LAHTI PRECISION

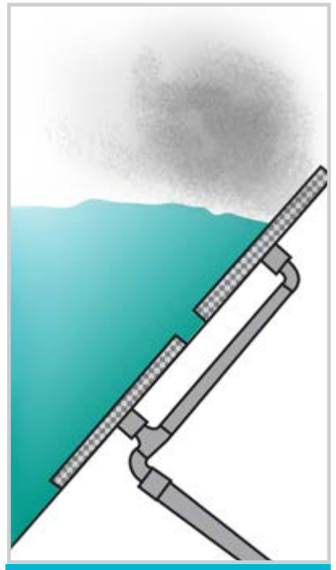
Lahti Precision

Fluidization

The Lahti Precision fluidization technology

The core idea of CONVENTIONAL fluidization system is quite simple: the friction between the silo wall and powder material as well as between the individual particles in the powder material is lowered by injecting large quantity of compressed air into the problem area i.e. using air as mechanical tool to brake the bridges or make the material loose.

This CONVENTIONAL technology is problematic since it is difficult to evenly distribute the air in a controlled way without redusing the force (pressure) at the same time.It is also essential to get the air penetrating the settled compact material while the air should not be allowed to take the easiest way through weak layers or escape through hair cracks resulting uneven flow that compromises the following process equipment function; such as dosing or conveying equipment etc. High pressure and large air flow means also high operation cost.



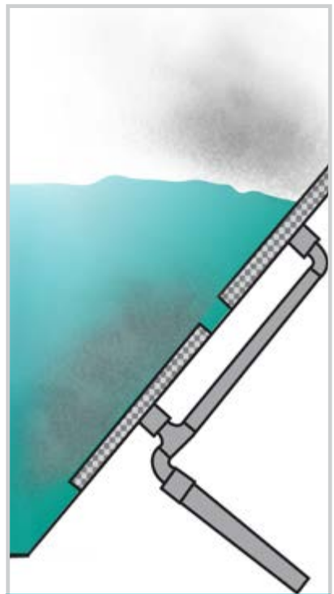
Traditional fluidization

The LAHTI FLUIDIZATION system keeps the flow even and ensures TRUE MASS FLOW OPERATION by forming thin air bed between the fluid element's surface and material to be moved i.e. the flow is based on gravity and not on injection of external force as described under above conventional technology. At the same time the creation of dust, excess pressure in the silo and segregation in the material is minimized.

Most important: It saves electrical energy consumption (minimal usage of pressurized air).

The LAHTI FLUIDIZATION works with different types of raw materials such as fine limestone powders, cement, burnt lime or any other dry powders under precondition that the dry powder material contains at least 15...20% particles smaller than 20 microns.

Using LAHTI FLUIDIZATION technology you have more options available for dosing and conveying equipment; such as dosing powder with LAHTI DOSING VALVES or conveying with LAHTI SCIROCCO II flexible hoses etc.



Patented

Equipment for optimum discharge and transportation

Silo unloading:

Lahti fluid elements

Process infeed:

Lahti fluid cones

Dosing:

Lahti special valves

Conveying:

Lahti Scirocco II hoses

A fluidized product has the properties of a liquid

When a gas goes through a bed of particles, it goes upward and creates free spaces. The particles move away from each others. Friction forces decrease progressively until the bed of particles has the properties of a liquid.

Only dry and small sized particles (< 20 microns = min. 20 %), such as cement, limestone, micro-silica, fly ash, etc. can be fluidized.

Scirocco II hose: a new principle of fluidization

Already used in the airslides, the fluidization has never been applied inside a rubber hose until today.

The operating principle of Scirocco II is not similar to that of one air slide application, but that of hundreds of small airslides i.e. fluid elements. There are air supply channels at the lower wall of the hose. From these main channels small openings lead into small chambers, which are covered with felt.

Thus, each chamber is supplied with air and works like an independent airslide or fluid element.

Since each “airslide“ has very small surface area, extremely efficient fluidization is achieved.

Advantages

LOW INSTALLATION COST

- Flexible system
- Light weight system
- Small size compared to the flow capacity
- Swivel flange

LOW OPERATION COST

- Optimized air consumption
- A 10 m long 4” Scirocco II needs only 14 m3 air to convey 60 tons of cement in one hour

RELIABILITY

- No risk of plugging or clogging
- No moving parts
- No device sensitive to dusty environments (such as electrical motors, etc)
- Virtually no wear: Thanks to the low conveying speed and fluidized material has low abrasion

CLOSED SYSTEM: NO DUST POLLUTION

- Special design of the hose: gasket are 100 % integrated inside the hose i.e. no dust leakage to environment

Design of the fluidization hose:

Maximum performance of Scirocco II hose:

	Cement	Limestone	Micro-silica	Fly ash	Aluminium
Fluidization pressure	0,15 bar	0,15 bar	0,15 bar	0,15 bar	0,5 bar
Fluidization air flow rate in the 4” Scirocco	140 l/min	170 l/min	170 l/min	100 l/min	360 l/min
	Flow capacity (tons/hour) when inclination -6°				
4” (102mm)	62	45	20	57	52
6” (152 mm)	140	101	45	115	110
8” (204 mm)	248	228	80	210	200
10” (254 mm)	388	513	125	330	300

Technical description

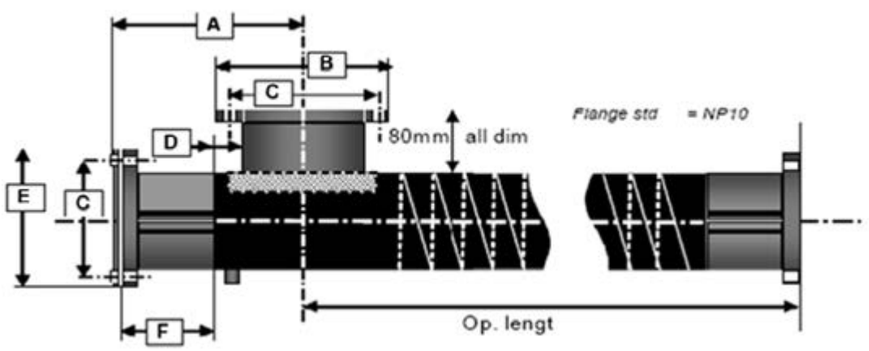
Inner tube:	SBR, black smooth, seamless
Fulidization felt:	Polyamide, temperature resistant to 100°C
Reinforcement:	Multilayer Polyester cord
Helix:	Steel
Cover:	SBR
Cover finish:	Woven pattern, light corrugation
Temperature range:	-5°C - +90°C
Working press.:	Maximum 2-4 Bar, for the hose
Channel press.:	Maximum 2 Bar, for the fluidization air
Electrical property:	Conductive, cupper wire flange-to-flange
Flanges:	Aluminium type; *BlockEnd®*
Line inclination:	-3° to -6°, depending on material
Compressed air:	ISO8573-1 with sub-classification; 3.2.3 alternatively 3.4.3. depending on lowest possible ambient temperature

Hose stand dimensions:

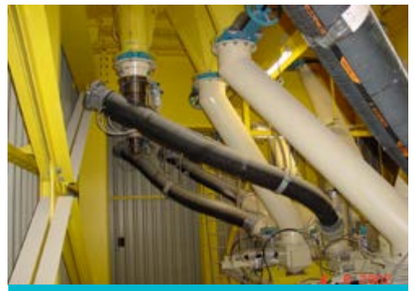
Size	Bending radius (mm)	ID (mm)	WP, max (Bar)	BP (Bar)	Fluidis, area cm^2/m	Weight (kg)
4”	800	102	3,0	6,0	1200	6,9
6”	1000	152	2,0	5,0	2000	10,2
8”	1400	208	2,0	5,0	2600	15,9
10”	1800	255	2,0	4,0	3400	19,2

Coupling dimemsions and flange measurements:

Size	“A“ (mm)	“B” (mm)	“C” (mm)	“D” (mm)	“E” (mm)	“F” (mm)
4”	280 +/- 40 mm	220	180	120	229	100
6”	380 +/- 40 mm	285	240	130	285	150
8”	400 +/- 40 mm	340	295	140	343	170
10”	450 +/- 40 mm	395	350	140	405	185



Scirocco II applications



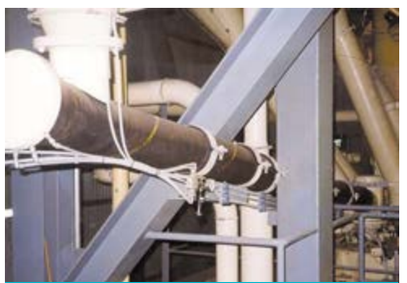
Powder dosing

Silo unloading

Micro-silica conveying
1 silo feeds 5 separate lines.

Cement dosing application

Silo unloading



Installation restricted area

Experience that weighs

Lahti Precision started manufacturing scales in 1914. Today our company is an expert in dosing, weighing and mixing applications supplying batching plants for glass industry, drymix plants and services globally. Our vast experience in core technology guarantees excellent dosing accuracy and consistent mixing quality. We help our customers to succeed in their own production by working closely together, finding the best solutions for the actual need. This ensures our customers the lowest cost of ownership.

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