Technology that makes its mark
KSB Pumps for Flue Gas Desulphurization

Absorber Recirculation Pumps
EEC Seminar, 22nd April 2016, New Delhi

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KSB Pumps for FGD

1. Introduction of KSB

- KSB is a leading manufacturer of pumps, valves and related systems
- Established in the year 1871 in Frankenthal, GERMANY
- Sales revenue of EUR 2.4 billion/year
- More than 30 manufacturing facilities & 150 service centres worldwide
- Own factory in India since more than 50 years

⇒ KSB is a real global player
KSB Pumps for FGD

2. KSB know-how

- Supplier for FGD applications since 1977
- KSB has delivered equipment for >225 FGD plants worldwide
  - nearly 1500 absorber recirculation pumps
  - > 3000 process pumps for auxiliary circuits
  - >> 1000 valves

➔ KSB provides you 40 years of experience & know-how in FGD business
Shematic view of a limestone gypsum FGD process
KSB Pumps for FGD

2. KSB know-how

- R&D for special FGD materials in own laboratory
- Flow simulation & FEM analysis
- Cavitation, Wear tests
- Specialised foundry for FGD materials

Hydraulic system and materials FGD-optimised
KSB Pumps for FGD

2. KSB know-how

- **High efficiency** of the hydraulic system plays an important role for KSB pumps, therefore
  - we use high quality materials
  - we use optimised hydraulics
  - we adjust the required TDH by trimming the impeller

- Test bed for hydraulic tests up to 18,500 m³/h to ensure our **KSB quality**

- ➔ **High efficiencies up to 93%**
Example:

<table>
<thead>
<tr>
<th>KSB Pump Type</th>
<th>KWPK 900-900-1133</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>15,500 m³/h</td>
</tr>
<tr>
<td>TDH</td>
<td>25 m</td>
</tr>
<tr>
<td>Efficiency</td>
<td>91%</td>
</tr>
<tr>
<td>Power demand</td>
<td>~ 1,000kW</td>
</tr>
</tbody>
</table>

Compared to a similar pump with 88% efficiency only:

- Energy costs: 0.05 USD/kWh
- Operating hours: 7,000 h/year
- Calculated period: 8 years
- Saving of energy costs: > 100,000 USD (per pump)

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2. KSB know-how

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  - we use high quality materials
  - we use optimised hydraulics
  - we adjust the required TDH by trimming the impeller
- Test bed for hydraulic tests up to 18,500 m³/h to ensure our **KSB quality**
  - High efficiencies up to 93%
KSB Pumps for FGD

2. KSB know-how

KWPK 900-900-1133

<table>
<thead>
<tr>
<th>DN</th>
<th>in mm</th>
<th>900</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q</td>
<td>in m³/h</td>
<td>15,500</td>
</tr>
<tr>
<td>H</td>
<td>in m</td>
<td>25</td>
</tr>
<tr>
<td>η</td>
<td>in %</td>
<td>91</td>
</tr>
</tbody>
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(applies to clean water to ISO 9906 Cl.1)

- Picture shows a complete aggregate, consisting of:
  - Pump, Coupling, GearBox, Coupling, Electr.Motor
秦式泵用于FGD

3. 设计

- **壳体材料**：整体式耐火铸铁+陶瓷内衬（**CPS®**）
  - CPS 保证了极高的耐磨损及耐腐蚀性！
  - 单件式蜗壳至10bar（无分块设计）
- **叶轮材料**：Noridur DAS (Duplex) 或 CPS (Ceramic)
  - 秦式泵为您选择最优化
- **可调轴承支架**：保证了使用寿命及持续的高效率
- **紧凑设计**：适合改装

**极长的服务寿命**

*CPS: 陶瓷Poly SiC®*
KSB Pumps for FGD

3. Design

- Due to “back-pull-out” design, in case of maintenance it’s not necessary to disassemble:
  - Casing
  - Motor
  - Gear box (if any)

→ Easy and fast maintenance
KSB Pumps for FGD

3. Design - Mechanical seal – KSB type 4K

- KSB seal optimised for FGD
- Balanced & robust design
- Stationary design
  - no clogging of springs
  - no wear on shaft sleeve
- Atmospheric side flushing as option

→ Reliable design / Easy Service
4. Materials

FGD means heavy duty for the pump components, which are subject to different types of wear:

- Corrosion:
- Blasting wear:
- Cavitation pitting: Impeller
- Abrasion: suction-side sealing clearance

→ KSB provides you a wide range of sophisticated materials
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5. Reference projects

Reference project in South Africa!

KSB supplies absorbent recirculation pumps for one of the largest coal-fired power station in the world.

Kusile:

6 x 800 MW units

24 PcsKWPK 900 - 900 -1138

Impeller material: CPS

Flow rate: \( Q = 12,800 \text{ m}^3/\text{h} \)

Head: \( H = 18.1 \text{ – 24.1 m} \)

Efficiency: \( \eta = 91.3\% \)

(applies to clean water to ISO 9906 Cl.1)
FGD plants are of importance for people, animals and plants alike. We are committed to environmental protection. What can we do for you? Our specialists and laboratories are at your disposal.

KSB products represent premium solutions at excellent cost/benefit ratios!

Follow us at www.ksb.com
Thank you very much for your attention!

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