

*Chemical Process,
Pump & Systems
Specialists*

KGO *Group Ltd.*

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"The Benefit of Experience"

Dry Polymer Systems



HydraFlex & Typhoon HydraMix

KGO Group Ltd., provides quality high performance dry polymer systems capable of hydrating a wide range of water soluble polymers of varying particle sizes and molecular weights. Our installations base is varied and includes Mining, Pulp & Paper, Water & Waste Water, and Major Industrial applications and shipped to locations worldwide. Our systems offer superior polymer wetting, safety, robust construction, with minimal maintenance, cleaning and service.

A significant focus on safety has emerged over the years and is a key factor in our designs and construction processes, we have addressed key ergonomic concerns regarding, structural support and safe access to bulk bags, containment of bulk powders, and nuisance dust with easy and safe access to all system components.

Our **HydraFlex & Typhoon** high performance wetting systems provide exceptional control of "fine" dust particles with the use of a non-mechanical pressurized vacuum system that ensures "all" material is drawn into the system and fed dust free to the mix and age tank, "wetting in our **HydraFlex & Typhoon** systems start when the dry material and water interface" and is not totally dependent on the tank agitator for hydration like many low quality systems. Our unique designs and properly sized components ensure agglomerate free and fully wetted polymer, regardless of low water temperatures or quality.

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HydraFlex HC Series

High Capacity Dry Polymer Systems



In our **High Capacity System** we have prioritized operator safety, starting with access to safely untie bulk bags providing certified bag support structures, locking “L” shaped bag hooks that reduce the stress on improper placement of holding straps. A solid platform on top of the access hatch fully supports the weight of a 1000 kg bulk bag of product for enhanced operator safety. Custom monitoring and alarm functions also add to the overall system operation implemented to prevent overflows, leaks and spills.

Consistent and accurate feeding is critical for industrial and municipal large volume polymer applications. Our designs include a single feed and conditioning screw in all our **HC Series Systems** volumetric feeders. Hoppers also include a safety screen, a vibrator pad (vibrator optional) hermetically sealed knife gate isolation valve, dust collection hookups and an access hatch with viewing window with a heavy duty locking mechanism.

Model HC 200

Utilities

| | |
|---|---------------------------------|
| Inlet Water Flow | 600 LPM – 150 GPM |
| Inlet Water Pressure (required) | 80 PSI Minimum |
| Power Requirement | 575 - 460 VAC |
| Polymer Consumption | 1050 Kg/day @ .5% Concentration |
| w / Alternating Tank Configuration * AT | 1500 kg/d Yield |
| PLC Standard | Allen Bradley MicroLogix |
| HMI Standard | Allen Bradley PanelView Plus |

Tank Sizing w/Standard Transfer Pump[†]

| Polymer Usage/Day | | Suggested Mix Tank Size (Working Volume) | | Std. Transfer Rate | |
|-------------------|------|--|---------|--------------------|-----|
| KG's | Lbs. | Liters | Gallons | L/Min | GPM |
| 325 | 716 | 5m ³ | 1320 | 600 | 158 |
| 550 | 1212 | 10m ³ | 2640 | 600 | 158 |
| 750 | 1653 | 15m ³ | 3962 | 600 | 158 |
| 900 | 1984 | 20m ³ | 5283 | 600 | 158 |
| 1000 | 2204 | 25m ³ | 6604 | 600 | 158 |
| 1050 | 2314 | 30m ³ | 7925 | 600 | 158 |
| 1250 | 2755 | *25m ³ /AT | 6604 | | |
| 1500 | 3306 | *30m ³ /AT | 7925 | | |

[†] Recommended 90-minute mix time.

Model HC 100

Utilities

| | |
|-----------------------------------|--------------------------------|
| Inlet Water Flow | 375 LPM – 100 GPM |
| Inlet Water Pressure (required) | 80 PSI Minimum |
| Power Requirement | 460/575 VAC |
| Polymer Capacity | 700 Kg/day @ .5% Concentration |
| w/ Alternating Tank Configuration | 1200 kg/d Yield |
| PLC Standard | Allen Bradley MicroLogix |
| HMI Standard | Allen Bradley PanelView Plus |

Tank Sizing w/Standard Transfer Pump†

| Polymer Usage/Day | | Suggested Mix Tank Size (Working Volume) | | Std. Transfer Rate | |
|-------------------|------|--|---------|--------------------|-----|
| KG's | Lbs. | Liters | Gallons | L/Min | GPM |
| 300 | 661 | 5m ³ | 1320 | 375 | 100 |
| 500 | 1102 | 10m ³ | 2640 | 375 | 100 |
| 600 | 1320 | 15m ³ | 3962 | 375 | 100 |
| 700 | 1545 | 20m ³ | 5283 | 375 | 100 |
| 750 | 1653 | 25m ³ | 6604 | 375 | 100 |
| 1125 | 2480 | *25m ³ /AT | 6604 | | |
| 1200 | 2645 | *30m ³ /AT | 7925 | | |

† Recommended 90-minute mix time.

HC 200 & 100 Specifications & Options:

Standard Components:

Structural 304 SS Construction

Piping 316 SS welded & flanged construction
 SS hopper assembly w/level sensor
 Double latch access door
 Removable safety screen
 TripKO Volumetric Feeder w/conditioner feeder w/VFD speed control

SS HydraFlex Vacuum Wetting System w/overflow protection
 Magnetic flow meter – source water
 All required check valves 316 SS
 Electrical certification UL/CSA

Optional Components:

Piping 316 SS B31.3 construction
 Electric hoist & trolley
 Bulk bag conditioning
 Dust collector
 Client specified instruments & components
 Loss of weight feed systems

Optional tank construction & configuration
 Electrical certification / CE
 Double latch access door w/viewing glass
 Knife gate hopper isolation valve
 Multi-stage booster pump
 Rapid Fill System



HydraFlex LC Series

Low Capacity Dry Polymer Systems



Model LCPB

The **HydraFlex LC Series** systems are designed for low volume polymer applications that use 750 kg / 1650 lb., bulk or 25 kg / 50 lb., bags. These high performance systems utilize many of the features found in our **HydraFlex HC Series**, attention to safety, excellent wetting, and overall polymer performance are part of these robust low capacity units.

The **HydraFlex Model LCPB Series** packaged systems incorporate bulk bag support structures that are generally used in remote locations or when staffing resources are limited.

The **HydraFlex Model LCP Series** packaged systems incorporate small volume hoppers for use with 25 kg / 50 lb., bags.

All **HydraFlex LC Series** systems are complete with the powder handling and wetting devices mounted on a single frame that includes a transfer pump, mix-age tank with a low shear, low speed mixer and are complete with an automated control panel and tank level sensors. Tank options are stainless steel or an economical polyethylene arrangement. Free standing application/day tanks can also be provided with the necessary automated controls and connections.

Utilities

| | |
|---------------------------------|--------------------------------|
| Inlet water flow | 115 L/m – 30 GPM |
| Inlet water pressure (required) | 80 psi minimum |
| Power requirement | 220/460/575 VAC |
| Polymer capacity | 110 kg/day @ .5% concentration |
| Plc standard | Allen Bradley MicroLogix |
| HMI standard | Allen Bradley PanelView plus |

Tank sizing w/standard transfer pump[†]

| Polymer usage/day | | Suggested mix tank size (working volume) | | Transfer rate | |
|-------------------|------|--|---------|---------------|-----|
| Kg's | Lbs. | Liters | Gallons | L/min | GPM |
| 65 | 143 | 1000 | 264 | 100 | 26 |
| 90 | 198 | 1500 | 396 | 100 | 26 |
| 110 | 242 | 2000 | 528 | 100 | 26 |

[†] Recommended 90-minute mix time.



Standard components:

Structural 304 SS construction
Piping 316 SS welded & flanged construction
SS hopper assembly w/level sensor
Double latch access door
Removable safety screen
TripKO Volumetric Feeder w/conditioner

Feeder w/VFD or DC speed control
SS HydraFlex Wetting System w/overflow protection
Magnetic flow meter
All required check valves 316 SS
Electrical certification UL/CSA

Optional:

Piping 316 SS B31.3 construction
Client specified instruments & components
Multi-stage booster pump
Knife/Slide gate hopper isolation valve

Double latch access door w/viewing glass
Optional tank construction & configuration
Electrical certification /CE



Model LCP

Model LCS

The **HydraFlex Model LCS** standard system is designed for applications where existing tanks and feed systems are in place, or when space and component layout is an issue. These low capacity systems are for use with 25 kg /50 lb., bags. These packaged units are complete with the powder handling and wetting system mounted on a single small footprint frame that includes an automated control panel and tank level sensors.

See Utilities chart above for details.

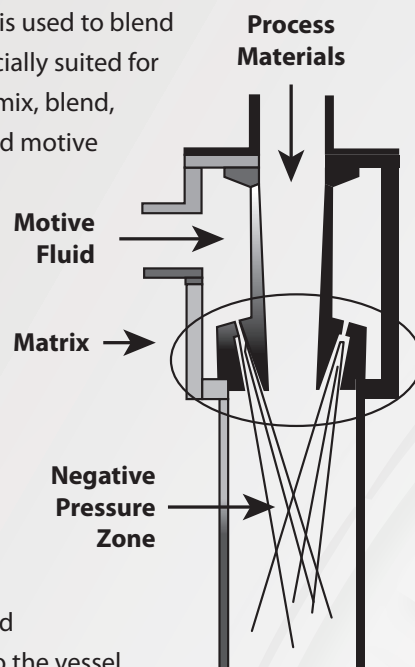
With site specific information we will custom design equipment components, configuration, capacities and controls to accommodate your service requirements.



Model LCS

Typhoon HydraMix

The **Typhoon HydraMix Dry System** is used to blend a variety of dry materials and is especially suited for extreme fine or difficult powders to mix, blend, hydrate or disperse. The pressurized motive fluid (water) is supplied to the "Typhoon" housing by means of a tangential inlet and forced through a complex matrix in the "Typhoon" insert. The flow of the motive fluid through the matrix creates a negative pressure zone, which increases the surface area and mixing capability of the process materials. The Typhoon device is mounted on top of the process/mix tank where the dilution water and powders interface and are driven into the vessel, thus significantly reducing the potential of any fine particles from escaping to the environment, providing a safe working area.



Features:

- > Superior wetting and mixing performance
- > Robust, Stainless Steel construction well suited for harsh and critical environments.
- > The full bore clearances (no restrictions) allow large solids entering the inlet tube to pass freely.
- > No moving parts, low maintenance
- > Typhoon inserts are available in Stainless Steel; Harden Tool Steel or Custom Synthetic Materials.
- > A range of Typhoon heads and inserts are available to cover a wide range of applications and flow rates.



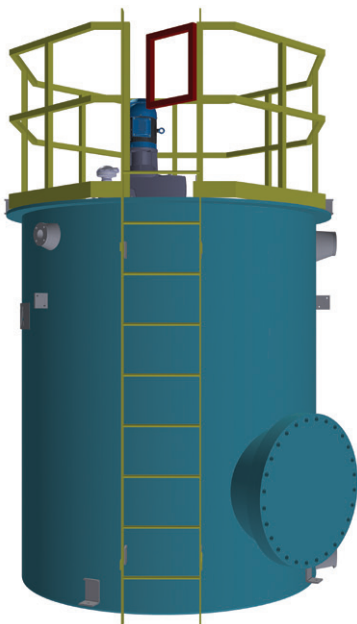
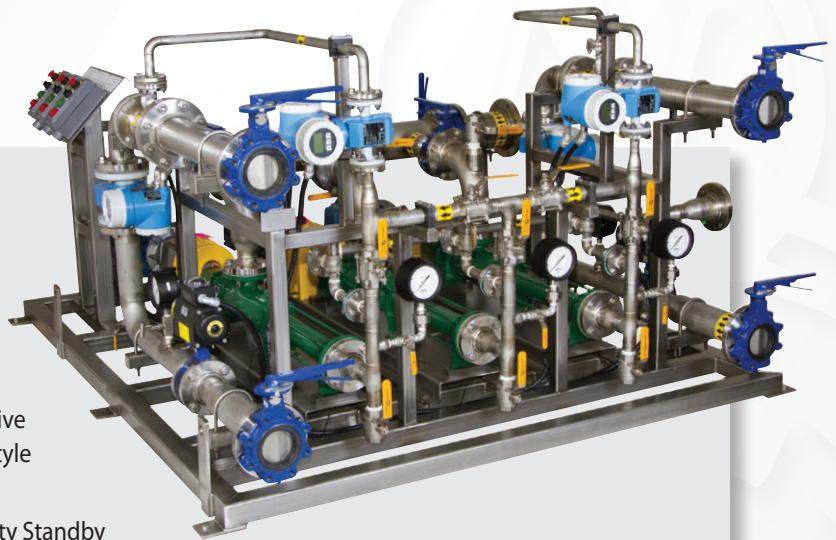
Pump & Dilution Assemblies

From the application tank the enhanced wetted polymer solution will be metered to the process via a metering pump system that may consist of Progressive Cavity, Rotary Lobe, Hose, or Diaphragm Style Metering Pumps

Standard Pump assemblies consist of a Duty Standby pump arrangement with flow control and metering tubes or flow meters, pre-piped, electrically wired and assembled on a single skidded system. Optional system with remote and PID controls and specified components are available.

Various processes may also require further dilution to enhance overall polymer performance and broader distribution.

Standard Dilution assemblies consist of a water flow control valve, check valve/back flow preventers, self cleaning injection quill, dilution water flow indicator, and a static mixer, a check valve is also required on the metering pump discharge. Dilution systems are mounted on the pump skid or a separate skid mounted arrangement. Optional Automated systems are available.



Tanks

Mix tanks are supplied with appropriately sized mixers that operate at speeds between 50 – 150 rpm, level and overflow control devices, adequately sized inlets, outlets and drains. For optimal performance we recommend tanks have internal anti-swirl baffles.

When the aging period has been achieved, the entire batch is transferred to an application tank, either by way of a transfer pump, (side by side tank configuration) or a dump/drop down valve, (stacked tank configuration). Alternating tank (flip flop) systems are available upon request.

Application tanks call for a refill when they reach a predetermined low level, and only when the menu driven “aging time” has been reached. When the contents of the mix tank have been emptied, the cycle to re-fill starts again

Application tanks are supplied with, level and overflow control devices, adequately sized inlets, outlets and drains. (Agitation not required)

The Mix Tank to Application Tank size ratio, is typically; 1:1.5 – 1:2.0 – 1:3.0, and is dependent on process and site conditions.

“You get what you pay for”

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Not all dry polymer systems are equal; over the years we have seen and heard from polymer equipment suppliers making claims and promises of their systems performance and unique wetting capabilities that are in fact, “overstated”. There are certain parameters that must be addressed before the selection of a dry polymer system is determined. Water temperature and quality (hardness & alkalinity) have a very definite effect on the wetting process, lower temperatures below 10-15° C can take as long as 3 hours to completely hydrate and reach maximum viscosity (assumed 0.5%) ratio. Conversely temperature of supply water in industrial applications may be well over 30°C which present a different set of consequences. Location of the equipment installation, storage area of the dry material, atmosphere surrounding the equipment and high humidity issues must be considered.

Polymer types, Anionic, Cationic and Non-Ionic powders all wet and hydrate differently, particle mesh/ micron size may vary from one product to another and will affect the length of time the beads or particles completely hydrate or reaches maximum viscosity. The statements made by equipment suppliers often use best case scenarios when publishing their claims, which can result in higher polymer usage and poor application performance, if those conditions are not met.

Claims of hydrating polymer in excess of 2.0% are more often exaggerated; generally most conventional wetting systems are capable of effectively hydrating polymer at concentrations at or below 0.75%. Viscosity will become a consideration when these concentrations are achieved.

Safety is one of the most overlooked aspects of polymer equipment design. Dust (fines), polymer leakage, slip hazards, accessibility to components, bulk bag support systems, access to bag tie straps, hopper screens, overflow protection, pressure indication, pressure relief and check valves, must be addressed and accounted for. Potential buyers of polymer systems need to evaluate the critical safety implications before deciding on a supplier or brand.

Maintenance is always an issue with dry polymer systems, trying to clean polymer from any surface is not easy, it's particularly difficult once the polymer has been wetted, allowed to dry and then harden. Systems that offer additional protection to prevent the buildup of polymer at the discharge of the screw feeder will reduce the ongoing maintenance often seen in this area; full or partial vacuum conveying is an excellent solution to these problems. Optional maintenance reducing items include; powder drop trays, dust collection systems, hermetically sealed hopper/feeder isolation, quality monitoring and alarm devices and most of all proper operator training and awareness.

System Sizing, is the most common cause of poor polymer performance, tanks, agitators (recommended speed <100 rpm, low shear propellers), line sizes, water supply and feeder output must be adequately matched, to ensure all your polymer is properly and completely mixed, if any one of these parameters are deficient you will incur a decrease in polymer performance and an increase in cost. Do not expect good results if you undersize a system to fit in a confined or pre-determined space, we have seen this many times in the past with less than stellar results.

The Bottom Line, when considering the purchase of a Dry Polymer System, ensure the items and issues indicated above become a significant part of your purchasing decision. Review the safety, robust construction, excellent wetting capability, access to components and the quality of the technical know-how and support of your supplier.

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