WE CONVEY QUALITY

presented by Dipl. Ing. Matthias Suttrup

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SCHADE

AUMUND Group

“We Convey Quality”
In over 12,000 conveyors Worldwide
INTRODUCTION

of

AUMUND GROUP COMPANIES

For the

Power and related Industries
AUMUND Conveying Technology

Heavy Duty Apron Feeders

Bucket Elevators and Pan Conveyors
LOUISE Products:

Rotary Discharge Machines, Flight Conveyors and Silo Dischargers with Centrex System
B&W Material Handling

- Ship loaders
- Stormajor
- Link Conveyors
- Grab Hoppers
- Samson Feeders
SCHADE Storage Systems
SCHADE in all major industries
SCHADE expertise in storing and blending of dry bulk materials from customized project design to commissioning of complete plants in:

- Cement Industry
- Chemical Industry
- Mining
- Harbour Terminals
- Power Industry
- Iron & Steel

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Stacking

Blending

Reclaiming

SCHADE equipment used for various stockyard applications

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Stacking

material flow

feeding belt

conveyor

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Boom type

Pylon type (hydraulic hoist)

Pylon type (rope hoist)

Tripper car

Stackers

presented by Dipl. Ing. Matthias Suttrup
Stackers (coal handling)

Stacker, slewing and luffing (hydraulic)
Stackers (coal handling)

Stacker, slewing and luffing (hydraulic)
Stackers (alternative fuel => woodchips handling)

Stacker, luffing (hydraulic)
Stackers (bulk material handling)

Stacker, slewing and luffing (hydraulic)
with by-pass unit
Stackers (coal handling)

Stacker pylon type, slewing and luffing (hydraulic)
Stackers (coal handling)

Stacker, slewing and luffing (hydraulic)
Stackers (coal handling)

Stacker pylon type,
slewing and luffing (rope hoist)
Stackers (coal handling)

Stacker pylon type, slewing and luffing (hydraulic)
Stackers (coal handling)

Stationary Circular Stacker, slewing and luffing (hydraulic)
Stackers (bulk material handling)

Tripper Car
Stacking Methods

Chevron

(mainly for blending purpose)
Stacking Methods

Chevron

(course of stacker movement)
Front Reclaiming from Stockpile
by Bridge Type Scraper Reclaimers

discharge via inclined drag trough
Typical Outdoor Storage Arrangements

- Stockpile built up by travelling / luffing Stacker in Chevron Method
- Reclaiming from the front of the pile by Bridge type Scraper Reclaimer
- Perfect homogenization and blending of segregated bulk material
- Automatic operation
- Simultaneous stacking and reclaiming by operating with two piles
Typical Storage Arrangements (coal blending)

Blending Bed of Longitudinal Shape
Typical Storage Arrangements

Blending Bed of Longitudinal Type
Typical Storage Arrangements

Blending Bed of Longitudinal Type

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Scraper Reclaimers (coal handling)

Bridge Reclaimer
(discharge via drag trough)
Scraper Reclaimers (coal handling)

Bridge Reclaimer
(discharge via drag trough)
Scraper Reclaimers (coal handling)

Bridge Reclaimer
(discharge via drag trough)
Scraper Reclaimers (coal handling)

Bridge Reclaimer
(discharge via drag trough)
Coal and Ore Handling

Truck Unloading with Samson Feeder

Stacker

Bridge Reclaimer

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Stacking Methods

Strata  (for medium blending purpose)
Stacking Methods

Side view

Top view

Coneshell (for buffer purpose)
Side Reclaiming from Stockpile
by Cantilever and / or Portal Type Scraper Reclaimers

discharge via inclined drag trough
Typical Storage Arrangements

- Stockpile built up by travelling and luffing Stacker
- Reclaiming from the side slope of the pile by Cantilever Scraper Reclaimer (for pile widths up to 30 m)
- Operating along the whole length of the stockpile or pre-selected sections
- Automatic operation
- Quick travelling between different working locations

Canter Lever Type

Buffer Storage of Longitudinal Type
Scraper Reclaimers (coal handling)

Cantilever Reclaimer
(discharge via drag trough)
Scraper Reclaimers (coal handling)

Cantilever Reclaimer
(discharge via drag trough)
Typical Storage Arrangements

- Stockpile built up by travelling, slewing and/or luffing Stacker
- Reclaiming from the side slope of the pile by Portal Scraper Reclaimer (for pile widths exceeding 30 m)
- Operating along the whole length of the stockpile or pre-selected sections
- Automatic operation
- Quick travelling between different working locations

Buffer Storage of Longitudinal Type
Typical Storage Arrangements

Buffer Storage of Longitudinal Type
Coal Storage Arrangements

Buffer Storage of Longitudinal Type
Coal Storage Arrangements

Buffer Storage of Longitudinal Type
Typical Coal Storage Arrangements

Buffer Storage of Longitudinal Type
Scraper Reclaimers (coal handling)

Portal Reclaimer
(discharge via drag trough)
Scraper Reclaimers (coal handling)

Portal Reclaimer
(discharge via drag trough)
Scraper Reclaimers (coal handling)

Portal Reclaimer
(discharge via drag trough)
Scraper Reclaimers (coal handling)

Portal Reclaimer with worldwide largest Capacity of 3,600 t/h, Span 52m, Dartbrook coal Pty. Limited, NSW, Australia
Scraper Reclaimers (coal handling)

Portal Reclaimer
(discharge via concrete ramp)
Scraper Reclaimers (coal handling)

Portal Reclaimer
(discharge via concrete ramp)
A-side view, showing boom, shovels, power supply

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Scraper Reclaimers (alternative fuel => woodchips handling)

Portal Reclaimer
(discharge via drag trough)
Batch Storage with a combined Stacker / Reclaimer

- For applications where stacking and reclaiming will not occur simultaneously
- Stacking and reclaiming performed with one machine only
- Less space required
- Reduced Capital expenditure

Buffer Storage of Longitudinal Type

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Combined Stacker / Reclaimers (coal handling)
Combined Stacker / Reclaimers (coal handling)
Portal Bridge Reclaimers!

1. Rails
2. Travelling beams
3. Portal structure
4. Reclaiming boom
5. Harrow sledge
6. Drum winch
7. Rope harrow
8. Triangular jib
9. Counterweight
10. Scraper chain
11. Rope hoist

Multiple Purpose Reclaimer
(front and side reclaiming)

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Portal Bridge Reclaimers

Multiple Purpose Reclaimer
(front and side reclaiming)
Scraper Reclaimer and Stacker (coal handling)
Typical Storage Arrangements

- Stockpile built up by Tripper Car
- Free sloping or comparted by walls
- Reclaiming from the side slope of the pile by Portal Scraper Reclaimer
- Operating along the whole length of the stockpile or compartments or pre-selected sections
- Automatic operation
- Quick travelling between different working locations
- Reduced building height due to Portal Reclaimer arrangement with two booms

Buffer Storage of Longitudinal Type
Side Reclaiming from Stockpile
by Portal / Semi-Portal Type Scraper Reclaimers

discharge via concrete ramp
Scraper Reclaimers (Bauxite handling)

Portal Reclaimer
(discharge via concrete ramp)
Scraper Reclaimers (Kimberlite Ore handling)

Portal Reclaimer (discharge via concrete ramp)
Scraper Reclaimers (FGD-gypsum handling)

Portal Reclaimer
(discharge via concrete ramp)
Typical Storage Arrangements

- Stockpile built up by Tripper Car
- Free sloping or comparted by walls
- Reclaiming from the side slope of the pile by Semi-Portal Scraper Reclaimers
- Operating along the whole length of the stockpile or or compartments or pre-selected sections
- Automatic operation
- Quick travelling between different working locations

Buffer Storage of Longitudinal Undercover type

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Covered Storage Arrangements

SEMI – PORTAL Undercover type

Buffer Storage of Longitudinal Type
Scraper Reclaimers (FGD-gypsum handling)

Semi-Portal Reclaimer
(discharge via concrete ramp)
Scraper Reclaimers (FGD-gypsum handling)

Semi-Portal Reclaimer
(discharge via concrete ramp)
Stacking Methods

Chevcon
homogenizing of circular stockpiles
Chevcon Stacking Methods

High capacity Circular Blending Bed
Circular Storage Arrangements

- One pile built up continuously by slewing / luffing Stacker in Chevcon Method
- Reclaiming from the front of the pile by Bridge type Scraper Reclaimer
- 360° rotation and endless pile
- Perfect homogenization and blending of segregated bulk material
- Automatic operation (also simultaneously)
- In enclosed buildings or outdoor operation

Blending Bed of Circular Type
Circular Stacker / Reclaimers (Zinc Ore handling)

Stacker (slewing and luffing)
with Bridge Reclaimer
Circular Stacker / Reclaimers (coal handling)

High Capacity Circular Blending Bed dia. 120m
Circular Stacker / Reclaimers (coal handling)

Stacker (slewing and luffing)
with Bridge Reclaimer

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Circular Stacker / Reclaimers (coal handling)

Stacker (slewing and luffing)

with Bridge Reclaimer

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Circular Storage Arrangements

- Less space required as with storages of longitudinal shape
- Large storage capacities on small base area
- Stockpile built up by Slewing Stacker
- Reclaiming from the inner side slope of the pile by slewing/luffing scraper boom
- Automatic operation (also simultaneously)

Circular Storage with walled Dome
Typical Storage Installations

9 SCHADE Circular Storages at the FPC –Mai Liao Plant in Taiwan – 180,000 tons each
Circular Stacker / Reclaimers (coal handling)

Circular Coal Storage, 4000 t/h stacking
2000 t/h reclaiming
Circular Stacker / Reclaimers (coal handling)

Stacker (slewing)

with Reclaimer Boom (slewing and luffing)
Circular Stacker / Reclaimers (coal handling)

Stacker (slewing)
with Reclaimer Boom (slewing and luffing)
Circular Stacker / Reclaimers (Iron Ore Concentr.)

Stacker (slewing)

with Reclaimer Boom (slewing and luffing)
Outdoor Circular Stacker / Reclaimers
(coal handling)

Stacker (slewing)
with Reclaimer Boom (slewing and luffing)
Outdoor Circular Stacker / Reclaimers

(USA alternative fuel => woodchips handling)

Stacker (slewing and luffing)
with Reclaimer Boom (slewing and luffing)
Outdoor Circular Stacker / Reclaimers

(USA alternative fuel => woodchips handling)

Stacker (slewing)

with Reclaimer Boom (slewing and luffing)
Circular Storage Arrangements

Circular with Semi-Portal Reclaimer
Circular Stacker / Reclaimers (coal handling)

Stacker (slewing) with Semi-Portal

Reclaimer (slewing and luffing)
Circular Stacker / Reclaimers (coal handling)

Stacker (slewing) with Semi-Portal

Reclaimer (slewing and luffing)
Circular Storage Arrangements

Circular with Full-Portal Reclaimer
Coal and/or Ore Handling

Wagon Unloading
with Armoured Chain Conveyor type PKF

Circular Storage
SCHADE equipment in an Iron Ore Processing Plant
SCHADE equipment in Power Plants
SCHADE equipment in Power Plants
SCHADE equipment in Power Plants
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SCHADE equipment in Power Plants
SCHADE equipment in Power Plants

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SCHADE equipment in Power Plants
Rotary discharge machine – Block design

Four-wheel drive

Closed, dust-tight

Gear unit (combined drive for travel and discharge)
Rotary discharge machine – Travel design

Double side discharge of a rectangular hopper

Double side discharge from open stockpile
Rotary discharge machine - Low profile design

- Hub with pocket for torque transmission
- Armoured tip
- Front plate of 10 mm wear resistant HARDOX
- Discharge wheel drive
- Discharge wheel with six arms
Applications
Block Design – Discharge from open stockpile

9 pc. RDM-BL 4000; 150 kW, 3300 t/h hard coal, Orba / Superior, Wisconsin - USA
Applications
Block Design – Discharge from open stockpile

9pc. RDM-BL 4000; 150 kW, 3300 t/h hard coal, Orba / Superior, Wisconsin - USA
Applications - Block Design

4 pc. RDM-BL 4000; 37 kW, 40 - 400 t/h hard coal, Okinawa, Japan
Applications
Block Design – Silo Discharge

4pc. RDM-BL 4000; 37 kW, 40 - 400 t/h hard coal, Okinawa, Japan
Applications – Block Design, Silo discharge

discharge table
roller
hydraulic unit
discharge wheel
material guide
belt conveyor
Applications - Block Design

RDM-BL 3000; 11 kW
90 t/h FGD-gypsum
Idstein - Germany

RDM-BL 3000; 11 kW, 200 t/h
Limestone and marl
LEUBE, Austria
Applications - Low profile design

RDM-FL 2500
11 kW, 200 t/h
limestone
Nürtlingen
Germany
Application – Low profile design with double swivel drive

Swivel motion cylinder

RDM-FL-BS
2500; 30 kW, 100-1000 t/h Rock
Raron - Switzerland
Application – Low profile design with double swivel drive

BEW-FL-BS
2500; 30 kW,
100- 1000 t/h
Rock
Raron - Switzerland

Variable speed discharge and travel with frequency controlled drive
Rotating rotary discharge machine for discharge openings with a diameter of 6 – 12 m

- Main and control cable collector (slip ring)
- Centre shaft
- Ratchet segments
- Slot to undercut material column
- Service platform
Applications – Rotating rotary discharge machine

2 x RRDM 8000/4500, 400 t/h FGD-gypsum
Culley Generating Plant, Indiana - USA
Rotary Wagon Tippers / Railcar Dumpers

- Economic unloading from four wagons per hours upwards
- Hydraulic lifting gear
- Handling up to 35 wagons per hour with tippers placed opposite one another
- Handling wagons with a total weight of 40 to 80 tons
- Tipping facility can be driven through by complete trains including locomotive
- Eliminates shunting times if wagons are not correctly arranged or if fitted with only one drop end
Rotary Wagon Tippers / Railcar Dumpers

Coal Unloading
...Samson Projects...

...Highlights...

over the

...Last Two Years...
Surface Installation

Surface installation eliminates underground pits and hoppers with complete flexibility in location and relocation.
The Samson Solution for Road

The Wide Apron-Belt Design receives direct from Tipping Trucks
Case Study – TDCIM - Portugal

A New Grinding Plant located at Sines including the Samson as the Primary Intake Facility
Case Study – TDCIM - Portugal

Side Tip Samson for Additions and Clinker Intake to Dome Storage
Case Study – Cementos Balboa -

The Samson Receives Limestone for Transfer to Storage Hall
Case Study – Cementos Balboa -

The Samson Under Rail Feeder

Wide Belt Eliminates Bridging in the Hopper allowing Reduced Pit Depth and Reduced Dust Generation

Economical Installation
Case Study – Cementos Balboa -

Complete Clinker Transport by Aumund
Case Study – Cementos Balboa - Spain

All Bucket Elevators for the Complete Plant by Aumund
Case Study – Cementos Lemona -

Discharge Direct to Bucket Elevator

The Samson Side Tip for Imported Clinker
Case Study – Cementos Lemona -

Integral Dust Plant with Filter Bag Housing above the Samson Enclosure
Case Study – Holcim Carboneras -

Granulated Blast Furnace Slag received by Loading Shovel
Case Study – Holcim Carboneras -

Levelling Blade Controls the Samson Discharge Rate with Independent Grizzly Screen to Reject Oversize material
Case Study – Holcim Carboneras - Samson Intake for Alternative Fuels handling Impregnated Sawdust
Case Study – Holcim Carboneras -

Samson main Coal and Pet-Coke Fuel Intake received by tipping truck from the local port storage
Case Study – Holcim Carboneras - Spain

Hydraulic Drive with Discharge to Circular Storage at 500 t.p.h.
Case Study – Encasur - Spain

Open Cast Coal Mining Operation
supplying
Endesa – Power Utility
Case Study – Encasur - Spain

The Samson Receives Run-of-Mine Coal for main Preparation Plant
Case Study – Encasur - Spain

Levelling Blade and Dust Filter
Barrosa - Portugal

Samson Handling Glass Cullet for Bottle Making Process