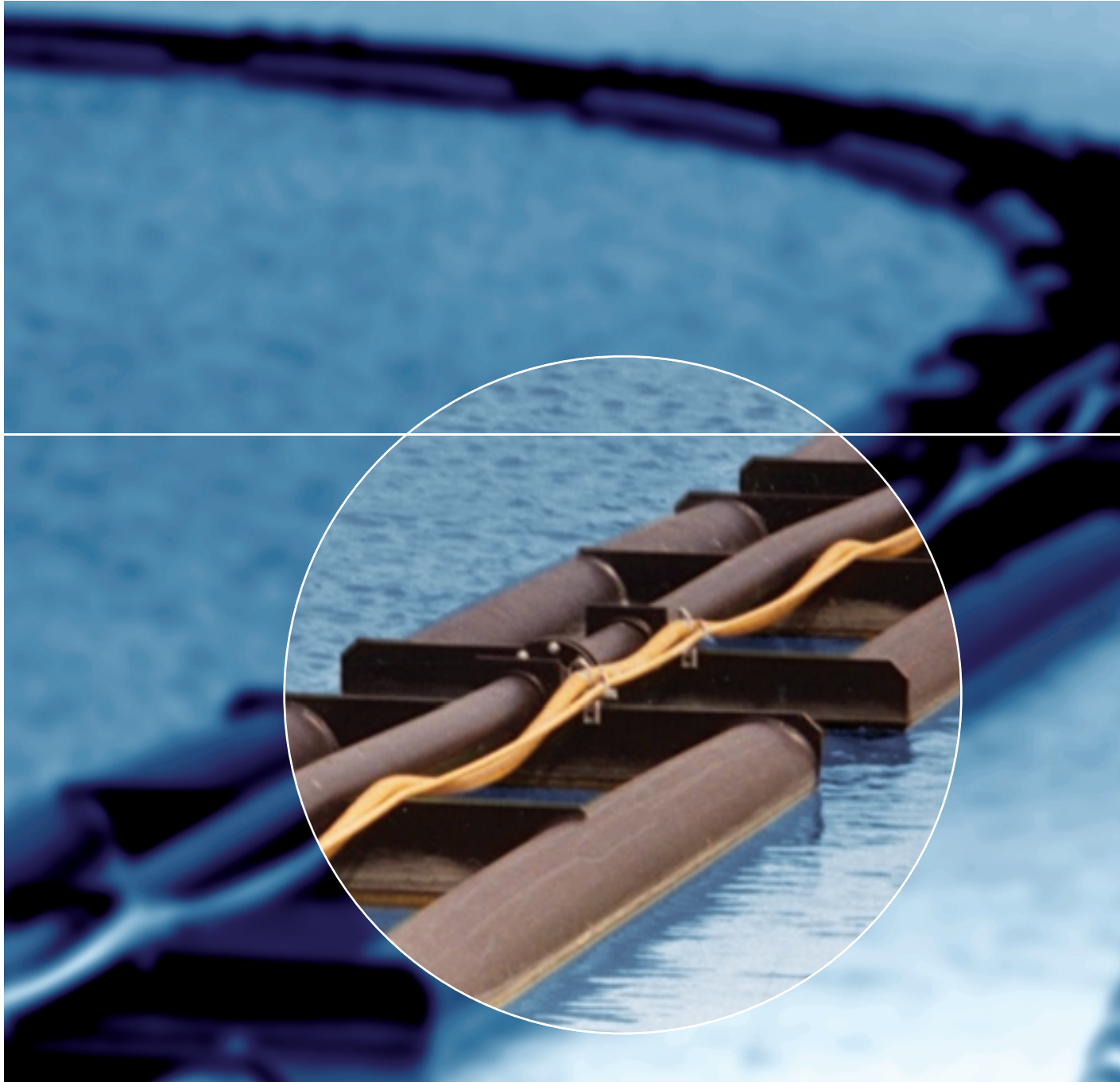


## Project Report 15



SIMONA® System Solutions  
for Equipping Gravel Factories



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# New Solutions for Duct Renovation

## 1.1 Conveying Systems and Floating Pontoons made of PE

SIMONA AG offers not only a comprehensive range of semi-finished products but also cutting-edge system solutions tailored specifically to the requirements of gravel factories. It has become evident that susceptibility of traditional metal materials to corrosion restricts the operational reliability of conveying systems and their service life. The resulting shutdowns for maintenance and repair work lead to considerable additional expenditure. Use of corrosion-proof plastics, particularly polyethylene (PE), reduces the risk of outages and thus guarantees economically efficient operation.

System solutions comprising SIMONA® semi-finished products, pipes and fittings made of PE have proved extremely reliable in practice. SIMONA offers standardised and customised conveying systems and floating pontoons for equipping gravel factories:

- Piping systems for hydraulic conveyance of solids
- Pressure and suction pipes in dredging
- Floating pontoons for piping systems and delivery pumps

SIMONA® conveying pontoons and floating pontoons are assembled from quality-monitored semi-finished PE products, pipes and fittings and are manufactured according to the highest industrial standards. The design and quality of the individual components used comply with the requirements of the chemical apparatus and installation engineering industry.

## 1.2 Range of SIMONA® Semi-finished Products, Pipes and Fittings

PE-HWU	
<b>Extruded sheets</b>	2000 x 1000 0,8 – 50 3000 x 1500 2 – 40 4000 x 2000 3 – 50 2440 x 1220 1,5 – 30 sheets in width 3 m and 4 m on request
<b>Pressed sheets</b>	2000 x 1000 10 – 200 4120 x 2010 10 – 120 6200 x 2010 10 – 80
<b>Welding rods</b>	coils, sticks: round 3 – 5 triangular 4 – 7 three core 5 spools, other sizes on request
<b>Solid rods</b>	8 – 800
<b>Hollow rods</b>	110 – 550 (PE 100)
<b>Profiles</b>	□ □

PE 80	
<b>Pipes</b> Pressure pipes	10 – 1000
<b>Fittings</b> injected segment welded seamless formed	20 – 400 90 – 1000 32 – 500
<b>Special fittings</b>	double containment piping system, shafts and further special fittings on request
<b>Valves</b>	metallic butterfly valves for PE piping systems

### 1.3 Material Specifications for PE 80 and PE-HWU

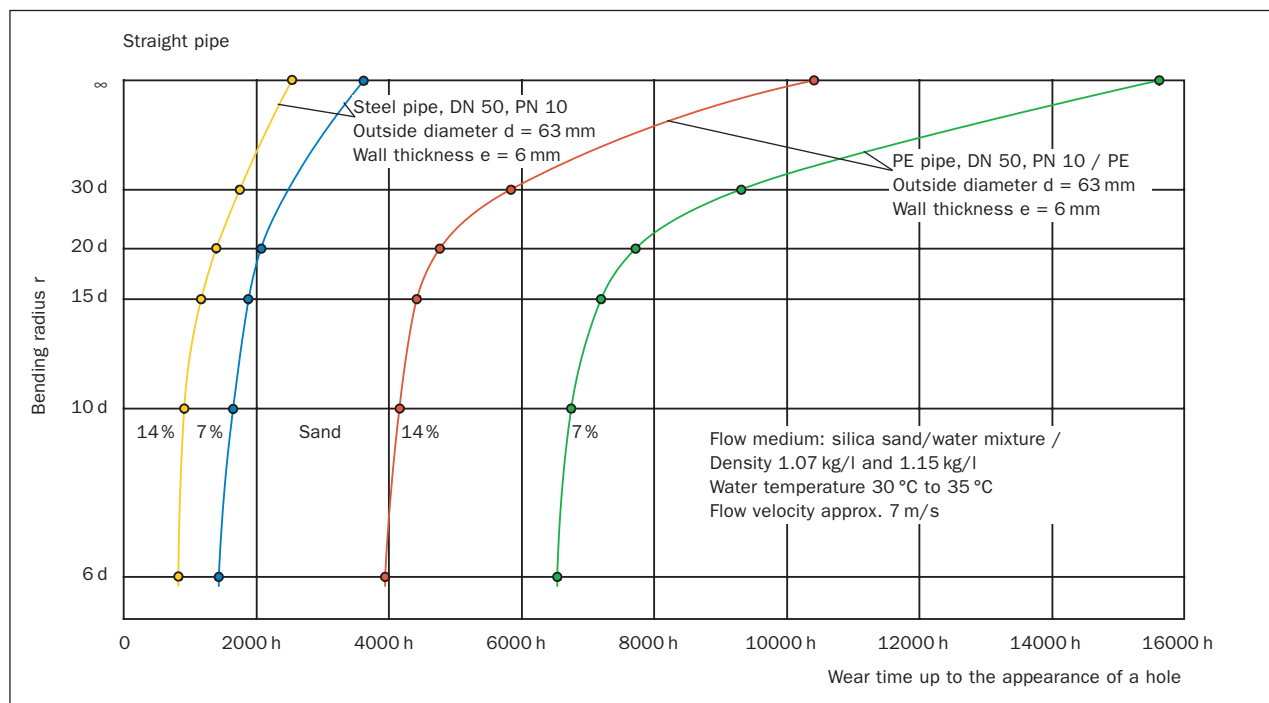
Property	Test Standard	Units	PE 80	PE-HWU
<b>Mechanical properties</b>				
Density	ISO 1183	g/cm <sup>3</sup>	0,95	0,95
Melt index group	ISO 1133	group no.	005	005
<b>Tensile test</b>	DIN EN ISO 527			
Yield stress		MPa	23	22
Elongation at yield		%	9	9
Elongation at break		%	≥300	300
Tensile-E-Modulus		MPa	800	800
<b>Impact resistance test</b>	DIN EN ISO 179			
Impact strength		kJ/m <sup>2</sup>	without break	without break
Notched impact strength		kJ/m <sup>2</sup>	12	12
<b>Surface hardness</b>				
Ball indentation hardness	DIN EN ISO 2039-1	MPa	40	40
Shore hardness	ISO 868	–	63	63
<b>Thermal properties</b>				
Crystalline melting range	DIN 53736	K (°C)	399 – 403 (126 – 130)	399 – 403 (126 – 130)
Average thermal coefficient of elongation	DIN 53752	K <sup>-1</sup>	1,8 · 10 <sup>-4</sup>	1,8 · 10 <sup>-4</sup>
Thermal conductivity	DIN 52612	W/m · K	0,38	0,38
<b>Electrical properties</b>				
Dielectric strength	VDE 0303-21	kV/mm	47	47
Volume resistivity	DIN IEC 93	Ohm · cm	> 10 <sup>16</sup>	> 10 <sup>16</sup>
Surface resistance	DIN IEC 167	Ohm	10 <sup>14</sup>	10 <sup>14</sup>
Track resistance	DIN IEC 112	V	600	600
<b>Other properties</b>				
Fire behaviour	DIN 4102	class	B2	B2
Water absorption	DIN 53495	%/24 hrs.	negligible	negligible
Physiological acceptability	Recommendation		yes	yes
Chemical resistance	DIN 8075 suppl.		conforms	conforms

The specifications are approximate figures for guidance only and may vary depending on the method of processing and now the test specimen is made.

#### 1.4 Abrasive Resistance of Various Materials

The high elasticity of SIMONA® PE 80 pipes in relation to aggressive currents of particles produces excellent abrasive resistance. The use of SIMONA® PE 80 pipes leads to a much longer service life than that of the much more rigid conventional pipe materials, even

when conveying water flows containing solids at high velocities. To counteract excessive stresses at the bottom of the pipe, flanged pipes can simply be turned. The use of welding collars with loose backing flanges makes it possible to turn individual sections without having to completely flange the pipe.



Abrasive strength of pipes and bends made of PE 80 and steel

#### Test conditions

Flow medium: Silica sand/water mixture  
Solids content: 7 and 14 per cent by vol.  
Grain size: 1 to 2.5 mm  
Flow velocity: 7 m/s  
Internal pressure: 1.4 bar  
Water temperature: 30 °C to 35 °C  
The sand was changed every 60 hours and every 45 hours

### 1.5 Advantages of SIMONA® PE Semi-finished Products and Piping Systems

- Excellent weather resistance of PE 80 and PE-HWU
- Service temperature range from  $-50\text{ °C}$  +  $80\text{ °C}$
- Very high resistance to aqueous solutions of salts, acids and alkalis
- Corrosion resistance of PE: no elaborate anti-corrosion measures (internal and external) necessary
- High abrasive resistance to solids in liquids – service life is up to four times longer than that of steel pipes
- Good handling due to light weight and high impact resistance
- High flexibility and elasticity, hence no fracture under load – even substantial changes in direction in the pipe can be implemented with bending radii, without the need for fittings
- No incrustations or deposits owing to low surface roughness
- High level of permanent watertight seal due to longitudinally strong and homogeneous-material connection by means of butt welding
- High cost-effectiveness due to project-oriented lengths of pipes delivered, floats and pontoons
- Simple assembly due to standardised flange assemblies

### 1.6 Quality Assurance

- Pipes: SIMONA® PE 80 to DIN 8074/75 with DIBt approval PA-VI-721.005
- Fittings: SIMONA® PE 80 to DIN 16963 with DIBt approval PA-VI-722.001
- Sheets, rods, welding rods: SIMONA® PE-HWU (high heat resistant, UV-stabilised) to DIN 16985
- Product monitoring in accordance with GKR Guideline with RAL certification.
- Production monitoring in accordance with DIN EN ISO 9001 with TÜV certification.
- Internal welding seam inspection by spark induction in accordance with DVS Guideline.



*Welding seam inspection in our plastics workshop*

### 1.7 Advice on Applications

We are able to provide you with expert advice from the planning of your projects to pre-engineering in the field. Equipped with our own plastics workshop, we are also in a position to make custom designs. Take advantage of the services we offer and contact us on +49 (0) 67 52 14-722 or at [pm.umwelt@simona.de](mailto:pm.umwelt@simona.de)

# Suction Pipe on Floating Pontoons

## 2.1 Karlsdorfer Rheinsand Gravel Factory Project Report

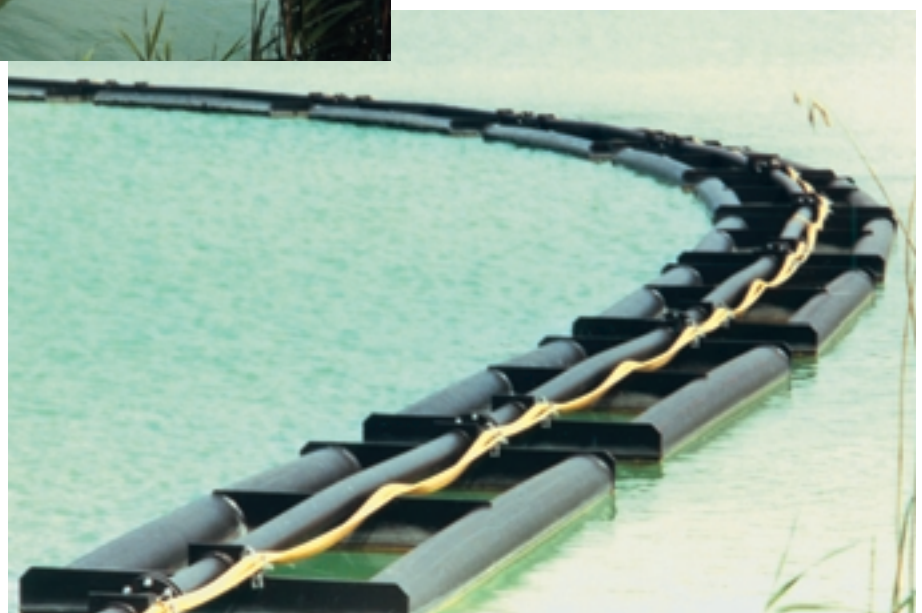
SIMONA® PE-HWU floating pontoons with PE 80 sand suction pipe	
<b>Project</b>	Karlsdorfer Rheinsand Gravel Factory
<b>Pre-engineering</b>	Applications Technology Department SIMONA AG
<b>Pipe supplier</b>	SIMONA AG Teichweg 16 55606 Kirn Germany www.simona.de
<b>Place of manufacture</b>	SIMONA AG Plant III 77975 Ringsheim Germany
<b>Sheets and welding rod</b>	SIMONA® PE-HWU to DIN 16985
<b>Pipe material</b>	SIMONA® PE 80 to DIN 8075
<b>Pipe dimensions</b>	Delivery pipe d 140 x 8 mm to DIN 8074, Float d 315 x 9.8 mm to DIN 8074
<b>Pipe connection</b>	Heating element butt welding to DVS 2207, flange assembly with stub flange/loose flange
<b>Construction period</b>	September 1989



*Conveying system for suctioning soil containing sludge.*



*Floating dredger with suction pipe for removing fine sand and sludge. The floating dredger is positioned with the aid of an anchor boom.*



*Attachment of the energy cables and the delivery pipe to the corrosion-proof floating pontoons made of polyethylene (PE). Despite the fixed flange assemblies on the delivery pipe the pipeline remains flexible and no articulated joints are required.*

# Pressure Pipe on Floating Pontoons

## 2.2 Hubele Gravel Factory Project Report

SIMONA® PE-HWU floating pontoons with pipes made of PE 80 for hydraulic conveyance of solids	
Project	Hubele Gravel Factory Sessenheim (Alsace)
Pre-engineering	Applications Technology Department SIMONA AG
Pipe supplier	SIMONA AG Teichweg 16 55606 Kirn Germany www.simona.de
Place of manufacture	SIMONA AG Plant III 77975 Ringsheim Germany
Sheets and welding rod	SIMONA® PE-HWU to DIN 16985
Pipe material	SIMONA® PE 80 to DIN 8075
Pipe dimensions	d 225 x 20.5 mm to DIN 8074
Pipe connection	Heating element butt welding to DVS 2207, flange assembly with stub flange/loose flange prefabricated in Plant III
Construction period	June 1994



*The PE floating pontoons are sized according to the particular application and the client's requirements. Pipe lengths of 6 m, 12 m and 20 m make it possible to optimise adaptation of the individual elements to system requirements.*

*Overall length and positioning of the floats (pontoons) depend on the buoyancy analysis. Calculation is based on the figure for solids content in the flow being discharged.*



*The high flexibility of the elements and long-term weather resistance of PE ensure that the delivery pipeline has an enormously high level of break resistance, even if radii are extreme.*

# Delivery Pipe under Floats

## 2.3 Epple Gravel Factory Project Report

<b>SIMONA® PE-HWU floats with pipes made of PE 80 for hydraulic conveyance of solids</b>	
Project	Epple Gravel Factory Setz (Alsace)
Pre-engineering	Applications Technology Department SIMONA AG
Pipe supplier	SIMONA AG Teichweg 16 55606 Kirn Germany www.simona.de
Pipe supplier	SIMONA AG Plant III 77975 Ringsheim Germany
Sheets and welding rod	SIMONA® PE-HWU to DIN 16985
Pipe material	SIMONA® PE 80 to DIN 8075
Pipe dimensions	d 250 x 22.8 mm to DIN 8074
Pipe connection	Heating element butt welding to DVS 2207, flange assembly with stub flange/loose flange
Construction period	October 1995





*Customised delivery piping system consisting of PE floats and PE pipes. Strong connections are guaranteed by welding collars with loose backing flanges prefabricated at the manufacturer's.*

*Laying the delivery pipeline under water reduces the area of wind attack and thus minimises the resulting tensile forces acting on the anchor attachments.*

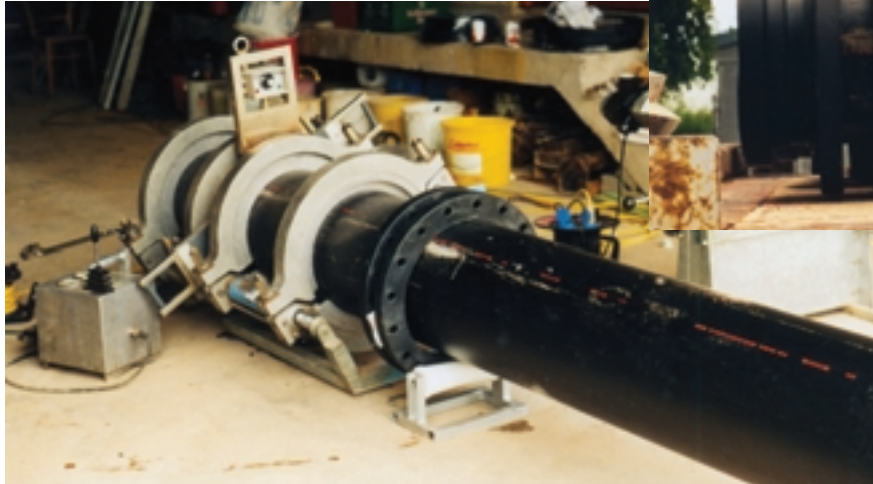


*Prefabrication of the floats at the manufacturer's in conjunction with the customised pipe lengths guarantee the shortest possible assembly times in the field. Variable float positioning also makes it possible to adapt the buoyancy at specific points.*

# Piping System with Steel Floats

## 2.4 Wolf Gravel Factory Project Report

SIMONA® PE 80 piping system for hydraulic conveyance of solids	
Project	Wolf Gravel Factory 76774 Leimersheim (Südpfalz)
Pre-engineering	Applications Technology Department SIMONA AG
Pipe supplier	SIMONA AG Teichweg 16 55606 Kirn Germany www.simona.de
Place of manufacture	SIMONA AG Plant III 77975 Ringsheim Germany
Pipe material	SIMONA® PE 80 to DIN 8075
Pipe dimensions	d 355 x 32.3 mm to DIN 8074
Pipe connection	Heating element butt welding to DVS 2207, flange assembly with stub flange/loose flange
Welding	Böcker 55743 Kirschweiler
Construction period	August 1996 Extension in July 1998



*State-of-the-art connection technology using stub flange and plastic-coated loose steel flanges ensure that the suction pipe is continuously resistant to corrosion.*

*Fitting the flanges is conducted with strong welds. Subsequent adjustment on site can be performed with site welding machines.*



*As a replacement for the old defective steel pipeline a new delivery pipe made of PE 80 was mounted on the existing steel pontoons.*



*The problem of the transition between the movable floating pipeline and the stationary classifying plant can be solved without any elaborate articulated joints due to the flexibility of the PE pipes. Flexible, cold-bent fitting pieces made with PE pipes thus permit cost-effective solutions without the use of specially designed components.*

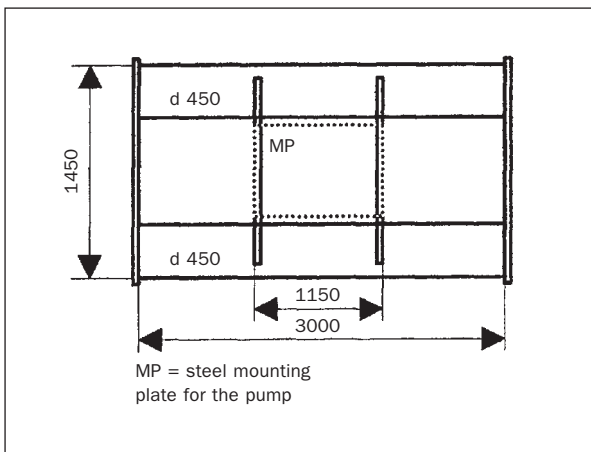
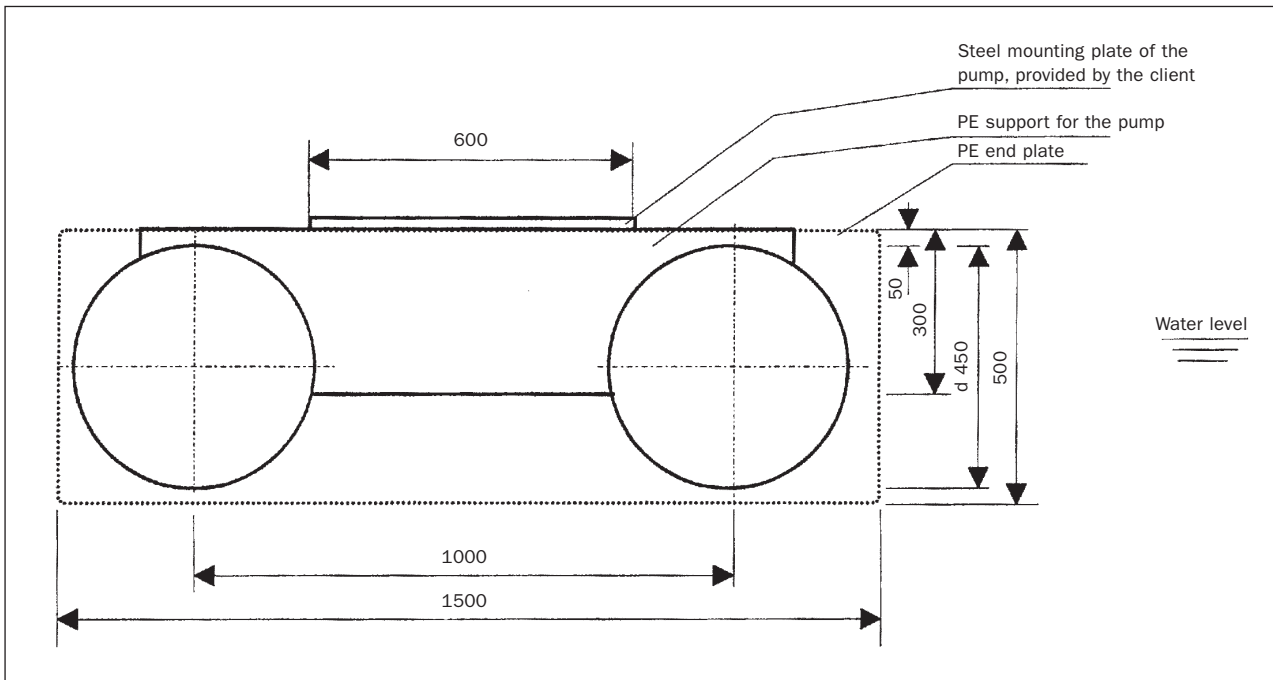
# Pontoons for Delivery Pumps and Pipelines

## 2.5 Stone Crushing Plant Project Report

Walk-on SIMONA® PE-HWU floating pontoons for delivery pumps and pipes made of PE 80 for the hydraulic conveyance of solids	
Pre-engineering	Applications Technology Department SIMONA AG
Pipe supplier	SIMONA AG Teichweg 16 55606 Kirn Germany www.simona.de
Place of manufacture	SIMONA AG Plant III 77975 Ringsheim Germany
Sheets, welding rod	SIMONA® PE-HWU to DIN 16985
Pipe material	SIMONA® PE 80 to DIN 8075
Pipe dimensions	d 225 x 12.8 mm to DIN 8074
Pipe connection	Heating element butt welding to DVS 2207, flange assembly with stub flange/loose flange
Construction period	July 2001



**Diagram of PE-HWU floating pontoons for delivery pump (load 365 kg)**



*Application-oriented advice on design and sizing by SIMONA AG. Customised production is based on shop drawings from our design department.*



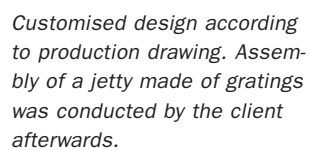
*Factory production of the basic structure consisting of welded plates and pipes made of PE. The lower specific weight of polyethylene with a material density of 0.95 g/cm<sup>3</sup> facilitates handling of the individual elements when they are finished.*



*Final quality control with a continuous welding seam inspection by spark induction testing in accordance with DVS (German Association of Welding) guarantees a high level of safety.*



*The finished coating pontoon with mounted pump and connecting pipe prior to installation on site.*

[illegible]

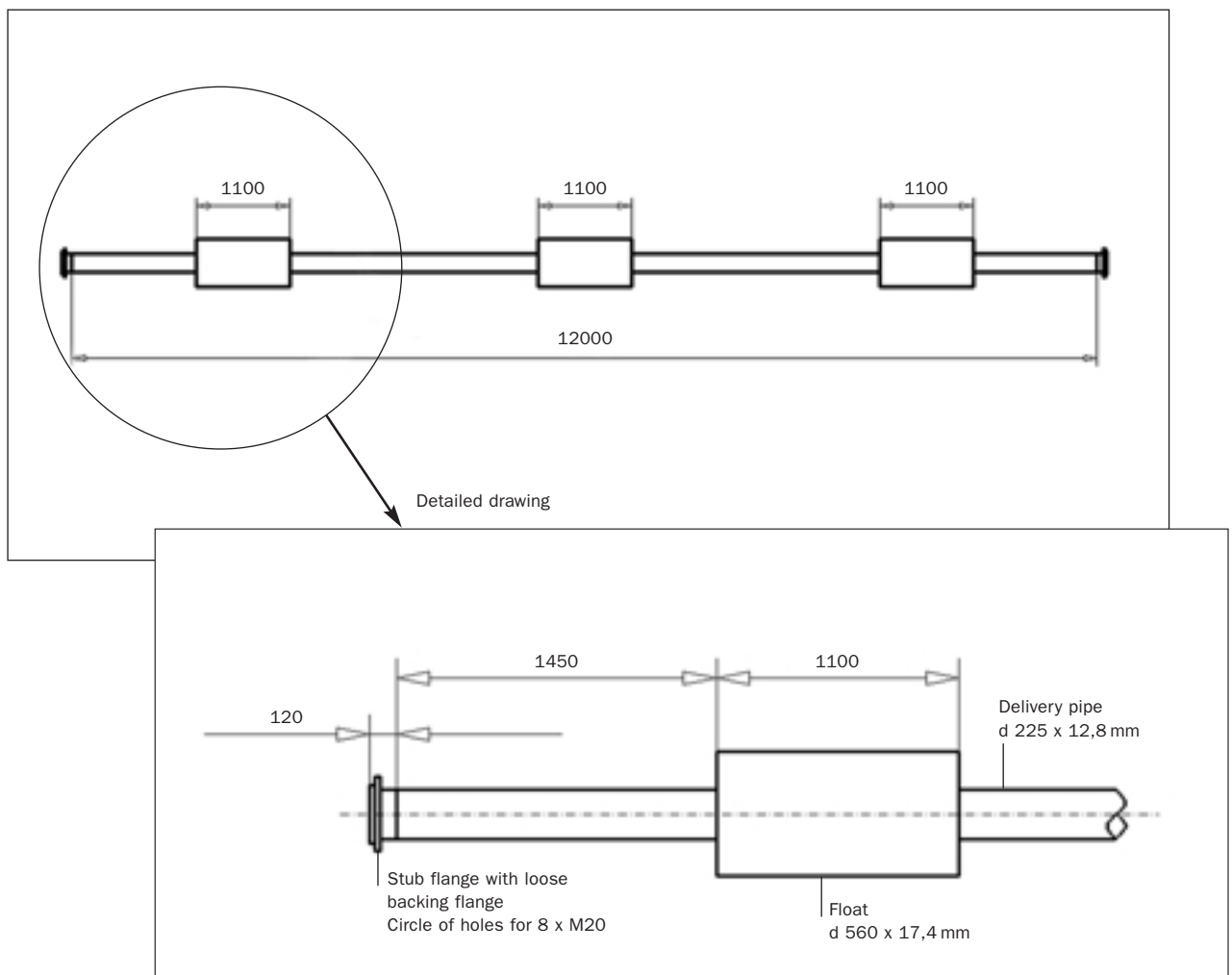
# Sand Delivery Pipe with Floats

## 2.6 Büttel Gravel Factory Project Report

<b>SIMONA® PE 80 pipes with integrated floats for the hydraulic conveyance of sand</b>	
Project	Gravel Factory II/Talaue 67578 Gimbsheim
Pre-engineering	Applications Technology Department SIMONA AG
Operator	Büttel – Sand, Gravel, Construction Materials, Recycling 67578 Eich/Rhineland-Palatinate
Pipe supplier	SIMONA AG Teichweg 16 55606 Kirn Germany www.simona.de
Place of manufacture	SIMONA AG Plant III 77975 Ringsheim Germany
Pipe material	SIMONA® PE 80 to DIN 8075
Floats	d 560 x 17.4 mm to DIN 8074, overall length 1.10 m
Pipe dimensions	d 225 x 12.8 mm to DIN 8074, overall length 12 m
Pipe connection	Heating element butt welding to DVS 2207, flange assembly with stub flange/loose flange
Construction period	April 2002

### PE 80 delivery pipe with integrated floats

Permanently watertight connection by means of factory-extruded welding of the floats. Flange assembly with welding collar and loose backing flange in accordance with DIN 2501, PN 10.







*Sand and gravel classification plant with supply silos. It also serves as a storage depot for the individual elements when they are delivered.*



*Low-cost solution with firmly integrated floats. The welded design minimises the cost of materials, but the floats can no longer be taken apart when the pipeline becomes worn.*



*Outlet pipe to the centre of the lake for flushing out particles.*

# Quality, service, innovation

SIMONA AG is one of the leading manufacturers of semi-finished plastics. Our portfolio of products covers a wide range of applications:

- Sheets in thicknesses from 0.5 to 200 mm
- Pipes in diameters from 10 to 1.000 mm
- Fittings in diameters from 16 to 1.000 mm
- Solid rods in diameters from 6 to 800 mm
- Hollow rods in diameters from 125 to 450 mm
- Profiles and welding rods
- Electrofusion fittings
- Valves

The materials used are PE, PP, PVC-U, foam PVC-U, PETG, PVDF and E-CTFE as well as special materials, i.e. for applications in the orthopaedic sector.

SIMONA AG with its head office in the Rhineland-Palatine Kirn (Germany) produces sheets, rods, profiles and welding rods in works I and II. Using technologically advanced equipment and machinery the pipes and fittings production is situated in works III in

Ringsheim in Baden-Württemberg. To complement this, our worldwide distribution network with subsidiaries and sales partners guarantees a service close to the customer on all continents.

The quality of our products and services is one of our utmost priorities. We, therefore, critically audit and improve our quality management on a continual basis. To us this is a never ending process.

The high demands that we set are not limited to our own organisation but extend to the needs and requirements of our customers. The quality standard of our services is the decisive factor within our product range.

Our sense of quality combines the project development, the purchase of raw materials, the production, the dispatch, the advice given during projecting on the spot and the cooperation with our customers.

So, we are proud to state that we have achieved the DIN EN ISO 9001 certification as the first enterprise of our kind and that our quality management will be constantly optimized by external and internal audits.



*SIMONA quality system certified according to DIN  
EN ISO 9001*

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