SHARAD PROJECTS INDIA LIMITED

# CASE STUDY ON KUANTAM PAPERS LIMITED:

## SPIL'S MPS PERFORMANCE ON PAPER MACHINE BACKWATER APPLICATION

The case study depicts the efforts made by Sharad Projects India Limited towards the reduction of fresh water requirement in the Pulp & Paper Mill by using **SPIL'S Micro Plate Settler (MPS)** to treat machine backwater at the source. It reduces the consumption of fresh water and also reduces load on ETP as MPS overflow i.e. clarified water of less than 60 ppm is achieved. It also recovers fibre from the backwater which can be reused in the process.

Analysing the results of MPS in the Paper Industry, demand for MPS has been increased in the various industries to reuse process water as well as to make their plants as Zero Liquid Discharge plants for sustainable development.

### ABOUT SHARAD PROJECTS INDIA LIMITED (SPIL)

Sharad Projects India Limited is leading Consultant/Designer in the field of Pulp & Paper Green Field Projects and Day to Day Consultancy.

Beside that SPIL has well-experienced technical team in the area of Environment/Industrial Water Management and providing technical innovation & turnkey solutions for Effluent Treatment Plant, Sewage Treatment Plant and Raw/Canal Water Treatment which comes under the head of water management.

The company is managed by a team of Professionals & Technocrats with an idea to provide turn-key services to various Industries.

The company's forte lies in the design, manufacturing and erection of major projects, offering services, competitiveness, and the ability to manage multidisciplinary teams. The commitment to delivering customized services tailored to client's need and local conditions has fostered successful business relationships.

### SPIL'S MICRO PLATE SETTLER (MPS)

**SPIL'S Micro Plate Settler (MPS)** separates settle-able solids particles from liquids and is used for the treatment of process water and waste water. Basically all solids that are settle-able in a given time, can be separated easily and economically with the MPS, depending upon the density those are usually solids larger than approximately 50 µm in diameter. For separating smaller particles and turbid substances, small quantity of flocculants are used in order to create settle-able flocs to achieve the outlet water of less than 30 ppm.

MPS concept is based on hazen's law i.e. the settling of suspended solids is the function of settling area. Development of Micro Plate Settlers find its design from the roots of hazen's law only. MPS are intended to improve the settling efficiency

of fine grain particles by decreasing settling distance.

Micro plate settler designed by Sharad Projects India Limited find its vast application in Pulp & Paper Industry, Water Industry, Textile Industry, Pharmaceutical industry and many more, where large streams of effluents are generated from different processes, operations with high suspended loads.

**Design & Features:**

- MPS is a unique equipment that is a custom design for each application and characteristics of fluid to be handled. It uses dual media with different working principles for water clarifications.
- Flocculation Chamber is used for flocs generations and suspension also keeps heavy solid from entering MPS Screw Pump
- MPS works on cross flow passage design for solid liquid separation.
- The plate media are inclined at specific angle required for different applications.
- Horizontal Fin Media have a unique design media in rack arrangement separates out fine suspended solids that passes through inclined plate media. This media works by creating steam line flow & utilizing the fluid boundary layer for solid liquid separation.
- MOC of the MPS is designed according to the fluid characteristics

**Advantages:**

- SPIL'S MPS works on 90-99% efficiency
- Low space requirement
- Low Hydraulic Retention times of only 30 min makes the unit very compact, lightweight with high specific clarification. Volumetrically less than 1/5th size of conventional Sedimentation Clarifier.
- Low Retention Time eliminates chances of septicity of the fiber/organic solids.
- Very low maintenance cost since there are no moving parts except flocculation Chamber Agitator.
- MPS is best substitute of Poly Disc Filter (PDF), Dissolved Air Floatation (DAF) & conventional clarifiers.
- Recovered water can be reused in the system hence reduced load on raw water source.
- Consumption of chemical/ polymer is either nil or negligible.
- Handles shock loads of flow without affecting effluent quality.
- Continuous operation without major down time.
- Individual plate sections can be easily removed.

**Applications:**

- Canal Water/Underground Water
- Machine Back Water, Fiber Recovery
- Centri cleaner Reject, Deinking Foam
- Black Liquor, Wet Washing
- Starch Recovery, Sulphate Removal
- Replacement of ETP Primary & Secondary Clarifiers

**CASE STUDY OF KUANTUM PAPERS LTD., PUNJAB**

## 1. Introduction:

**Kuantum Papers Ltd.** is an integrated manufacturing facility based on agro & wood raw materials. In 2008, they expanded by introducing a wood-based pulp mill, exclusively utilizing wood waste from the furniture industry supplemented by wood logs sourced from social forestry, as opposed to traditional forest-based wood. Evolving from their initial production of 30 TPD, they have grown to an impressive 450 TPD, producing over 150,000 MT of paper annually.

Their product range includes Maplitho, Creamwove, and a wide range of Specialty products such as Thermal Paper, Bond Paper, Parchment Paper, Azurelaid Paper, Cartridge Paper, Colored Paper, Ledger Paper, Stiffener Paper, Cupstock Paper, Carry Bag Paper, and Straw Paper, available in a GSM range of 42 – 200.

## 2. Problem:

In Kuantam papers Ltd., the excess backwater from Paper Machine 3 was directly being recirculated back to process.

Paper Machine 3 Backwater has TSS value of 1500-2500 ppm which is degrading the paper quality, wastage of good fibre and increasing load on ETP.

## 3. Solution:

SPIL has suggested a fiber recovery and water clarification system at source by installing **Micro Plate Settler (MPS-150)** at **Paper Machine 3 back water.** The results of MPS were favourable and SPIL's MPS performance was amazing in the backwater application as per SPIL guaranteed. MPS was highly effective in reducing the TSS. The readings are as follows.

| S. No. | Flow ($m^3$/hr) | pH Inlet | MPS Inlet TSS (mg/l) | pH Outlet | MPS Outlet TSS (mg/l) |
|---|---|---|---|---|---|
| 1 | 120 | 7.6 | 916 | 7.5 | 37 |
| 2 | 120 | 7.6 | 1042 | 7.4 | 50 |
| 3 | 119 | 7.5 | 1218 | 7.3 | 54 |
| 4 | 122 | 7.5 | 1618 | 7.3 | 55 |
| 5 | 120 | 7.5 | 1430 | 7.6 | 52 |
| 6 | 121 | 7.4 | 1166 | 7.5 | 40 |

**TABLE NO. 1**

The inlet TSS levels were elevated, as indicated in the table above. However, following the installation of the MPS, the outlet TSS values fell within the acceptable range (<60 ppm) without requiring polymer dosing. As a result, the clarified water meets the requirements for reuse within the plant, thereby reducing the load on the ETP. Notably, the TSS is collected as fibre, which is also reused in the process. This dual reuse of water and fibre significantly enhances resource efficiency.

**BEFORE**

**AFTER**

**MPS INSTALLED AT KUANTAM PAPER LTD.**

**4. Conclusion:**

After analysing the readings, it has been concluded that

a. The TSS removal efficiency exceeds **95-97% without polymer dosing**, achieving levels below 60 ppm. With minimal polymer dosing, levels as low as 30 ppm are attainable.
b. The process yields high fibre recovery and minimal fibre wastage as sludge.
c. Average fibre recovery reaches **96%,** with an average of **3.42 TPD** recovered, as per Table 1.
d. Average Water recovery is **92.18%.**
e. The system utilizes **minimal polymer in the machine backwater clarification**, resulting in substantial chemical savings compared to other water clarification equipment.
f. Clarified Water is directly reused in the process.
g. The system reduces the load on the ETP.
h. Energy savings are achieved through reduced heat energy loss due to lower retention times, maintaining inlet water temperature.

**Therefore, by summing up the case study**, it has been proved that SPIL'S MPS has been working efficiently. MPS is designed in a such a way where no polymer is required for the separation of the solids from liquid. Sometime we observed in some of the mills that charge on the fibre is very high, in that case we have to neutralize the charge by minor dosing of polymer up to some extent to achieve less than 30 ppm. SPIL successfully conducted trial and installed a commercial plant at Kuantam Paper Ltd., yielding desired results. Further fine-tuning of polymer dosing, considering inlet flow and fibre charge, can reduce TSS levels in the final outlet.

Hence SPIL'S MPS is a perfect solution to clarify water from various applications like Paper Machine Backwater, Deinking Foam Water, Wet Washing System, Black Liquor Clarification, Raw/Canal Water Clarification, etc.

With over 100 companies trusting SPIL's innovative solutions, Sharad Projects India Limited has established itself as a leading technology provider.