



TEREX[®]
WASHING SYSTEMS



FRAC FOCUS

**WASHING AS IT
SHOULD BE**

 AGGREGATES  RECYCLING  INDUSTRIAL SANDS  MINING  WATER MANAGEMENT



CONTENTS

Washing As It Should Be 5

Washing Made Simple.....6-7

APPLICATION SOLUTIONS

Industrial Sands8-9

Water Management.....10-13

4SITE 14

Applications, Training & Support, Laboratory Testing..... 15

FracPro™16-17

FracPro™ Hydro 18

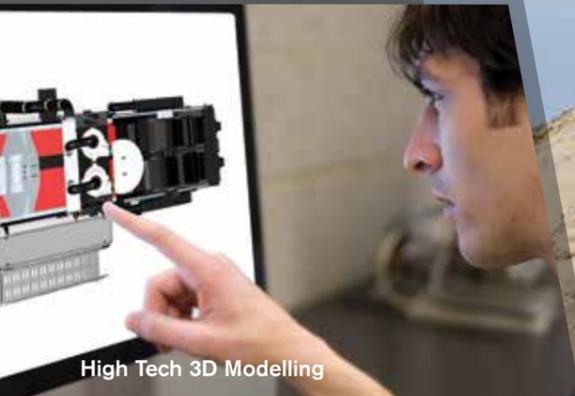
SandScrub.....19

SERVICES FOR YOU

Automation & Control20

Finance21





High Tech 3D Modelling

An unrivalled heritage of over 60 years development experience and expertise in the washing solutions industry, has resulted in today's world class leading equipment - turning virgin and waste materials and minerals into high value, saleable products.



WASHING AS IT SHOULD BE

Terex® Washing Systems (TWS) is the premier provider of advanced plant solutions for material and mineral washing needs in aggregates, recycling, industrial sands and mining.

An unrivalled heritage of over 60 years development experience and expertise in the washing solutions industry, has resulted in today's class leading equipment - turning virgin and waste materials and minerals into high value, saleable products.

As stringent materials regulations and the need for clean aggregates increases internationally, TWS has become a world leader in providing high quality, high efficiency and rapid return on investment solutions.

Our design and manufacture is driven by a spirit of innovation, universal health and safety and response to market demands, resulting in unique, market leading products and world class machines designed for world beating performance.

A complete range of in-house project specialisations ensures that from customer brief to tailor-made solution, every aspect of every commission is unique and every aspect of client service is covered.

TWS is headquartered in Northern Ireland with additional centres of excellence in Europe, Asia and America. We also partner with qualified and respected organisations worldwide to bring our customers consistent lifetime service, local expertise and knowledge and local aftersales. Our modular machines and parts are held in stock regionally and with our distributors guaranteeing fast response to our end users.

A unique level of focus and specialisation and an unparalleled washing heritage have made TWS the supply partner of choice for a wide range of operators, from independently owned one-site quarries through to international mining and construction organisations.



WASHING MADE SIMPLE

With a history spanning decades TWS have amassed unrivalled project experience and the product portfolio to match. Recognising the unique characteristics of the different industry sectors that we serve TWS have evolved 5 key segments; **Aggregates, Recycling, Mining, Industrial Sands, and Water Treatment.** Each sector brings a unique set of challenges and customer expectations and TWS tailor equipment and services offerings to match. Whilst operators across these segments have highly diverse input materials and production goals, all are consistent in their need for readily installed, highly efficient, rapid return on investment equipment solutions. These are the core driving principles of TWS design. Whether you need a compact station to recover maximum solids from a dredged slurry; you need to consistently achieve concrete specification sand with a variable feed source; or you need to maximise the Fe value of iron ores fines, TWS have the equipment and the experience to help.

New products and solutions are continuously developed to keep TWS at the cutting edge of the materials washing market and we constantly explore new materials, new sectors and new challenges. TWS are leading the sector's development towards compact modular systems bringing this to customers who were previously limited to capital intensive and highly inflexible conventional solutions.

Each sector brings a unique set of challenges and customer expectations and TWS tailor equipment and services offerings to match.

- AGGREGATES**
- RECYCLING**
- INDUSTRIAL SANDS**
- MINING**
- WATER MANAGEMENT**

MODULAR SOLUTIONS



Today's end users rightly expect total understanding of their requirements and total performance. TWS was founded on this principle and we have combined our ability to offer competitive single unit 'standardised' equipment with the capacity to design and deliver complete turnkey projects for even the most demanding materials and requirements.

SCRUB



Static and modular systems offering aggressive attrition for sticky and high clay content materials. Highly effective with overburdens, clay-bound ores and recycled materials containing lightweight contaminants.

SCREEN



From our unique track mounted M-Series which can operate on a wet or dry basis through to our comprehensive range of static and modular units for sizing and dewatering TWS offers a substantial selection of screens covering numerous applications and sectors.

WASH & CLARIFY



Highly comprehensive range of dewatering options for fine materials including screw dewaterers, bucket wheels, and hydrocyclone technologies, all proven on a global basis. Unique ability to offer off-the-shelf ready-made products or to design complete bespoke solutions.

FEED & STACK



High performance, heavy duty electrical screening solutions, ideal for aggregate and recycling applications or you can opt for our stand alone feeder options.

Cost effective efficient modular and mobile units that can be used on a stand-alone basis or integrated with larger TWS systems. Hydraulic, electric, static, mobile. Move it, wash it, stack it, sell it.

WATER MANAGEMENT



All washing systems need water but TWS designs and efficiencies keep requirements to a minimum. Proven water management and recycling systems, from thickeners to presses and moisture reclamation systems, ensure that operators in even the most controlled or arid environments can produce high quality materials at a low cost per ton.

INDUSTRIAL SANDS

One of the most specialised and diverse sectors within materials processing is the rapidly evolving world of industrial sands, particularly silica sand. High quality silica sand has become a much sought after commodity and whilst the range of clients is almost as diverse as the range of end uses for their sands we find they have a number of notable core requirements in common. Maximum SiO₂ content, reduced clay fractions, reduced metallic contamination and of course efficient and highly accurate size separation.

Our systems have long been used within the industrial sand sector but we are committed to understanding current and future market needs and offering equipment today which will solve tomorrow's problems. The system is also highly flexible to accommodate industrial sand applications beyond the fracking sector; for example sports sand product, filter sand, glass sand and foundry sands.

From a single unit scope of supply through to a complete project solution TWS are ready to add value to your materials and to your operations.



Dry Material Instantly Saleable, 12-15% Moisture

We are committed to understanding current and future market needs and offering equipment today which will solve tomorrow's problems.



DID YOU KNOW?

Sand used in the construction of the Burj-Al-Arab Hotel, Dubai was washed using a T100.

aquaclear

WATER MANAGEMENT SOLUTIONS

Terex Washing Systems offers a complete tailored solution for water treatment and management, including a full range of filter presses, flocculant dosing systems and thickening tanks. Combined this equipment can remove the need for settling ponds.

It is critical that systems are selected appropriate to your specific materials, as requirements can be refined according to your specific needs. This includes qualified sampling and testing to ensure complete peace of mind for performance and the ability to handle inevitable feed variations.

Intelligent automation is common throughout our equipment range and this is particularly relevant to water management systems. The majority of our systems include fully automated control and adjustment of the flocculant dose, according to the amount of suspended solids and settlement time required. This ensures maximum performance even with highly variable feed materials such as recycled sources and eliminates any risk of over-dosage.

Our wide choice of thickener models and formats ensures you are offered the best solution for your individual needs, all with low operational cost and maximum dewatering in mind. Following the thickener you have a choice of filter presses, again depending upon your individual material characteristics and performance needs.



FILTERPRESSES

Filter presses are based on a simple and ancient principle invented by the Romans to press olives and grapes. Today's technology makes it an essential tool for many industries.

Terex Washing Systems filter presses use high pressure pumps in order to squeeze water out of the sludge, recovering up to 95% of the water. Remaining solids are pressed into dry slabs, 'filter cakes', which can be easily handled; ready for reuse or disposal. Filter presses are the ideal complement to wash-plants operating in the aggregates, mining and recycling industries.

SIMPLE SEAMLESS INTEGRATION

Additional upgrades which can be incorporated into our washing systems to further benefit the final material specification.

FEATURES AND BENEFITS

- 100% Fully Automatic
- High pressure pumps to filter sludge. Produces extremely dry cake.
- Utilising only highest quality components
- Up to 95% recovery of water
- Up to 80% reduction in silt handling and transport costs



aquaclear

WATER MANAGEMENT SOLUTIONS

THICKENERS

Terex Washing Systems offers a range of Thickener sizes and types to suit a variety of materials and applications. The TWS Applications team balance the client's needs in terms of material type and slurry volume, desired sludge characteristics in order to propose the best thickener for each project.

DEEP CONE THICKENERS

Deep cone thickeners are based on static decantation principles allowing for minimal footprint and virtually no moving parts. The deep cone and cylinder section imparts a greater pressure head on the settled slurry thus producing a higher percentage solids content than that of a standard rake thickener.

FEATURES AND BENEFITS

- Produces thick mud at 50% solids
- Reduced cost for concrete basement
- Extra stock for mud
- Extremely low operating cost
- Non-moving parts
- No extraction pump required
- Low maintenance costs
- Combined thickening and clarification

- Galvanised Inspection walkway
- Clean water outlet
- 5mm thick mild steel tank construction
- Also available in 304 stainless steel
- Thickened sludge outlet
- Clean water weir
- Central feed well / flow diffuser
- Slurry inlet
- Includes galvanised ladder to market requirements



RAKE THICKENERS

TWS also offers a range of rake style, high rate thickeners which allow for minimal feed height, facilitating gravity feed from upstream cyclone based washing systems. Rake thickeners are designed specifically to deal with high volumes of slurry. The integral scrapers aid transportation of material from the outskirts of the tank to the outlet, thus accelerating the removal of sludge from the thickener.

FEATURES AND BENEFITS

- Produces sludge with 30 - 40% solids content
- Lower level feed in height
- Can handle high volumes of slurry
- Extra stock for slurry
- Combined thickening and clarification

FLOCCULANT DOSING SYSTEM

TWS flocculant dosing systems control the amount of chemical flocculant required to achieve the most rapid settling times within the thickener tank. The automatic dosing system enables the unit to adjust the flocculant dosage dependent on the feed material and solids content, thus reducing wastage and ensuring the correct dose is added continually.

FEATURES AND BENEFITS

- Automatic dosing system
- Stainless steel construction
- Dry or emulsion based polymer system
- Reduced flocculant consumption by up to 30%



With you every step of the way.

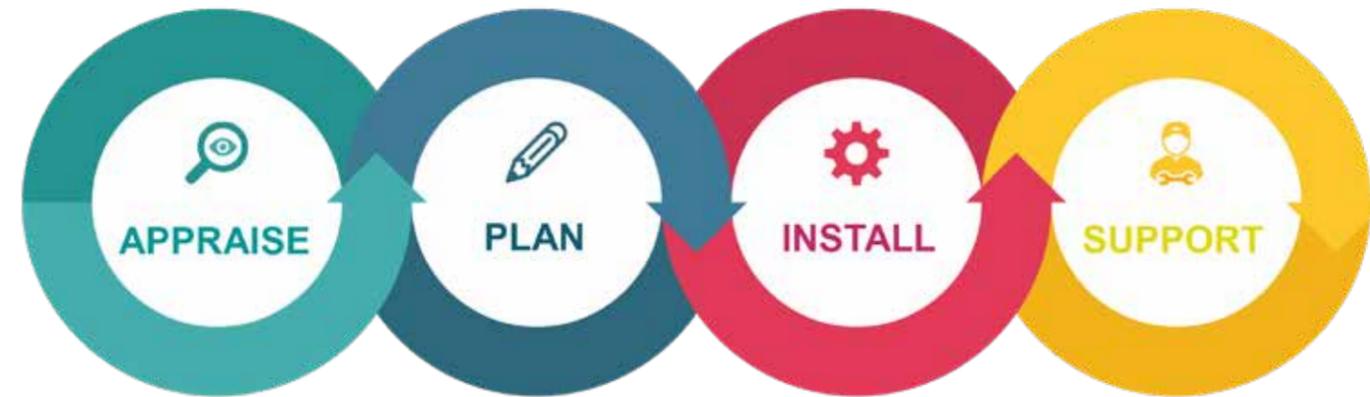
Terex Washing Systems offer **4 SITE**, a comprehensive project management service which provides you with enhanced levels of support during every step of your project. We believe that rapid-response, qualified, and effective support is crucial in meeting end-user needs, letting you deliver on your promise as well as developing long term client relationships.

Contact us today to discuss the best management package for your needs:
TWS.4Site@terex.com

4 SITE

A COMPLETE PROJECT MANAGEMENT SERVICE

Each of our project management packages include **4 Key Steps**.



- | | | | |
|--|---|--|--|
| <ul style="list-style-type: none"> ▪ Application Review ▪ Sieve Analysis ▪ Equipment selection and options confirmed through our Application and Engineering Review Process ▪ Crossfunctional team review based on prior lessons learned ▪ Initial Process Flow Diagram created and data reviewed | <ul style="list-style-type: none"> ▪ Cross functional kick off meeting ▪ Production control ▪ Cost control ▪ Risk management and mitigation ▪ Tested equipment ▪ Quality control from start to finish ▪ Basic civils design ▪ Electrical control ▪ Shipping arrangements and machine packing | <ul style="list-style-type: none"> ▪ Tailored installation plan specific to your project ▪ Flexible levels of installation service team support ▪ Schedule risk management and project log ▪ Clear line of communication during installation and commissioning ▪ Electrical support | <ul style="list-style-type: none"> ▪ Aftersales and Engineering support via our Helpdesk ▪ Ongoing Project support from time of order right through to commissioning |
|--|---|--|--|



APPLICATIONS

- Virgin Aggregate
- Manufactured Sand
- Sand & Gravel
- Crushed Rock
- Crusher Dust
- Scalpings
- Iron Ore
- Other Mineral Ores
- Construction & Demolition Waste Material



TRAINING & SUPPORT

TWS offers fully tailored training packages for both dealers and customers alike. This training covers all aspects of our machinery, including basic operational data, correct sizing of screens, pumps, cyclones and full sales and application training.

For further information on training or to book a training session email: TWS.Applications@terex.com



LABORATORY TESTING

TWS offers full in-house sample analysis and testing of proposed products. This process allows us to specify the correct screening media apertures so that the customer achieves the desired product size. Sieve analysis is extensively used as a powerful quality control and acceptance tool. The gradation data is used to calculate relationships between various aggregates or aggregate blends, to predict trends during production and to check compliance with such blends.



We also test for many other factors including correct specification of flocculent type, oil / water separation etc.

For further information on your requirements and to discuss your specific application: Email: TWS.Applications@terex.com

FRACPRO™

Terex Washing System's FracPro™ range enables a clean, in-spec sand to be produced for the industrial hydraulic fracturing market. The modular FracPro™ range incorporates, washing, screening and sand classification through a double-wash system to accomplish a high-quality, industrial product for the Frac industry. The intelligent TWS design and pre-assembled, factory machine ensures a quick and easy build procedure and the inclusion of Terex's AquaClear range results in the full solution.

FEATURES & BENEFITS:

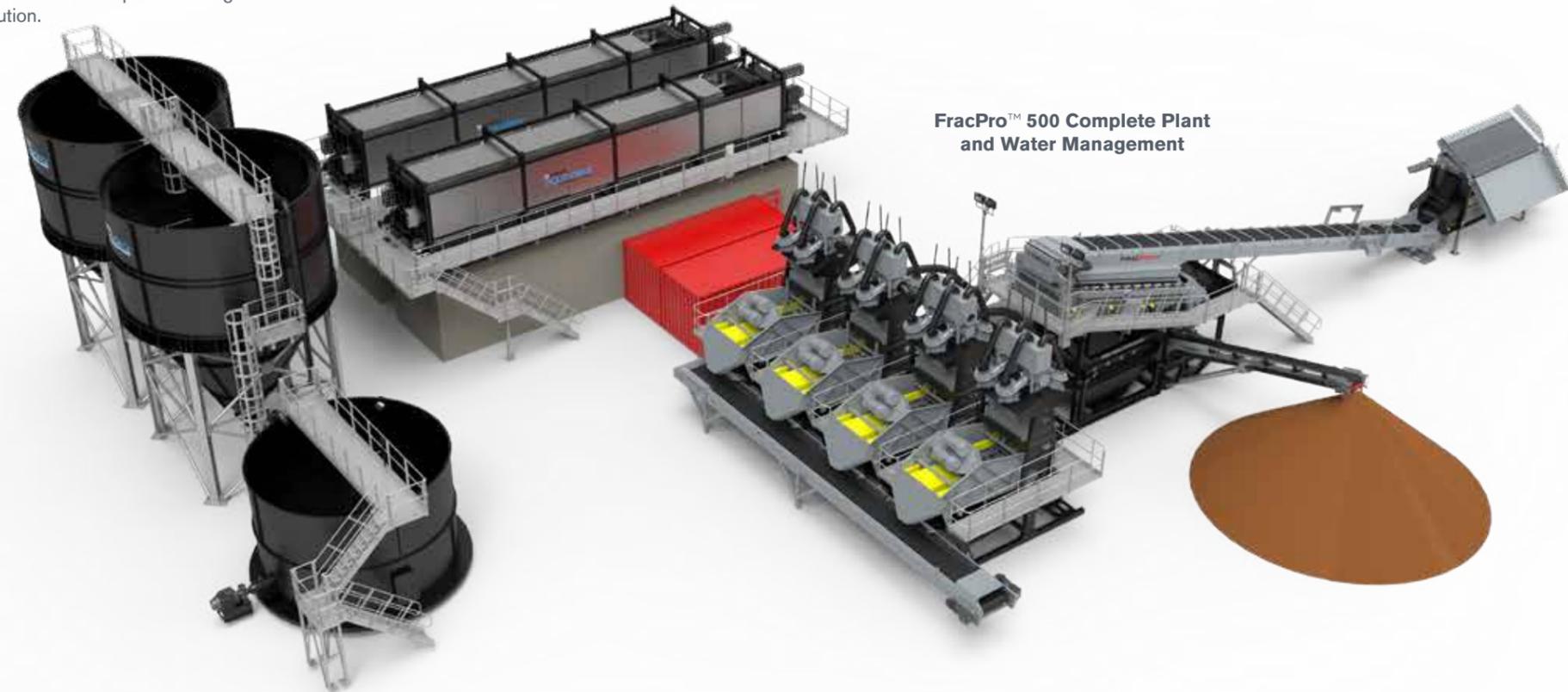
- Hopper and Feed Conveyor
- 206 Rinsing Screen
- Oversized Conveyor
- Large Volume Sump Tank and Pump
- Localised MCC

HYDROCYCLONE SAND PLANT:

- Built in Double Wash System
- High Frequency Dewatering Screen
- Sand Transfer Conveyor

AQUACLEAR:

- Deep Cone Thickener
- Flocculent Dosing System
- Homogenising Tank
- Filter Press
- Clarified Water Tank



FracPro™ 500 Complete Plant and Water Management



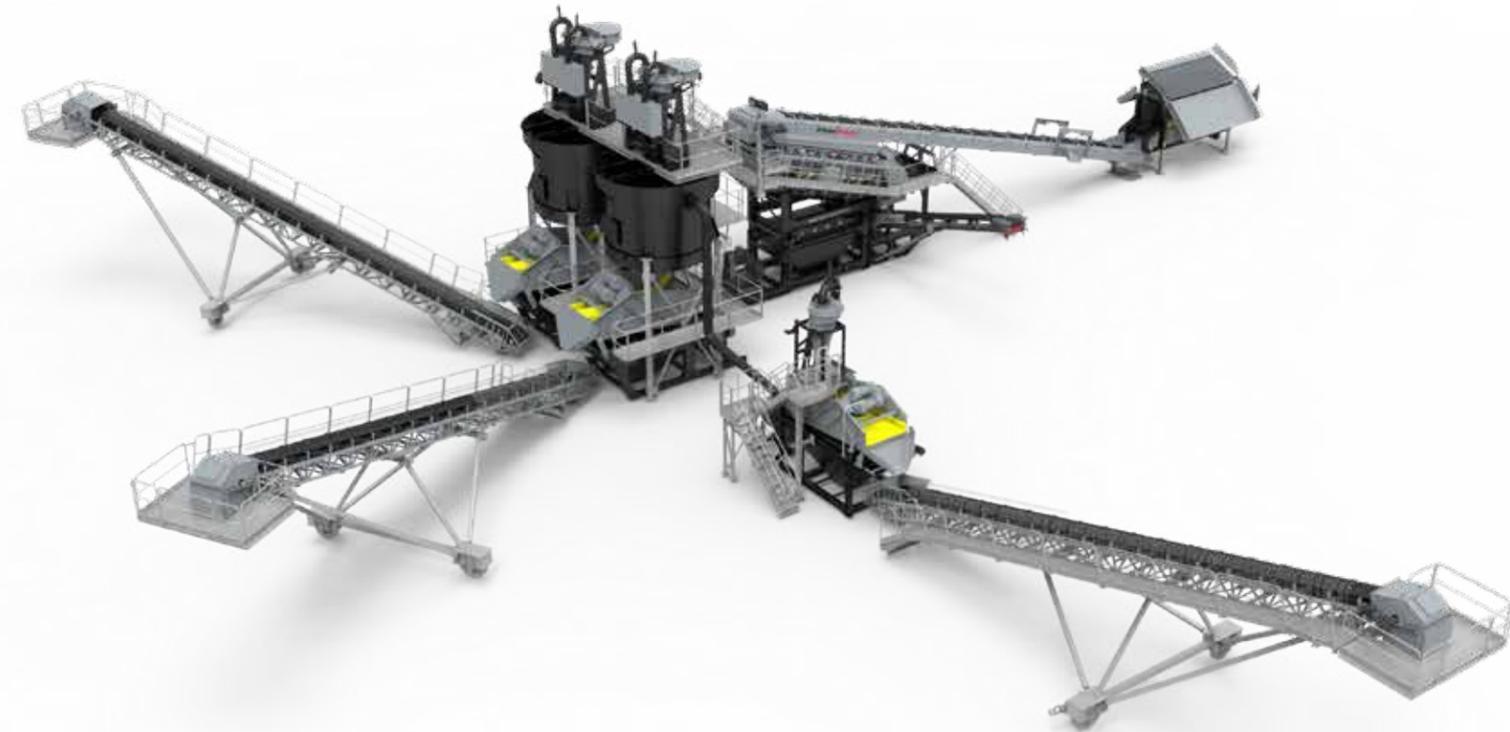
FracPro™ 150 Complete Plant



FracPro™ 300 Complete Plant

FRACPRO™ HYDRO

Terex Washing system FracPro™ Hydro allows for multiple in spec sands to be washed for use in the hydraulic fracturing industry. This extremely versatile machine can produce up to 3 high quality grades of frac sand from a single feed source through the use of upward current flat bottom classification units. The use of flat bottom classification units enables precise cuts to be made to specific mesh sizes. Having the flexibility to change the cut point ensures the production of top quality, in-spec sand that reduce drying costs and improves the yield of dry sand.



FEATURES & BENEFITS

- Hopper and feed conveyor
- 206 rinsing screen
- Oversized conveyor
- Large volume sump tank and pump
- Localised MCC
- Hydrocyclone sand classification
- Upward current flat bottom classification units
- High frequency linear motion dewatering screen
- Classification Hydrocyclone

SANDSCRUB

Terex Washing System's SandScrub combines multiple sand attrition scrubbers with dewatering cyclones to clean and scrub challenging applications. The sand attrition scrubbers are designed to liberate any deleterious material and remove it from any competent, silica material by scrubbing the surface of the particles. The SandScrub is also capable of disjoining conglomerated clusters within silica sand.

FEATURES & BENEFITS

- 2 off. rubber lined dewatering cyclones
- 4 off. sand scrubbing attrition units
- On-line and reactive measurement of solids concentration results in maximisation of process conditions



ATTRITION SCRUBBER FEATURES & BENEFITS

- Completely rubber lined cell
- High torque electric drive motors ensures large shear force is applied to the sand particles
- Rubber coated rotating shafts and paddles to reduce wear





AUTOMATION & CONTROL

For some material washplants, simplicity is key. In these cases we provide basic 'relay-logic' control panels to control and protect the main components such as motors, pumps and valves. However, when more advanced plants are required, Terex Washing Systems offers fully automated solutions using Programmable Logic Control Systems (PLC) and Human Machine Interfaces (HMIs). All software and hardware is developed in-house by our electrical systems team using strict design, develop and test procedures to help ensure systems are developed in line with all relevant safety standards and exceed customers' expectations in terms of ease of use and performance.

Fully integrated radio control and remote telemetry systems are also available to further simplify and enhance the operation of the plant and provide the customer with real-time data such as operational status, active alarms and tonnage per hour.



Central control panel for typical large washplant installation



Aggresand™ Control Panel



Local machine control panel



H12 Feeder Control Panel



FINANCE SUPPORT FOR YOU

Perhaps the only thing more comprehensive than our vast product line is our wide range of effective finance and leasing solutions, structured to complement customers' cash flow and budgets.

Our team of finance professionals knows the importance of working closely with your customers to understand the unique challenges of their business and their financial goals and requirements. Obtaining financing is often a time consuming task, so we work hard to provide a reliable, flexible and responsive service.

The Terex® Financial Services™ (TFS) team can help assist in all areas of asset management, from the analysis of future equipment values through the disposition of used equipment.

TFS is part of the Terex® family, so you'll work directly with financial professionals who understand your business and can help you get the equipment you need with financial solutions based on your business goals and objectives.



TFS is a one-stop shop for effective financing solutions:

- **Trade-in Programs — we'll work with you to get you out of your existing equipment and into new Terex® equipment**
- **Helping you manage cash flow and conserve working capital**
- **Ownership and lease options**
- **Much, much more**

Build the fleet you want with competitive financing rates, as well as special lease and purchase options from TFS. It's a great way to have the equipment you need while managing your cash flow.

Contact: TWS.sales@terex.com to discuss finance packages available to you





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should be

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