



BW WATER

**HYDRO-PAQ
HIGH
PERFORMANCE
CLARIFIER**



CLARIFICATION SYSTEM

HYDRO-PAQ CLARIFIER

High Performance concept clarifier with enhanced flocculation and sludge thickening

Our technology is based on the principal of optimized coagulation, flocculation and precipitation through contact sludge recirculation. This is followed by a multi-zone clarification, in which specially designed honeycomb modules are used.

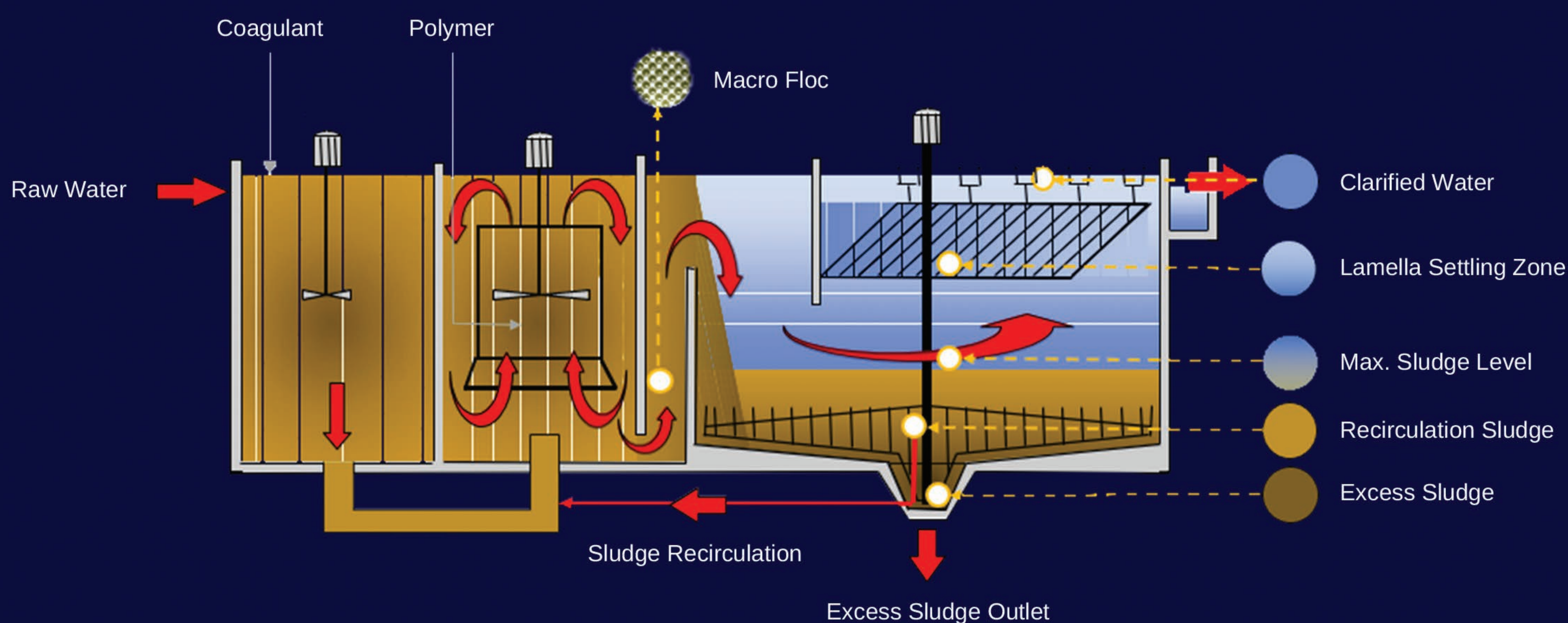
Hydro-PAQ combines a number of process steps into a single unit and thus saves space.

ADVANTAGES OF HYDRO-PAQ SYSTEM

- ✔ Excellent clarified water quality which can reduce loading on MMF or UF systems
- ✔ Lower space requirements as compared to a traditional clarifier
- ✔ Reduction in chemical dosing through the advantage of highly recirculated sludge aiding the forming of micro floc
- ✔ Reliable technology references all over the world

ITEM	CONVENTIONAL	HYDRO-PAQ	MF/UF
Footprint	Large Footprint required	80% Less	80% Less
Investment cost	Lowest	Medium	High
Operation cost	High	Lowest	Medium
Efficiency	< 5 NTU	< 3 NTU	< 0.1 NTU
TSS Outlet Expected	< 10 ppm	< 5 ppm	< 0.1 ppm

HYDRO-PAQ DESIGN SCHEMATIC



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ADVANCED COAGULATION

Coagulation – Destabilization of colloidal suspension by the addition of chemical reagents (iron III chloride, aluminum sulphates etc.) to overcome the repulsive charge.

OPTIMIZED MIXING ZONE BY USAGE OF A FLASH MIXER

- ✓ Retention time 6-7 min
- ✓ Velocity gradient 250 s^{-1}



Coagulant Mixer

ADVANTAGE AS COMPARED TO CONVENTIONAL SYSTEMS

- ✓ Approximately 10% reduction in coagulant dosing

ADVANCED FLOCCULATION



Floc Turbine & Mixer

RAPID FLOCCULATION

- ✓ Agglomeration of the neutralized colloids by adding of flocculants (organic polymers)

OPTIMIZED FLOCCULATION REACTOR BY SLUDGE RECIRCULATION AND USAGE OF HYDRO-PAQ TURBINE

- ✓ Retention time 6 - 8 min

ADVANTAGE COMPARED TO CONVENTIONAL SYSTEMS

- ✓ Overdosing of flocculants not required, therefore lower risk of filter clogging with polymers
- ✓ Chemical reduction
- ✓ Space Saving

HYDRO-PAQ DESIGN SCHEMATIC

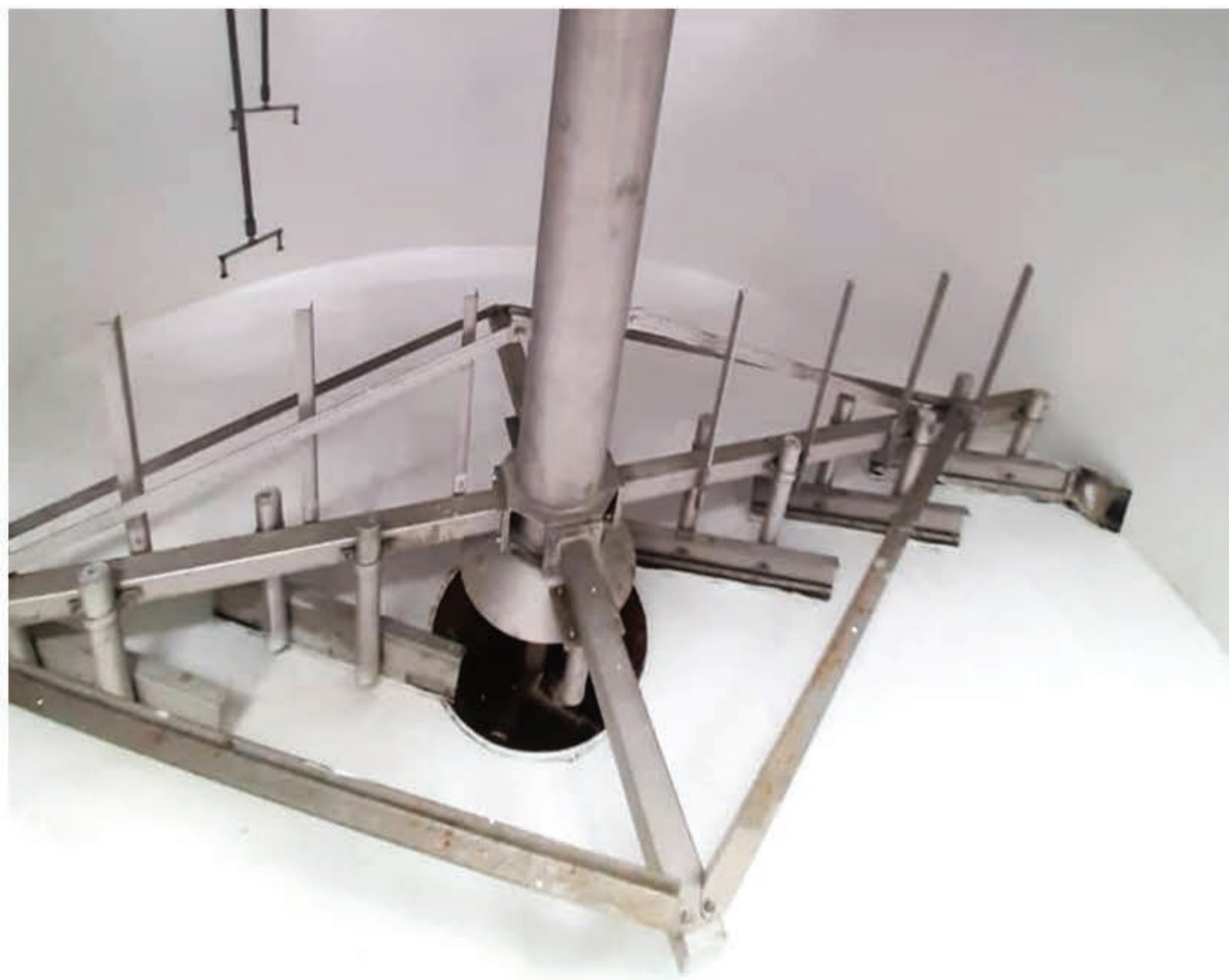
Slow flocculation – Formation of fragile flocs and transfer of these agglomerates into the sedimentation zone

OPTIMIZED TRANSFER OF FLOCS

- ✔ Retention time 3 - 4 min



ADVANCED SEDIMENTATION AND SLUDGE THICKENING



SEDIMENTATION BASIN

All the floc settles here and is either recirculated or sent as excess sludge for further treatment. The sludge scraper enhances quality of sludge.

OPTIMIZED SLUDGE THICKENING ZONE

30 – 100 g/l sludge concentration, additional sludge thickening in many cases not required.

ADVANCED LAMELLA DESIGN



ADVANTAGES COMPARED TO CONVENTIONAL LAMELLA SETTLING SYSTEM

HEXAGONAL MODULES

- ✔ Inclined at 60 ° to the horizontal
- ✔ Made of polystyrene

- ✔ Maximum orifice for a given hydraulic efficiency and module length.
- ✔ Modules resist bending under the weight of accumulated sludge.
- ✔ Excellent flow distribution via the complete settling area and therefore excellent clarified water quality.
- ✔ Honeycomb tube modules could achieve higher velocity due to the hydraulic conditions as modules are inclined and hexagonal cross section.
- ✔ Higher rate of returned solids to the sedimentation basin leading to higher quality effluent water.

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