Bucket Elevators

Scavenger Supplies utilising experience gained for over 20 years in the design, manufacture and installation of bucket elevators. Bucket elevators are designed to move flowing powders or bulk solids vertically. Bucket elevators use an endless belt or chain and have a series of buckets attached to it. Bulk material is spread into an inlet hopper. Buckets dig into the material and convey it up and over the head sprocket/pulley, and then throw the material out a discharge throat.

Bucket elevators are not self-feeding, and are fed at a controlled rate. The buckets are usually where the chain or belt path is vertical or steeply inclined in a single plane. The buckets are returned back down to a tail pulley or sprocket at the bottom.

There are four broad classifications of bucket elevators: centrifugal, continuous, positive, and internal discharge. The most commonly used are the centrifugal and continuous discharge elevators.

Scavenger Supplies industrial bucket elevators are made in a variety of shapes, weights and sizes, all utilizing centrifugal buckets or continuous buckets. Centrifugal bucket elevators are most commonly used to convey all free-flowing, powdered bulk solids such as grains, animal feed, sand, minerals, sugar, aggregates, chemicals and more. They operate at high speeds, which throw the materials out the buckets into discharge throats by centrifugal force.
# Elevator Design Specifications

**Issued by Braime Elevator Components Ltd, Leeds, England**

**Client:** Scavenger Supplies

## Elevator Details

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>26/10/03</td>
</tr>
<tr>
<td>Elevator No</td>
<td>1</td>
</tr>
<tr>
<td>Desired Capacity</td>
<td>120 tph</td>
</tr>
<tr>
<td>Material</td>
<td>Fertiliser</td>
</tr>
<tr>
<td>Density</td>
<td>1.1 t/m³</td>
</tr>
<tr>
<td>Fill of Bucket</td>
<td>0.8%</td>
</tr>
<tr>
<td>Intake Angle</td>
<td>55 degrees</td>
</tr>
</tbody>
</table>

### Details of Existing Elevator

- **Head Pulley Dia:** 500 mm
- **Boot Pulley Dia:** 500 mm
- **Height:** 12.3 m
- **Width of Trunking:** 1118 mm
- **Depth of Trunking:** 572 mm
- **Dist Between Trunks:** 480 mm

### Buckets and Belt to be Installed

- **Bucket:** Special
- **Bkt Length:** 900 mm
- **Bkt Projection:** 350 mm
- **Bolts:** 6 bolts at
- **Bucket Capacity:** 26 liters
- **Rows of Bkts:** 1 row
- **Bkt Speed:** 2.5 m/sec

### Install Belt Speed

- **Install TPH:** 0.6 m/sec

### Belt Calculation

- **Req TPH:** 120 achieved

### Belt Information

- **Trunking Width:** 1118 mm
- **Trunking Depth:** 572 mm
- **Belt Width:** 1000 mm
- **Pulley Width:** 1100 mm

### Bucket Information

- **Bucket Type:** SBR

### Belt Information

- **Belts:** SBR belt

### Output

- **Capacity Achieved:** 116.8 tph
- **Capacity Required:** 120 tph
- **Drill Required:** 10.2 kw
- **Factored Drive:** 10.2 kw
- **Motor Drive Installed:** 15 KW

### Belt Strength

- **600 kg/cm²:
  - 442.9 kg/cm² calc
  - Min 600 kg/cm²

### Quantities

- **65 Pcs Special Buckets**
- **520 Bolts:** 10 mm dia x 30 long
- **520 Washers:** 10 mm dia
- **29 Mts Belt:** 1000 mm wide SBR belt
- **580 Bolt Holes:** 10 mm dia
A sample of our design program is shown here:

**ELEVATOR**

<table>
<thead>
<tr>
<th>Reference Elevator for a Capacity of</th>
<th>120 TPH OF</th>
<th>Fertiliser</th>
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<tbody>
<tr>
<td><strong>At a Density of</strong></td>
<td>1.1 T/M³ AT</td>
<td>12.3 MTS HT</td>
</tr>
<tr>
<td><strong>Utilise</strong></td>
<td>1 ROW</td>
<td>special BUCKETS AT</td>
</tr>
<tr>
<td><strong>And a Belt Speed of</strong></td>
<td>0.6 M/sec</td>
<td>22.9 RPM</td>
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<tr>
<td><strong>Capacity</strong></td>
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<td>2.5 PER MTR</td>
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</table>

<table>
<thead>
<tr>
<th>rows</th>
<th>tiles</th>
<th>factor</th>
<th>bkt/s/m</th>
<th>m/sec</th>
<th>density</th>
<th>bkt fill</th>
<th>TPH</th>
<th>m³/hr</th>
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<tr>
<td>1</td>
<td>25</td>
<td>3.6</td>
<td>2.5</td>
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<tr>
<td><strong>Nominal</strong></td>
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</tbody>
</table>

**Specifications**

- **Head Pulley**: 500 mm dia
- **Boot Pulley**: 500 mm dia
- **Height**: 12.3 mtrs
- **Motor Power**: 15 kw 20 hp
- **Belt**: 1000 mm wide at 600 kg/s/cm
- **Trunking**: mm width 1118 depth 572 dist between trunks 480 mm
- **Intake**: 1400 mm deep@ 55 deg angle 98 mm calculated depth
- **Outlet**: 1450 mm deep
- **Head Shaft**: 120 mm dia 103.9 mm dia calc
- **Boot Shaft**: 80 mm dia 81 mm dia calc
- **Quantities**: 65 pcs special buckets
- 520 bolts/hub 10 mm dia x 30 mm long
- 520 pcs 10 mm dia washers
- 29 mts 1000 mm wide SBR belt 600 kg/s/cm
- 580 holes in belt 10 mm dia