

Water Technologies

# Dynamic Radial Wedge Belt Press (DRW)

**SIEMENS**



Water Technologies

# DRW Offers Superior Performance



## Higher Flow Rates, Drier Cake Solids, Lower Operating Costs

The high performance Dynamic Radial Wedge (DRW), a Sernagiotto™ product, is the most technologically advanced belt press in the world today. It is capable of processing unstable, slow draining materials at flow rates 50% higher than comparable models, while achieving consistently higher cake solids. Available in 1.2, 1.6, 2.0, 2.5, and 3.0 meter designs, the DRW can be equipped with up to 15 pressure rollers, which will allow it to produce extremely high cake solids with an exceptional capture rate. A proven performer in the harshest, most demanding industrial and municipal environments, the modular design, rugged I-beam frame, and unique roller construction assure the greatest return on your dewatering investment.

## Superior Engineering Features

**Longer Gravity Zone** A long gravity zone provides effective thickening even at high flow rates. With the use of innovative compression plows, flocculated sludge is furrowed, rolled and compressed along the entire gravity section, increasing the hydraulic capacity while reducing moisture content.

**Low Friction Dynamic Radial Wedge** The upper and lower belts converge around a large diameter (47 inch) perforated stainless steel roller that exerts continuous, even pressure on the thickened sludge encapsulated between the belts. Due to the geometry of the roller, the sludge is also subjected to shear forces, which release bound water within the sludge particles and improve the overall dewatering efficiency. By eliminating friction between the belt and support grid, the Dynamic Radial Wedge can reduce power requirements by a factor of two and increase belt life by two or more times.

**More Rolls For Higher Solids** The DRW can be equipped with up to 15 pressure rollers. The first five progress from large diameter to small diameter, gradually increasing the pressure on the sludge. The remaining pressure rollers are all the same diameter (10 inch) and provide high pressure for maximum cake solids. The number of high pressure rollers is selected based on pilot or lab test results and the specific application.

**Pneumatic Operation** A pneumatically operated tension system assures even belt tension and accurate tracking. Pneumatic actuation is provided by an air bellow system, which eliminates problems associated with O-ring wear and hydraulic fluid leaks.

**Thorough Belt Washing** After the cake is discharged, the belts are cleaned in a high-pressure spray wash zone and are then ready to receive more solids for dewatering. The wash headers feature internal brushes to dislodge debris from the spray nozzles without disruption.

### ISO 9001:2000 QMS

The quality management system governing the manufacture of the Dynamic Radial Wedge is ISO 9001:2000 certified.

► *Perforated stainless steel rollers with over 40% open area allow water to easily drain from the belts throughout the low pressure zone.*



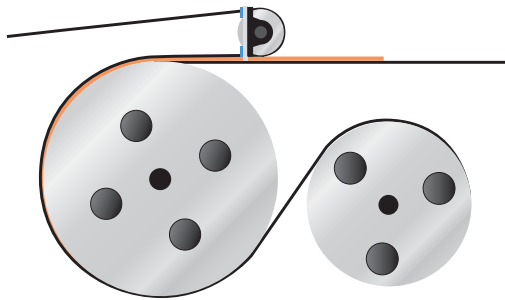
► *Conditioned sludge travels through the gravity zone, where specially designed plows efficiently roll the sludge for maximum water drainage.*





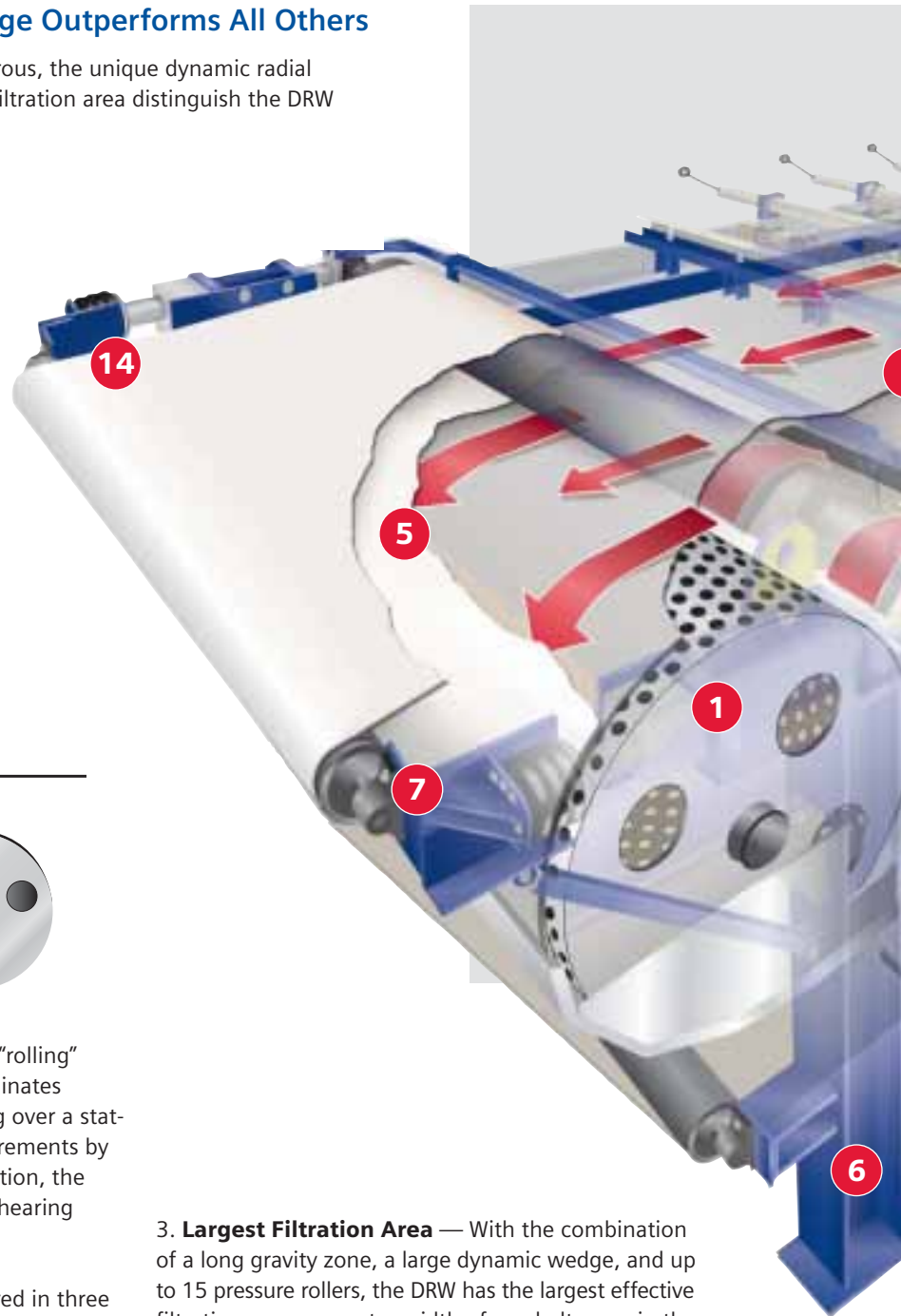
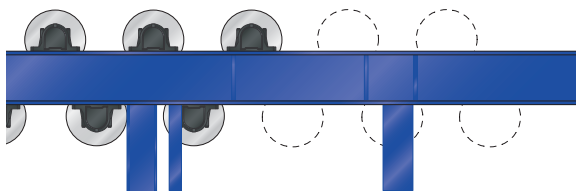
## Why The Dynamic Radial Wedge Outperforms All Others

While the engineering features are numerous, the unique dynamic radial wedge design, modular frame and large filtration area distinguish the DRW from any other belt press on the market.



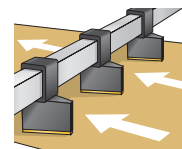
**1. Long Radial Wedge Zone** — A large “rolling” wedge for low-pressure compression eliminates abrasive wear caused by the belt traveling over a static surface, and reduces horsepower requirements by 50% (< 6 HP on the 3 meter unit). In addition, the geometry of the rolling wedge causes a shearing action, which helps release bound water.

**2. Modular Design** — The frame is offered in three different sizes: the short size accommodates 5–7 rolls, the medium size accommodates 9–11 rolls, the large size accommodates 13–15 rolls. Within a particular frame size, rolls can be added or removed based on changing sludge characteristics and/or throughput requirements.

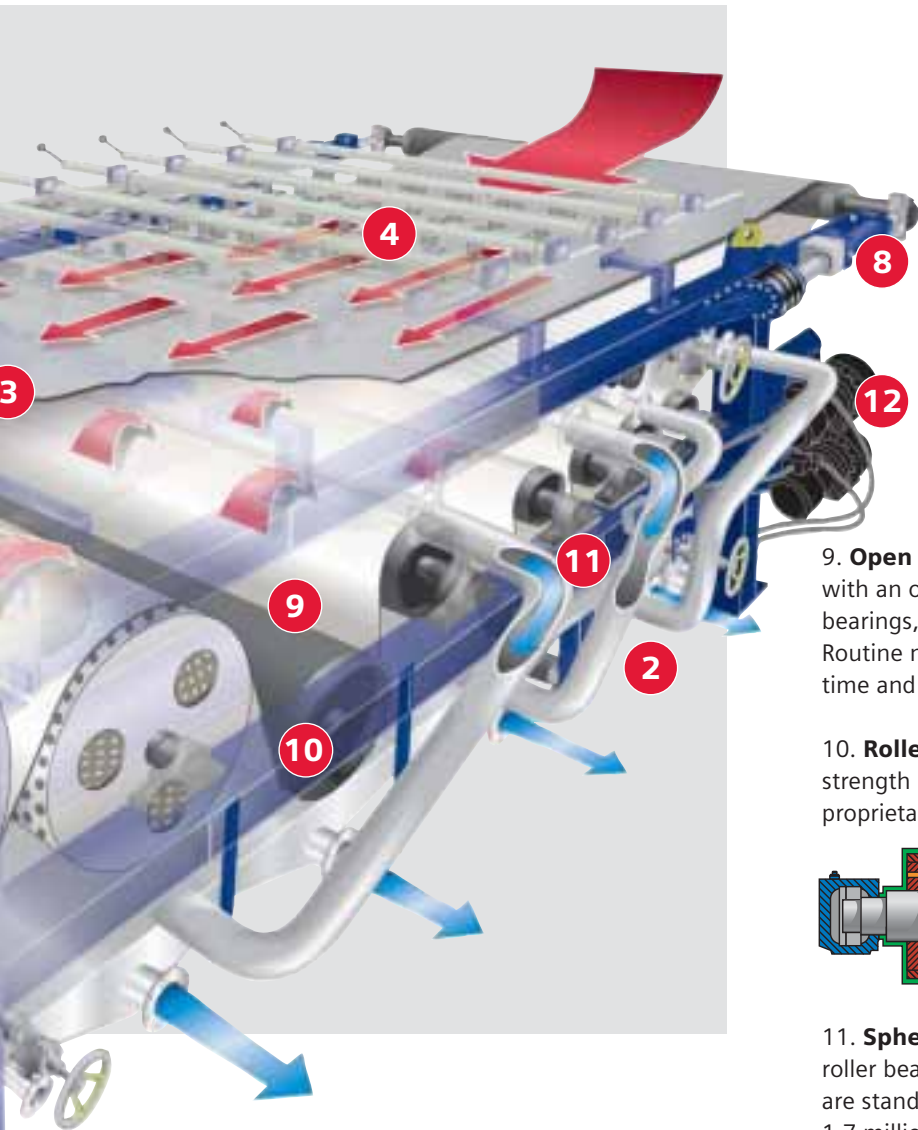


**3. Largest Filtration Area** — With the combination of a long gravity zone, a large dynamic wedge, and up to 15 pressure rollers, the DRW has the largest effective filtration area per meter width of any belt press in the world — up to 725 sq. ft on the 3 meter unit.

**4. Furrowing Action** — Wear resistant plows with replaceable wear shoes are suspended from stainless steel frames to provide continuous turning and compression of the sludge in the gravity zone, assisting in the release of entrained water.



**5. Equal Length Belts** — Two equal length belts simplify replacement and cut inventory requirements in half.



**6. Frame Construction** — Heavy-duty structural I-beams minimize the potential for deflection. The design also allows the bearing to be mounted inside the centerline of the frame, reducing roller shaft length and deflection. These structural enhancements correspond to higher allowable roller pressures that maximize cake solids.

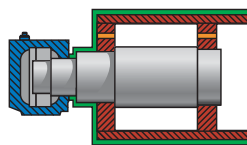
**7. Standardized Parts** — All moving parts and wear items are available from the Siemens factory in Holland, Michigan. In many cases, parts can be shipped on a same day basis.

**8. Rack and Pinion Tension Equalization** — Tension from the air bellows is synchronized by a rack and pinion interlock system, ensuring accurate belt tracking.



**9. Open Architecture** — The DRW is engineered with an open frame design for easy access to all bearings, belts, and other critical components. Routine maintenance is easier and maintenance time and cost are reduced.

**10. Roller Construction** — Rollers feature high strength material of construction that are joined in a proprietary “interference fit” process that eliminates



roller failures. For corrosion protection, all rollers are coated completely to the bearing insertion point with Rilsan® or BUNA-N rubber.

**11. Spherical Roller Bearings** — Heavy duty roller bearings, capable of handling high radial loads, are standard. Designs for an L-10 bearing life of up to 1.7 million hours are available.

**12. Dual Drive System** — The two belts are driven by a variable speed dual motor system with independent traction rolls. This provides constant tension of both belts throughout the entire dewatering process.



**13. Motorized Mixer/Flocculation Tank** (optional) — A stainless steel mixing/flocculation system features a variable speed mechanical agitator for adjustable mixing to match sludge flow and viscosity, assuring optimum flocculation.

**14. Pneumatic Tensioning and Tracking System** — Pneumatic bellows for tensioning and belt tracking eliminate the mess and problems associated with hydraulic systems. With no oil or oil filters to change, maintenance costs are reduced. The heavy duty rubber bellows eliminate problems with shaft seal leaks and corrosion on pneumatic or hydraulic cylinders.

## On-site Analysis



*The belt press simulator uses sophisticated mathematical modeling technology to enable extremely accurate reproduction of belt press performance.*



*The mobile pilot test unit provides on-site analysis to ensure accurate assessment of performance and operating costs.*

## Technology Services



Siemens Water Technologies in Holland, Michigan, maintains a fully staffed, state-of-the-art feasibility laboratory for dewatering studies. Predictive Technology Services range from laboratory simulation to large scale portable pilot units for on-site testing. This customer focused resource produces tangible results that can determine the most effective dewatering solution for your specific application.

In addition to ensuring accurate data for system design, this valuable service is also available to help you maintain maximum performance when process conditions change or new regulatory standards are implemented.

## Variable Energy Mixing Solutions

Optimum dewatering begins with proper sludge conditioning; an efficient mixing of sludge and polymer along with sufficient time and energy to ensure proper flocculation before dewatering.

Venturi mixing devices are compact, economical solutions. Polymer is introduced into the feed stream through a series of ports arranged concentrically around the feed line. As the sludge and polymer are forced through the adjustable venturi opening, a turbulent flow is created, resulting in rapid mixing. Retention time is provided by downstream piping prior to the press.

Mechanical mix tanks offer more precise mixing and additional retention time that can provide improved performance on difficult applications. These vertical tanks have a variable speed, multi-impeller mixer that provides a rapid mix at the base followed by up to 60 seconds of retention time to allow complete floc formulation. Thorough mixing occurs independent of flow rates, and can be precisely adjusted.

The ideal system utilizes both an inline venturi device and a mixing tank for robust, controllable mixing. Your Siemens Water Technologies engineering support staff can design a mixing system that factors in your sludge characteristics, throughput and system configuration.



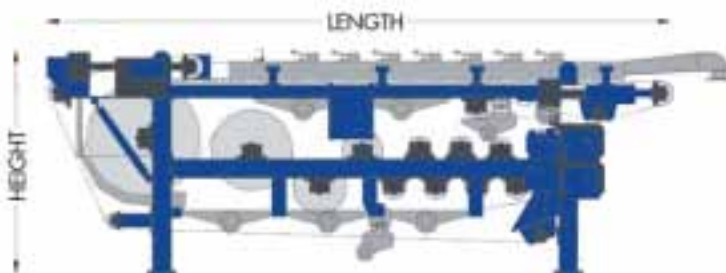
High velocity Venturi mixer



Variable speed mixing tank

## DRW Technical Data

Rollers	BPR 1200						BPR 1600						BPR 2000						BPR 2500						BPR 3000					
	5	7	9	11	13	15	5	7	9	11	13	15	5	7	9	11	13	15	5	7	9	11	13	15	5	7	9	11	13	15
Effective Belt Width (mm)	1200						1600						2000						2500						3000					
Overall Length (in.)	288	321	360				280	322	368				290	322	351				320	355	395				328	361	452			
Overall Width (in.)	97	97	97				119	119	119				134	134	134				161	161	161				180	180	180			
Overall Height (in.)	105	105	105				107	107	107				107	107	107				107	114	114				118	118	118			
Weight—Dry (lbs.)	16,060	17,160	19,140				18,260	19,800	25,800				24,200	26,400	31,900				33,000	35,900	41,500				42,900	50,600	59,400			
Weight—Operating (lbs.)	18,260	19,360	21,340				20,460	22,000	28,200				26,400	28,600	34,100				35,200	38,000	43,200				47,300	55,000	63,800			





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