

PVC Cable Trays in a phosphoric acid plant



Site: Jorf Lasfar Complex
City: El Jadida
Country: Morocco (Africa)
Engineering: Jacobs SA
Installer: Samsung C&T
Owner: Group OCP Maroc
Years: 2014-2016

1. The company: OCP (Office Chérifien des Phosphates)



Office Chérifien des Phosphates is the world's leading producer of phosphate rock and phosphoric acid as well as one of the leading global fertilizer players, with more than 90 years of history serving agriculture. OCP Group has access to Morocco's phosphate rock reserves – the largest global reserve base according to USGS. Fully integrated throughout the value chain, the Group's activities range from mining mineral resources to producing high value-added products. With a global footprint and revenues of more than US\$5.5 billion in 2013, the Group has 23,000 employees and serves every key agricultural market in the world. 3.7 Milliard dollars\$ is a investment of the group in Ethiopia during The visite of king Mohammed 6 at this contry.

2. The site: Chemical complex of Jorf-Lasfar

To respond to the international market and develop a local phosphate industry, OCP acquired the Safi chemical complex in 1965 and the Jorf Lasfar complex in 1984. These world-class facilities specialize in the production of phosphoric acid and fertilizer derivatives. About half of the production is concentrated then exported as semi-finished products (merchant grade phosphoric acid), while the other half is locally processed into solid fertilizers. Most of these fertilizers are shipped outside of Morocco. The share reserved for local customers is large enough to ensure the local market's total satisfaction.

In conjunction with the completion of this mineral pipeline, OCP Group built a new phosphoric acid production plant fired with the pulp originating from the terminal station. With a capacity of 1,400 tons of P_2O_5 /day (i.e. 450,000 tons of phosphoric acid per annum), this new unit allows to raise the production capacity of acid while providing greater flexibility of production and clear improvements in yields.



In addition to water and sunlight, plants have a vital need for three components that are essential to their development: nitrogen (N), phosphorous (P), and potassium (K). Arable lands naturally contain these three elements in varying proportions. Before the early 20th century, agriculture production did not call for large inputs of these elements; however, between 1900 and 2000, agricultural production increased by 600 percent.

As a result of this growth, it became necessary to add various amounts of these three elements to most land in order to improve its productivity. Today, between 40 and 60 percent of global food production requires the use of NPK fertilizer. Phosphorous alone represents a quarter of the 170 million tons of consumed nutrients per year.

If global agricultural production does not increase in this decade compared to the prior decade, we may face a global food output shortfall by 2050, when the world's population is anticipated to reach 9.2 billion people and arable land per capita is expected to drop from its current .20 hectares per capita level to .12. Therefore, food

production must increase by 70 percent, or 1.5 percent per year. This would be impossible without the use of chemical fertilizers. Cereal production, for example, will have to grow at an increased pace to serve expected consumption levels, which are currently between 400 and 1,500 daily grams per person worldwide. Industrial fertilizers, particularly phosphate fertilizers, provide an essential means to meet the planet's future dietary needs in a straightforward and effective way. They are the only way for populations to increase yields per hectare substantially and therefore limit the amount of land devoted to agriculture at the expense of an already strained forest cover.



From 50 million tons at present, demand for fertilizer will increase to around 70* million tons in 2020, an average growth of 2.6 percent per year. Therefore, 2 million additional tons of fertilizer will need to be produced each year.



3. The product installed: Basorplast BPE

BPE 60x100 to 60x300



BPE 100x200 to 100x600



Models (HxB):

60x100; 60x150; 60x200; 60x300; 100x200; 100x300; 100x400; 100x600.

Types: Slotted or solid bottom.

Finishes: PVCMI UV RAL 7035

Characteristics of the tray:

- Non metallic system
- Resistant to UV radiation. Excellent behaviour in outdoor installation.
- Impact Strength: 20J, except 60x100 with 10J
- Minimum temperature: -4 °F
- Maximum temperature: 140 °F
- Non-flame propagating component
- Without electrical continuity
- Electrical insulating component
- Dielectric Strength 18 +/- 2 kV/mm
- High protection inside and outside against corrosive substances
- M1 reaction to fire acc. to UNE 23727
- Glow wire test degree 1760 °F, EN 60695-2-11
- Flammability UL 94-VO, ANSI/UL 94-1995
- Limiting Oxygen Index LOI>50%, EN ISO 4589
- Comply with RoHS directive, 2002/95/CE
- Raw material without silicone

INSTRUCTIONS FOR USE

-For the assembly, two union joints and four M8 Bolt sets are needed for each stretch (8 for H100 models).
- Suitable for wet, salty and chemical aggressive environments.

- To assure good performance under expansions, the increase in temperature must be noted, between the installation and the maximum temperature expected.

Depending on the expected growth in the temperature (ΔT) leave a gap (h) between cable trays according to the following table:

ΔT (°F)	h (mm)
68	5
86	7
104	9
122	11

Safe Working Load - kg/m (lb/ft)

MODEL	2,4m (8ft)	1,8m (8ft)	1,5m (5ft)
BPE-60X100	9,7 (6,5)	17,3 (11,6)	25 (16,7)
BPE-60X150	9,9 (6,6)	17,6 (11,8)	25,3 (17)
BPE-60X200	28,1 (18,8)	49,9 (33,5)	71,9 (48,3)
BPE-60X300	55,2 (37)	98,1 (65,9)	141,3 (94,9)
BPE-100X200	69,6 (46,7)	123,7 (83,1)	178,2 (119,7)
BPE-100X300	107,2 (72)	190,5 (128)	274,4 (184,4)
BPE-100X400	178 (119,6)	316,4 (212,6)	455,6 (306,2)
BPE-100X600	219,7 (147,6)	390,5 (262,4)	562,4 (377,9)

Safe Working Load - kg/m (lb/ft)

MODEL	2,4m (8ft)	1,8m (8ft)	1,5m (5ft)
BPE-60X100	6,9 (4,6)	12,3 (8,3)	17,8 (11,9)
BPE-60X150	7 (4,7)	12,5 (8,5)	18 (12,1)
BPE-60X200	20 (13,4)	35,6 (23,9)	51,3 (34,5)
BPE-60X300	39,4 (26,4)	70 (47)	100,8 (67,7)
BPE-100X200	49,7 (33,4)	88,3 (59,3)	127,2 (85,5)
BPE-100X300	76,5 (51,4)	136 (91,4)	195,9 (131,6)
BPE-100X400	127 (85,3)	225,9 (151,8)	325,3 (218,6)
BPE-100X600	156,8 (105,3)	278,8 (187,3)	401,5 (269,8)

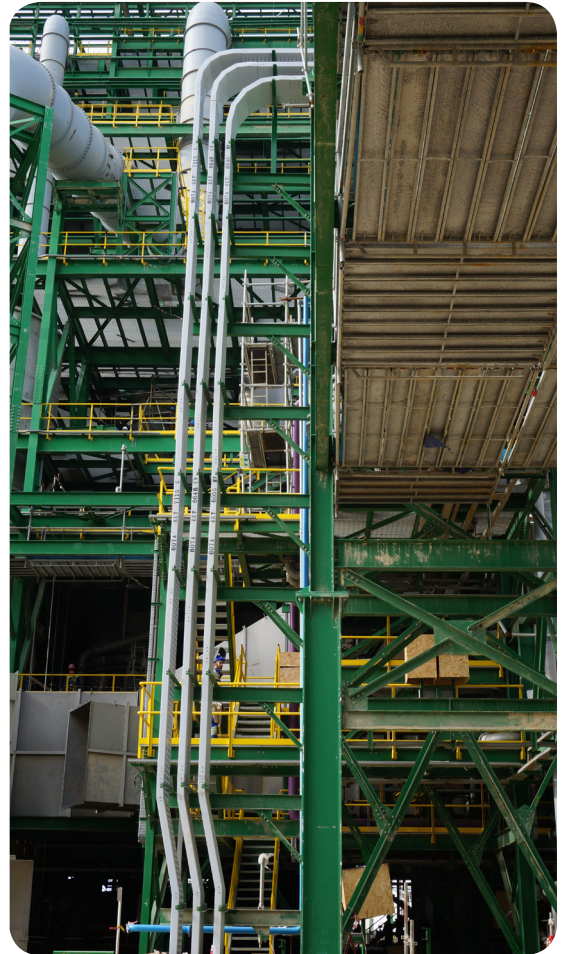
4. Other information about the BPE series

INSTALLATION RECOMMENDATION

- Trays for electrical systems can not be installed under other types of pipelines with risk of water, vapour or gas loss
- The correct support interval must be 3,3ft
- To guarantee a good ventilation, the installed trays must be a minimum distance of 250mm between them
- No grounding needed

TECHNICAL SPECIFICATIONS

- Product: Cable Management System for outdoor
- Raw Material: PVC polymer. UV resistant
- Listing according to UL-568
- Minimum temperature: -20° / -4° F
- Maximum temperature: 60° / 140° F
- Accessories: Flat bend, inside bend, outside bend & supports (Tee & Cross under demand)
- Insulating
- Covers: For accessories & end covers
- Fittings: Union joints, screws, nuts & derivations
- Material Dimensions:
 - Height: 2.2/5" & 4"
 - Width: 4", 6", 8"



5. Chemical Resistance according to ISO/TR 10358

Agressive Medium	Concentration	Temperature	Material		
			PP	PVC	PE
fruit wine		20	●	●	●
		40			
		60			
		80			
		100			
fats and oils*, vegetale		20	●	●	●
		40	●	○	○
		60	○		
		80			
		100			
oleum vapours*	low	20	○	●	○
		40			
		60			
		80			
		100			
olive oil*		20	●	●	●
		40	●	●	●
		60	●	●	○
		80	●		
		100			
oleic acid	technically pure	20	●	●	●
		40	●	●	●
		60	○	●	○
		80			
		100			
oxalic acid*	cold saturated, hydrous	20	●	●	●
		40	●	●	●
		60	●	●	●
		80			
		100			
oxygen*	up to 2%, in air	20	○	●	○
		40	○		○
		60			
		80			
		100			
	cold saturated, hydrous	20	○	●	○
		40	○	●	○
		60			
		80			
		100			
paraffin oil		20	●	●	●
		40	●	●	●
		60	○	○	●
		80			
		100			
perchloroethylene (tetrachloroethylene)	technically pure	20	○	○	○
		40			
		60			
		80			
		100			
perchloric acid*	10%, hydrous	20	●	●	●
		40	●	●	●
		60	●	○	●
		80			
		100			
petroleum ether*	technically pure	20	●	●	●
		40	●	●	○
		60	○	●	○
		80			
		100			
petroleum	technically pure	20	●	●	●
		40	○		●
		60	○		○
		80			
		100			
phenol*	up to 10%, hydrous	20	●	●	●
		40	●	○	●
		60	●		○
		80			
		100			
	up to 90%, hydrous	20	●	○	●
		40	●		●
		60	●		○
		80			
		100			
phosgene*	technically pure, gaseous	20	○	●	○
		40		○	
		60		○	
		80			
		100			
phosphor chloride:*	-phosphor-tri-chloride technically pure	20	●	○	●
		40			
		60			
		80			
		100			
	-phosphor-penta-chloride	20	○		○
		40			
		60			
		80			
		100			
	-phosphoryl chloride	20	ng	ng	ng
		40			
		60			
		80			
		100			
phosphoric acid	up to 30%, hydrous	20	●	●	●
		40	●	●	●
		60	●	●	●
		80	●		
		100			
	up to 50%, hydrous	20	●	●	●
		40	●	●	●
		60	●	●	●
		80			
		100			
	85%, hydrous	20	●	●	●
		40	●	●	●
		60	●	●	○
		80			
		100			
phthalic acid*	saturated, hydrous	20	●	●	●
		40	●	○	●
		60	●	○	●
		80			
		100			
picric acid*	1%, hydrous	20	●	●	●
		40			
		60			
		80			
		100			

Agressive Medium	Concentration	Temperature	Material		
			PP	PVC	PE
phosphoric acid	up to 30%, hydrous	20	●	●	●
		40	●	●	●
		60	●	●	●
		80	●		
		100			

Key

●	resistant
○	limited resistant
○	not resistant
ng	not testet
*	stress cracking
GL	saturated solution
°	moisture expansion/softening

6. Some pictures of the installation



6. Some pictures of the installation



6. Some pictures of the installation

