



1)

$$P_c = i \cdot \rho \cdot j$$

$$Q = 3.6 \cdot \frac{P_c \cdot v}{t}$$

pitch (m)=[2h,3h]

MODL	C (mm)	Z2 (l)	Weight (kg)	tmin (m)	tmax (m)	vmin (m/s)	vmax (m/s)
SJ250-250/3	190,00	7,00	13,72	0,38	0,57	0,77	1,15
SJ250-250/4	190,00	7,00	13,72	0,38	0,57	0,77	1,15
SJ330-250/3	190,00	9,60	18,82	0,38	0,57	0,56	0,84
SJ370-250/3	190,00	10,80	21,17	0,38	0,57	0,50	0,75
SJ470-250/3	190,00	14,00	27,44	0,38	0,57	0,38	0,58
SJ330-250/4	190,00	9,60	18,82	0,38	0,57	0,56	0,84
SJ370-250/4	190,00	10,80	21,17	0,38	0,57	0,50	0,75
SJ470-250/4	190,00	14,00	27,44	0,38	0,57	0,38	0,58
SJ470-250/4.7	190,00	14,00	27,44	0,38	0,57	0,38	0,58

We select the first bucket because it allows centrifugal discharge and has low weight.

2)

$$\frac{F_R}{m \cdot g} = \frac{v^2}{g \cdot R} - \cos \lambda$$

alfa (°)	alfa(rad)	v(m/s)	cos(alfa)	v*v/(g*R)	Fr/m*g
-90	-1,57	1,15	0	0,452529	0,45
-60	-1,05	1,15	0,50	0,452529	-0,05
-30	-0,52	1,15	0,87	0,452529	-0,41
0	0,00	1,15	1,00	0,452529	-0,55
30	0,52	1,15	0,87	0,452529	-0,41
60	1,05	1,15	0,50	0,452529	-0,05
90	1,57	1,15	0,00	0,452529	0,45

The pulley diameter is badly designed.

3)

$$Q_{m,cinta} = Q_{m,elevador} = 95 \text{ t/h}$$

$$Q_m = 3600 \cdot v \cdot A \cdot \gamma \cdot k$$

$$A_{v1} = A_{v2}$$



MECHANICAL ENGINEERING DEPARTMENT
SUBJECT: TRANSPORTATION. 5º INDUSTRIAL ENGINEERING

$$A_{v1} = \frac{Q_{m,1}}{3600 \cdot v_1 \cdot \gamma \cdot k} = \frac{Q_{v,1}}{3600 \cdot v \cdot k} = \frac{Q_{v,1}}{3600 \cdot 1 \cdot 1} = \frac{Q_{v,1}}{3600}$$

$$A_{v2} = \frac{Q_{m,2}}{3600 \cdot \gamma \cdot k} = \frac{95}{3600 \cdot v_2 \cdot 2.8 \cdot 1}$$

$$\frac{Q_{v,1}}{3600} = \frac{95}{3600 \cdot v_2 \cdot 2.8 \cdot 1} \rightarrow Q_{v,1} = \frac{33.93}{v_2}$$

v (m/s)	Q1 (m ³ /h)
0,66	51,41
0,84	40,39
1,05	32,31
1,31	25,90
1,68	20,20
2,09	16,23
2,62	12,95

THEORETICAL CAPACITY Q_t (m³/h) at v = 1 m/s

THREE-SECTIONED CARRYING IDLERS															
B (mm)	l ₁ (mm)	λ°		20		25		30		35		40		45	
		β°	10	15	10	15	10	15	10	15	10	15	10	15	
400	180		36	43											
500	200		60	73		67	79								
650	250		110	132		123	145	134	155	145	164	153	171	160	176
800	315		172	207		183	226	211	243	227	257	240	268	250	276
1000	380		201	337		315	369	345	396	371	419	391	437	407	449
1200	465		412	493		461	640	505	581	543	614	573	640	597	668
1400	530		573	685		642	750	703	807	755	803	797	888	829	913
1600	600		753	907		851	983	932	1068	1000	1120	1056	1075	1097	1200
1800	670		970	1150		1068	1270	1155	1365	1279	1443	1350	1502	1402	1544
2000	750		1204	1438		1351	1577	1479	1695	1588	1791	1676	1965	1742	1917
2200	800		1475	1740		1556	1930	1813	2074	1946	2191	2052	2281	2131	2342