



OSBORN

an Astec Industries Co.



Pan Feeders

Osborn Pan Feeders (Volumetric Feeders)

The main feature of this feeder is the low power consumption, low noise and little maintenance required.

Osborn Pan Feeders are generally installed at a 10 degree downslope to provide the best efficiency for the free flow of material. Fitted with replaceable liners and can be floor or suspension mounted.

Skirt boards should be fitted to give an approximate clearance of 30 mm minimum between the deck and the side plates when operating with 4 pole motors and 60 mm for feeders with 6 pole motors.

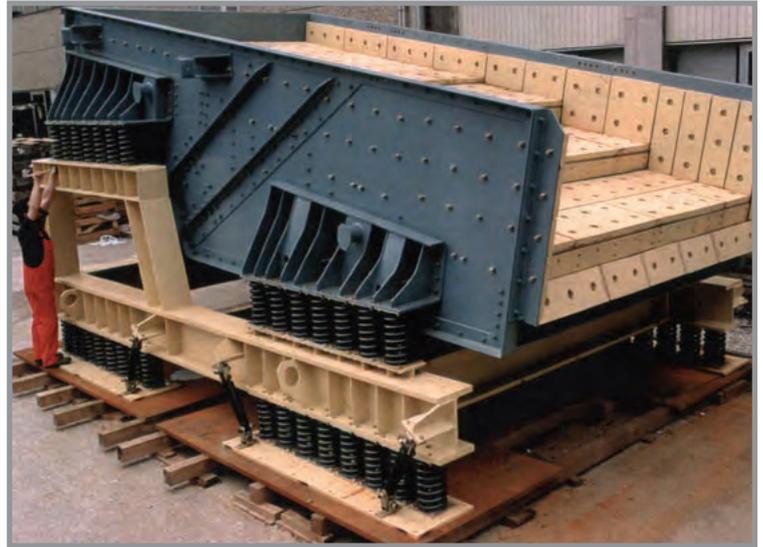
These recommended clearances are measured at the feed end of the deck and will increase to approximately double at the discharge end.

Of significant importance when installing an Osborn Pan Feeder is the design of the feed hopper. (see hopper / chute design)

Incorrect hopper design will cause the feeder to underperform to the specified duties. Osborn Pan Feeders are manufactured in many different widths and lengths from 300 mm wide up to a 2400 mm wide and up to 4000 mm long.

Osborn feeders all work on the same principle, that being the extraction of materials from under crushers, bins, hoppers etc, or fed by a conveyor with a regulated flow to promote a steady supply to maximise production in the processing plant.

Sometimes fed by a dump truck or a front end loader, or directly from under a stockpile. Whatever type of feed is required and dependent upon the type of the feeder installed, the feed rate is controlled by the machines vibration frequency and often the controls, which can be manual or automatic and can be programmed to receive a signal from a PLC.



Osborn GBEX H.D. Pan Feeder



Osborn OBEX Pan Feeders



Osborn Linear Pan Feeder

Vibrating Feeders – Types of Drive Mechanism

Twin Motor Type (OBEX)

Two vibrating motors fitted to the rear of the feeder rotate in opposite directions, synchronise and impart a vibrating force in a longitudinal direction to a desired stroke angle. This action lifts the material and carries it forward on each rotation providing a constant feed rate. The amplitude can be varied by adjusting the out-of-balance weights on the vibrating motors to a required stroke length.



Double Shaft Type (Linear)

A three way motion, horizontal, vertical and elliptical is generated by mounting the eccentric shafts on a horizontal plane and by making use of the resulting moment arm effect caused by the spacing of the shaft centres. Thus the feed material is thrown upward and forward on an elliptical path with a turning action before it free falls back to the feeder pan bed. This motion provides higher capacity, faster conveying, more consistent feed rate and an even spread of product over the width of the feeder. Self-counterweighted shafts connected to wide faced helical gears and an oil splash lubrication system are the main components of this highly successful design.

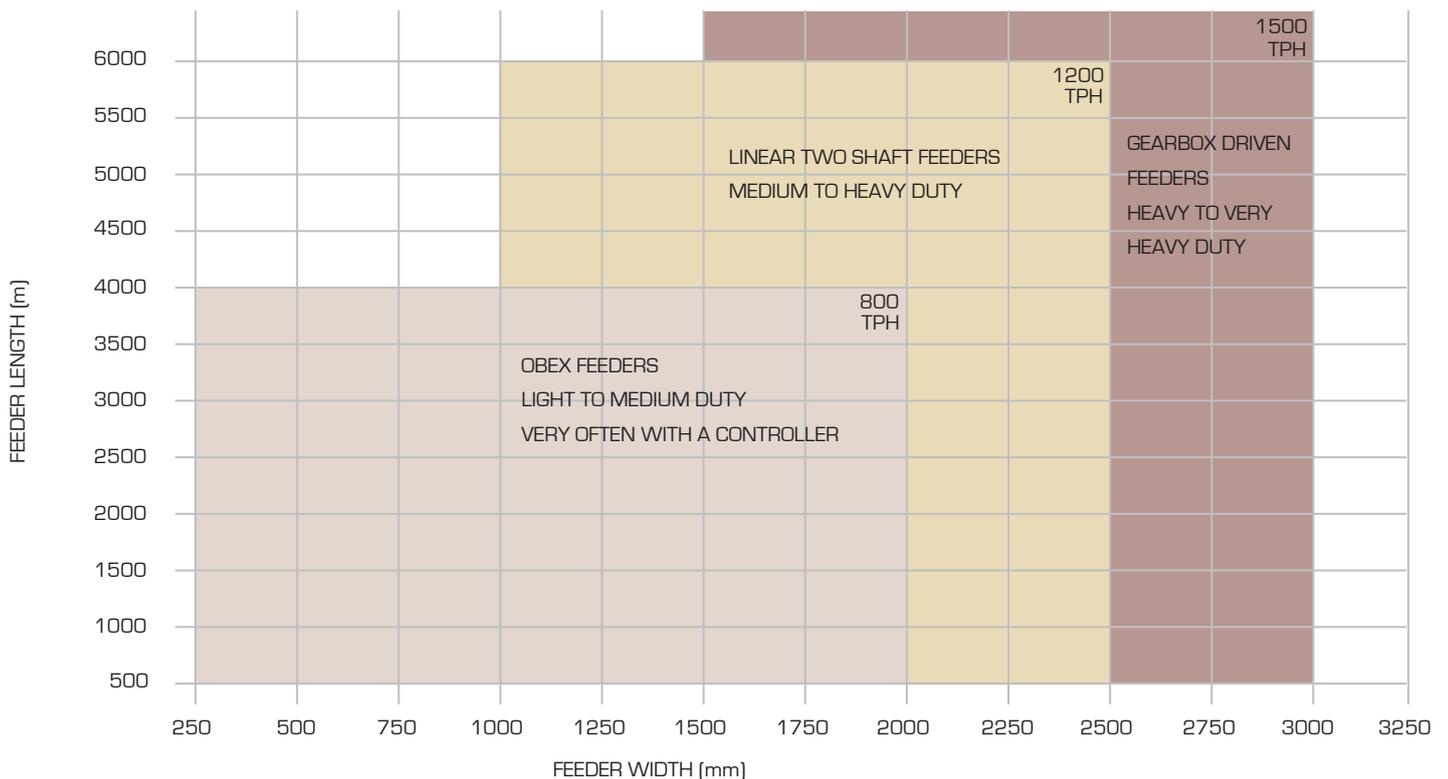


Gearbox Driven (GBEX)

This extremely robust drive unit is designed for high performance in exciting large masses of material with a linear vibratory movement. A pair of matched low noise gears with splash lubrication transmit torque to the two unbalanced weights. Each weight also has 3 additional weights for adjustment of the out-of-balance moment. Shafts are supported by heavy duty roller bearings lubricated with an oil mist. Forces can be significantly increased for very large feeders by connecting multiple drives on a common beam with Cardan shaft connectors. This exciter drive offers outstanding reliability of operation and is designed for continuous operation.



Vibrating Feeders with 10 Tonnes/Hour to 3 500 Tonnes/Hour Capacity

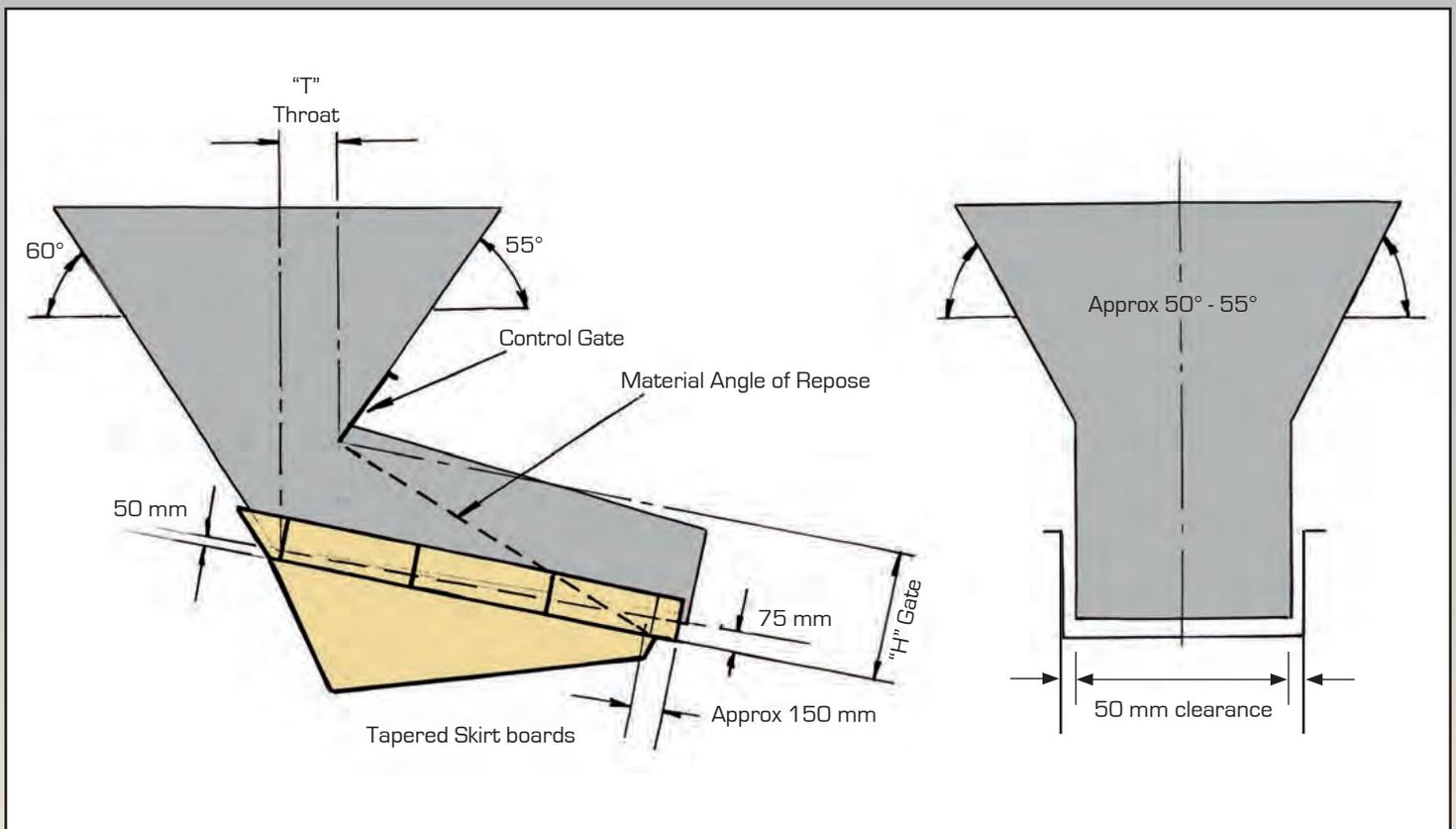


Tonnage Indicators based on Material Bulk Density of 1.6t./m³

Recommended Hopper Design

For optimum performance from an Osborn feeder it is important to pay attention to the design of the feed hopper. Incorrectly designed hoppers will result in substantially reduced feeder capacities by as much as 30%. The hopper opening must be large enough to allow the maximum size piece of material to flow through.

- The rear face of the hopper should be at approximately 60 degrees to ensure flow from the rear of the hopper.
- The front wall should be sloped at 5 degrees less than rear wall and typically set at 55 degrees. If the slope is too shallow a build up of material above the gate opening could occur whilst too steep a slope may cause irregular flow patterns within the hopper.
- The gate height (H) should be a minimum of twice the diameter of the largest particle of material.
- The hopper throat opening (T) should be approximately half the gate height. A ratio of throat (T) to gate height (H) should ideally be 0.3 to a maximum of 400mm throat length on large feeders to provide a uniform flow of material to the feeder deck. With these parameters, the material at the front and rear ends of the hopper should move at the same velocity and the discharge depth (D) is closely equal to the hopper gate height.
- Skirt boards should be vertically clear of the feeder pan by a minimum of 50 mm and horizontally by 75 mm when the feeder is in a no load condition. Side skirts should be tapered away from the feeder trough and be clear of the feeder sidewalls by a minimum of 12 mm, this is to minimise material being wedged between the skirts and the trough deck.
- The length of the feeder is determined by the angle of repose of the material from the gate point to the feeder pan plus approximately 150 mm.
- The feeder must be free to vibrate and must not be in any contact with any stationary structure.



Vibrating feeders – Trough Liners

Depending on the abrasiveness and flowability of materials to be handled by the vibrating feeder, a selection of different liners is available to suit these applications.

VRN-200 LINER

Often used as it is easily replaceable and has good AR (abrasion resistant qualities). A very cost effective choice of liner.

CERAMIC LINER

Has approximately a 92% Alumina content which delivers long life and reduced wear. Often selected for handling extremely abrasive materials.

RUBBER LINER

Can be used for handling wet sticky materials such as wet coal and due to the nature of the rubber it has a self-cleaning effect.

POLYURETHANE LINER

Very similar application to rubber. Good for wet materials and where less impact is present.

POLY-HISOLIDUR LINER

Used to handle very sticky materials and has a low co-efficient of friction.

STAINLESS STEEL 304 OR 3CR12 LINER

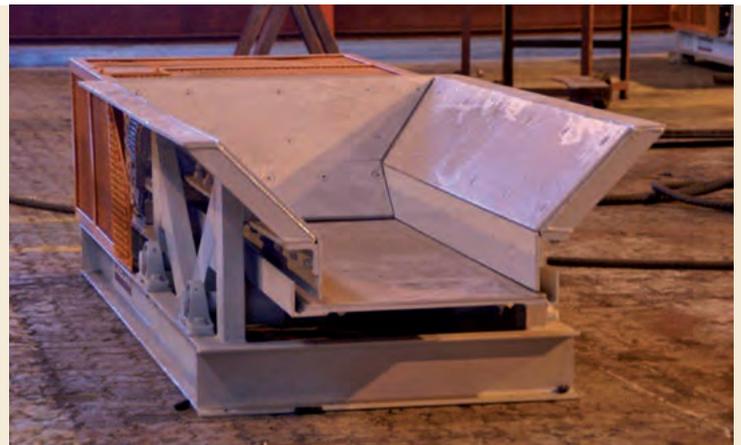
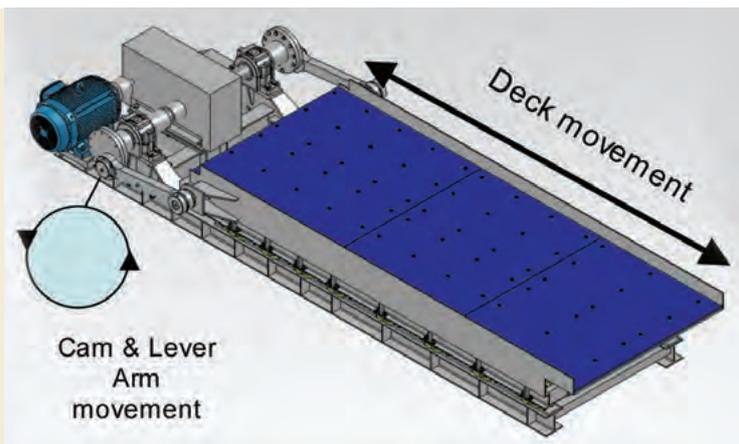
Not often used due to high cost but would suit the food industry.

Reciprocating Plate Feeder (Push-pull Feeder)

The reciprocating plate feeder is generally installed at a primary crushing site and receives a positive feed of material from a bin or hopper. Its "push-pull" action is generated by a link arm that is connected to a crank shaft which is in turn connected to a variable or fixed speed drive unit.

Plate feeders generally operate at low frequencies. Often used in the drawdown of a coal stockpile where large lumps and moisture in the coal is being handled as the flow characteristics of coal are perfect for a reciprocating plate feeder. The hopper or bin cannot be emptied by the plate feeder and feeding is discontinuous thus ensuring a cushion of material on the plate to protect the feeder. The feeding of the material takes place in the return stroke only due to the reciprocating action. The main advantages of a plate feeder over other feeding equipment are:

- Minimum damage from impact of large lumps due to cushion of material on the plates
- With no carry-back of material, plate feeders operate with minimum spillage
- Wedging damage is minimal
- Low maintenance and operating costs



Vibrating Pan Feeders - Application Data Sheet

Customer				Contact Person		
Phone No.				Phone No.		
Email				Date	Eng. No:	
TYPE OF MATERIAL						
DRY BULK DENSITY t/m ³						
MAX FEED SIZE (mm)						
MOISTURE CONTENT %						
CAPACITY tph						
PARTICLE DISTRIBUTION	Particle	% Passing				
FLOWABILITY	Good	Fair	Poor			
APPLICATION	Light Duty	Medium Duty	Heavy Duty	X-Heavy Duty		
Tick where Applicable ✓						
QUESTIONS						
How is the Feeder being fed?	Tick where Applicable ✓			Tonnes or m ³ capacity		
a. From a Feed Hopper						
b. By an Apron Feeder						
c. By a Conveyor						
d. By Dump Truck						
e. By Front End Loader						
f. By Excavator						
Is the material feed constant?						
COMMENTS						



Head Office:
57 Jansen Road, Elandsfontein

PO Box 8182
Elandsfontein, 1406
Johannesburg
South Africa

Tel: +27 11 820 7600
Fax: +27 11 388 1136
Call Centre: 0861 OSBORN

E-mail: osborn@osborn.co.za
www.osborn.co.za

an Astec Industries Co.

All rights reserved. Unless otherwise indicated, all materials on these pages are copyrighted by OSBORN. No part of these pages, either text or image may be used for any purpose other than personal use. Therefore, reproduction, modification, storage in a retrieval system or retransmission, in any form or by any means, electronic, mechanical or otherwise, for reasons other than personal use, is strictly prohibited without prior written permission.

Pan/0613/Rev1

Companies of the Astec Aggregate and Mining Group



www.osborn.co.za



www.telsmith.com



www.rockbreaker.com



www.astecmobilescreens.com



www.kpijci.com