

FLY ASH STORAGE, CONDITIONING AND TRUCK LOAD OUT (1997)

Powell River, British Columbia, Canada



SUMMARY

KAMENGO FEEDERS: (1) Ash feeder with loading deck

BIN STORAGE: 10,500 cu-ft

CAPACITY: 50 t/hr

SIMILAR PROJECTS

Conditioned Fly Ash Storage and Load out (1995)
Kamloops, British Columbia, Canada

Fly and Bottom Ash Dry Storage and Conditioning (2005)
Rothschild, Wisconsin, USA

Wet Bottom Ash Storage and Feed (2007)
Kogan Creek, Australia

SYSTEM OVERVIEW

The fine cohesive ash at the Powell River mill is typical of ash from a fluid bed boiler with a high efficiency collector. The 10,500 cu-ft silo was designed to load dry ash to closed top rail cars or open containers.

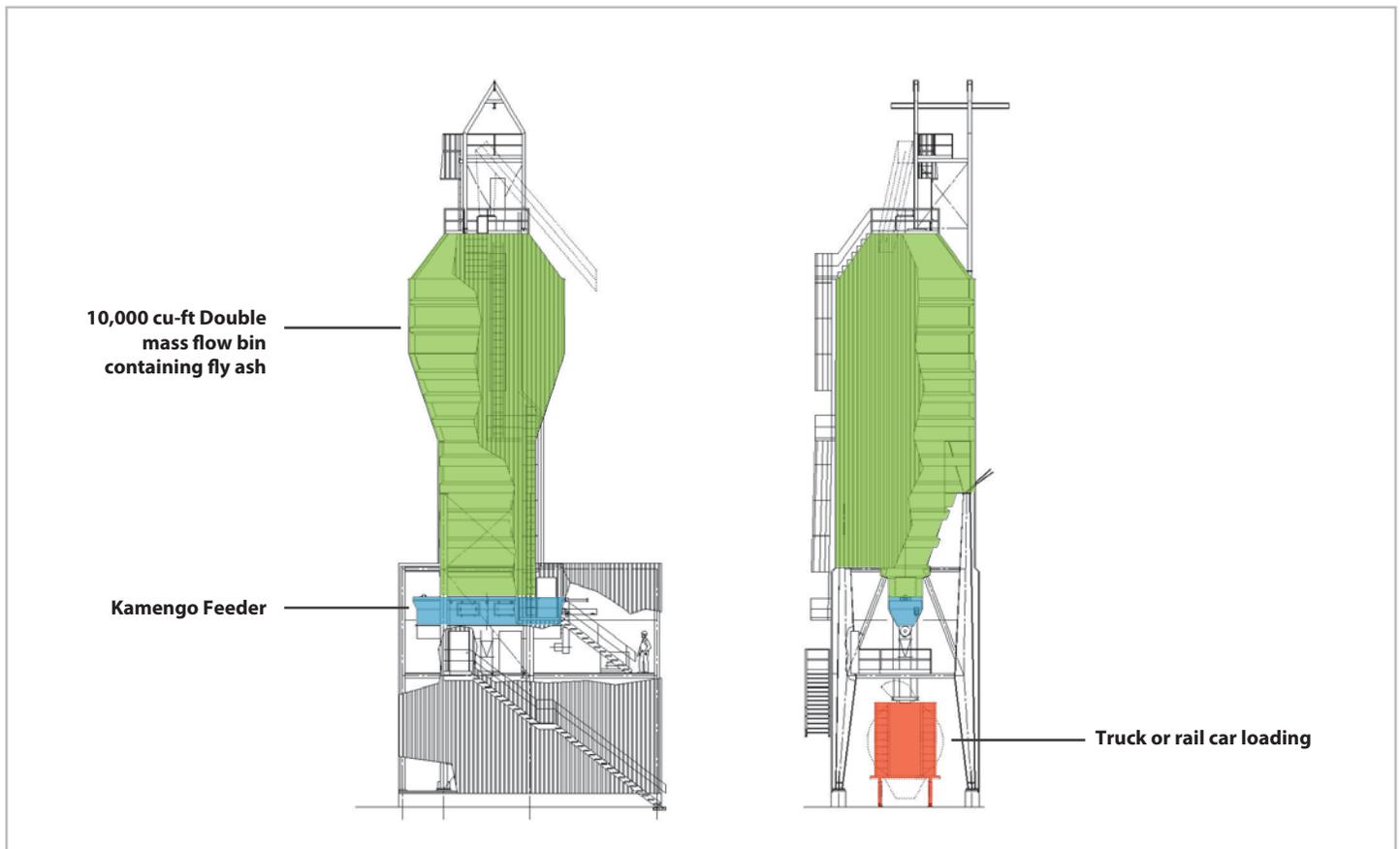
A special loading deck with a collapsible rubber chute is lowered on to the top of the rail car to form an air-tight seal against the hatch when loading out dry ash. The rubber chute has an annular filter to handle displaced air as ash is loaded into the rail car. The feeder also has a built-in conditioning system to wet the ash during load out if needed.

Typically, the ash is loaded out to open top containers for disposal of the ash.

The fly ash bin has provided reliable flow without any hang-ups since start-up in October 1997. Little maintenance work has been needed since commissioning.

The fly ash bin has provided reliable flow without any hang-ups since start-up in October 1997

SYSTEM LAYOUT



HANDLING ASH WITH MINIMUM WATER

An alternative to handling ash wet or as a slurry is to store it dry and only condition it (wet it down) as it is discharged into a truck or rail car. This concept is advantageous for those plants that are keen to minimize the use of water.

Conditioning ash using a Kamengo Ash Feeder offers several advantages:

No over- or under-watering of ash: The Kamengo Ash Feeder is fitted with small spray nozzles that hit each stream of ash flowing from the feeder with a mist of water. The stream of feed from the Kamengo Feeder is consistent, and as such the rate of water can be fine-tuned appropriately.

Dust-free loading: A Kamengo Ash Feeder is fitted with a load-out deck that drops on top of and seals against a truck or rail car container. The load out uses an annular filter and creates a negative vacuum seal to suppress dusting from displaced air.

A dry ash handling system with conditioning upon discharge was first used by Kamengo in 2005 for a pulp and paper mill in Rothschild, Wisconsin.



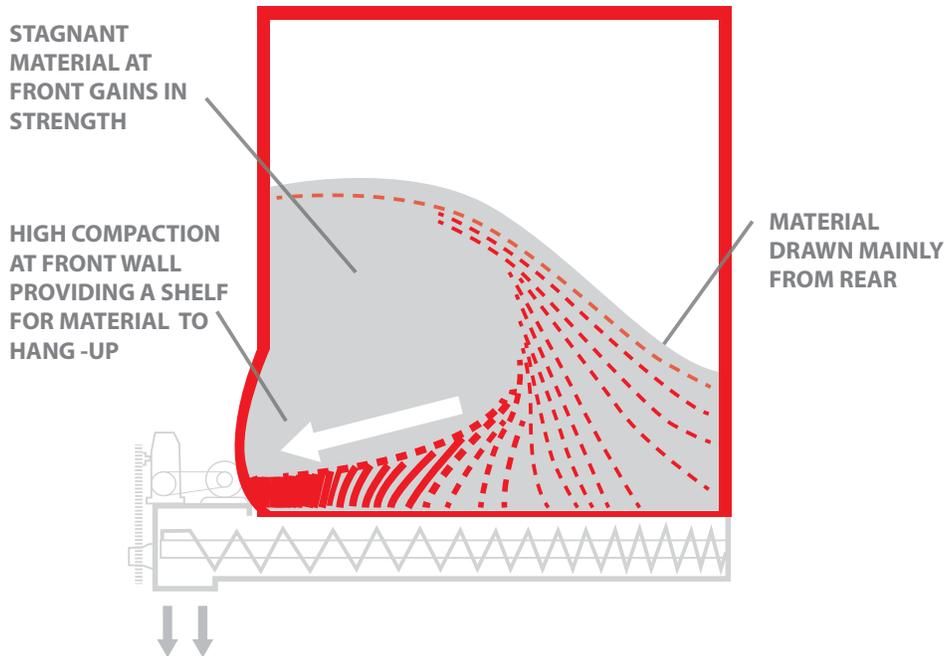
Loading deck below Kamengo Feeder



Powell River ash feeder

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

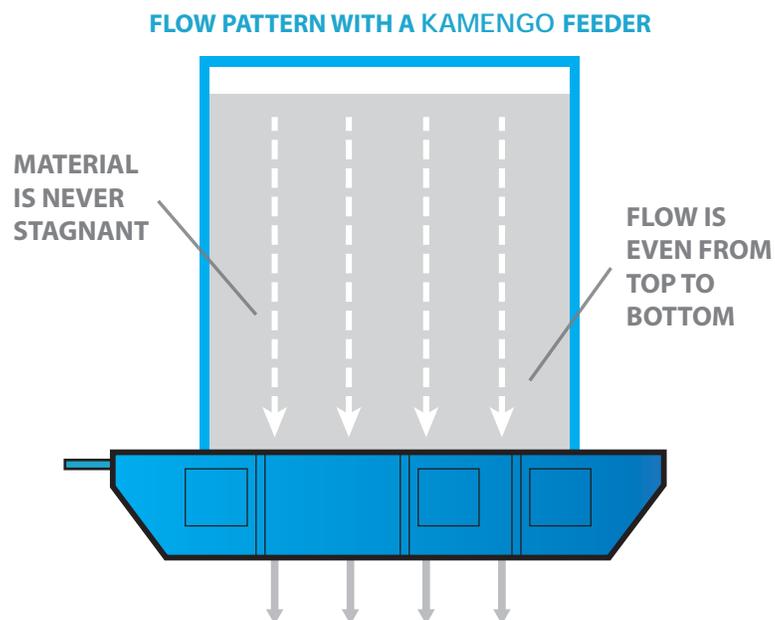
The compacted and stagnant material at the front of the bin is a major cause of bridging and hang-ups. Also, with material drawn mainly from a small section at the rear of the bin, live storage is greatly reduced, and stable rat-holes are permitted to form, resulting in dangerous bin hang-ups.

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?

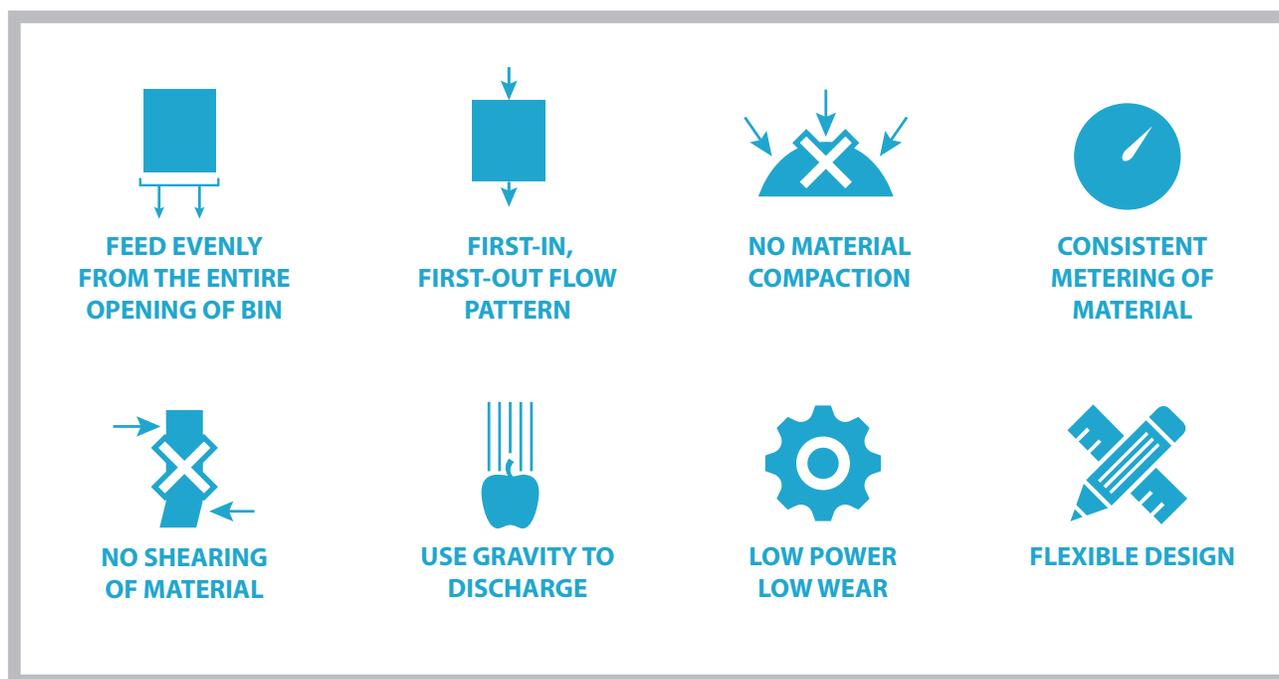


The Kamengo Feeder is different because it meters material evenly from the entire hopper outlet. With no stagnant pockets, the stored material is not afforded an opportunity to hang up.

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

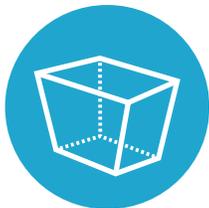


What makes Kamengo different is the tool kit we use to solve complex materials handling challenges:



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.



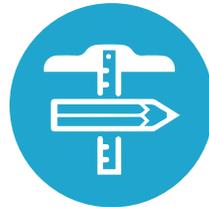
Design Protocols To Determine Correct Bin, Feeder And Chute Geometry

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.**

FLY ASH STORAGE, CONDITIONING AND TRUCK LOAD OUT (1997)

Powell River, British Columbia, Canada





KAMENGO

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