



Equipment To Characterize The Flow Properties Of Fibrous And Cohesive Materials

In the 1980's Kamengo developed new testing equipment capable of characterizing the flow properties of stringy, fibrous and cohesive materials.



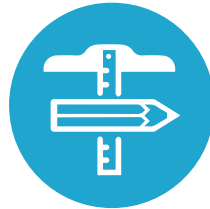
Design Protocols To Determine Correct Bin, Feeder And Chute Geometry

Kamengo has developed design protocols that use a material's flow properties to determine the bin, feeder and chute geometry required to promote reliable material flow. Correct equipment geometry will deny a stored material the conditions it needs to gain in strength and hang-up.



The Kamengo Feeder: Proven Solution For Handling Difficult Flowing Materials

The Kamengo Feeder resolves many of the shortcomings of conventional feeders. The Feeder withdraws material evenly from the full discharge opening of the hopper *and* does not compact stored material, resulting in a fully live bin. With installations running 24/7 for more than 20 years, the Kamengo Feeder has proven that it is a reliable solution for handling difficult flowing materials.



The Kamengo Feeder: A Design Advantage

The flow properties of difficult flowing materials often demand a fully live bin. A fully live bin is very difficult to achieve with a conventional feeder, but is easily achieved with a Kamengo Feeder.



Skilled Design Practice

Over the past 25 years, Kamengo has developed a design practice capable of tackling complex projects, including retrofits of storage and feed arrangements that suffer from plugging. Kamengo has the engineering capability to deliver complete packages of materials handling equipment including storage bins, feeders, chutes, structural work, and conveyors. We have delivered solutions for biomass, ore concentrates, fly and wet bottom ash, wood chips, pellets, and FGD gypsum.

► **We invite you to explore how Kamengo can apply its specialized tool kit to solve your materials handling challenges.**



www.kamengo.com

E-mail: info@kamengo.com

Tel: (604) 270-9995

1-866-KAMENGO

Fax: (604) 270-9921

Suite 590 - 4400 Hazelbridge Way
Richmond, British Columbia,
Canada V6X 3R8