10 PLANT LOCATION, LAYOUT, BUILDING STRUCTURE, PLANT DOCUMENTATION

10.1 General considerations

Owing to the hazardous nature of the materials handled in a sulphonation plant it should be accommodated in its own building at least 20m from other buildings. It should not be in the centre of the factory but on the periphery, remote from residential and other areas where gas emissions could be considered unsafe or a nuisance. The site should have easy access by road for the receipt of raw materials and should be near the powders/liquids processing plants so that long transfer lines for sulph(on)ated products (acids or pastes) can be avoided.

Sulphur powder can be stored in air open bunkers provided that they have a water-tight roof to keep out the rain. Molten sulphur storage tanks and organic feedstock, sulphonic acid and AD paste tanks can also be located in the open air provided that the local climate is not extremely cold.

The whole of the gas raising plant can be sited in the open air, dependent upon the climate and the plant throughput. Smaller plants (1-2 ton AD/h throughput) normally have indoor gas-raising plants, notably in tropical areas and in very cold regions of the globe. The effluent treatment plant can be outside the building.

10.2 Plant layout

The equipment suppliers quote the following overall dimensions for typical plant layouts (table 40).

**Table 40 Overall dimensions for typical plant layouts**

<table>
<thead>
<tr>
<th>Plant cap.</th>
<th>1.5 ton AD/h</th>
<th>3.0 ton AD/h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length (m)</td>
<td>Width (m)</td>
</tr>
<tr>
<td>Ballestra</td>
<td>24</td>
<td>18</td>
</tr>
<tr>
<td>MM</td>
<td>34</td>
<td>22</td>
</tr>
<tr>
<td>Chemithon</td>
<td>33</td>
<td>17</td>
</tr>
</tbody>
</table>

The plant dimensions in table 40 are indicative. Examples of plant layout are depicted in figures 49, 50 and 51.
Fig. 49. TYPICAL SULPHONATION PLANT LAYOUT

BALLESTRA SULPHUREX PLANT 2000 kg/h

- Low pressure blower
- Pre cooled air
- Fan for preheating air & SO₂/SO₃ cooling
- Cooling group for process air
- Silicagel drier
- Fan for regeneration air
- Regeneration group
- SO₂ cooler
- Oleum collecting vessel
- Constant level tank
- Oleum pump
- Interstage heat exchanger
- Sulphur furnace
- Dosing pumps
- Sulphur filter
- Silicagel drier
- Air pre heater
- Conversion in catalyst tower
- Ageing
- Stabiliser
- Neutralizer
- Finishing tank
- Acid filter
- Reactors 1st
- Reactors 2nd
- Reactors 3rd
- Reactors 4th
- Exhaust gas suction fan
- Circulation pump
- Laboratory