basor electric

# PVC Cable Trays in a phosphoric acid plant

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

JACOBS® SAMSUNG SAMSUNG C&T OCP

## 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 Mohhammed 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 procuct 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: PVCM1 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-! ame propagating component
- Without electrical continuity
- Electrical insulating component
- Dielectric Strength 18 +/- 2 kV/mm
- Hight protection inside and outside against corrosive substances
- M1 reaction to " re acc. to UNE 23727
- Glow wire test degree 1760 °F, EN 60695-2-11
- Flammability UL 94-VO, ANSI/UL 94-1995
- Limiting Oxigen 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 agresive 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 |

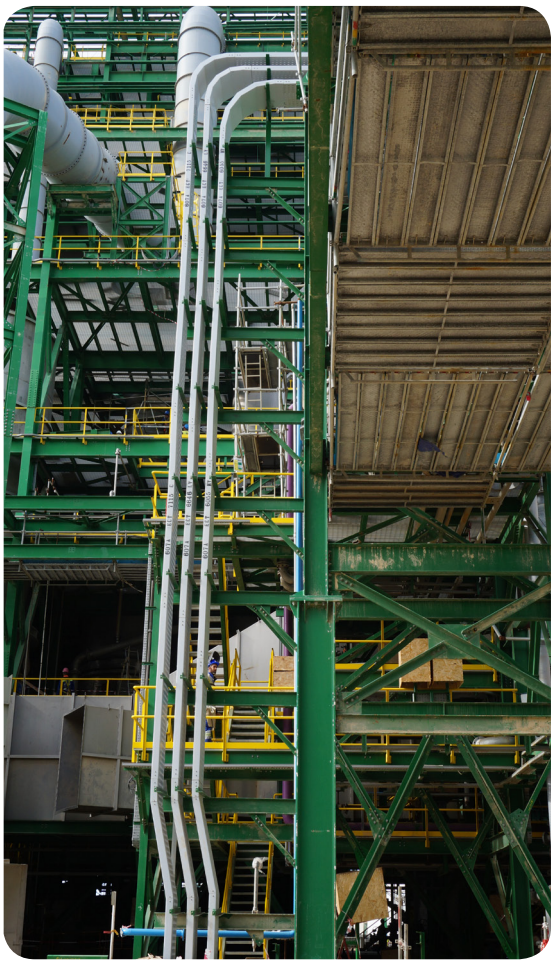
| | Safe Working Load - kg/m (lb/ft) | | |
|---|---|---|---|
| MODEL | 2,4m (8ft) | 1,8m (8ft) | 1,5m (5ft) |
| BPE-60X100 | 9,7 (6,5) | 17,3 (11,6) | 25 (16,7) |
| BPE-60X150 | 9,9 (6,6) | 17,6 (11,8) | 25,3 (17) |
| BPE-60X200 | 28,1 (18,8) | 49,9 (33,5) | 71,9 (48,3) |
| BPE-60X300 | 55,2 (37) | 98,1 (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 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°/ -4F°
- 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 | | | |

| Agressive Medium | Concentration | Temperature | Material | | |
|---|---|---|---|---|---|
| | | | PP | PVC | PE |
| 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 | | | |
| | 70%, 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 | | | |

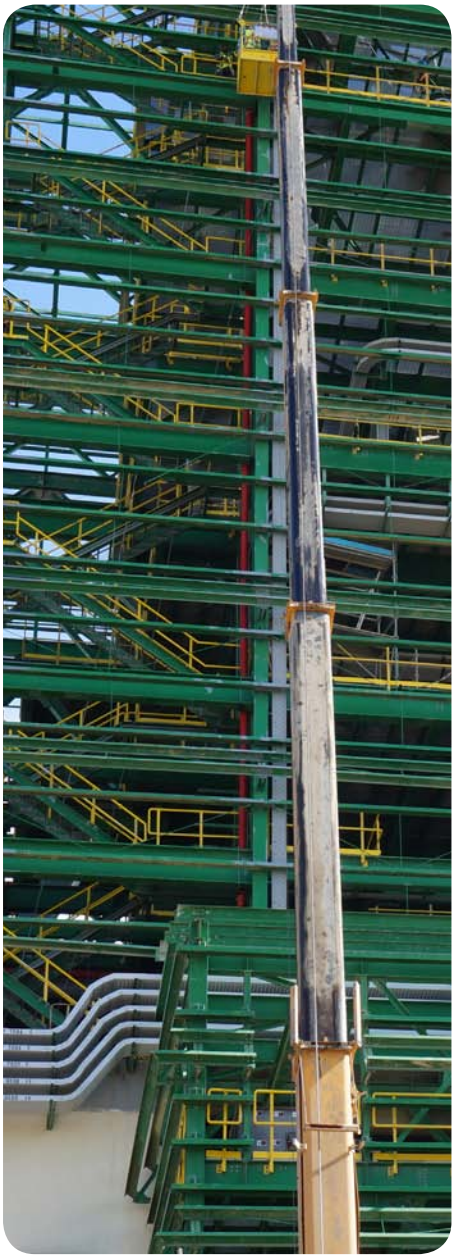
| Agressive Medium | Concentration | Temperature | Material | | |
|---|---|---|---|---|---|
| | | | PP | PVC | PE |
| phosgene* | technically pure, gaseous | 20 | ⊙ | ● | ⊙ |
| | | 40 | | ⊙ | |
| | | 60 | | ⊙ | |
| | | 80 | | | |
| | | 100 | | | |
| phosphor chloride:* | | 20 | ● | ○ | ● |
| -phosphor-tri-chloride | technically pure | 40 | | | |
| -phosphor-penta-chloride | | 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 | | | |

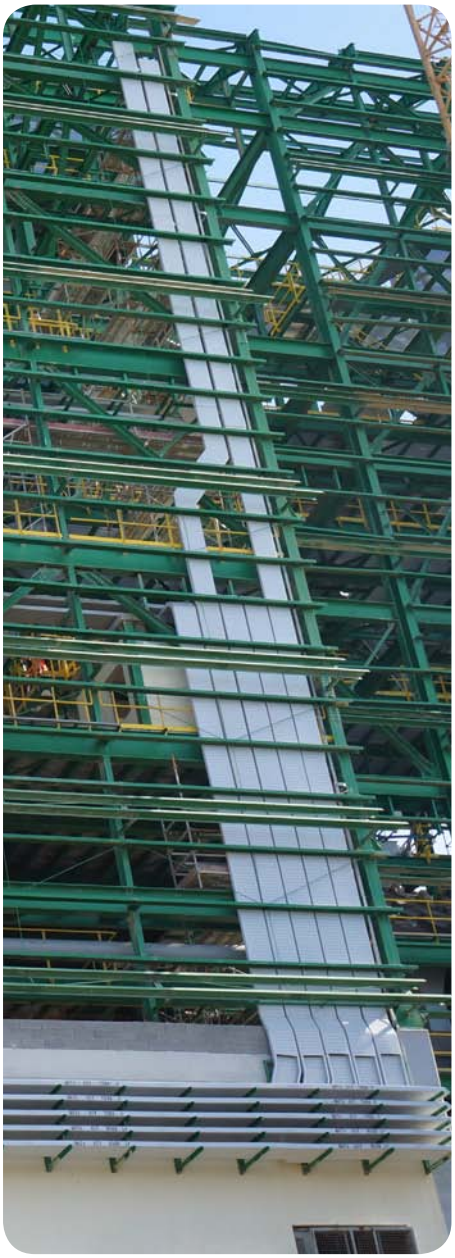
Key

| | |
|---|---|
| ● | 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