W1.91

Selecting Pneumatic Gravity Conveyors
(Airslides)

Airsllides or p.g.conveyors are used to convey pulverised material that can be fluidised. Fluidised material flows like fluid and hence these conveyors can convey only downwards.

Aieslides are installed at an angle of 6-10 degrees sloping down wards.Therefore discharge point will always be at a lower level than feed point. Hence there should be sufficient head room available in the layout according to length of conveyor.

Normally pulverised ground material with a fineness of minus 40 % passing 200 mesh can be conveyed in airslides. The material should be dry enough so that particles do not agglomerate and should be easily fluidised.

Airslide trough is in two parts separated by a porous material either fabric or tile. The temp. of material that can be conveyed in airslides is thus governed by the porous material used for aeration of mate rial. Limits for commonly used porus materials are

1 silicon treated mildew proof cotton fabric	135 ^{o} c
2 polyester fabric	175 ^{o} c
3 asbestos wire mesh fabric	upto 260 ^{o} c
4 refactory / sintered metal	upto 425 ^{o} c

Capacities of airslides are proportional to width of trough and are volumetric. Capacities in tph are obtained by multiplying volumetric capacities by bulk densities of materials conveyed.

capacity chart for airslides

width of air slide mms	capacity m^3/hr
100	11
150	28
200	57
250	85
300	114
350	171
400	228
450	300
500	400
600	600
850	1425

Capacity in tph = cap. in m^3/hr* bulk density of material. Density of fluidised material to be used and not density of stored material.

commonly used slopes for different applications and materials are

material and application	slope degees
raw meal	8
coarse return from separator	8-12
separator fines	6
from mill discharge	10
from elevator to separator	10-12
under dust collectors	10
raw meal from blending to storage silos	8
raw meal from storage silo to kiln feed	8
cement	6
cement coarse return from sep.	6-10
cement mill discharge	8-10

Air used for aeration and conveying is related to the aeration surface that is effective width * length of airslide

conveying air and its pressure:

For closed air slides, centrifugal fans are used to supply fluidising air; for open airslides with load of material on conveying surface, roots blowers are used.

1 closed airslides which do not have to support head of material,
150 $m^3/hr/m^2$ of fluiduising surface at 500 mmwg.

2 open airslides inside silos, bins, conical hoppers etc have to support head of material and fluidise it and make it easy to flow.
centrifugal fans are used
200 $m^3/hr/m^2$ at

a in flat bottom silos 0.35 kg/cm^2
b in conical silos 0.21 kg/cm^2
3 in level boxes 0.14 kg/cm^2
4 in nib traps 0.07 kg/cm^2

type positive displacement blowers aare used

3 airslides at discharge of hopper and flow gate
200 $m^3/hr/m^2$ at 0.07 kg/cm^2

altitude correction factor is used above 300 m altitude

for long airslides, air is admitted at more than one point so that fluidisation is effective through out thelength.
vent air is equal to air admitted forfluidisation

Height difference between feed and discharge ends of aislides according to length and slope can be worked out

length of slide meter	slope 6 °	slope 8 °
	difference in meters	
5	0.523	0.696
10	1.045	1.392
15	1.568	2.088
20	2.091	2.783
25	2.613	3.479
30	3.136	4.175
35	3.658	4.871
40	4.181	5.567
45	4.704	6.263
50	5.226	6.959
55	5.749	7.655
60	6.272	8.350

inputs
calculated outputs

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