



Pulp & Paper

*Instrumentation Solutions*



- Longer operating life compared to flowmeters with standard lining
- Cost savings due to reduced maintenance requirements
- Quality assurance through constant measuring results
- Standard installation lengths / inside diameter with no constriction at all
- Compatible with already used transmitters
- High long-term stability

## 1 Introduction

The deteriorating quality of recovered paper resulting from frequent re-dissolving requires the addition of large quantities of auxiliary products like Titanium dioxide or Calcium carbonate. Many other additives like, for example, pigment slurries, milk of lime or chalk suspension contain more and more solid material. The sand content of pulp produced in deinking plants without cleaner stages increases permanently. Material mixtures with medium consistency are then often abrasive. For many reject measurements the increasing content of contraries like glass splinters, CD particles, metal particles or even small stones is a problem.



Fig. 1-1: Electromagnetic flowmeter in stock preparation

## 2 The Problem

In today's paper industry, suspensions tend more and more to be abrasive. In order to achieve efficient processes and a high production capacity utilization, the quantity of all above-mentioned fluids must be measured precisely using the appropriate volume flowmeters.

Electromagnetic flowmeters have been used successfully for volume flow measurement in the pulp and paper industry for many years. The main advantage of this measuring system is its straight and free sensor tube which does not produce any unwanted pressure loss and is easy to clean. To ensure correct measurement, these flowmeters are provided with an insulating lining. In practice, the most commonly used lining materials are rubber, plastics, or Teflon.

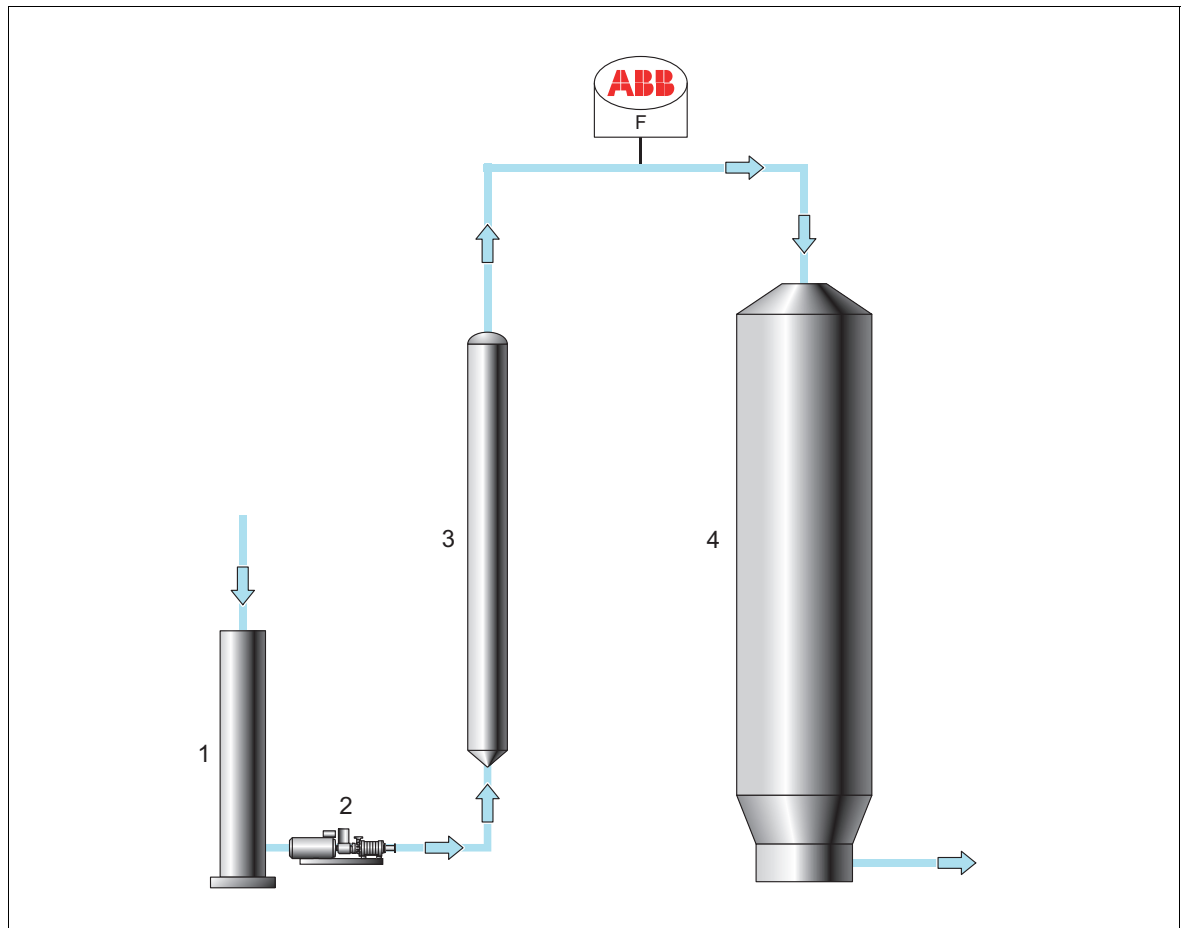


Fig. 2-1: Schematic diagram of an MC pump used for fluids of medium consistency

- |             |              |
|-------------|--------------|
| 1 Standpipe | 3 Reactor    |
| 2 MC pump   | 4 Fluid tank |

### 3 The Solution

Due to the above-described rough operating conditions, the standard lining is suitable only to a limited extent. In some cases, the lining is abraded in no time, resulting in a short-circuit of the flowmeter sensor or inaccurate measurement. In order to minimize the frequency of repeatedly occurring, costly flowmeter replacements and ensure a trouble-free production process, ABB now offers a special lining made of ceramic carbide for electromagnetic flowmeters to be used for demanding applications. The lining consists basically of epoxy resin with ceramic additives which considerably increase the operating life in most cases. An example is the sand trap downstream of the fourth cleaner stage. A flowmeter with standard PTFE lining was able to resist to the demanding operating conditions for approximately two months, only. The device with special ceramic lining is still working perfectly after a operating life of already 1.5 years.

Another important advantage of this model is the easy installation. Stainless steel protectors on the inlet and outlet side ensure that the flowmeter sensor has the standard mounting length without causing any tube constrictions. As a result, special lining flowmeters can easily replace existing flowmeters with standard lining without requiring changes of the tube.

At present, the flowmeter sensor is offered with a nominal size of DN 25 or greater. Of course, the devices with special lining are available with the same features and options – e.g. HART or Fieldbus protocol and extended diagnostics – as the standard devices of the flowmeter product family.

#### 4 Features of the Components Utilized



Measuring point	Instrumentation	
F		<p><b>Electromagnetic Flowmeter FSM4000 as remote mount system</b></p> <ul style="list-style-type: none"> <li>• Multi-talent flowmeter for multi-phase fluids and demanding applications</li> <li>• High performance due to digital signal processing technology</li> <li>• Short response time and undisturbed output</li> <li>• Local measured value display</li> <li>• Integrated monitoring and diagnostic functions</li> <li>• Flowmeter sensor with nominal size DN 1 ... DN 1000</li> </ul>
F		<p><b>Electromagnetic Flowmeter ProcessMaster, as integral mount system</b></p> <ul style="list-style-type: none"> <li>• Industrial measurement of all standard process applications</li> <li>• High performance due to advanced filter technology</li> <li>• Non-contact keys and modular design</li> <li>• Easy commissioning through Sensor Memory and Easy Set-up</li> <li>• Extended monitoring and diagnostic functions</li> <li>• Flowmeter sensor with nominal size DN 3 ... DN 2000</li> </ul>

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