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 bucketsCentrifugal 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.

Scavenger Supplies, elevator design program can assist clients in almost all fields of industrial application for design and manufacture of new machines along with recommendations for retrofitting modification to increase performance of existing machines.

SELEV PAGE 1 **ISSUED BY BRAIME ELEVATOR COMPONENTS LTD LEEDS ENGLAND**

DATE	28/10/03		ENTER ALL RED ITEMS			
CLIENT		Scavenger Supplies				
ELEVATOR NO	1					
DESIRED CAPACITY	120	tph	109	m3/hr		
MATERIAL	Fertiliser					
DENSITY	1.1	t/m3				
FILL OF BUCKET	0.8	%	note 0.9 to .95 grain zone 2, .0.7 to.9 cement. water level			
INTAKE ANGLE	55	degrees	note 45 degs grain,50 degs meals,55 degs industrial			
DETAILS OF EXISTING ELEVATOR						
HEAD PULLEY DIA	500	mm				
BOOT PULLEY DIA	500	mm				
HEIGHT	12.3	mts				
WIDTH OF TRUNKING	1118	mm				
DEPTH OF TRUNKING	572	mm				
DIST BETWEEN TRUNKS	480	mm				
BUCKET AND SPEED SUITABLE FOR THE REQUIRED CAPACITY						
MAX SPEED CENTRYFGL	**2.44**	m/sec	note centfgl disch angle, max 8 deg min 32 degs			
AVERAGE SPEED	**1.83**	**m/sec =**	**19.9 degree discharge angle p/ht =**		183.1	
MIN SPEED CENTRYFGL	**1.3**	m/sec			F	F
MAX BUCKET SIZE	**1028**	mm long	**472**	mm proj	90	100
BKT CAP AT AVG SPYD	**9.8**	litres at	**2.1**	approx bukets per metre centryfgl discharge		
AVERAGE GRAVITY						
DISCHARGE SPEED	**1.1**	m/sec =		70 deg d.a. for cement and stone		
BUCKETS AND BELT TO BE INSTALLED						
BUCKET	special	max/mtr =	10.5	bkts/mtr=	95.2 mm pitch	
BKT LENGTH	900	mm				
BKT PROJECTION	350	mm				
BOLTS	8	bolts at	10	mm dia x 30 mm long	F	
BUCKET CAPACITY	25	ltrs	for grain S,SPS,SJ buckets zone 2		OK	
			for J bkts w/level + 10% , for AA bkts w/level		too many	
ROWS OF BKTS	1	rows			p/ht 1703.3	
BKTS /MTR **OK**	2.5	per mtr but aprox	instal upto 10.5 bkt/mt max for centryfgl dischrg			
			5.7	per mtr for slow centr/gravity discharge		
INSTALL BELT SPEED	0.6	mt/sec =	**22.9**	rpm 108 m3/hr=deg	**122.9**	
REQ TPH=	**120**	achieved =	**118.8**	t/hr + o - -**1.2**	tph balance	
TRUNKING WIDTH	1118	mm	1050	mm calc **1118 existing trunk width**		
TRUNKING DEPTH	572	mm	470	mm calc **572 exist trunk depth**		
BELT WIDTH	1000	mm	930	mm calc	F	75
PULLEY WIDTH	1100		1088	mm calc	F	60
BELT TYPE	SBR		note, nbr, sbr, st core, or hi-temp			
DIG FACTOR	14		9.1mts for grain,, 12 for meals 14 for industrials			
OUTPUT						
CAPACITY ACHIEVED	118.8	tph	108	m3/hr		
CAPACITY REQUIRED	120	tph	109.1	m3/hr	F	F
DRIVE REQUIRED	10.2	kw	13.7	hp	1	1
FACTORED DRIVE	10.2	kw	13.7	hp	1	1
MOTOR DRIVE INSTALLED	15	KW	20	hp	1	
BELT STRENGTH	600	kgs/cm	442.9	**kg/cm calc**	**min 600kg/cm**	
QUANTITIES			note .If bucket proj is larger than 220mm add 10% to belt strength			
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	600 KGS/CM	
580 BOLT HOLES						
IN BELT	10	mm dia				

A sample of our design program is shown here:

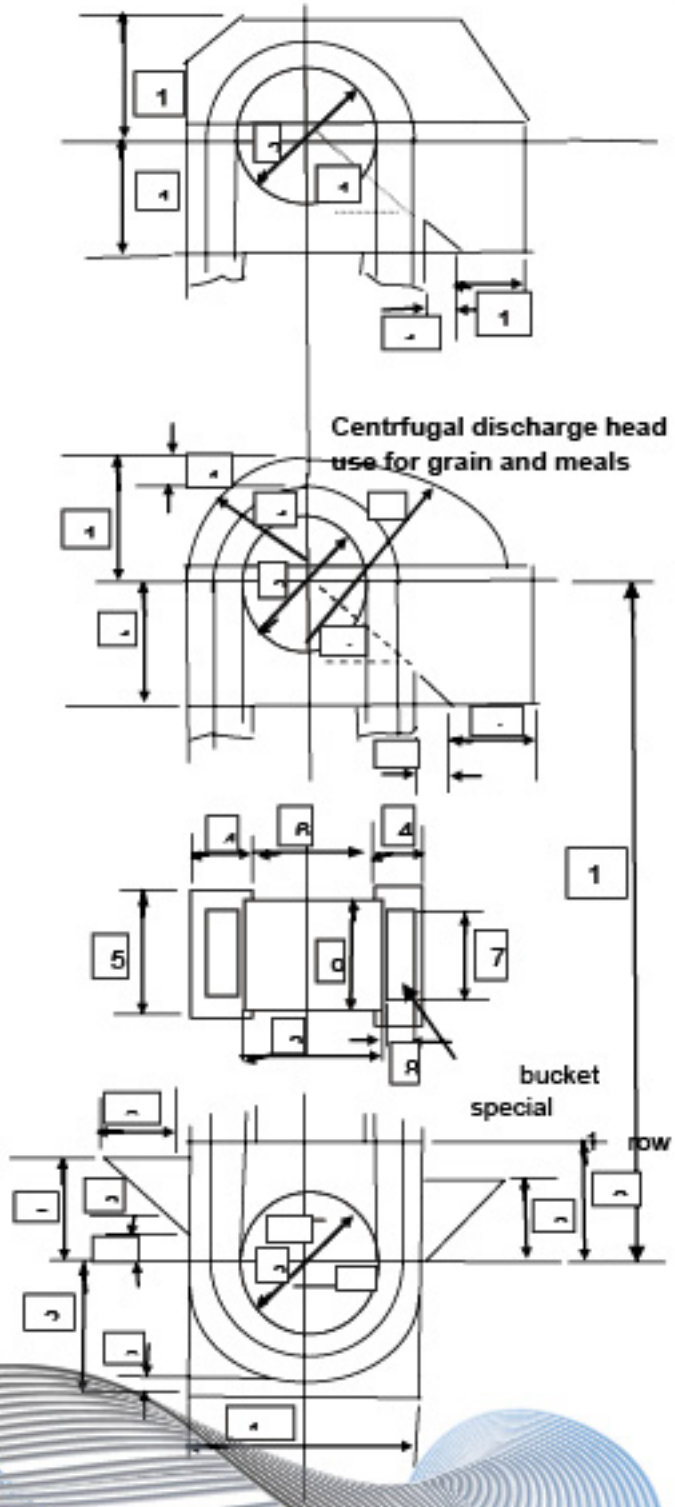
scavenger SUPPLIES

ELEVATOR 1

REFERENCE ELEVATOR FOR A CAPACITY OF	**120**	**TPH OF**		**Fertiliser**					
AT A DENSITY OF	**1.1**	**T/M3 AT**		**12.3**	**MTS HT**				
UTILISE	1	ROW		special	BUCKETS AT		2.5 PER MTR		
AND A BELT SPEED OF	0.6	M/SEC		22.9	RPM				
CAPACITY	rows	litres	factor	bkts/mt	m/sec	density	bkt fill	TPH	m3/hr
	1	25	3.6	2.5	0.6	1.1	0.8	118.8	108
			nominal	**120**	TPH				
SPECIFICATIONS					**(ENTER RED ITEMS)**				
Head Pulley	500	mm dia							
Boot Pulley	500	mm dia							
Height	12.3	mts							
Motor Power	15	kw		20	hp				
Belt	1000	mm wide at		600	kgs/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/nuts		10	mm dia x 30 mm long				
	520	pcs		10	mm dia	washers			
	29	mts		1000	mm wide		SBR belt	600 kgs/cm	
	580	holes in belt		10	mm dia				

PAGE 3 **CLIENT**

DATE 26/10/03 **head for gravity discharge**

TPH of Fertiliser **Industrial use**

ELEVATOR FOR	120	
ELEVATOR NO.	1	
Motor	15	KW
Belt	1000	mm wide
DIMENSIONS		
no 1	12.3	mts
no 2	500	mm
no 3	500	mm
no 4	572	mm
no 5	1118	mm
no 6	480	mm
no 7	900	mm
no 8	350	mm
no 9	1100	mm
no 10	912	mm
no 11	925	mm
no 12	812	mm
no 14	2362	mm
no 15	315	mm
no 16	100	mm
no 17	1450	mm
no 18	45	degs
no 19	1564	mm
no 20	810	mm
no 21	30	mm
no 22	1400	mm
no 24	1681	mm
no 25	55	degs
no 26	210	mm
no 27	1471	mm
no 28	1731	mm
no 29	300	mm
no 30	150	mm