MULTICRETE

WE SELL SOLUTIONS

CATALOGUE

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TABLE OF CONTENTS

1. SHOTCRETE EQUIPMENT

ALIVA® 237 SPRAYING MACHINE

ALIVA® 257 SPRAYING MACHINE

ALIVA® 267 SPRAYING MACHINE (WET/DRY)

ALIVA® 320.1 SPRAYING ARM

MULTICRETE INTEGRAL PRE-DAMPENER

MULTICRETE HURON 4 SHOTCRETE CARRIER

MULTICRETE MSU 420/302 MOBILE SC UNIT

SHOTCRETE NOZZLES, PARTS SUPPLY

RAISE ROBOT® REMOTE SHOTCRETE APPLICATION SYSTEM

HW10H HYBRID-WET SHOTCRETE CARRIER

ALIVA® AL-237 SHOTCRETE SPRAYING MACHINE

Machine

The AL-237 is a compact concrete spraying machine for dry shotcrete as well as for small wet shotcrete application of mortars. The low filling height of the hopper allows easy handling of pre-bagged materials with little effort. The integrated FU (Frequency changer) enables an infinitely variable speed of the rotor and with it the conveying capacity for each specific job. With a range of conveying capacity from 0.4 to 4.0 m3/h, the AL-237 is suitable especially, but not only for:

- Concrete renovation (entire surface or selectively)
- Joint-fillings
- Concrete restoration
- Swimming ponds, swimming pools
- Slope protection, slope stabilization
- Canal-renovation (sewage)
- Mining
- Everywhere mainly dry shotcrete is applied

Concrete renovation with sprayed concrete in the dry-shotcrete method guarantees for good bond strength and impeccable compaction. Depending on the requirement one of the Aliva machines is the right one for your application (AL-237, AL-257, AL-267).

Safety and Environment

The AL-237 is equipped with a robust rotor-protection to prevent accidents on the turning rotor. Same time the rotor-protector serves as dust collector to keep the environment free of dust.

Safety

The AL-237 includes a emergency button which stops the turning rotor immediately and closes a magnetic-valve for air supply completely. Accidents on the turning rotor or on the under pressure operating machine are eliminated.

Output

The speed of the rotor on the AL-237 is adjusted completely variable with a frequency converter. This gives you absolute freedom for adjusting your output. With only one rotor various jobs can be conducted. Automatic lubrication of the sealing gaskets is included.

Wet and Dry Spraying

The newly designed hopper of the AL-237 allows spraying wet- and dry mixes. With a simple engineered exhaust on the hopper, the AL-237 achieves filling degrees of the rotor chambers of up to 90%. Regular cleaning of the exhaust system on the hop-per guarantees trouble free shooting of dry mixes and now and then wet mixes.

AL-237 Top, /Running gear
Height H1 with rotor 0.7 L= 980 mm 2.0 L = 980 mm 3.6 L= 1050 mm 5.6 L= 1130 mm

ALIVA® AL-257 WET/DRY SHOTCRETE UNIT

Machine

The AL-257 is the universal machine for the application of dry- and wet shotcrete in the thin-stream method. The new and very compact design of the machine impresses through its dimensions, weight and performance. With just 750 kg and dimensions as little as a small dry shotcrete machine, the AL-257 fits on every job site and is easy to install and operate. With its unbelievable output capacity range from 0.7– 9.6 m3/h (with 3 rotor sizes) the machine works on small concrete renovation work as efficient as on big slope protection or in mines. Less maintenance and wear cost makes it the ideal shotcrete machine for all applications.

Fields of application:

Wet- and dry shotcrete application

- Concrete renovation
- Joint-fillings
- Swimming ponds, swimming pools
- Slope protection, rock consolidation
- Canal-renovation (sewage)
- Mining and tunnel applications

Concrete renovation with sprayed concrete in the dry-shotcrete method guarantees for good bond strength and impeccable compaction. Depending on the requirement one of the Aliva machines is the right one for your application (AL-237, AL-257, AL-267).

Dry- and Wet Shotcrete

With the newly developed, universal AL-257, dry- and wet shotcrete are equally possible. No changing on the machine from dry to wet shotcrete has to be per-formed. For changing from wet to dry shotcrete, the machine has to be cleaned and dried up. The integrated exhaust system and a newly designed hopper allow a high filling degree of the rotor chambers, which leads to low pulsation and less rebound.

Built in components

The AL-257 is equipped with a fully automatic lubrication system for the rotor-discs. The rotor-speed is adjusted with a frequency converter and therefore, can be adjusted to every specific need on the job. The machine has an emergency button which stops the turning of the rotor and closes the main valve of the air supply. This enables working free of danger and complies with the new EU standard.

Application and conveying capacity

With a weight of just 750 kg and compact measurements, the AL-257 fits on every site, is easy to handle around and adjusts itself to every application. With a huge spectrum of conveying capacity from 0.7–9.6 m3/h, there is no work which could not be conducted economically. Is it for thin layer concrete renovation with the 2.5 l rotor up to slope protection of an excavation with the 12 l rotor, with the AL-257 one has always the right equipment at hand.

Sealing System

The machine is equipped with rotors made of high tech aluminum and is operating with steel - on -steel wear and rotor plates. Experience has shown up to 10 times less wear on the steel plates, depending on material, output capacity, hose diameter and com-pressed air supply! This again leads to less down time and wear cost and therefore to a more economical spraying operation.

ALIVA® AL-267 SHOTCRETE SPRAYING MACHINE WET/DRY

Application and conveying capacity
The AL-267 is a multi-functional machine for Wet and Dry application of sprayed concrete in the thin stream method. The modular construction allows the right type for all requirements. With an output capacity of 4-21 m3/hr the range of applications covers: Excavation-protection, rock stabilization, slope protection, swimming pool construction, hydro power projects, tunneling, mining etc.! Easy handling, flexibility and functionality are unique for the AL-267

Fields of application:

- Wet- and dry shotcrete application
- Concrete renovation
- Joint-fillings
- Swimming ponds, swimming pools
- Slope protection, rock consolidation
- Canal-renovation (sewage)
- Mining and tunnel applications

Concrete renovation with sprayed concrete in the dry-shotcrete method guarantees for good bond strength and impeccable compaction. Depending on the requirement one of the Aliva machines is the right one for your application (AL-237, AL-257, AL-267).

Dry and Wet Shotcrete
With the newly developed, universal AL-267, dry- and wet shotcrete are equally possible. No changing on the machine from dry to wet shotcrete has to be performed. For changing from wet to dry shotcrete, the machine has to be cleaned and dried up. The integrated exhaust system and a newly designed hopper allow a high filling degree of the rotor chambers, which leads to low pulsation and less rebound.

Built in components
Depending on the Type of AL-267 all components as Dosing Unit for accelerators, automatic central lubrication system and regulation of the rotor-speed are compact integrated under the covers of the machine. Opening the covers stops the rotor from turning and shuts the air-flow automatic

Sealing System
Unique developed sealing system from Aliva made of special steel on steel with vulcolanic dust sealing rotor plates. Very low wear of up to 1500 m3/plate guarantee economic operation, low wear and no more interruption for changing plates.

Safety and Design
Modern designed hoods and covers of all moving components with integrated emergency Stop to guarantee the highest level of safety for the operator. Danger of accident is reduced to the ab solute minimum (according to EU Norm).

Innovative Clamping Device
Pneumatic fine-tuning of the 3-pt. clamping device (longer hose length, more pressure on the clamping device). Both rotors made of aluminum. (15.5 l and 26.5 l) Easy handling and cleaning of the components and exhaust.

ALIVA® AL-302 ROBOTIC TELESCOPIC SPRAY ARM

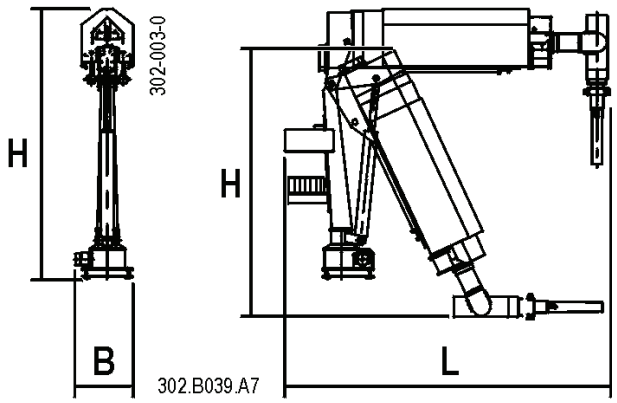
Machine:
The telescope spraying arm Aliva®-302 is used for the application of sprayed concrete in mines, small galleries and excavations.

With its simple and rigid construction, the Aliva®-302 is very suitable for the mounting onto different types of carriers.
The telescope spraying arm Aliva®-302 is available in 2 different types:

Type PROP
Electric remote control (wireless remote control optional) hydraulic aggregate with electric motor

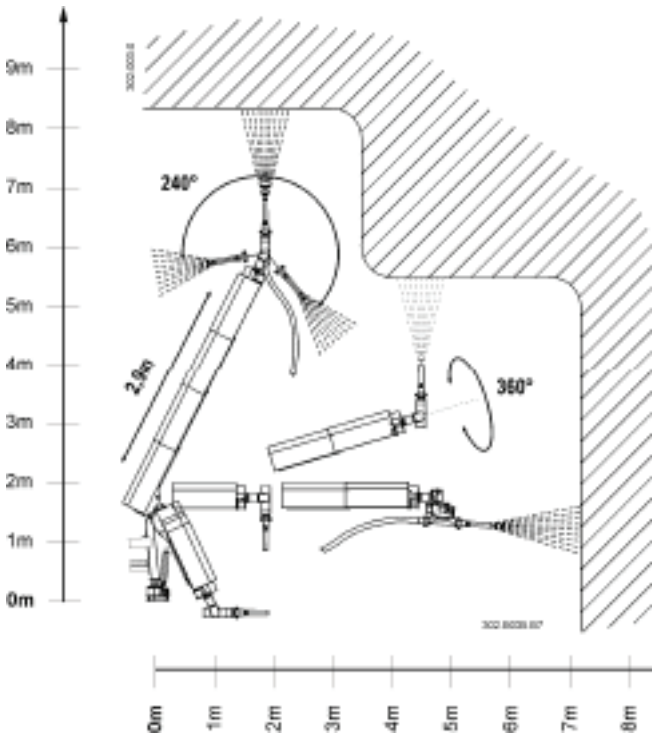
Type AIR
Hydraulic remote control, hydraulic aggregate with air motor

Aliva®-302 Properties:



Transport length 2.45 m
Transport width 0.5 m
Transport height 2.0 m
Weight arm approx. 550 kg
Weight aggregate approx. 200 kg (empty)

Working Range



MULTICRETE INTEGRAL SHOTCRETE UNIT

PRE-DAMPENER AND ALIVA DRY MIX SHOTCRETE MACHINE COMBINATION

DESCRIPTION

This easily transported Multicrete Integral Shotcrete Unit consists of an Aliva dry mix shotcrete machine and a Multicrete Predampener, mounted together on a common frame. Preparation includes connecting the “Bull Hose” from the air supply to the inlet on the predampener frame. The water line is then connected to the spray nozzle assembly located on the mix auger. Finally, the material delivery hose can be attached to the outlet chamber assembly of the Aliva pot and shotcreting can proceed.

PURPOSE

The Hopper on the Predampener allows for a continuous feed of pre-blended dry mix shotcrete - even during bulk bag changes. The feed auger located under the hopper then feeds a mix auger where water is added to suppress dust and to allow the nozzle man to easily regulate the water at the nozzle.


Scoop Bucket Slots

Power Options - Electric

5 hp helical snuggler gear motor to mix auger.
3 hp variable speed motor to cross feed auger.
Centrally mounted electrical control panels.

Power Options - Pneumatic

2” filter/regulator/lubricator system.
12 hp vane motor, helical worm gear reducer to mix auger.
7 hp vane motor, helical shaft mount reducer to feed auger.

MULTICRETE HURON 4

ALIVA®-257 SHOTCRETE MACHINE, ALIVA®-302 SPRAY ARM ON A CARRIER

Description

A shotcrete carrier which includes a state of the art Aliva 257 wet/dry shotcrete machine on the rear, an Aliva® 302 wet mix shotcrete spraying arm on the front, enhanced hydraulics, self contained liquid accelerator storage & pumping system all on a Huron 4 transmixer chassis. A very compact, maneuverable, tough unit designed to get the job done!

SPECIFICATIONS, HURON 4 TRANSMIXER TRUCK:

Chassis: Monoblock. Heavy duty type.

Engine: Diesel CUMMINGS type QSB 4.5 (TIER III-COM III),4 cylinders, turbo inter-cooler. Liquid cooling. Power DIN 116kW(155HP) to 2,200 r.p.m. It is designed to work at 4700 MASL.

Axles: Monolithic with epicycloid reducer. Dynamic loading capacity per axle 8000 kg. Steering type front axle with oscillating assembly. Fixed rear axle.

Transmission: Hydrostatic type with automatic regulation. Axial pistons pump of variable flow applied directly to diesel engine. Hydraulic motor at axial pistons mounted on reducer cap.

Steering: Hydraulic on front axle. Brakes: Internal discs oil bathed on front wheels. Hydraulic activate in two independent circuits. Parking brakes on transmission with hand lever control.

Drum:
Concrete output capacity:.....4m3
Direct unloading height:..... 1465mm
Unloading height:..... 1100mm
Hydraulic rotation of drum for loading-mixing and unloading is effect by electric speed regulation of rpm.

Aliva® 302 Spray Boom partially extended

Water System: Hydraulic operated self-priming water pump. The water is supplied from an external source, taken directly to the drum, to the tank or the washing hose. It can also be taken from the truck mixer tank to the drum or the washing hose. High pressure pump for cleaning purposes. Liter counter.

Max Slope:

Fully loaded: 30% (SAE normative)

Speed

1st:.....0 - 8 km/h (for working)
2nd:.....0 - 20 km/h (for movement)

Steering Radius

Internal:.....4,150 mm
External:.....7,800 mm

Electrical: 12 V battery 180 Ah, 650 A

Tires: 10’00R20 16PR

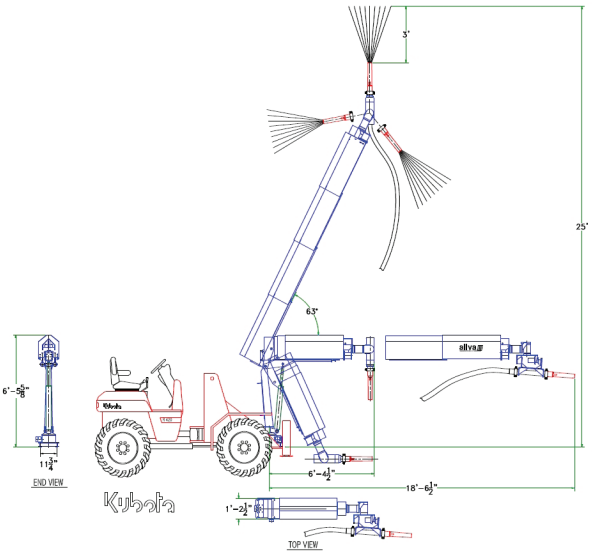
Aliva® 302 Spray Boom with 240/360 degree Nozzle Rotation

MULTICRETE MSU 420/302

MOBILE SHOTCRETE UNIT: FORKLIFT WITH ALIVA®-302 SPRAY ARM

SHOTCRETE BOOM

Maximum Height	21’
Maximum Length	19’
Minimum Length	8’
Angle of Rotation	110
Spraying Angle	240
Remote Control	Hydraulic
Hydraulic Aggregate	14 L/min
Electric Drive	5.5 kW
Or Air Drive	7 kW
Diesel Engine	Via carrier



DESCRIPTION

Multicrete Systems Inc. announces the Multicrete MSU 420/302, a complete mobile shotcrete unit complete with front forks and a shotcrete boom with a reach of over 18 feet!

CARRIER

Make & Model Kubota, R420 D1503-T-RP-1
Type Liquid cooled, 3 cylinder
Turbo Diesel

Horse Power	43.0 @ 2,600 rpm
Operating Weight	7,275 lbs (3,300 kg)
Displacement	91.4 cu. In. (1,497 cc)
Turbo Charger	Yes
E-TVCS	Yes – Low Emissions
Overall Width	4’-11.8”
Wheel Base	5’-9.9”
Ground Clearance	11.3”
Tread	3’-10.5”
Angle of Articulation	40
Frame Oscillation	
FORKLIFT	8
Maximum Lift	10’
Forks (folding)	2-1/2” X 5”X40”
Capacity	5500 lbs
Free Lift	Full

SHOTCRETE NOZZLES & PARTS

WE STOCK A COMPLETE LINE OF NOZZLES, BODIES, HOSES, CLAMPS, AND MORE TO FILL YOUR SHOTCRETING NEEDS!

WE ALSO STOCK A COMPLETE LINEUP OF WEAR PLATES, ROTORS, AND OTHER PARTS FOR MOST ALIVA EQUIPMENT.

ICTUS EQUIPMENT (Pty) Ltd

RoMix INCORPORATED
CUSTOM FORMULATORS • MANUFACTURING CHEMIST

Sika® aliva® equipment

ChemGrout®

MSI RAISE ROBOT® REMOTE SHOTCRETE SYSTEM

FOR REMOTE VIEWING OF RAISES UP TO 400m. DEEP

The Raise Robot® is a remotely controlled robotic assembly for the spraying of shotcrete; used in shafts and raises of subterranean excavations. Together with the Raise Ranger®, these robotic units are designed for use in mines and on large civil construction projects.

Standard Raise Robots® are designed for use in raises a minimum of 1.5 meters diameter up to a maximum of 5.5 meters diameter. Spring-loaded retractable arms stabilize the Raise Robot® and allow for undulations along the interior surface of the raise.

In 2008 Multicrete completed a 3.5 meter diameter X 300 meter raise. A second raise, over 400 meters in depth was completed in 2009.

Figure 1: Raise Ranger® at top of Raise Shaft

APPLICATION OF SHOTCRETE:

The Raise Robot® is used in conjunction with the AL 252 electric powered shotcrete machine mounted on a Multicrete Integral Predampener. Predampened material is conveyed through 50 mm. diameter heavy duty hose for the remote application of shotcrete via the Raise Robot®.

At surface level, technicians monitor the progress of the Raise Robot® via video display. This allows for the rate of application to be modified without personnel entering the raise.

Figure 2: Raise Ranger® completing top meter of 3.5m x 300m deep raise.

OPERATING PRINCIPLE

The Raise Robot®is lowered by means of a heavy-duty incremental winching system. This system allows for variable speeds from 5 cm/minute up to 6 m / minute.

During its descent, the Raise Robot® washes (hydro-blasts) the interior surfaces.

On its return, the unit commences spraying shotcrete in a uniform single pass. The electric motor on the spray head allows for 360° non-stop rotation.

Figure 3: Setting up the Raise Robot® over the vent raise.

SHIPMENT

All the required equipment, spares and accessories can be compacted for shipment into a 20' sea container. The Raise Robot® collapses to just 1.8 meters in height, 2.7 meters in length and 1.8 meters in width for ease of transport.

MSI HW10 HYBRID WET® SHOTCRETE APPLICATION CARRIER

ALIVA® 257 SHOTCRETE MACHINE, AL-302 SPRAY ARM ON ARVA CARRIER

Multicrete Systems has created a new technology for a shotcrete carrier based on simplicity. The **HW10H Hybrid-Wet Shotcrete® Carrier** is a self-contained shotcrete machine that carries its own supply of dry, premixed shotcrete which it converts into wet shotcrete and pumps it to the front mounted spray boom – all on a single carrier.

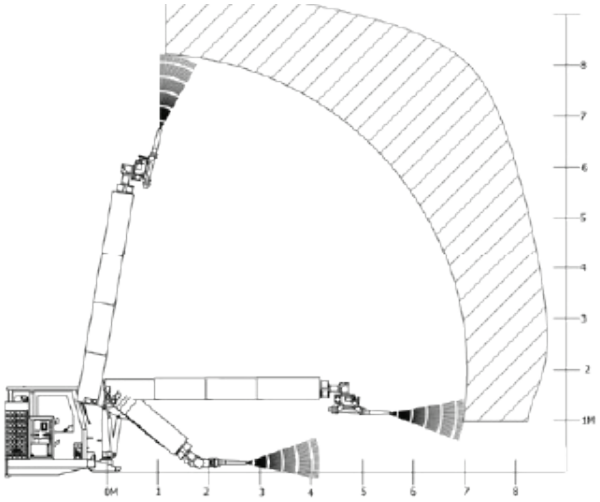
The carrier permits the application of shotcrete according to a hybrid wet process, incorporating some elements from both the wet and dry mix processes. However, it is designed to overcome numerous disadvantages associated with both prior methods.

Aliva 302 Spray Boom and Aliva 257 Wet/Dry shotcrete machine assembled on a Carrier

Some of the features included with the HW10H Hybrid-Wet Shotcrete® Carrier are:

- Backup camera
- Ample lighting
- Water booster pump
- Onboard form release system
- Pressure washer for easy cleanup
- 10 ton material capacity hopper
- Shooting rate of up to 9 m˝ per hour
- Robust, on-board PLC controlled system designed to provide consistent feed rate and synchronized accelerator dosing

SPRAYING ARM REACH DIAGRAM



FLEXIBLE DESIGN CONFIGURATION AND INTEGRATION

The HW10H Hybrid-Wet Shotcrete® Carrier is offered to the customer with several options allowing for the flexibility of configuration to suit their work environment. The carrier integrates nicely with several Multicrete-designed bulk handling, transportation, loading and mixing solutions.

MSI HW10 HYBRID WET® SHOTCRETE APPLICATION CARRIER

(CONTINUED FROM PREVIOUS PAGE)

HOW DOES HYBRID-WET SHOTCRETE® TECHNOLOGY BENEFIT YOU?

- SINGLE Carrier
- UNLIMITED Pot-Life
- REDUCED Accelerator
- RAPID S etting
- NO Admixtures
- LOWER Slump
- SAFE Operation
- LOW Rebound
- MINIMAL Manpower
- AVAILABLE 24/7
- MITIGATION of Dust
- EASY Cleanup
- EASY Maintenance
- LESS Material Waste

Aliva 302 Spray Boom with 240/360 degree nozzle rotation

HYBRID-WET SHOTCRETE® CARRIER

INTEGRATES with our Support Solutions including: Bulk Shotcrete Handling Solutions
Shotcrete Transportation Solutions
Loading and Mixing Station Solutions

ALIVA 257 SHOTCRETE MACHINE

The AL-257 is the universal machine for the application of dry- and wet shotcrete in the thin-stream method. The new and very compact design of the machine impresses through its dimensions, weight and performance. With just 750 kg and dimensions as little as a small dry shotcrete machine, the AL-257 fits on the back of the Huron 4 and is easy to operate. With its unbelievable output capacity range from 0.7– 9.6 m3/h (with 3 rotor sizes) the machine works on small concrete renovation work as efficient as on big slope protection or in mines. Less maintenance and wear cost makes it the ideal shotcrete machine for all applications.

Built in Components: The AL-257 is equipped with a fully automatic lubrication system for the rotor-discs. The rotor-speed is adjusted with a frequency converter and therefore, can be adjusted to every specific need on the job.

Mixing auger discharge to Aliva 257 hopper

2. SHOTCRETE MATERIALS & ADDITIVES

MEGASTICK® SHOTCRETE DRY OR HYBRID-WET®

XPR SHOTCRETE

FLASH-SET SHOTCRETE

DRAMIX® STEEL FIBERS

MULTICRETE SHOTCRETE SET ACCELERATOR

MULTICRETE ACTI-GEL

LIQUID P1AF ACCELERATOR FOR WET MIX SHOTCRETE

MEGASTICK® SHOTCRETE DRY OR HYBRID-WET®

FOR DRY OR HYBRID-WET® APPLICATIONS

DESCRIPTION

Megastick® Shotcrete is a pre-blended shotcrete mixture containing aggregates, silica fume and other carefully selected additives. Megastick Shotcrete has greatly enhanced shooting characteristics and physical properties.

USES: In the dry process, Megastick® Shotcrete is blown through the hose and mixing water is added at the nozzle. The shotcrete impacts the surface at a high velocity resulting in a well compacted, high quality concrete with excellent bond. Some common uses include:

- Slope Stabilization
- Initial and Secondary Tunnel Support
- Structural linings
- Concrete Rehabilitation

Megastick® Shotcrete may be used in combination with steel fiber reinforcement to enhance load carrying capacity and with non-caustic accelerator to provide high early strengths and faster set times. It can be blended to meet ACI 506 gradation #1 or #2.

ADVANTAGES: Stickiness. Megastick® Shotcrete has vastly improved cohesion characteristics compared to conventional shotcrete. This stickiness saves times and money:

- Rebound is significantly reduced, resulting in lower material usage.
- Sagging and sloughing are eliminated.

Thick layers can be applied in a single pass in both the vertical and overhead orientations without the use of caustic accelerators. This increases shooting efficiency as passing over work two or three times to achieve a certain thickness is no longer necessary.

PACKAGING: Megastick® Shotcrete can be custom blended with or without steel fiber reinforcement. It is normally packaged in bulk bags up to 1680 kg (one cubic yard), with double shrink-wrap on wooden pallets.

SAFETY PRECAUTIONS

Megastick® Shotcrete contains Portland cement, silica fume and other carefully selected additives. Normal safety wear such as rubber gloves, dust mask and safety glasses used to handle conventional cement based products should be worn. Material Safety Data Sheets are available on request.

TECHNICAL DATA

	TEST METHOD	RESULTS
Compressive Strengths:	CAN3-A23-14C ASTM C42	Mpa (PSI)
1-day:		17 (2500)
7-day:		28 (4000)
28-day:		41.5 (6000)
Flexural Strengths:	ASTM 1018	6.8 (988)
Boiled Absorption:	ASTM C842	5.0 per cent
Volume of Permeable Voids:	ASTM C842	14.0 per cent
Toughness:	ASTM C1018	
60-kg/cu m		1-5, 3.5
(100 lb/cu yd):		1-10, 5.0
Fiber:		
Set Times:		
(3% Accelerator):	ASTM C555	
Initial Set		10 min.
Final Set		15 min.
Freeze Thaw Resistance:	ASTM C555	Megastick®
	Acceptable	Shotcrete
	80%	96%
Rebound:	Consultant's Test	
	Vertical	12%
	Overhead	20%

Aggregate Gradation:

As per ACI 506 RTable 2.1 for Gradation #1 & Gradation #2

XPR SHOTCRETE

FOR COLD TEMPERATURE APPLICATIONS

DESCRIPTION

XPR Shotcrete is a pre-blended, dry shotcrete based on a modified hydraulic cement for a very rapid strength gain.

XPR Shotcrete also has greatly enhanced shooting characteristics and physical properties due to specially selected ad-mixtures.

USES

In the dry process, the XPR Shotcrete is blown through the hose and mixing water is added at the nozzle. The shotcrete impacts the surface at a high velocity resulting in a well-compacted, high quality concrete with excellent bond. XPR Shotcrete was specially developed for the following shotcrete applications: Slope Stabilization

- Areas requiring Rapid Strength gain (+/- 2500 psi in 3 hours.
- Spraying onto frozen ground such as structural tunnel linings.
- Cold Weather Use.

XPR Shotcrete may be used in combination with steel fibre reinforcement to enhance load-carrying capacity and accelerator to provide fast set times. It can be blended to meet ACI 506 gradation #1 or #2.

ADVANTAGES: Rapid Strength Gain: XPR Shotcrete is specially designed to meet the demands of high early strength for structural support which cannot be met with a conventional Portland cement based product.

Stickiness: XPR Shotcrete has vastly improved cohesion characteristics compared to conventional shotcrete This stickiness saves time and money because:

- Rebound is significantly reduced, resulting in lower material usage.
- Sagging and sloughing are eliminated.
- Thick layers can be applied in a single pass in both the vertical and overhead orientations without the use of caustic accelerators. This increases shooting efficiency as passing over work two or three times to achieve a certain thickness is no longer necessary.

Physical properties: Silica fume in XPR Shotcrete creates a higher strength shotcrete with low permeability and excellent freeze/thaw durability.

Resistance to water washout: XPR Shotcrete in the plastic state has tremendous resistance to washout by flowing water. This resistance allows XPR Shotcrete to be applied to moderately wet surfaces.

PACKAGING: XPR Shotcrete can be custom blended with or without steel fibre reinforcement. It is normally packaged in bulk bags up to 1680 kg (one cubic yard), with double shrink-wrap on wooden pallets.

SAFETY PRECAUTIONS

XPR Shotcrete contains Portland cement, silica fume and other carefully selected additives. Normal safety wear such as rubber gloves, dust mask and safety glasses used to handle conventional cement based products should be worn. Material Safety Data Sheets are available on request.

TECHNICAL DATA

	TEST METHOD	RESULTS
Compressive Strengths:	CAN3-A23-14C ASTM C42	Mpa (PSI)
3-hour:		17 (2500)
1-day:		28 (4000)
7-day:		35 (5000)
28-day:		45 (6500)
Flexural Strengths:	ASTM 1018	7 (1000)
Boiled Absorption:	ASTM C842	5.0 per cent
Volume of Permeable Voids:	ASTM C842	14.0 per cent
Rebound:	Consultant's Test	
	Vertical	8.0 per cent
	Overhead	<20.0 per cent

FLASH-SET SHOTCRETE

FOR APPLICATIONS REQUIRING RAPID SET TIMES

DESCRIPTION

"Flash-Set" Shotcrete is a pre-blended, dry shotcrete based on a modified hydraulic cement for a very rapid set. "Flash-Set" Shotcrete also has greatly enhanced shooting characteristics and physical properties due to specially selected ad-mixtures.

CAUTION

"Flash-Set" Shotcrete is not intended for use as a structural support lining. Its unique properties make it ideal as a sealing coat to enable additional shotcrete to be applied.

USES

"Flash-Set" Shotcrete is designed to be used with the Dry Process. It was specifically developed for the following applications:

- Sealing a raveling surface.
- Spraying onto wet areas to contain and direct the water flow.
- Providing "instant" temporary support in wet or unconsolidated ground.

"Flash-Set" Shotcrete may be used in combination with steel fibre reinforcement to enhance load carrying capacity. It can be blended to meet ACI 506 gradation #1 or 2.

ADVANTAGES: Instant Set: "Flash-Set" Shotcrete sets within moments of application to create a sealing membrane and provide limited immediate support.

Stickiness: "Flash-Set" Shotcrete has vastly improved cohesion characteristics compared to conventional shotcrete Rebound is significantly reduced, resulting in lower material usage;

- Rebound is significantly reduced, resulting in lower material usage.
- Sagging and sloughing are eliminated.

Physical properties: Silica fume in "Flash-Set" Shotcrete creates a higher strength shotcrete with low permeability and excellent freeze/thaw durability.

Resistance to water washout: "Flash-Set" Shotcrete in the plastic state has tremendous resistance to washout by flowing water. This resistance allows XPR Shotcrete to be applied to moderately wet surfaces.

PACKAGING:

Flash-Set Shotcrete can be custom blended with or without steel fibre reinforcement. It is normally packaged in bulk bags up to 1680 kg (one cubic yard), with double shrink-wrap on wooden pallets.

SAFETY PRECAUTIONS: Flash-Set Shotcrete contains Portland cement, silica fume and other carefully selected additives. Normal safety wear such as rubber gloves, dust mask and safety glasses used to handle conventional cement based products should be worn. Material Safety Data Sheets are available on request.

TECHNICAL DATA

	TEST METHOD	RESULTS
Compressive Strengths:	CAN3-A23-14C ASTM C42	Mpa (PSI)
2-day:		33 (4757)
14-day:		54 (7775)
28-day:		58 (8363)
Boiled Absorption:	ASTM C842	5.0 per cent
Volume of Permeable Voids:	ASTM C842	14.0 per cent
Rebound:	Contractor's Test	
	Vertical	8.0 per cent
	Overhead	<20.0 per cent

DRAMIX® STEEL FIBRES

FOR INCREASED LOAD BEARING CAPACITY

DESCRIPTION

The water-soluble Dramix® bundles are the only real guarantee of obtaining a homogeneous distribution of high performance steel fibers without special equipment and without considerably increasing the mixing time.

The glue specially developed allows the use of Dramix® steel wire fibers with high L/D ratios in bundles for wet as well as for dry spraying. Dramix® steel fibers can be added to the mixer or the batching equipment – either on site or at the ready mix plant – or in dry packed mortars delivered in big bags or in silos.

Dramix® steel wire fibers can be added with automatic dosing and dispensing equipment.

TECHNICAL ADVANTAGES:

- The homogeneous reinforcement gives a resistance to tensile stresses at any point in the shotcrete layer
- An increase of load-bearing capacity due to the redistribution of stresses
- The removal of the mesh increases the bond of the shotcrete to the surface
- Excellent corrosion resistance. The use of Dramix® instead of mesh results in a good quality homogeneously reinforced concrete. A high degree of density and impermeability prevents the formation of water passages. Despite the eventual appearance of rust spots on the surface, no spalling will occur in the concrete. If aesthetics are a major concern a flash coat of unreinforced shotcrete can be applied.
- Excellent control of cracks due to shrinkage and temperature gradients.

ECONOMIC ADVANTAGES:

Allows the shotcrete to follow the contours resulting in a consistent thickness, which provides a significant reduction in shotcrete consumption.

The use of Dramix reinforced shotcrete minimizes losses due to rebound.

The elimination of the need to install mesh and the reduction in the time for which the lifting equipment is needed results in a reduction of cycle times and overall costs.

The elimination of the difficult and even dangerous job of installing mesh considerably increases safety at work site.

TECHNICAL DATA:

- **Geometry:**

Length (l)	Diameter (d)	Aspect ratio (= l/d): 55
30 mm (1 3/16 in)	0.55 mm (0.022 in)	16,750 fibers/kg 7,600 fibers/lb

- **Tensile strength:**
  - on the wire: minimum 1,150 N/mm² (167 ksi)
- **Coating:** None
- **Approvals:**

Product	Conforms to	Quality System in American Plants	Approval Poland Nr.
ATG 1857 DN 1631	ASTM A 820	ISO 9002	Z-2117/95

MULTICRETE SHOTCRETE SET ACCELERATOR

CHLORIDE FREE DESIGNED FOR USE WITH DRY SHOTCRETE

Multicrete Shotcrete Set Accelerator is a chloride-free, dry powder accelerator designed for use with shotcrete. It is also suitable for use as a set accelerator in some other Portland cement products such as concrete mixes.

USES: A major use for this product is in accelerated shotcrete for mining, tunneling or rock stabilizations operations where rapid set or high early strength are required for structural support.

Accelerated shotcrete is also used for rapid sealing of water seepage through rock, earth or concrete.

In situations where rapid installation of a reinforced shotcrete is needed, steel fiber reinforcement can be included in the mix to provide the required performance.

ADVANTAGES:

- In addition to the advantages of rapid set and high early strength, Multicrete Shotcrete Set Accelerator has the advantage of being less caustic and less hazardous to personnel than the Portland cement products to which it is added.
- The dry powder form of this product is ideal for dry-process shotcrete applications and provides added convenience for transportation, storage and application.

PROCEDURES: Determine the amount of Multicrete Shotcrete Set Accelerator needed to give the required setting time and rate of strength development for the planned application. The temperature during mixing and curing must be considered during the testing because, like most chemical reactions, the degree of acceleration is reduced as the temperature is lowered. In general, the addition of 1% to 5% of Multicrete Shotcrete Set Accelerator by weight of cement will provide satisfactory results. The most common addition rate is 3% to 4%.

Higher addition rates can be used for applications such as water sealing where very rapid setting is essential, and a slight reduction of the final strength is acceptable. For dry-mix bagged shotcrete applications, it is preferable to premix the shotcrete and the accelerator before adding water. The premixing can be done during batching of the shotcrete, or an additive dispenser can be included in the application equipment. In some cases, on-site additions of set accelerator are undesirable because of conditions such as the lack of suitable dispensing equipment or the absence of adequate quality control. Multicrete manufactures and supplies a wide range of dry-bagged, premixed standard and accelerated shotcrete, with or without silica fume or steel fibre reinforcement. The premixed product is supplied in standard paper bags, or in bulk sacks of up to 1 cubic yard.

PACKAGING: Multicrete Shotcrete Set Accelerator is packaged in 2000 lb. Bulk bags. Custom size packaging available.

TECHNICAL DATA: When added to a standard shotcrete mix with aggregate gradation meeting the requirements of ACI 506 Table 2.2.1, Gradation No. 2 shotcrete with Multicrete Shotcrete Set Accelerator gives approximately the following properties:

Accelerator added: % by wt. of cement: 3.5

Setting time: 21^{0}C (700F), ASTM C266

Initial Set, Minutes	185	3
Final Set, Minutes	2203	10

Setting time: 2^{0}C (35F), ASTM C266

Initial Set, Minutes	>720	24
Final Set, Minutes	>720	33

Compressive strengths: Panels when cured at approximately 16^{o}C (60^{o}F) for 8 hours, then core and most cured at 23^{o}C (72^{o}F).

	Mpa	psi	Mpa	psi
At 10 hrs	*	*	14	2030
At 3 days	19	2760	21	3050
At 7 days	30	4350	28	4060
At 28 days	41	5950	39	5660

*Insufficient strength for coring

Note: The typical results shown are for shotcrete made with Type 10 Portland cement with C3A content of 8.2%. The properties obtained will vary for other cement compositions.

Caution: Before using Multicrete Shotcrete Set Accelerator in Portland cement mix, check that the accelerator is compatible with the cement using ASTM C1117 and/or C1140. Some Portland cements with low C3A contents do not respond as readily to additions of this accelerator. Test mixes should always be made to determine the amount of Multicrete Shotcrete Set Accelerator required to give the specified setting time, or to determine the effect of the accelerator on the early and later age strength of the mix.

MULTICRETE ACTI-GEL 208®

REINFORCEMENT SHOTCRETE ADDITIVE AND ANTI-SETTLING AGENT

DESCRIPTION

Acti-Gel is a low-dose natural mineral rheology modifier that stabilizes conc rete mixtures and dramatically improves the workability, flowability, pumpability and adhesion/cohesion in all shotcrete applications.

ADVANTAGES:

Reduces Shotcrete Cost:

- Sgnificant rebound reduction
- Eliminates expensive fine SCM's and Nano products Increases application thickness in a single pass by over 100%
- Decreases cycle times
- Reduces pump pressure

Increases Quality & Workability:

- Reduces grey mist / dust when spraying
- Sprays concrete without sagging or sloughing off Achieves higher lifts
- Returns superior plastic properties at reduced cementitious contents
- Reduces time to reach 1 MPA
- Improves re-entry times in underground applications Allows lower quality aggregates and coarser fine sands to be utilized

TECHNICAL DATA:

Viscosity – Dispersion, cps	4,200
Free Moisture, wt. % @ 220°F	9.0
Residue (Wet), % retained on 325 mesh screen	0.01
pH	8.5

% SiO2	51.1	% Na2O	0.5
% Al2O3	10.8	% K2O	0.6
% Fe2O3	3.5	% TiO2	0.4
% CaO	2.2	% P2O5	0.6
% MgO	8.4	LOI (Loss on Ignition)	20.0

Product Data Sheet
Edition 8.12.2010
Identification no.
P1AF-P3

MULTICRETE

Construction

P1AF (Concentrate)

Liquid Alkali-free Shotcrete Accelerator

Description

P1AF (Premixed) is a high performance, alkali-free liquid set accelerator for wet shotcrete applications.

Applications

P1AF (Premixed) is suitable for both wet and Hybrid wet spraying processes and it is used for:

- Support at the face while advancing tunnels and mines
- Rock and slope stabilization
- High quality lining shotcrete

Advantages

P1AF (Premixed) liquid shotcrete set accelerator has the following characteristics and advantages:

- High early strength development
- Alkali and Chloride free
- No pollution of groundwater by leaching of alkalis
- Distinct reduction in rebound
- Improves bond of shotcrete to rock and concrete thus facilitating overhead spraying
- Distinct reduction of dust

How to Use

Dosage

The most effective dosage must be determined by trial. Dosage rates will vary according to w/c ratio, materials used, ambient conditions, shotcrete methods used and the requirements of a specific project. For general applications Sika recommends a dosage between 4-8% by weight (45-86 fl.oz/100 lbs) of the total cementitious content. The performance of the P1AF (Premixed) will vary according to w/c ratio of the mix. Dosage rates outside the recommended range may be used where specialized materials such as microsilica are specified, extreme ambient conditions are encountered or unusual project conditions require special consideration. In this case please contact your local regional office or technical service department at 1-800-933-7452. The effect of P1AF (Premixed) depends on cement type, cement age, cement content and type of subgrade.

Mixing

P1AF (Premixed) is dosed and added on-site by a liquid dispensing system. Optimum dispersion in the shotcrete is governed by nozzle configuration and shotcreting techniques. Important information: The concrete temperature should not be lower than 59°F (15°C) when shotcreting in thick layers - 4 inches and above (100mm and above). Use of P1AF (Premixed) requires the technically correct installation of dosing and conveying equipment. Metal components that come into direct contact with the product should be fabricated of stainless steel. Do not use brass parts.

Combination with other Sika admixtures:
P1AF (Premixed) is compatible with Sika's water reducing, high range water reducing, hydration control admixtures and other admixtures.

Trials with local materials is always recommended to verify performance.

Sika®

Construction

Packaging	P1AF (Premixed) is available in 55 gallon drum (208 liter), 275 gallon totes (1040 liters) and bulk delivery.
Storage and Shelf Life	Store in stainless steel or plastic container as the low pH of the admixture may cause corrosion if stored in normal steel container, which might affect the performance of the admixture. Protect from direct sunlight, heat and frost. If these conditions are unattainable, P1AF (Premixed) may precipitate. If this occurs, the performance of P1AF (Premixed) may be adversely effected and the regional Sika representative or technical service department at 1-800-933-7452 should be contacted. Shelf life when stored in unopened original containers, protected from direct sunlight and frost and kept at temperatures between 50°F and 86°F (5°C-30°C) is 6 months.
Typical Data **Appearance**	White powder, then mixed with warm water to obtain a Liquid; translucent blue/ green to white
Specific Gravity	Approx. 1.4
Caution	Irritant. Contains Aqueous Solution of Aluminum Salts (CAS:Mixture). May cause eye/skin/respiratory irritation. Harmful if swallowed. For further information, refer to the current Material Safety Data Sheet for this product.
Handling and Storage	Avoid direct contact. Wear personal protective equipment (chemical resistant face shield/goggles/gloves/clothing) to prevent direct contact with skin and eyes. Use only in well ventilated areas. Wash thoroughly with soap and water after use. Remove contaminated clothing and launder before reuse.
First Aid	**Eyes:** Hold eyelids apart and flush thoroughly with water for 15 minutes. **Skin:** Remove contaminated clothing. Wash skin thoroughly for 15 minutes with soap and water. **Inhalation:** Remove to fresh air. **Ingestion:** Do not induce vomiting. Dilute with water. Contact physician. **In all cases contact a physician immediately if symptoms persist.**
Clean Up	Use personal protective equipment (chemical resistant gloves/goggles/ clothing). Without direct contact, remove spilled or excess product and place in suitable sealed container. Dispose of excess product and container in accordance with applicable environmental regulations.

KEEP CONTAINER TIGHTLY CLOSED • KEEP OUT OF REACH OF CHILDREN • NOT FOR INTERNAL CONSUMPTION • FOR INDUSTRIAL USE ONLY

Distributed By:

Multicrete Systems Inc.
360-555 Hervo Street • Winnipeg, Manitoba R3T 3L6 CANADA
• Phone: 204-262-5900 Sales: 306-292-6367 •
www.multicretesystems.com

3. SHOTCRETE ACCESSORIES & REINFORCING

AUTOMATED LUBE SYSTEM

BULK BAG LIFTING CROSS TYPE 1

BULK BAG LIFTING CROSS TYPE 2 (FLAT)

LATTICE GIRDERS

MESH PANEL FORMS

MULTI-DRAIN®
SHOTCRETE BUTTERFLY PLATES

SHOTCRETE DEPTH MEASURING DEVICE

AUTO-LUBE SYSTEM FOR SHOTCRETE MACHINE WEAR PLATES

ELIMINATES OVER LUBRICATING

DESCRIPTION:

The fully automatic lubrication system consists of an air filter, air regulator with gauge, an airline lubricator, a timer switch, a 3-way solenoid pump, and injectors. Controls can be electrical, mechanical or manual.

The electrical timer switch opens a three-way solenoid valve, permitting air to flow to the pump forcing the air piston forward and lubricant through supply line to the injectors. When the valve closes, air exhausts back through the valve, and the spring in the pump returns to the air piston, completing the lubrication cycle. Frequency of the cycle can be set as desired.

FEATURES:

- Cycle time can be set from 20 seconds to a maximum of 24 hours
- Timing is suspended during power interruptions. This feature eliminates over lubrication due to pre-lube when the machine is frequently started and stopped
- Actual on time can be set from 10 seconds to 60 seconds, 24 second maximum

ADVANTAGES:

- Reduces downtime by increasing wear pad life
- Drastically reduces premature wear on wear plates
- Simple refilling procedures on grease pump

BULK BAG LIFTING CROSS TYPE I

EXCELLENT FOR LIFTING & HANDLING BULK BAGS UP TO 6000lbs

DESCRIPTION:

The Bulk Bag Lifting Cross is an apparatus that can be used in conjunction with other machinery to lift and handle bulk bags up to a capacity of 6000 lbs.

Designed with ease of use and Safety in mind this apparatus can take the punishment making your worksite more productive.

FEATURES:

- Durable steel or aluminium construction
- Strap hooks at ends to ensure secure load
- Safe design for ease of mind and use

BULK BAG LIFTING CROSS TYPE II (FLAT)

EXCELLENT FOR LIFTING & HANDLING BULK BAGS UP TO 6000lbs

DESCRIPTION:

The Bulk Bag Lifting Cross is an apparatus that can be used in conjunction with other machinery to lift and handle bulk bags up to a capacity of 6000 lbs.

Designed with ease of use and Safety in mind this apparatus can take the punishment making your worksite more productive.

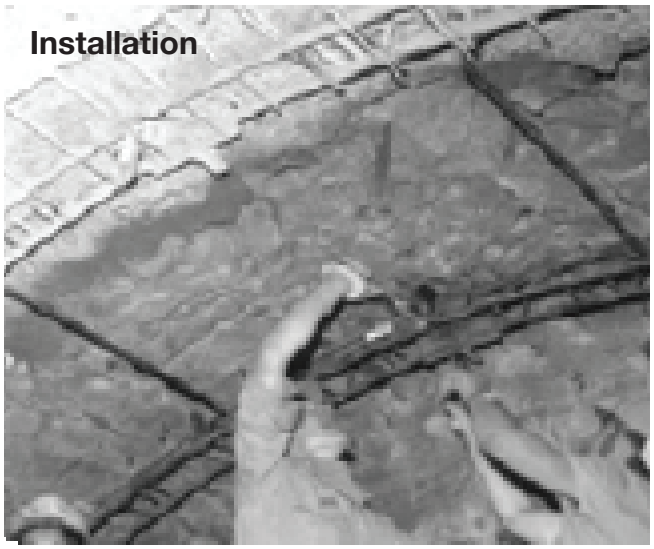
FEATURES:

- Durable steel or aluminium construction
- Strap hooks at ends to ensure secure load
- Safe design for ease of mind and use

LATTICE GIRDERS

INTEGRATED INTO THE SHOTCRETE SHELL

Preshaped Girders



Installation

DESCRIPTION:

Lattice Girders were developed for the special demands of mining and tunnel construction.

Contrary to rolled sections, regardless of shape, the Lattice Girders are completely integrated into the shotcrete shell.

Porous zones, respectively spray shadows are avoided.

Settling of the surrounding ground is reduced and the water tightness of the shotcrete shell is improved significantly.

After Shotcrete Application

Ready to Shotcrete

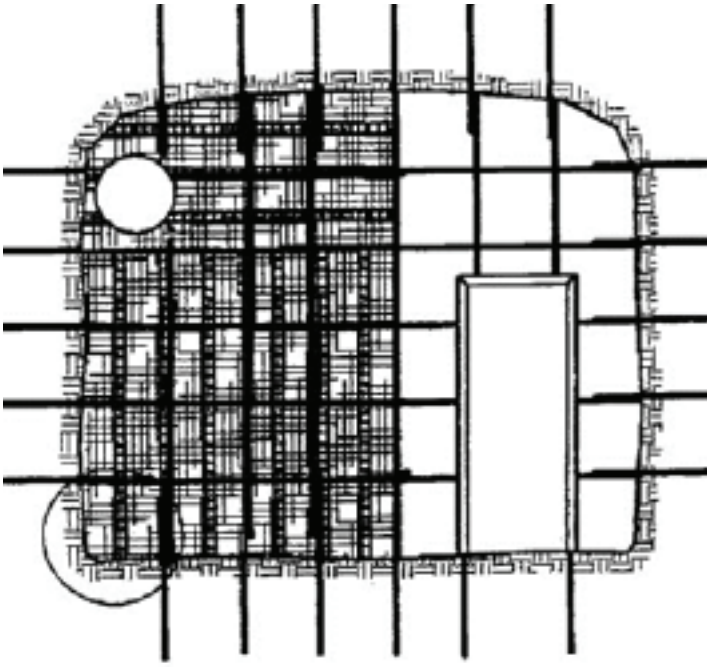
MULTICRETE MESH PANEL FORMS

FOR INTEGRATING INTO THE SHOTCRETE SHELL

MULTICRETE MESH PANEL FORMS are constructed with galvanized mesh and Brattice Cloth. Stiffeners are incorporated for three-dimensional stability. The panels are 4' x 8', lightweight and can be cut-to-shape with small bolt-cutters. When Shotcrete is applied to these panels, the result is a durable, waterproof wall, which is extremely resilient to close proximity blasting.

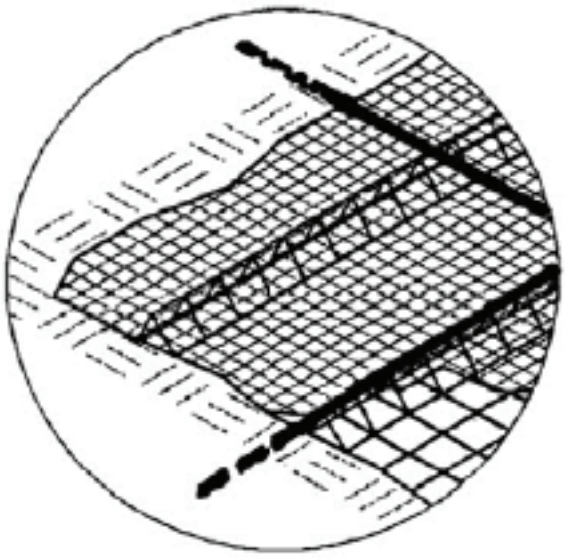
ADVANTAGES
Fast and easy to erect
Fireproof
Non-corrosive
Very Concussion-resistant

ADVANTAGES
Fast and easy to erect
Fireproof
Non-corrosive
Very Concussion-resistant



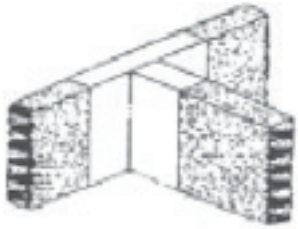
WHERE TO USE
Protective wall for shaft areas
Building bulkheads
Construction of walls for lunchrooms and utility rooms

INSTALLATION PROCEDURE
Install grouted dowels on 2-4' centers around perimeter of proposed wall.
Tie 1/2" Rebar to the dowels and form a grid of approximately 2-3" squares.
Tie the Multicrete Mesh Panel Forms to the rebar grid using the wire. The rib stiffener of the panel is then tied to the rebar. The panels must be butted together and wire tied about every foot. Panels can be easily trimmed to conform the tunnel of drift irregularities using ordinary bot-cutters.
Apply Shotcrete through the rebar grid.

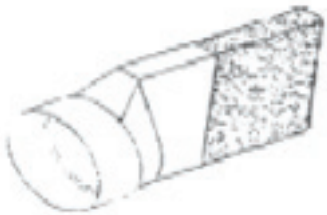


MULTI-DRAIN® PREFABRICATED STRIP DRAIN SYSTEM

IN-LINE JOINTS with MULTI-Drain®



T-JUNCTION JOINTS with MULTI-Drain®



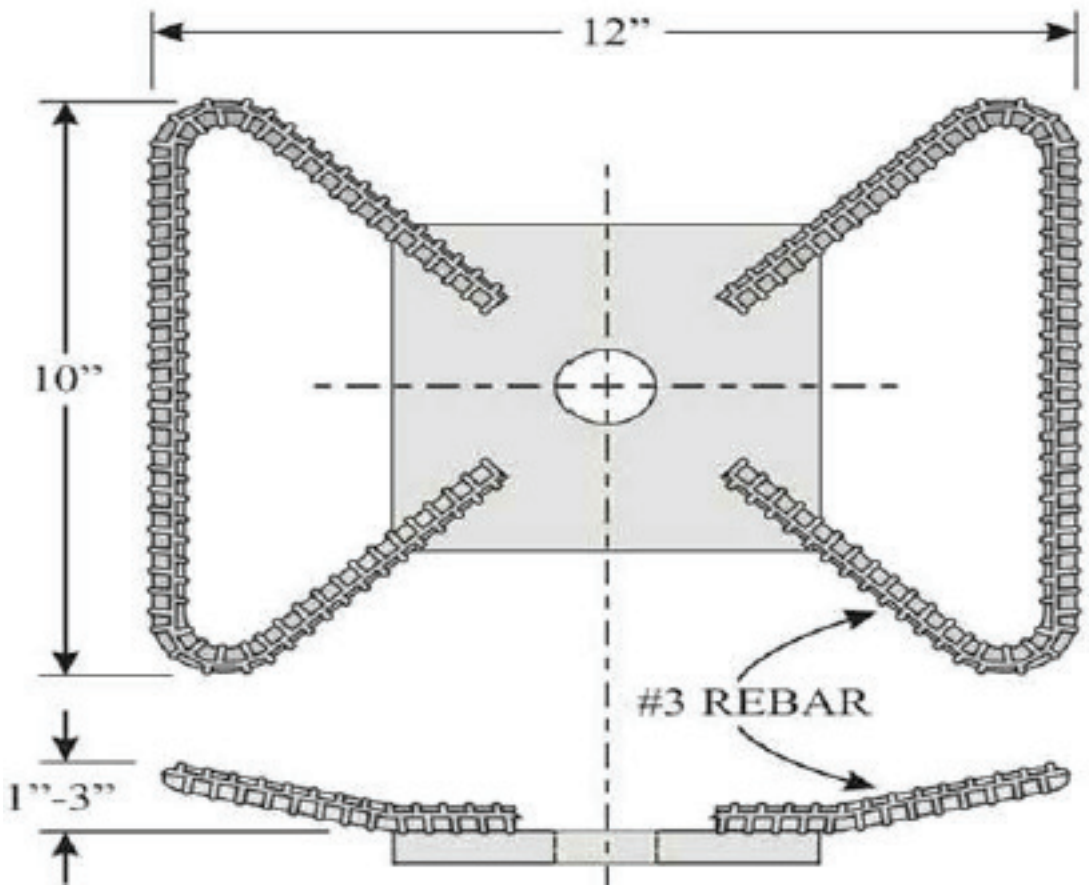
DRAINAGE CAP with MULTI-Drain®

Multicrete MULTI-Drain® strip drain is a prefabricated, high-flow drainage system that offers better draw down of water than pipe while costing around 60% less to install.

MULTI-Drain® strip drain consists of a formed polymeric core surrounded by a geo-textile filter fabric. The fabric allows water to pass into the core while restraining other particles which might clog the core. The core allows water to flow to designed rain exits. MULTI-Drain® strip drain is 1" thick by 4" – 36" wide and is available in 100' and 500' long rolls.

The multichannel structure of the formed polymeric core provides significantly in-creased water flow. The tough non-woven, needle-punched geo-textile filter fabric covering prevents core clogging while allowing water entry through every inch of its surface.

MULTICRETE SHOTCRETE BUTTERFLY PLATES

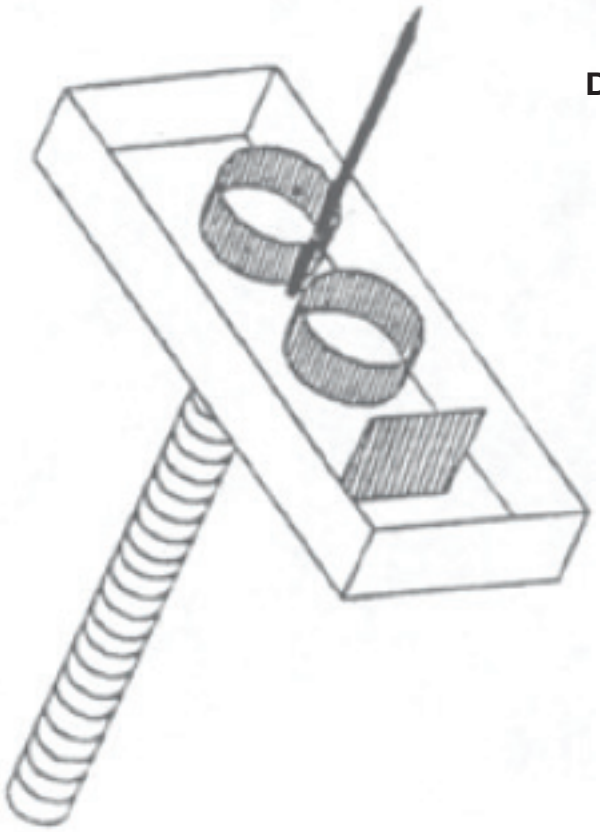


SHOTCRETE BUTTERFLY WASHER PLATES

Shotcrete butterfly plate washers are available in a range of sizes.

MULTICRETE SHOTCRETE DEPTH MEASURING DEVICE

ACCURATE SHOTCRETE DEPTH MEASURING & BRANDING SYSTEM



Depth Measuring & Branding Device

Multicrete Shotcrete Depth Measuring Device Branding System has an easy-reach system.

Shotcrete Depth Measuring Devices are sold c/w three different size brands: choose a combination of 50 mm, 75 mm, 100 mm, 125 mm and 150 mm.

For easy reach of high back areas, the Depth Measurer comes complete with a 12 foot telescopic extension.

Shotcrete Depth Measuring Devices clearly indicate the depth of shotcrete on walls and back areas. They must be used when shotcrete is wet.

An EXCELLENT device to monitor shotcrete thicknesses.

4. SHOTCRETE TRAINING

SHOTCRETE & EQUIPMENT NOZZLE-MAN TRAINING COURSE

SHOTCRETE TRAINING

SHOTCRETE EQUIPMENT & NOZZLE-MAN TRAINING COURSE

Preparing the Test Panels for Shotcrete Spraying

Preparing a Test Panel for Overhead Shotcrete Spraying

SHOTCRETE EQUIPMENT & NOZZLE-MAN TRAINING COURSE

HANDS-ON TRAINING SEMINARS FOR SHOTCRETE NOZZLE-MEN

Receiving Instruction and Demonstration from Course Instructor

COURSE COMPLETION IS ATTAINED THROUGH SUCCESSFUL DEMONSTRATION OF SHOTCRETE KNOWLEDGE AND APPLICATION SKILLS OF SHOTCRETE AS A NOZZLE-MAN.

To obtain Graduation, the participant must:

- Score min 70% on written or verbal test on fundamentals.
- Demonstrate proper nozzling technique.
- Demonstrate proper potman and maintenance technique.

All participants will receive a copy of our Shotcrete Nozzleman/Potman Training Manual.

Practicing Shooting Shotcrete Ensuring the Encapsulation of the Rebar

SHOTCRETE EQUIPMENT & NOZZLE-MAN TRAINING COURSE

HANDS-ON TRAINING SEMINARS FOR SHOTCRETE NOZZLE-MEN

A Successfully Shot Test Panel

COURSE SCHEDULE

Day One

- General Concrete and Shotcrete Theory, both Wet and „Dry Mix".
- Use of Shotcrete and Accessories as an Underground Support System
- Underground Shotcrete Applications and case histories.
- On-site Shotcrete Analysis and Discussion Re: troubleshooting, equipment and placement concerns.

Day Two

- Hands-on training in the application of shotcrete under the supervision of qualified instructor.
- Analysis of shotcrete conveying equipment for purpose of maintenance and operating adjustments.
- Overview of Robotic Application Equipment.

Day Three

- Nozzlemans" written or verbal test of Shotcrete Nozzleman techniques.
- Test Panel Shoot.
- Shotcrete Nozzling Technique Evaluation.
- Equipment Maintenance and Operation Test.
- All Team instructors have extensive practical experience to convey to participants.
- The principal instructors who provide certification have comprehensive teaching experience as well a practical experience in appropriate industrial applications.

COURSE DESCRIPTION:

This is a practical hands-on course in the theory and proper application of shotcrete. Major emphasis is focused on the proper techniques of placing shotcrete for the purpose of underground support or under-ground construction. Training in maintenance and troubleshooting shotcrete equipment will also be provided.

The following Course Training Material is included:
Comprehensive Shotcrete Resource Binder
Shotcrete Nozzleman Training Manual

Registration: Participants should register promptly as attendance is limited and on-site courses are presented on a limited, sequence basis.
Lunches and coffee are included

SHOTCRETE EQUIPMENT & NOZZLE-MAN TRAINING COURSE

HANDS-ON TRAINING SEMINARS FOR SHOTCRETE NOZZLE-MEN

COURSE SCHEDULE

Day One

General Concrete and Shotcrete Theory, both Wet and „Dry Mix".
Use of Shotcrete and Accessories as an Underground Support System
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Nozzlemans' written or verbal test of Shotcrete Nozzle-man techniques.
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5. CELLULAR CONCRETE & CRF EQUIPMENT

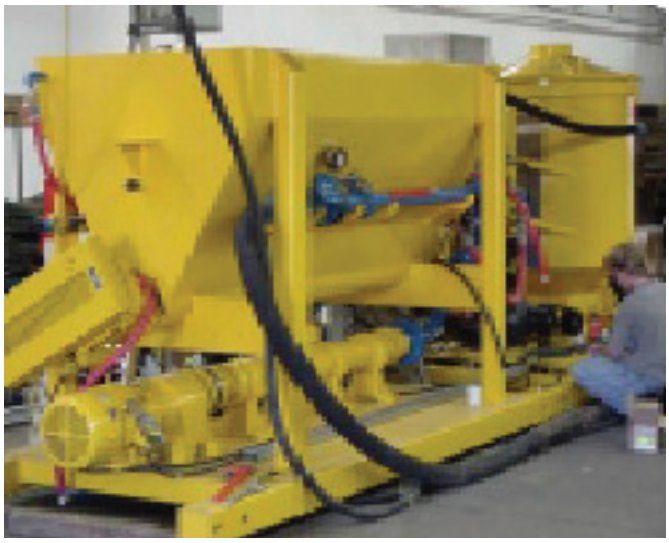
AUTOFOAM CELLULAR CONCRETE SYSTEM

CRF SLURRY MIXER PLANT

MULTIFOAM

AUTO-FOAM CELLULAR CONCRETE SYSTEM

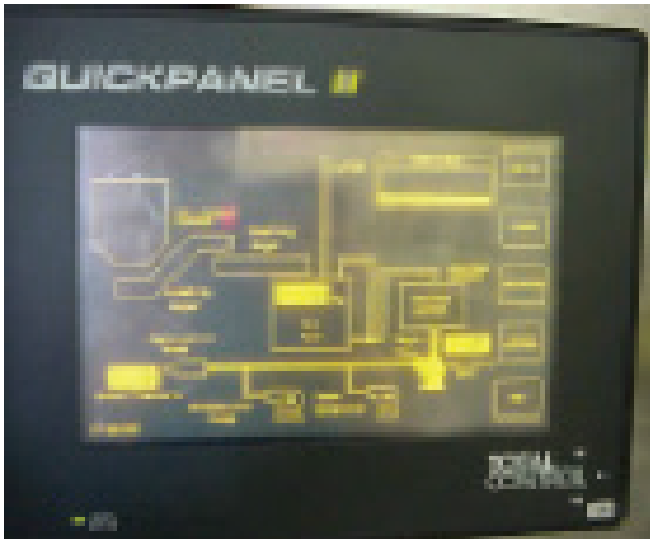
WITH AUTO-FOAM GENERATOR FOR HIGH-VOLUME PRODUCTION



Colloidal Mixer for Autofoam Cellular Concrete System

Cellular Concrete Production Plant
Multicrete features the high volume Cellular Concrete Production Plant. This unit consists of a 5 ton dry cement bin, which feeds a 1 cubic meter colloidal mixer and from the mixer dis-charges into a 3 cubic meter agitator hopper.

The hopper feeds a Moyno pump, which conveys the material through a static mixing system, where the foam is added. The Autofoam Generator is capable of producing 20-100 cubic meters per hour. This system can be operated manually, through touch screen controls or completely automatic via PLC. A wide range of densities, from 5 pcf to 120 pcf, can be produced.



Touch Screen

CRF SLURRY MIXER 680

CEMENTED ROCK FILL PORTABLE SYSTEMS, IDEAL FOR BACK FILLING

Description

The CRF Slurry Mixer is a PLC- controlled single drum, high speed, high-shear unit designed for the efficient production of cement based slurries. The product produced exhibits colloidal properties and is nearly immiscible in water.

The machine can handle cement / sand ratios up to 1:3 by weight and produce pumpable mixtures. It will mix a wide range of materials such as Cement: P.F.A., Pre-blends, Bentonite, Lime or Chemicals.

Advantages

Portable
Completely Unbolts to Suit Caging Requirements
Cement Bags, Bulk Bags or Silo feed
P.L.C.- Controlled for Fully Automatic Unattended Operation
Self-Cleaning / Purging
Incorporates Proven Colloidal Mixer as Scale, Mixer and Pump
Rapid Underground Assembly
Ideal for Backfilling in Remote Areas

Cemented Rock Fill (CRF) Slurry Mixer Plant

Power Unit

Electric, 2 x 30 hp motors (575 volt) Output
Up to 16 m3/hr.
Pressure
Up to 30 psi.
Batch Capacity
680 liters

MULTI-FOAM®

USED FOR VOID FILLING & STRUCTURAL CEMENTITIOUS FOAM

DESCRIPTION
MULTI-foam® is a non-combustible, void-filling, and structural cementitious foam. When combined with the proper amount of air and water in the specially designed placer unit, forms a low density foam. This product can be designed for different densities, strengths and set times.

USES
MULTI-foam® can be used for:
Filling voids with:
-Compressible Contact Grout
-Low density, light-weight fill
-Rapid strength gaining grout
Bulk heads:
-Safety plug in a raise
Construction:
-Insulating roof tops
-Foundation fill
-Road backfill
Structural purposes:
-Backfilling over a set of arches to provide con-tact against the roof, filling a cavity to prevent me-thane build-up, and as a cushion against falling debris over false roof.
Mining and Tunneling division:
-Compressible barrier construction.

ADVANTAGES
Engineered Void Filler:
-Can bridge gaps over 1” (25 mm) wide
High Yield:
-Non segregating and pumpable
-Less material to handle
Engineered Properties:
-Densities and properties easy to adjust
Low Causticity:
-Absolutely minimizes the possibility of cement burns
Cost Effective:
-VERY cost effective

PACKAGING
Dry grout material can be packaged in 20 kg and 30 kg small bags. Bulk bags are available in 228 kg or 1 MT bags for mass production.

APPLICATION
MULTI-foam® shall be thoroughly mixed to desired consistency by varying the amount of water used. Multicrete Foaming Agent should be added using a MULTI-foam® generator.

SAFETY PRECAUTIONS
MULTI-foam® contains blended hydraulic cement and carefully selected additives. Normal safety wear, such as dust masks and rubber gloves used to han-dle conventional cement products, should be worn. Material Safety Data Sheets are available on request.

TECHNICAL DATA
Compressive Strengths:

1 hour	**up to**	**50 P.S.I.**
28 day	**up to**	**3500 P.S.I.**

Multicrete Foaming Agent may be used in many types of foam generating devices. When used in other con-tinuous or batch type Foam Generators, the result is a very compact self-contained precision foam system which may be integrated with solids metering feeders, slurry mixers and pumps to permit continuous dis-charge of foamed slurries through pipe or hose lines.

6. CONCRETE EQUIPMENT

CONCRETE PUMPS - SCHWING® 500 SERIES:

SCHWING® BPA 450/ BPA 500 Rock Valve™ Pumps - Trailer Mounted

REED® PUMPS:

REED® “A” SERIES “ROCKMASTER” PUMPS

MULTICRETE

SCHWING AMERICA INC.

LINE PUMPS

BPA 450/500

Rock Valve™ Pumps - Trailer Mounted

- Concrete
- Shotcrete
- Grout

Shown with Optional Agitator

- **Output to 45 cu.yds./hr.**
- **Pressure to 1100 psi**
- **1” Max. Aggregate**

Here are the multi-duty pumps for handling structural concrete, grout or shotcrete. All the reliability of Schwing’s larger pumps in a smaller package for all around versatility. The BPA 500 features a larger hydraulic pump which allows more strokes per minute and higher output. Long term durability is assured with the legendary Rock Valve™.

BPA-450 / BPA-500

Technical Data

	BPA 450		BPA 500	
	U.S.	Metric	U.S.	Metric
Concrete Output (cu.yds./hr/cu.m/hr)	35	26	45	35
Max. Pressure on Concrete (psi/bar)	1100	76	1100	76
Max. Horizontal Pumping Distance* (ft/m)	1160	354	1160	354
Max. Vertical Pumping Distance* (ft/m)	330	100	330	100
Max. Pump Strokes/Min.	27@2300		32.5@2500	
Max. Aggregate Size* (in/mm)	1	25	1	25
Concrete Valve Type	Rock™		Rock™	
Shifting Cylinders	Single		Dual	
Concrete Cylinder Diameter (in/mm)	6	150	6	150
Concrete Cylinder Stroke Length (in/mm)	39	1000	39	1000
Differential Cylinder Diameter (in/mm)	3.14	80	3.14	80
Outlet Diameter (in/mm)	5	125	5	125
Hopper Capacity (cu.ft/cu. m)	11	.31	11	.31
Charging Hopper-Height (in/mm)	48	1219	48	1219
Engine Model	Deutz BF4L2011			
Engine Power (h.p./kw)	68	51	72	54
Electric Powered (h.p./kw)	60	45	60	45
Hydraulic Circuits: System #1	Conc. Pump			
System #2	Twin Circuit			
System #3 (optional)	Agitator			
Hydraulic Circuits: System #1	Axial Piston, Variable Displacement and Output regulator			
System #2	Axial Piston, Variable Displacement			
System #3	Gear Driven, Fixed Displacement			
Hydraulic Tank Capacity (gal/ltr)	50	189	50	189
Fuel Tank Capacity (gal/ltr)	20	75	20	75
Suspension	Torsion Spring			
Length (in/cm)	166	422	166	422
Width (in/cm)	66	168	66	168
Height (in/cm)	76	193	76	193
Trailer Units Weight (lbs/kg)	5000	2268	5200	2360
Remote Control on/off w/cable (ft/m)	100	30	100	30
(Wireless Remote Control Optional)				

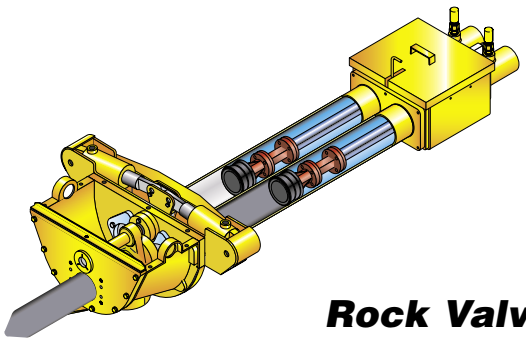
*Pumping distances shown are to be used as a guide only since they have been considerably exceeded on specific projects. Maximum attainable distances depend upon concrete mix design and pipeline diameter. Maximum output and distance cannot be achieved simultaneously.

**Pump specifications are for standard units. Other units are available.

Specifications subject to change without notice.

Ask any Schwing owner about the unmatched back up in parts and service that you will rely on in the fast-paced construction industry. More concrete is pumped through Schwing units than any other brand because we are there to support our customers with knowledge and service.

And only Schwing offers the extensive line to grow with you as your pumping needs expand in the future. Choosing Schwing equipment means you can focus on your business - and your success. **Solutions, Value and Success**…only from Schwing.



Rock Valve™

The patented Rock Valve™ has pumped more concrete than any other type of valve. Line pumps are equipped with either a short or long version of the Rock Valve™ depending on the mix design. Proof of performance of this valve is millions of yards successfully placed.

SCHWING AMERICA INC.

LINE PUMPS

1300 Gresham Road
Marietta, GA 30062
800-237-8960
678-560-9801
FAX 678-560-1269
www.schwing.com

Represented by

360-555 Hervo Street
Winnipeg, Manitoba
Canada R3T 3L6
Ph: 204-262-5900
Sales: 306-292-6367
www.multicretesystems.com

10/05-2000

REED

MULTICRETE

A Series "Rockmaster" Pumps

A30/A30HP/A40HP Trailer Mounted Concrete Pumps

"Rockmaster":

Premium pump in its class, built with the same leading edge engineering as our top-of-the line pumps. The **Rockmaster** delivers outstanding long term value for the money by virtue of its reliability, toughness, ease of use, durability and pumping power.

The **Rockmaster** is powered by a 82 hp (61 kW) continuous duty diesel engine. This best-in-class power is the basis for the pump's versatility. It can be used to pump rough concrete mixes as well as shotcrete. (A40HP is recommended for higher pressure applications).

The **Rockmaster** features an "Open-Loop" hydraulic system, a large fuel tank, and ***REED's*** Can-Bus Solid State Cycle Control.

Standard Features:

- Powerful 82 hp (61 kW) diesel engine (continuous duty)
- Variable Displacement Piston Hydraulic Pump (A30HP and A40HP models)
- Gear Pump (A30 model)
- Heavy-duty "S" Valve
- Lightweight
- ***REED*** Can-Bus Solid State Electric System
- Chromed concrete cylinders for long service life
- Easy to change Piston Cups
- High-strength frame design
- Only 4 hydraulic hose groups (8 hoses total)
- Adjustable tongue jack
- Fuel Filters (Pre-filter with water separator and spin off primary filter)

Applications:

- ***Big Rock***
- ***Grout***
- ***Pea Gravel***
- ***Shotcrete***
- ***Slope Stabilization***
- ***Ponds & Spas***
- ***Slabs***
- ***Rockscaping***
- ***Mines***
- ***Backfill***
- ***Foundations***
- ***Pressure Grouting***

A Series "Rockmaster" Pumps

A30/A30HP/A40HP Trailer Mounted Concrete Pumps

Additional Features:

- Reversibility at any point in the stroke
- Variable volume output
- Weatherproof NEMA 4 control panel
- High capacity hydraulic oil cooler
- Highway rated axle
- Electric brakes
- Fenders and flush-mounted tail-lights
- Adjustable pintle hitch
- Hopper grate
- Safety emergency stop function
- Steel pistons with urethane cups
- Hard chromed concrete cylinders
- Hour meter
- Splined shaft on "S" Valve
- Dual hydraulic circuit
- Highest standard horsepower and concrete pressure in class

Optional Features:

- Radio remote control
- 7-function hardwire remote control (On/Off/Reverse/E-stop/Horn-reset/RPM control/Stroke Change)
- Hopper Agitator (A40HP only)
- Chrome wheels
- Hydraulic Surge Brakes
- 2 5/16" Ball Hitch
- Screw-type Outriggers (manual, adjustable)
- U.S. Tool Kit (for International Customers)
- Emergency Stroke Kit

MODEL		A30	A30HP	A40HP
Concrete Output	yd^3/hr	30	30	40
	m^3/hr	23	23	31
Concrete Pressure	psi	903	903	1172
	bar	62	62	81
Horizontal Pumping Distance *	ft	900*	900*	975*
	m	274*	274*	297*
Vertical Pumping Distance *	ft	350*	350*	400*
	m	107*	107*	122*
Perkins Diesel Engine	hp	82	82	82
	kW	61	61	61
Main Hydraulic Pump		Gear Pump	71cc Variable Displacement	100cc Variable Displacement
Concrete Cylinder Diameter	in	5"	5"	6"
	mm	127	127	152
Stroke Length	in	30"	30"	30"
	mm	762	762	762
Maximum Aggregate Size	in	1"	1"	1.5"
	mm	25	25	38
Hopper Capacity	ft^3	10	10	10
	liters	283	283	283
Hopper Height	in	40	40	40
	mm	1016	1016	1016
Hydraulic Oil Capacity	gal	40	40	40
	liters	151	151	151
Fuel Capacity	gal	29	29	29
	liters	110	110	29
Outlet Size	in	5	5	5
	mm	127	127	127
Dimensions		Length	Width	Height
	in	160	61	64
	mm	4064	1549	1626
Weight (Approx.)	lbs	4600	4600	4760
	kg	2087	2087	2159

* Theoretical distances and performance shown above are estimated using standard industry methods.
Actual performance will vary depending on the concrete pump (concrete pressure, horsepower), material (mix design, slump, local sand and rock characteristics), and delivery system (pipeline diameter, type (steel or hose) and reductions/bends.
Maximum output, pressure, and distance cannot be reached simultaneously. Specifications subject to change without prior notice.

Distributed By:

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Canada R3T 3L6
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www.multicretesystems.com

7. CONCRETE MATERIALS & PRODUCTS

DRY STANDARD MIX CONCRETE

DRY - RAPID SET CONCRETE

TOP ‘N ‘ BOND SELF BONDING CEMENT MIX

MULTI-BLOCKS®

STANDARD PRE-MIXED CONCRETE MIX

A QUALITY PRE-BAGGED PRODUCT

PRODUCT
Standard Pre-Mixed Dry Concrete is a bagged product consisting of accurately weighed Portland admixtures and specially graded, coarse and fine aggregates. With the addition of water and thorough mixing, proper consolidation, finishing and curing, a quality concrete suitable for a variety of uses will be produced.

QUALITY
Concrete aggregates conform to requirements of the ASTM C 33-90 standards. Cement conforms to the requirements of the ASTM C 150-89. Regular quality control tests are performed and copies of the test reports are available on request.

APPROXIMATE YIELDS
When mixed with water to a slump of approximately 3 inches (75 mm) 67 lbs) (30 kg) bag of Rapid Set Concrete gives the following approximate yields:

Bags per yd3	55
Bags per m3	72
ft3 per bag	0.49
Liters per bag	14.5

SAFETY PRECAUTIONS
Standard Pre-mixed Concrete Mix contains Portland cement, silica fume and other carefully selected additives. Normal safety wear such as rubber gloves, dust mask and safety glasses used to handle conventional cement based products should be worn. Material Safety Data Sheets are available on request.

TYPICAL PROPERTIES
When mixed to a slump of approximately 3 inches (75 mm) and adequately cured, Standard Pre-mixed Concrete Mix will develop compressive strengths of 30 Mpa or more after 28 days.

OPTIONAL PROPERTIES
Strengths up to 40 Mpa (6000 psi)

ADMIXTURE OPTIONS
Admixtures can pre-blended into the product such as:
Air Entrainment
Super Plasticizers
Accelerators
Fiber Reinforcements

SPECIAL MIX SPECS
Sulphate Resistant or Acid Resistant Cement Type S
Calcium Aluminate

PACKAGING
Note: Packaging available in up to 1 cubic yard Bulk Bags.

RAPID SET CONCRETE MIX

A QUALITY PRE-BAGGED PRODUCT FOR HIGH EARLY STRENGTH

PRODUCT
Rapid-Set Concrete is a rapid curing premixed, bagged product used where high early strengths are required. It is ideally suited for cold weather applications. The product consists of accurately weighed Portland admixtures and specially graded coarse and fine aggregates. With the addition of water, through mixing, proper consolidation, finishing and proper curing, and quality concrete suitable for a variety of uses will be produced.

QUALITY
Concrete aggregates conform to requirements of the ASTM C 33-90 standards. Cement conforms to the requirements of the ASTM C 150-89. Regular quality control tests are performed and copies of the test reports are available on request.

APPROXIMATE YIELDS
When mixed with water to a slump of approximately 3 inches (75 mm) 67 lbs) (30 kg) bag of Rapid Set Concrete gives the following approximate yields:

Bags per yd3	55
Bags per m3	72
ft3 per bag	0.49
Liters per bag	14.5

PACKAGING
Note: Packaging available in up to 1 cubic yard Bulk Bags.

SAFETY PRECAUTIONS
Rapid-Set Concrete mix contains Portland cement, silica fume and other carefully selected additives. Normal safety wear such as rubber gloves, dust mask and safety glasses used to handle conventional cement based products should be worn. Material Safety Data Sheets are available on request.

TYPICAL PROPERTIES
When mixed to a slump of approximately 3 inches (75 mm) and adequately cured, Rapid Set Concrete will develop compressive strengths of 20 Mpa or more after 4 hours at 200C.

OPTIONAL PROPERTIES
Strengths up to 40 Mpa (6000 psi)

ADMIXTURE OPTIONS
Admixtures can pre-blended into the product such as:
Air Entrainment
Super Plasticizers
Accelerators
Fiber Reinforcements

TOP-N-BOND CEMENT MIX

A SELF BONDING CEMENT MIX

PRODUCT
A one-part, self bonding, cement base patching mate-rial specifically formulated for thin-section repairs to existing surfaces. When used as directed, it has superior bonding power to regular sand and cement boxes and adheres se-curely to concrete, masonry and stucco. The material re-quires only the addition of clean water. Exhibits the color of concrete, and may be used on interior and exterior installa-tions. Edges feather easily, does not shrink and Top-N- Bond develops exceptional strength. Final set is obtained in 4-5 hours, depending on relative surface and air temperature.

USES: Top-N-Bond is recommended for repairing steps, leveling slabs, patching small holes, and smoothing rough, worn or spalled concrete surfaces. Application may be by either trowl-on or brush-on methods. Be-cause of its bonding strength, Top n Bond may be used as a mortar for repairing old masonry and setting units of stone, marble and brick.

PREPARATION:Surface of working area must be clean and free from all deleterious material. Remove oil, grease, wax, silicones, paints, efflorescence or other materials which interfere with the bond and chemical action of the material. Slick or sealed surfaces must be thoroughly roughened.
Structural cracks should be widened with hammer and chisel to an inverted "V" shape and filled with a sand and cement mixture. Allow repair to cure for 24 hours prior to resurfacing area with TOP-N-BOND. Treating surface with a commercial grade, dilut-ed muriatic acid may be helpful in removing embed-ded coatings such as paint, sealers and hardeners. It is suggested that a test patch be made on a small section to determine if a good bond is obtainable.

MIXING: Use clean tools and water, free of impurities. Gradually stir in water until a thick, workable mixture is obtained. A 40 lb bag requires approximately 3 quarts of water and a 10 lb tub. 1 ½ pints. Mix with a trowel, scoop, hoe or mechanical mixer, making sure that all pockets of dry material are blended into the wetted mass. After mix-ing, allow the wetting material to stand 10 minutes before using. For a brush or broom coat application, add addi-tional water as required to a "thick paint" consistency. Too much water will cause aggregate in mix to settle.

APPLICATION
General Repair: Place patch material on surface to be coated. With a steel trowel, use enough pressure to force the mix into the original concrete. Trowel over the patched area and finish smooth. If surface is to receive a brush coat, precoat the area to be repaired. TOP-N-BOND may be applied to temperatures as low as 500F; best results are obtained at temperatures around 700F. During cold weather, store at room temperature for a 24 hour period prior to use. On excessively hot days, use material only if protected from direct heat of sun. Brush-Coat Resurfacing: Dampen surface by satu-rating with water to prevent concrete base from ab-sorbing water in material mix. Use wide, soft-bristle push broom to spread the TOP-N- BOND concrete re-surfacer. Wet broom with water prior to starting. Spread the material as thin as practical and then "finish" by brushing the surface in only one direction, so that brush marks will show uniformly. Because of high water retention properties, no special curing is required under normal conditions. When applica-tion is more than ½ inch thick or when exposed to direct heat of the sun, cover or shade patched area for 24 hours. Do not re-wet surface. Under normal conditions, re-paired surfaces can be used for light traffic after 24 hours or heavy traffic, after 48 hours.

TECHNICAL DATA
Design strengths, PSI (based on a mortar consistency)
COMPRESSIVE STRENGTH (ASTM C-109)

2 days	3 days	7 days	28 days
2000	3500	4500	5500

TENSILE STRENGTH

2 days	3 days	7 days	28 days
-	-	600	690

BOND STRENGTH/(shear Bond)

2 days	3 days	7 days	28 days
-	-	400	500

COVERAGE
General Repair – 40 lbs, covers approximately 18 square feet, ¼ inch thick.
Brush Coat Resurfacing – 40 lbs will cover up to 80 square feet, with variance due to surface texture and porosity.
Packaging - 10 lb container, 40 lb triple-walled bag

MULTI-BLOKS®

PRECAST CONCRETE BLOCKS FOR SAFETY BARRIERS, HIGHWAY PROJECTS, SURFACE AND UNDERGROUND APPLICATIONS

Multicrete MULTIbloks® are portable, stackable, and cost effective.

LOCKING TOP PATTERN ENSURES SECURE JOINT

STACKABLE INTER-LOCKING DESIGN ENSURES SECURE AND SAFE STRUCTURE

8. GROUT EQUIPMENT & ACCESSORIES

CG500 HIGH VOLUME GROUT PLANT

CG500 HP HIGH PRESSURE GROUT PLANT

MULTICRETE HIGH PRESSURE GROUT PUMPS

ICTUS® M500 GROUT PUMP

MULTICRETE 3100 GROUT MIXER

MULTICRETE COLLOIDAL SD6 MIXER

MINEPRO® MP3

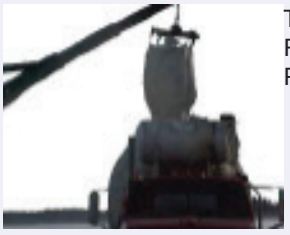
YORK® 400 HIGH PRESSURE GROUT PUMP

CHEMGROUT® LINE UP

GROUT SELECTION CHART

APPLICATION	MATERIALS	EQUIPMENT
Cable Bolts and Structural Pads. **Cable bolts are grouted ten-dons that "anchor" equipment or machines to structures.**	**Sanded or Unsanded Cement based Cable bolt Grout (MSI CB-S / CB Grout)**	 C3100 Ictus Pump (small)
	Non-Shrink MSI 424+	 CG542 (medium)
	CB-S / CB or MSI 424+	 Minepro 3 (large)
Void Filling. **Voids can cause overlying structures to settle. Grout is pumped under pressure into a void beneath a structure. The cavity might have been caused by a water supply or drainage line break where the soils have been washed away.** **Ideal for situations during new construction or machine placement where a void cannot be easily filled without extensive rip out.**	**Sanded**	 CG542 (low)
		 G500 (low)
		 Schwing pump 306/500 (large)

GROUT SELECTION CHART (CONTINUED)

APPLICATION	MATERIALS	EQUIPMENT
Water Control/Cutoff. **This type of grouting may serve two purposes: to decrease the permeability of the soil and provide "water-tightening" and "waterproof " excavations/tunnels.**	**Water Cutoff grout**	 Chemgrout 600/Piston Pump (small)  D6 and York 400 (med)
Consolidation and Fracture/Pressure Grouting. **Grout is pumped under pressure into unconsolidated rock masses or soils.** **Pressure grouting is ideal for situations requiring strengthening and/or water flow reduction.**	**Unsanded**	 Chemgrout 600/ Piston Pump (small)  York 400 (high)
Tremie/Preplaced Aggregate (High volume/low pressure) **Tremie grout is specially designed for use in underwater grouting applications. This highly flowable, cement based, non-shrink grout remains in a cohesive, well blended mix when placed or pumped in off-shore concrete repairs.**	**Sanded, Silica Fume Enhanced Mix**	 Truck Mixer and Reed or Schwing Piston Pump

GROUT SELECTION CHART (CONTINUED)

APPLICATION	MATERIALS	EQUIPMENT
SRF Slurry **Cement grouting, also known as slurry grouting or high mobility grouting, is a grouting technique that fills pores in granular soil or voids in rock or soil, with flowable particulate grouts.**	**Unsanded F/A - Cement Blend**	 Colloidal Mixer and Optional Moyno pump (progressive cavity) (small - med)  MSI 680 (large)  Progressive Cavity Moyno or Piston Pumps (large)
Polyurethane **Polyurethane grouting seals concrete joints. Polyurethane chemical grouts react with water to either bond with the concrete to form watertight, permanent seals or to become rigid, filling voids and stabilizing soil.**	**Universal**	 Hand Pump (small)  Electric Pump (medium)

CG-500 VERSATILE SERIES HIGH VOLUME GROUT PUMP

The ChemGrout® CG-500 versatile series are high production, skid-mounted grout plants. These versatile units are designed to mix and pump neat cement, sanded grouts and most commercial pre-blended grout mixes.

The versatile series features two 70-gallon (265 L mixing tanks, a 15-gallon (57 L) holding hopper and an open throat progressive cavity pump. Two high-capacity 70-gallon mixing tanks, pump, and 15-gallon holding hopper are all mounted on a single skid for quick, easy set-up and immediate operation. The holding hopper includes an internal auger that keeps the material thoroughly mixed while supplying the pump.

The open throat grout pump features a non-pulsating positive displacement rotor-stator that provides a constant discharge of materials. This progressing cavity pump is variable speed with an output of up to 20 gpm with a standard maximum pressure of 174 psi (261 psi optional).

Application include:

- Soil compaction
- Rock grouting
- Void-filling
- Waterproofing
- Soil anchors
- Cable bolts
- Rock bolts
- Well encasements
- Contact grouting
- Well abandonment
- Marine/underwater
- Post tensioning
- Precast
- Machine base installation
- Self-leveling floor underlayments
- Slab undersealing and slab-jacking.

Progressing Cavity Pump	Hopper Volume	Max. Output	Max. Pressure
CG t-2C6 Grout Pump	15 Gallons (57L)	20 GPM (75 LPM)	174 PSI (12 BAR)
CG t-3C6 Grout Pump	15 Gallons (57L)	20 GPM (75 LPM	261 PSI (18 BAR)
Model Number	**Description**	**Dimensions**	**Weight**
CG 500/2C6/A	Skid Mounted Air Powered Grout Pump Requires 250 CFM, 100 PSI	88” L X 34” W X 58” H	1100 lbs
CG 500/2C6/H	Skid Mounted Hydraulic Grout Pump Requires 12 GPM, 1200 PSI	88” L X 34” W X 50” H	950 lbs
CG 500/2C6/ EH3	Skid Mounted Electric/Hydraulic Grout Pump Requires 230/460 V 38/19 A	88” L X 34” W X 58” H	1150 lbs
CG 500/2C6/ GHES	Skid Mounted Gas/Hydraulic Grout Pump HP Briggs&Stratton Vanguard, Electric Start	88” L X 34” W X 58” H	1425 lbs
CG 500/2C6/ DH	Skid Mounted Diesel/Hydraulic Grout Pump HP Lombardini, Electric Start	100” L X 34” W X 58” H	1625 lbs

CG-500 VERSATILE SERIES HIGH PRESSURE GROUT PUMP

The ChemGrout® CG-500 High Pressure series are high production, skid-mounted grout plants. . The versatile series features two 70-gallon (265 L mixing tanks, a 21-gallon (80 L) holding hopper and a high pressure plunger grout pump. The unique double mix tank design permits continuous pumping as each tank alternately feeds the pump. Each mixer is equipped with baffles, bag breakers and variable speed high-efficiency paddles that provide rapid mixing. The tank outlets are large slide gates that allow viscous grouting materials to flow quickly into the removable holding hopper. The holding hopper is connected directly to a double acting, positive displacement plunger pump that is available in three configurations, 3x8, 2x8 and 1x8, offering discharge pressures of 1,000 psi, 1,6-- psi and 2,000 psi respectively. The plunger pump is designed so that conversion between the pressure outputs is quick, easy and cost effective. The pumps' patent fasteners dramatically reduce disassembly time for cleaning and maintenance. Operator controls are centrally located for efficient production.

Application include:
Civil engineering - soil nails, tiebacks, earth anchors, high pressure rock grouting
Structural - building restoration, foundation stabilization, foundation raising, soil compacting grouting
Construction - post tensioning, slab undersealing, slab jacking and slab raising
Marine - underwater foundations, piers, breakers, shoreline foundations
Mining - high pressure rock grouting, tunnel lining, contact grouting, waterproofing, cable and rock bolts
Utilities - encasements, waterproofing, dam foundations
Geo technical - deep well casing, monitor wells, well sealing and abandonment.

Pump Size	Maximum Output	Max. Pressure
1" x 8"	10 GPM (38 LPM)	2000 PSI (138 BAR)
2" x 8"	15 GPM (58 LPM)	1,600 PSI (110 BAR)
3" x 8"	20 GPM (77 LPM)	1,000 PSI (69 BAR)

Model Number	Description	Dimensions	Weight
CG 500/3x8/A	Skid Mounted Air Powered Grout Plant Requires 250 CFM, 100 PSI	88" L X 34" W X 58" H	1300 lbs
CG 500/3x8/H	Skid Mounted Hydraulic Grout Plant Requires 12 GPM, 1200 PSI	88" L X 34" W X 50" H	950 lbs
CGPU15/EH3	Power Pack 15 HP Electric/Hydraulic Grout Pump HP requires 230/460 V, 38/19 A, 3 Phase	44" L X 32" W X 38" H	450 lbs
CGPU18/ GHES	Power Pack Gas/ Hydraulic 18 HP gasoline engine with electric start	44" L X 32" W X 35" H	425 lbs
CGPU20/ DHES	Power Pack Diesel/Hydraulic 20 HP diesel engine with electric start	44" L X 32" W X 38" H	525 lbs

HIGH PRESSURE GROUT PUMP

High Pressure grout pumps combine the latest advances in grouting equipment design and flexibility. With the HP series, you can customize pump to meet specific needs by installing a simple conversion kit to increase discharge pressure in the field from standard 1,000 to **1,600 PSI** or **2,000 PSI**.

High Pressure Series pumps are offered separately, or with optional mixing tanks. They can accommodate a variety of power sources to deliver higher volumes at greater pressures for optimum production.

ICTUS® M500 GROUT PUMP

INJECTION GROUT PUMP - IDEAL FOR USE WITH MULTICRETE TC3100 MIXER

The Ictus® M500 series is portable and lightweight while robustly constructed. In combination with the Multicrete-TC3100 grout mixer it is mainly used for full-column grouting as in cable–anchoring and also for spraying materials. Combining the air-motor with different riser-tube assemblies (fluid sections) will adapt the pump to suit a particular need. The most important are tabled below.

All the pumps are equipped with a VFO lubricator/filter to ensure clean lubricating air operates the pump. The riser-tube is fitted with a clamp and allows removal of the tube for cleaning without the need of special tools. The pumps come with hoses and fittings to suit the application. The pumps can handle a variety of mixes, from a thin liquid to a viscous grout (1:3 water to cement ratio). Other models can be manufactured to meet special needs (coal mining).

SPECIFICATIONS

Weight (kg/lb).....16.....36
Riser Tube Length (mm/in) .....650.....26
Riser Tube Options (mm/in) 375.....15
Riser Tube Diam. (mm/in) .....72.....2.9
Stroke Length (mm/in) .....80.....3
Stroke/Minute (5 Bar/90psi) .....180..... -
Swept Volume (ml/cu.in).....163.....9.9

PUMPING CAPACITY

Thick, Viscous Material ..... 9.....2.4
Thin, Watery Material .....30..... 7.8
Air Requirent/min (bar/psi) .....3.....44
Delivery Pressure (bar/psi) .....110... 1595
Air Consump. (cu.m/sec/CFM) 0.0006.....12
Horiz. Pump. Dist. (m/ft) .....90..... 300
Vert. Pump. Dist. Max (m/ft) .....14.....46
Aggregate Size Max (mm/in).....6..... 1/4

ICTUS EQUIPMENT (Pty) Ltd

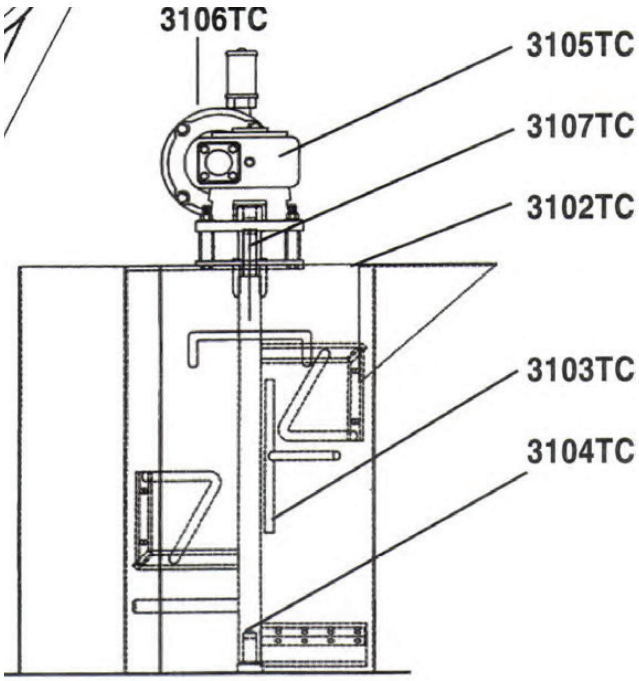
MULTICRETE 3100 GROUT MIXER

USED IN COMBINATION WITH THE ICTUS M500 GROUT PUMP

The Multicrete 3100 Grout Mixer System allows mixing of grout and may be used in combination with the Ictus® M500 Grout Pump.

FEATURES

- Sturdy, Heavy-Duty Construction
- Portable—Weighs 72 kg. (160 lbs.)
- Removable Hopper
- 4.6 HP Vane Air Motor with Reducer
- 2.2 cm (1”) Filter-- Lubricator System
- 90 Liter (20 Gallon) Mixing Tank
- The compatible partner to the Ictus/Spedel M60 grouting pump which fits perfectly in forward section of mix tank.



MULTICRETE COLLOIDAL MIXER

MIXES A RANGE OF MATERIALS ON THE JOB SITE

This machine is a single drum, high seed, high shear unit designed for the efficient production of cement- based grouts. The product exhibits colloidal properties and is nearly unmixable in water. Can handle cement/sand ratios of up to 1:3 by weight and produce pumpable mixtures. Will mix a wide range of materials such as cement/PFA, pre-blends, bentonite, lime or chemicals.

General Specifications

Length	1.3m
Width	0.85 m
Height	1.25 m
Power Unit	11 kW electric motor
	15 hp diesel motor
Output	2.5 m3/hour
	Pressure 2.0 bar

Batch capacity - The mixing batch capacity is 120 liters

MINEPRO MP3
GROUT MIXER & PUMP

MINEPRO grout mixer/pumps are designed specifically for the mining industry. MINEPRO pumps are used extensively for cable bolt grouting and will outperform all other existing grout pumps. They will allow the mines to install high quality, grouted cable bolts at a much lower cost than other pumps.

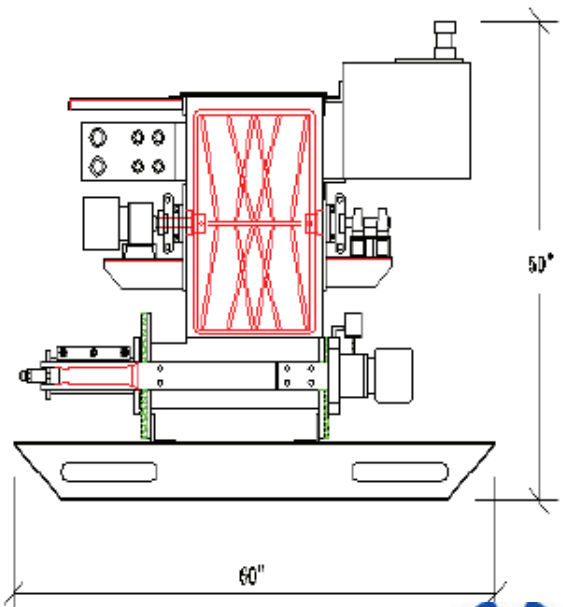
Features:
Quiet and powerful
Reliable and low maintenance
Easy one man operation

Mixer:
Vertical shaft mixer
145 L wet grout capacity
(9 x 20 kg bags of cement + 54 L of water)

Pump:
Produces high sheer, high density, thixotropic grout
Progressive cavity
20 L/min (300 psi)
0-20 L/min (3 MPa)

Mobility Options:
Skids
Heavy-duty 4-way skids
4 wheel pull cart
2 wheel highway trailer

Power Options:
Direct air drives (80 psi, 500 cfm)
Air/Hydraulic
Electric/Hydraulic
Diesel/Hydraulic (10 HP)



MINEPRO LANGFORD ELECTRIC GROUT MIXER & PUMP / LEH

MINEPRO grout mixer/pumps are designed specifically for the mining industry. MINEPRO pumps are used extensively for cable bolt grouting and will outperform all other existing grout pumps. They will allow the mines to install high quality, grouted cable bolts at a much lower cost than other pumps.

Features:
Quiet, powerful, and robust
Reliable and low maintenance
Produces high shear, high density thixotropic grout
Easy one man operation

Mixer:
145 L wet grout capacity
(9-20 kg bags of cement + 54L of water)

Pump:
Progressive cavity
20 L/min (300 psi)
0-20 L/min (3 MPa)

Mobility Options:
Skids
Heavy-duty 4-way skids
4 wheel pull cart
2 wheel highway trailer

Power Options:
Direct air drives (80 psi, 500 cfm)
Air/Hydraulic drive (80 psi, 500 cfm)
Electrical/Hydraulic (550 V 10 HP)
Diesel/Hydraulic (10 HP)

MINEPRO LAM LANGFORD AIR GROUT MIXER & PUMP

MINEPRO grout mixer/pumps are designed specifically for the mining industry. MINEPRO pumps are used extensively for cable bolt grouting and will outperform all other existing grout pumps. They will allow the mines to install high quality, grouted cable bolts at a much lower cost than other pumps.

Features:
High-density cement grout of 0.3:1 water to cement ratio
Mixes consistent high density thixotropic grout
Reliable and low maintenance – No need for spares
Easy one man operation
Easy cleaning, rubber lined – Disassemble quickly without tools

Mixer:
145 L wet grout capacity
(9-20 kg bags of cement + 54L of water)

Pump:
Progressive cavity
0-320 gpm (425 psi)
0-20 L/min (3 MPa)

Weight:
950lbs (430 kg) (air drive, skids)

Operating Weight:
1,300 lbs (590 kg)

Size:
1.5m x 0.8m x 1.1m (60” x 32” x 44” high)

Mobility Options:
Skids
Heavy-duty 4-way skids
4 wheel pull cart
2 wheel highway trailer
Remote package

Power Options:
Direct air drives (80 psi, 500 cfm)
Air/Hydraulic drive (80 psi, 500 cfm)
Electrical/Hydraulic (550 V 10 HP)
Diesel/Hydraulic (10 HP)

MINEPRO CAM COMPACT
AIR MECHANICAL GROUT MIXER & PUMP

MINEPRO grout mixer/pumps are designed specifically for the mining industry. MINEPRO pumps are used extensively for cable bolt grouting and will outperform all other existing grout pumps. They will allow the mines to install high quality, grouted cable bolts at a much lower cost than other pumps.

Features:
Compact and strong
Reliable and low maintenance
Easy one man operation

Mixer:
85 L wet grout capacity
(5 x 20 kg bags of cement + 30L of water)

Pump:
Double-action Piston (Non-surging)
20 L/min (300 psi)
0-20 L/min (3 MPa)

Weight:
350lbs (290 kg) (air drive, skids)

Operating Weight:
627 lbs (290 kg)

Size:
1.3m x 0.5m x 0.8m (51” x 24” x 32” high)

Mobility Options:
2 wheel highway trailer

Power Options:
Air (80 psi, 150 cfm)

MINEPRO KANUK ELECTRIC
HYDRAULIC GROUT MIXER & PUMP

MINEPRO grout mixer/pumps are designed specifically for the mining industry. MINEPRO pumps are used extensively for cable bolt grouting and will outperform all other existing grout pumps. They will allow the mines to install high quality, grouted cable bolts at a much lower cost than other pumps.

Features:
Mixing hopper and discharge hopper
Quiet, powerful and robust

Mixer:
85 L Mixer, 85 L Hopper

Pump:
Produces high sheer, high density, thixotropic grout
Progressive cavity
20 L/min (300 psi)
0-20 L/min (3 MPa)

Weight:
1,400 lbs (635 kg)

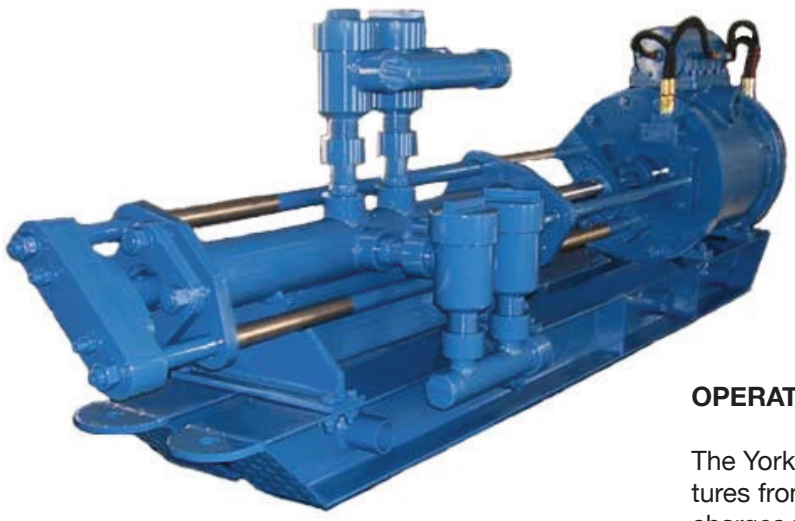
Operating Weight:
1,932 lbs (876 kg)

Size:
1.83 m x 1.22 m x 1.33 m (72” x 48” 53” high)

Mobility Options:
Skids
Heavy duty 4-way skids
4-wheel pull cart package
2 wheel highway trailer

Power Options:
Direct air drive (80 psi, 500 cfm)
Air/Hydraulic
Electrical/Hydraulic
Diesel/Hydraulic (10 HP)

YORK-400 GROUT PUMP



York-400 is used for high pressure grouting at 3500 psi. Works excellent in conjunction with our MSI SD6 colloidal Mixer plants.

The York cement grout pump is a heavy duty, high capacity, high pressure cement grout pump for the most demanding underground mine grouting applications. The York grout pump is made in Canada and has been used successfully for many years in all types of mine grouting work.

OPERATION

The York cement grout pump draws cement grout mixtures from a grout mixer or grout agitator tank and discharges through high pressure grout hose and fittings. The pump is compressed-air operated and can be easily regulated to deliver any desired grout flow rate or grout pressure within a wide operating range. The wetted components are easily disassembled for cleaning, inspection and replacement as required. A double set of intake and outlet check valves provide a double-acting displacement of grout on each pump stroke.

TECHNICAL DATA:

Air Motor Inside Diameter	36 cm (14 inches)
Wetted Piston Diameter	5 cm (2 inches)
Pump Stroke	30.5 cm (12 inches)
Pump Displacement	1200 mi/cycle (0.32 US gal/cycle)
Pump Output	72 liters (19.2 US gal) at 60 cycles/mm
Pump Inlet & Outlet Diameter	2” NPT (interchangeable)
Air Motor:	Wetted Piston Ratio 49:1
Maximum Operating Pressure	3500 psi (recommended)
Air Pressure Control	2” Regulator Included
Check Ball Diameter	2 inch
Air Motor Inlet & Exhaust	2” diameter
Overall Dimensions	274 cm (108 inches) X 60 cm (24 inches) X 75cm (30 inches)
Operating Weight	475 kg (1050 lbs)
Skid Mounted	15 cm (6 inch) wide flange beams
Lifting Lugs	Two on each end

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Mining
Geotechnical
Building Construction

Restoration Repair
Highway
Municipal
Maintenance/Plant

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ChemGrout®

Experience in Grouting for more than 45 Years

There's no substitute for experience.

For more than 45 years, ChemGrout has manufactured the world's largest selection of grouting equipment. Based in LaGrange Park, Illinois, ChemGrout offers both colloidal and paddle type grout mixers, as well as a variety of grout pumps, including piston, plunger and progressing cavity. The concepts of mixer-pump balance, user-friendly operation and ease of maintenance are emphasized in the design of our grouting systems. Enough technology is incorporated to maximize efficiency, yet not so much as to compromise ease of operation or maintenance.

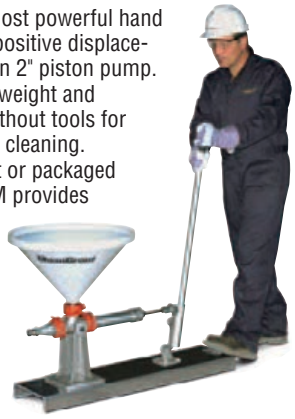
Complete integrated mixing and pumping units are available in a variety of power options, including air, hydraulic, electric, electric/hydraulic, gasoline and diesel/hydraulic. All of our grout plants are offered skid mounted, with many available in a trailer version. To assist you in finding the grout plant that best fits your needs, we have provided a five step process, as well as a selection guide on the back cover.

Using proven methods, along with unique and innovative features, ChemGrout remains an industry leader for the equipment you can count on.

Mini-Series

CG-050M Hand Grout Pump

The industry's most powerful hand pump utilizes a positive displacement hand-driven 2" piston pump. It's rugged, lightweight and disassembles without tools for fast and efficient cleaning. For sand/cement or packaged grouts, the 050M provides injection pressures of more than 200 psi (14 bar). Net Wt. 52 lbs. (23.6 kg).



CG-050 Mini Grout Pump

Max. output 5 gpm (19 l/m); max. pressure 225 psi (16 bar); max. pressure 400 psi (28 bar) for hydraulic model. Pumps a bag of non-shrink grout per minute. Positive displacement 2" piston pump delivers sand/cement or packaged grouts. For small volume grouting in construction, maintenance & mining.

CG-550P Mini Grout Pump & Mixer

Max. output 5 gpm (19 l/m); max. pressure 225 psi (16 bar). Features the CG-050 2" piston pump. Mixes and pumps sand/cement or packaged grouts. Large 34 gal. (128 l) mixing tank offers easy, continuous pumping. Net Wt. 300 lbs. (136 kg) Drive power — air, hydraulic.

Rugged Series

CG-550/030 Rugged Series

Max. output 12 gpm (45 l/m); max. pressure 400 psi (27 bar). Powerful 3" piston pump allows single operator to mix and pump cement, bentonite and cement/sand slurries. Applications include well casings, void filling, underground pipe installation, slab jacking, restoration, pavement repair, soil & slab stabilization and self-leveling underlayments.

CG-555/030 Rugged Trailer

Workhorse Series

CG-550/C4 Workhorse Series

Max. output 8 gpm (30 l/m); max. pressure 174 psi (12 bar) or optional 261 psi (18 bar). Mixes & pumps cement, flyash, bentonite and sand, packaged non-shrink grouts and underlayments. Utilizes C4 progressing cavity pump. Consistent flow, with variable output from 0.5 gpm (2 l/m) to 8 gpm. One man operation.

CG-555/C4 Workhorse Trailer

MULTICRETE

Colloidal Series

ChemGrout offers a wide variety of custom systems to fit the special requirements needed today for many unique applications. Please call us for information and pricing.

CG-600 Colloidal Series

Max output 20 gpm (76 lpm); max pressure 261 psi (18 bar). Combines the latest advances in colloidal mixing and meets the high-shear mixing standards required by a growing number of industries. Process reduces mix time and increases fluidity, both important factors in dam, rock and soil grouting. The high strength benefits of the colloidal process are also necessary for sensitive applications such as post-tensioning.

CG-680 High Capacity Colloidal Series

Max. ouput 30-60 gpm (170/lpm: max. pressure 261 psi (18 bar). High capacity colloidal grout plant is specially designed for large, heavy construction projects. Mixes and pumps slurries of cement, fly ash, bentonite and lime flour. Commonly used in tunneling, mining, dam foundations, soil compaction and encasements. Units feature both a 17 cubic foot colloidal mixer and agitating storage tank.

CG-620 Colloidal Mixer

The CG-620 is a skid mounted, stand-alone colloidal mixer, used with other ChemGrout agitating/pumping equipment. Featuring ChemGrout's "Turbo-Mix" colloidal mixing pump, the CG-620 is available in 8, 13 and 17 cubic foot sizes.

CG-680/3.5X8 High Pressure Colloidal Series

Max. output 32 gpm, (120 lpm); max pressure 1,500 psi (103 bar). High Pressure colloidal grout plant is ideal for heavy construction projects such as foundations, tunnels, mining and anchors. Cement slurries, bentonite, fly ash and lime flour are commonly used. Units feature 17 cubic foot colloidal mixer, 17 cubic foot agitating tank and high capacity, double acting plunger pump.

Accessories

Heavy Duty Grout Hose

Fill Rite Water Meter

Water Batcher

Protected Pressure Gauge

Multi-Purpose Spray Wand

Mechanical Surface Packer

Hand Mixer

How to Select a Grout Plant:

Step 1:

Identify your application and determine the materials required.

Step 2:

Determine the maximum flow rate (GPM) and grouting discharge pressures (PSI) needed for your application.

Step 3:

Select a grout pump based on flow rate and pressure requirements.

050 Piston Pump 2" = 5 GPM, 225 PSI

030 Piston Pump 3" = 16 GPM, 400 PSI

C4 Progressive Cavity Pump = 8 GPM, 174/261 PSI

C6 Progressive Cavity Pump = 20 GPM, 174/261 PSI

Plunger Pump = 10-20 GPM, 1000, 1600, 2000 PSI

Step 4:

Select a power system.

A = Air

H = Hydraulic

EH = Electric/Hyd.

GH = Gas/Hyd.

DH = Diesel/Hyd.

Step 5:

Select a model number (example: CG-500/3C6/A)

Part 1 – Mixing System (500) = 2 - 70 gallon mix tanks

Part 2 – Pump (3C6) = 20 GPM, 261 PSI

Part 3 – Power System (A) = Air

ChemGrout®

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Thick-Mix Series

CG-570/C6 Thick-Mix Series

Max. output 8 gpm (30 lpm); max. pressure 261 psi (18 bar). Mixes, pumps or sprays thick to thin materials including non-sag repair mortars, plasters, stuccos, fireproofing, waterproofing, bentonite and cement/sand grouts. Utilizes C6 progressive cavity pump.

CG-575/C6 Thick-Mix Trailer

Thin-Mix Series

CG-550/L4 Thin-Mix Series

Max. output 8 gpm (30 lpm); max pressure 174 psi (12 bar) or optional 261 psi (18 bar). This efficient grouter mixes and pumps cement, cement/bentonite and cement/flyash mixes. A single operator can mix and pump providing a non-stop discharge of material. Ideal for well grouting. Uses L4 progressive cavity pump.

CG-555/L4 Thin-Mix Trailer

Geothermal Series

CG-500/030/GT High-Capacity Geothermal Series

Max. output 16 gpm (60 lpm); max. pressure 550 psi (38 bar). The versatile CG500/030 Geothermal Series pumps bentonites, neat cement and the latest geothermal grouts. Two large 70-gallon mix tanks and a 45-gallon holding hopper permits continuous output, as each mix tank alternates feeding the pump. Utilizes powerful 3" single action piston pump. Series is available with a single or double mix tank design and a choice of several power options.

* Models shown with optional water batcher

CG-555/030/GT Geothermal Trailer

Versatile Series

CG-500/C6 Versatile Series

Max. output 20 gpm (76 l/m); max. pressure 174 psi (12 bar) or optional 261 psi (18 bar). Twin 70-gallon mix tanks on a single skid provide high volumes & continuous mixing for a wide range of applications. Mixes and pumps neat cement or sand/cement up to 2:1 ratios. Uses C6 progressive cavity pump.

CG-500/C6 Versatile Grout Plant

Sprayer/Finisher Series

CG-502/C4
Sprayer/Finisher

Max. output 8 gpm (30 lpm); max. pressure 174 psi (12 bar) or optional 261 psi (18 bar). Low profile design for surfacing, finishing/coating floors, walls and ceilings. Mixes and pumps self-leveling underlayments or sprays cementitious materials. Features twin 45 gallon mix tanks and C4 progressing cavity pump.

CG-502/030
Multi-Purpose Grouter

Maximum output 12 gpm (45 lpm), 400 psi (27 bar). Ideal for higher output, multi-purpose grouting applications. Handles a wide variety of materials ranging from fluid slurries to repair mortars. Features two 45 gallon mix tanks and 3" single acting piston pump.

High Pressure Series

CG-500HP High Pressure Series

Series features a double acting high pressure plunger pump available in 2 sizes. 2X8=15 gpm, 1600 psi, 3X8=20 gpm, 1000 psi. Unique pump design allows operator to customize discharge with an optional conversion kit. Perfect for cement slurries. Available in several power options.

CG-600HP
High Pressure Colloidal Series

Series features same double acting high pressure plunger pump as CG500HP with the advantages of colloidal high shear mixing. Standard machines utilize 13 cubic ft. colloidal mixer and 13 cubic ft. agitating storage tank. Commonly used for foundations and tie backs.

* Shown with optional water batcher

High-Pressure Series

CG-580 High-Pressure Series

Max. output 32 gpm (120 lpm): max. pressure 1,200 psi (80 bar). A high output, high pressure skid mounted grout plant that mixes and pumps neat cement, bentonites, lightly sanded grouts and most commercial pre-blended non-shrink grout mixes. Unit features two 128-gallon (480 liters) mixing tanks, a 30-gallon (118 liter) holding hopper and a 3.5X8 double acting plunger pump. Rugged steel frame includes collapsible worker's platform.

* Shown with optional water batcher

Cable & Rock Bolt Series

CG-542 Mining Grouter

Max. output 3.5 gpm (13 lpm); 522 psi (36 bars). Low profile design ideal for a wide variety of mining and tunneling applications including rock bolts and cable stays. Mixes and pumps thicker grouts with low w:c ratios.

High-Capacity Series

CG-580 High-Capacity Series

Max. output 40 gpm (151 lpm): max. pressure 261 psi (18 bar). Mixes and pumps high volumes of material for a wide variety of applications. Unit features two 128-gallon (480 liters) mixing tanks, a 30-gallon (118 liters) holding hopper and your choice of 2J8 open throat or 3L8 progressive cavity grout pump. Rugged steel frame includes collapsible worker's platform and is available in several power options.

Utiform Quattro

Max output 13 gpm (49 lpm); max pressure 450 psi (31 bar). Self-contained with its own water pump, the wheel mounted Quattro delivers a steady, non-stop material flow for a variety of applications. Compact design allows easy movement through standard size doorways for access to the job site. Progressive cavity pump is ideal for cementitious grouts and self-leveling underlayments. Electric - requires 440V, 20A, 3-phase.

Grouting Equipment Selection Guide

Market Segments	Applications	050	050HP	400	550P	540	542	Rugged HP	Rugged 550/030	Workhorse 550/2C4	Thin-Mix 550/2L4	Thick-Mix 570	Quattro	500/550 Geothermal	Versatile 500	500HP	502	580	600	600HP	620	680 High Cap.	680 HP	Materials
																		COLLOIDAL						
Heavy Construction Dams Tunnels Shafts	soil & rock							•		•			•	•	•		•	•	•		•	•	cement, cement/sand,** bentonite mixes
	void filling/waterproofing	•						•		•	•		•	•		•	•	•					
	anchor, cable, rock bolts					•	•		•				•	•			•	•					
	tie backs						•								•		•	•	•			•	
	encasements							•					•	•		•	•	•			•	•	
	foundation, soil, building stabilizing		•				•								•		•	•	•			•	
	marine/underwater		•		•			•		•			•	•			•		•				
Mining	high pressure														•		•	•	•			•	cement, cement/sand, mortars
	anchor, rock bolts						•	•	•				•	•			•	•					
	spraying					•		•	•		•												
Geotechnical	geothermal		•					•					•										cement, cement/sand, bentonite mixes
	well casings							•		•			•										
	abandoned shafts/holes				•			•		•			•										
Environmental Remediation	in-situ injection			•			•								•								ORC, HRC, Permanganate
	biological & chemical injection						•																
Building Construction	post tension																		•	•	•	•	cement, cement/sand, ** premixed grouts
	hollow metal filling-windows/doors	•			•																		
	precast	•			•																		
	machine base	•	•		•	•			•	•	•			•	•								
Restoration Repair	spraying					•				•		•	•										cement, cement/sand, premixed grouts, fireproofing, EIFS coating mortars, plasters/stuccos underlayments
	underlayments								•	•			•	•	•		•						
	waterproofing walls					•				•		•	•										
	resurfacing concrete					•				•		•	•				•						
	topping/bonded overlays					•																	
	undersealing/slab raising	•	•		•				•	•	•	•	•	•	•	•		•					
Highway	undersealing								•	•	•	•		•	•	•		•					
	slab raising				•				•	•	•	•		•	•	•		•	•		•	•	cement, cement/sand, cement/flyash, premixed grouts, manhole relining
	doweling				•																		
	manhole sealing									•		•											
	bridge rehab				•				•	•	•	•		•									
Municipal	undersealing							•	•	•	•	•		•	•	•		•					cement, cement/sand, cement/flyash, manhole relining
	slab raising				•				•	•	•	•		•	•	•		•	•		•	•	
	manhole sealing									•		•											
Maintenance/ Plant	machine base/tank stabilization	•			•				•					•	•			•					cement, cement/sand, premixed grouts,
	encasements								•					•	•		•	•	•			•	

* HP Pumps can be teamed with ChemGrout mixers including 500HP or 620, 630 colloidal mixers

** Sand must be added at agitator with colloidal units

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10/11

9. GROUT MATERIALS

MSI 424+ NON-SHRINK GROUT

SUB-ZERO GROUT

MULTI-GROUT CB®

MULTI-GROUT CB/S®

WATER CUT-OFF GROUT

POLYURETHANE GROUT

XPR GROUT

MULTI-WHITE®

MSI 424+ NON-SHRINK GROUT

FOR GENERAL GROUTING PURPOSES

PRODUCT

MSI 424+ Non-Shrink Grout is a sanded, cement-based, non-ferrous, non-shrink grout. This specially formulated grout features reliability and high performance for a variety of general grouting purposes.

ADVANTAGES

- Non-bleeding
- Non-segregating
- Precision Non-Shrink
- Non-corrosive
- Can be used over a wide range of consistencies from dry pack to flowable

USES

- Grouting under base plates, columns and equipment not subjected to heavy impact loading
- Grout jacking of concrete slabs
- Grouting of ducts
- Underpinning of structures

APPLICATION

Surface Preparation: All surfaces to be in contact with MSI 424+ Non-Shrink Grout shall be entirely free of grease, laitance or other foreign substances. Roughen surface to ensure a good bond to existing concrete. Clean thoroughly with liberal quantities of water, leaving concrete saturated but free of standing water.

Mixing: MSI 424+ Non-Shrink Grout shall be thoroughly mixed to the desired consistency by varying the amount of water used.

Note: Do not exceed maximum recommended amount of mixing water.

Consistency

Recommended Water Qty/30 kg bag

Dry pack:	3 liters	(3.15 qts)
Trowellable:	4 liters	(4.23 qts)
Flowable:	5 liters	(5.28 qts)

Methods of Placing: MSI 424+ Non-Shrink Grout may be dry-packed, trowelled, flowed, pumped or vibrated into place.

Post-placement Procedures: MSI 424+ Non-Shrink Grout should be cured for a minimum of one day with wet burlap or approved curing compound. In-service operation may begin immediately after minimum required grout strengths are reached.

PACKAGING

MSI 424+ Non-Shrink Grout is packaged in 30 kg, heavy-duty bags producing approximately 2/3 cubic foot of hardened grout, depending on the consistency mixed. Allow 5% wastage.

SAFETY PRECAUTIONS

MSI 424+ Grout contains Portland cement and carefully selected additives. Normal safety wear such as dust mask and rubber gloves used to handle conventional cement based products should be worn. Material Safety Data Sheets are available on request.

TECHNICAL DATA

	TEST METHOD	RESULTS
Compressive Strengths:	ASTM C109	Mpa (PSI)
1-day:		38 (5510)
3-day:		45 (6527)
7-day:		52 (7542)
28-day		65 (9427)
Early Volume Change:	ASTM C827	0.0 per cent Shrinkage

MULTICRETE SUB ZERO GROUT

SPECIALLY FORMULATED GROUT FOR USE IN FROZEN GROUND

PRODUCT

Sub Zero Grout is hydraulic cement- based, non-ferrous, unsanded grout. This specially formulated grout features reliability and high performance for a variety of general grouting purposes.

ADVANTAGES

- This product can be used in applications where the substrate temperature can range from -100C to +50C (140 F to 410 F)
- Non-bleeding
- Non-segregation
- Precision Non-shrink
- Multicrete Sub Zero Grout achieves strength of 15 Mpa (over 2000 psi) in two to three hours.
- This makes it ideal for grouting in water-laden areas that required rapid strength gain
- **29 MPa at 24 hours in -10^0 C conditions**
- **31 MPa at 3 days in -10^0 C conditions**
-

USES

- Low temperature grouting
- Grouting anchors or cable bolts requiring rapid tensioning.
- Providing high early strength for anchors to allow quick “cycle” time.
- Patching high traffic areas that require minimal disruption.
- Grouting earth tieback anchors into porous soil where is flowing into drill holes.

PACKAGING

Sub Zero Grout is packaged in 25 kg, heavy- duty, polyethylene-lined bags. Each bag yields approximately 0.6 cubic feet of grout. All Sub Zero Grout packaged materials can be custom packaged to meet specific project requirements.

SAFETY PRECAUTIONS

Sub Zero Grout contains Portland cement and carefully selected additives. Freshly mixed materials may cause skin irritation. Avoid direct contact and wash exposed skin area promptly with water. If any cementitious material gets into eyes, rinse immediately and repeatedly with water and seek prompt medical attention. Normal safety wear such as dust mask and rubber gloves used to handle conventional cement based products should be worn. See MSDS for more information.

MIXING

Recommended use with mechanical mixer with paddles. 40-60 rpm mixer is required to achieve max pot life.
Product must remain dry prior to mixing.
Use 10.5 kg of potable water per 25 kg bag.
Ideally the dry product and water will be 17- 22^{0}C prior to mixing. The wet mix temperature must initially be 17-22^{0}C. Ideal mix temperature is 20^{0}C.
Note:
Mixed grout will remain fluid/pumpable for 15 min after adding water. If more time is required, the grout must remain agitated as much as possible. If continuously mixed it will remain fluid for up to 30 min. After grout is 15 minutes old it MUST remain continuously agitated until ready to pump. It will begin to set up after 5 min in a static state after 15 min life.

Due to limited pot life, only mix grout that can be placed within the time limit.

Wash out equipment IMMEDIATELY after placing grout. Once grout has hardened it can only be removed manually or by mechanical device.

LIMITATIONS

The area in which the grout will be placed must not be below -10^{0}C, be free of water, and cleared of all debris.

MULTICRETE MULTIGROUT® CB

IDEAL FOR ANCHOR GROUTING

PRODUCT

MULTIgrout® CB is an unsanded, cement-based expanding grout containing silica fume (microsilica) and other carefully selected additives. MultiGrout® CB gains strength quickly and resists water washout, making it ideal for anchoring tendons, cables and bolts into soil or rock media.

ADVANTAGES

- High early strength: MULTIgrout® CB has superior early strength gain compared to Type 30 grouts, allowing early tensioning of anchors. It has comparable strength gain to high alumina grouts, but does not experience strength regression.
- Resistance to water washout: MULTIgrout® CB has excellent cohesive properties. It resists washout or dilution by water and thus can be used in wet ground conditions and still retain its excellent physical properties.
- Reduced Grout Takes: MULTIgrout® CB has thixotropic properties. It tends to get after placement or pumping. This gelling action prevents the loss of grout in porous or fractured geology.
- Cold weather Performance: When cold weather grouting standards are followed, MULTIgrout® CB can achieve excellent physical properties in temperatures down to 50C (410F).

USES: MULTIgrout® CB can be used for most grouted anchor requirements, including:

- Earth tiebacks for excavation and slope stabilization
- Rock bolts or soil anchors in tunnel support systems.
- Cable bolting
- Soil or rock tendons used for anchoring piles or foundation structures. Infill of pipe piles.

APPLICATION

Step 1: Mix MULTIgrout® CB to the consistency required for placement. MULTIgrout® CB's thixotrophic properties make the grout appear thick and cohesive when in fact it is quite pumpable.

Consistency: Recommended Water Qty/30kg bag

Pumpable:	8.2 liters	(2.1 US gal)
Flowable:	9.3 liters	(92.5 US gal)

Over-watering will result in compressive strengths and inferior physical properties.

Step 2: Introduce potable water into a high shear mixer and then add MULTIgrout® CB while operating at medium speed.

Step 3: Mix at high speed for a minimum of five minutes. Ten minutes in mortar style mixers

PACKAGING

MULTIgrout® CB is packaged in 30 kg, heavy-duty, polyethylene-lined bags. All MULTIgrout® CB packaged materials can be custom packaged to meet specific project requirements.

SAFETY PRECAUTIONS

MultiGrout® CB contains Portland cement and carefully selected additives. Normal safety wear such as dust mask and rubber gloves used to handle conventional cement based products should be worn. Material Safety Data Sheets (MSDS) are available.

LIMITATIONS

Adhering to recommended water additions is very important. Exceeding the maximum recommended water content per sack will result in inferior physical properties.

TECHNICAL DATA

The data outlined below is representative of typical values achievable under controlled laboratory conditions. Results obtained in the field may vary from those stated.

Typical Properties at Flowable Consistency

(Corps of Engineers CRD-C821 and ASTM C1107

Flow:	22 seconds
Expansion, % volume:	
At 3 & 14 days:	Not greater than at 28 days
At 28 days:	0.4 maximum (0.24 typical)

Setting time: 15 hours at 20^0 C

Compressive Strength:	Mpa (lb/in ^{2})
At 24 hours:	13.8 (2000)
At 48 hours:	29.5 (4280)
At 7 days:	45.7 (6630)
At 28 days:	58.9 (8540)

Approximate Yield:

Bags per m^3:	55	Bags per yd^3:	42
Liters per bag	18.4	Ft^3 per bag:	0.65

MULTICRETE MULTIGROUT® CB/S

IDEAL FOR ANCHORING INTO SOIL OR ROCK

PRODUCT

MULTIgrout® CB/S is a sanded, cement based non-shrink grout containing silica fume (micro-silica) and other carefully selected additives. MultiGrout® CB-S gains strength quickly and resists water washout making it ideal for anchoring tendons, cables and bolts into soil or rock media.

ADVANTAGES

- High early strength: MULTIgrout® CB-S has superior early strength gain compared to Type 30 grouts, allowing early tensioning of anchors. It has comparable strength gain to high alumina grouts, but does not experience strength regression.
- Resistance to water washout: MULTIgrout® CB-S has excellent cohesive properties. It resists washout or dilution by water and thus can be used in wet ground conditions and still retain its excellent physical properties.
- Reduced Grout Takes: MULTIgrout® CB-S has thixotropic properties. It tends to get after placement or pumping. This gelling action prevents the loss of grout in porous or fractured geology.
- Excellent Pullent Resistance: MultiGrout® CB-S exhibits excellent pullent resistance for cable bolts and rock bolts due to the increased friction component imparted by the sand.
-

USES: MULTIgrout® CB-S can be used for most grouted anchor requirements, including:

- Earth tiebacks for excavation and slope stabilization
- Rock bolts or soil anchors in tunnel support systems.
- Cable bolting
- Soil or rock tendons used for anchoring piles or foundation structures. Infill of pipe piles.

APPLICATION

Step 1: Mix MULTIgrout® CB-S to the consistency required for placement. MULTIgrout® CB-S' thixotrophic properties make the grout appear thick and cohesive when in fact it is quite pumpable. Add water as per bag recommendation. Over-watering will result in compressive strengths and inferior physical properties.

Step 2: Introduce potable water into a high shear mixer and then add MULTIgrout® CB-S while operating at medium speed.

Step 3: Mix at high speed for a minimum of five minutes. Ten minutes in mortar style mixers

PACKAGING

MULTIgrout® CB-S is packaged in 30 kg, heavy-duty, polyethylene-lined bags. All MULTIgrout® CB-S packaged materials can be custom packaged to meet specific project requirements.

SAFETY PRECAUTIONS

MultiGrout® CB-S contains Portland cement and carefully selected additives. Normal safety wear such as dust mask and rubber gloves used to handle conventional cement based products should be worn. Material Safety Data Sheets (MSDS) are available.

LIMITATIONS

Adhering to recommended water additions is very important. Exceeding the maximum recommended water content per sack will result in inferior physical properties.

TECHNICAL DATA

The data outlined below is representative of typical values achievable under controlled laboratory conditions. Results obtained in the field may vary from those stated.

Typical Properties at Flowable Consistency

(Corps of Engineers CRD-C821 and ASTM C1107

Flow:	22 seconds
Expansion, % volume:	
At 3 & 14 days:	Not greater than at 28 days
At 28 days:	0.4 maximum (0.24 typical)

Setting time: 15 hours at 20^0 C

Compressive Strength: Mpa (lb/in ^{2})

At 24 hours:	13.8 (2000)
At 48 hours:	29.5 (4280)
At 7 days:	45.7 (6630)
At 28 days:	58.9 (8540)

Approximate Yield:

Bags per m^3:	55	Bags per yd^3:	42
Liters per bag	18.4	Ft^3 per bag:	0.65

MULTICRETE WATER CUT-OFF GROUT

PUMPABLE GROUT, RESISTANT TO WATER WASHOUT

PRODUCT

Water Cut-Off Grout is an unsanded blend of cement, silica fume (micro-silica) and other carefully selected admixtures. It is designed to be a pump-able grout that resists washout by flowing water and behaves similar to a micro-fine cement.

ADVANTAGES

- Water Cut-Off Grout is pumpable, yet resists washout from flowing water.
- Extremely fine particle size allows grout to penetrate into soils and rock not penetrable by normal cementitious grouts.
- Evenly distributed particle size reduces bridging and plugging within the grouted mass yielding a higher quality grout and great void reduction at lower pumping pressures.
- The bond between Water Cut-Off Grout and steel is greatly enhanced compared to ordinary grouts.
- Can be mixed to a wide range of consistencies and pumped using standard cementitious grouting equipment.

USES

- Any application where flowing water must be overcome.
- Pumped into rock fissures to stop water flow in mines and tunnels.
- Grouting earth tieback anchors into porous soil where water is flowing into drill holes.

APPLICATION

Step 1: Mix Water Cut-Off Grout to as stiff as consistency as the pump can handle. This will range from between 9 and 11 liters of mix per 30 kg bag. Mix water should not exceed 11 liters per bag.

Step 2: Introduce water into a clean high shear mixer and then add Water Cut-Off Grout while operating the mixer at medium speed.

Step 3: Mix at high speed for at least 5 minutes. A very thorough high-speed mixer is necessary – an older style mortar mixer is not satisfactory for this.

Step 4: Decrease mixer speed to low, but ensure that mixing continues while pumping the grout.

Step 5: The grout has a pot life of 1 to 1.5 hours.

PACKAGING

Water Cut-Off Grout is packaged in 30 kg, heavy -duty polyethylene-lined bags that yield approximately 2/3 ft3 of hardened grout. Allow 5% wast-age.

SAFETY PRECAUTIONS

Water Cut-Off Grout contains Portland cement plus non-caustic, non-toxic micro-silica and carefully selected additives. Normal safety wear such as dust mask and rubber gloves used. Refer to MSDS.

TECHNICAL DATA

Compressive Strengths: Mpa (psi) ASTM C109
(Water cut-off vs. Earth Tie-Back Formulation)

At 1 day: 7 (1020) vs. 37 (5370)

At 7 days: 14 (2030) vs. 70 (10,150)

POLYURETHANE WATER CUT-OFF GROUT

CHEMICAL PRODUCT REACTS WITH WATER

PRODUCT

Polyurethane Water Cut-off & Soil Stabilization Grout is made of polyurethane, which reacts with water by expanding. The cured product is a cellular material.

USES

This grout is extremely well suited for the filling of large cavernous spaces and cracks in stone or concrete structures. Additionally is used for cutting off gushing water of high pressure and speed.

Polyurethane Water Cut-Off & Soil Stabilization Grout can also be used as an effective chemical grout for soil stabilization. The moisture content of the soil must be sufficient to ensure reaction of the material. The stabilized soil will be of a content volume and will be insensitive to moisture or dryness.

APPLICATION

Step 1: It is composed of two components, which are supplied separately, in order to achieve a longer shelf life. Component A contains a polyisocyanate. Component B is an accelerator to increase the gel time. There are two different accelerators B and Bs available to adjust the gel-time individually.

Mixing Ratio (Parts by volume)
Component A 10
Component B or Bs 1

Since the above grout reacts only with water the mixture does not have to be used up immediately.

PACKAGING

Product is available in 5 gallon or 0.5 gallon containers.

TECHNICAL DATA

	COMP. A	COMP. B
Appearance:	Dark brown	Clear
Density: g/cm^3	1.12	0.93
Flash Point: C/F:	180/356	170/388
Viscosity: cps	180	20
Mixing Ration by Volume:	10	1
Solubility in Water:	NOT	NOT

CURED PRODUCT ACCELERATOR B

Expansion: %	3000
Induction time approx:	30 seconds
Gel time approx:	50 seconds
Elogation:	20%
Corrosiveness:	Non-corrosive
Appearance:	Gold-Yellow Polyurethane Foam
Toxicity:	Essentially non-toxic in cured form
Resistance to Chemicals:	Resistant to most organic solvents, mild acids, akali and micro organisms.

CURED PRODUCT ACCELERATOR BS

Expansion: %	3000
Induction time approx:	15 seconds
Gel time approx:	30 seconds
Elogation:	20%
Corrosiveness:	Non-corrosive
Appearance:	Gold-Yellow Polyurethane Foam
Toxicity:	Essentially non-toxic in cured form
Resistance to Chemicals:	Resistant to most organic solvents, mild acids, akali and micro organisms.

XPR NON-SHRINK GROUT

SPECIALLY FORMULATED GROUT: RAPID SET AND QUICK STRENGTH GAIN

PRODUCT

XPR Non-Shrink Grout is hydraulic cement-based, non-ferrous, non-shrink grout that can be sanded or unsanded (concentrate). This specially formulated grout features reliability and high performance for a variety of general grouting purposes.

ADVANTAGES

- Non-bleeding
- Non-segregation
- Precision Non-shrink
- XPR Non-Shrink Grout achieves strength of 15 Mpa (over 2000 psi) in two to three hours.
- XPR Non-Shrink Grout, although containing modified hydraulic cement, exhibits working time similar to Portland cement.
- This product can be used in applications somewhere below 0^0C
- XPR Non-Shrink Grout contains admixtures, which greatly reduce “water wash-out”.
- This makes it ideal for grouting in water-laden areas that required rapid strength gain.

USES

- Grouting anchors or cable bolts requiring rapid tensioning
- Providing high early strength for anchors to allow quick “cycle” time.
- Patching high traffic areas that require minimal disruption.
- Low temperature grouting
- Grouting earth tieback anchors into porous soil where is flowing into drill holes.

PACKAGING

XPR Non-Shrink Grout is packaged in 30 kg, heavy-duty, polyethylene-lined bags. Each bag yields approximately 2/3 cubic feet of grout. All XPR Non-Shrink Grout packaged materials can be custom packaged to meet specific project requirements.

SAFETY PRECAUTIONS

XPR Non-Shrink Grout contains Portland cement and carefully selected additives. Freshly mixed materials may cause skin irritation. Avoid direct contact and wash ex-posed skin area promptly with water. If any cementitious material gets into eyes, rinse immediately and repeatedly with water and seek prompt medical attention. Normal safety wear such as dust mask and rubber gloves used to handle conventional cement based products should be worn. See MSDS for more information.

TECHNICAL DATA

Compressive Strength: psi		**ASTM C109**
At 3 hours:	2500	
At 24 hours:	5200	
At 7 days:	6325	
At 28 days:	7350	

Flexural Strength: psi		**ASTM C78**
At 5 hours:	650	
At 28 days:	1260	

MULTICRETE MULTI-WHITE® WHITE CEMENT PAINT

A BRILLIANT WHITE GROUT IDEAL FOR APPLICATIONS OVER SHOTCRETE SURFACES TO ENHANCE VISIBILITY

PRODUCT

MULTI-white® white cement paint is a sanded, cement based white grout containing silica sand and other carefully selected additives. MULTI-white® can be mixed and applied as a thin spray using compressed air to cover existing shotcrete or concrete surfaces. MULTI-white's® bright pigmentation is ideal for enhancing visibility in critical areas.

SAFETY ADVANTAGES: Increased Surface Visibility: Multi-white® white cement paint is a durable solution for increasing specific area brightness. It bonds effectively with the shotcrete or concrete substrate. Application is quick and easy and does not need any special equipment** to do so. A cement -based "paint" slurry, inert, fume (odor) free.
** Spray nozzle, compressed air, mixer/pump. Contact us for recommended equipment list.
It can also be mixed and trowelled on using lower water/cement ratios.

USES: MULTIwhite® white cement paint is a cement based inert grout mix which can be applied as a thin paste paint coating onto existing shotcrete or concrete surfaces, producing Bright white highly visible surface ideal for:

- Lunch Rooms
- Refuge Stations
- Safety Bays
- Tramway Corners
- Intersections
- Shop Bays

APPLICATION:

Step 1: Mix MULTIwhite® white cement paint to the consistency required for placement. Add water as per bag recommendation, ideally using a .75 water cementitious ratio. Although MULTIwhite® use is as a "slurry paint", over-watering will result in lower compressive strengths and inferior physical properties.
Step 2: Introduce potable water into a high shear mixer and then add MULTIwhite® white cement paint while operating at medium speed.
Step 3: Mix at high speed for a minimum of five minutes. Ten minutes in mortar style mixers. Apply with a Moyno type screw pump for best constant feed results.

PACKAGING

MULTI-white® white cement paint is packaged in 25 kg plastic pails. MULTI-white® white cement paint can however be custom packaged to meet specific project requirements.

Fig.1 Shotcrete surface prior to application of MULTI-white®

Fig.2 Shotcrete surface after application of MULTI-white® and inset closeup

TECHNICAL DATA: The data outlined below is representative of typical values achievable under controlled laboratory conditions. Results obtained in the field may vary from those stated.

Compressive Strength:	**Mpa**	**(lb/in^2)**
At 3 days:	**24.7**	**(3582)**
At 7 days:	**30.3**	**(4395)**
At 28 days:	**37.4**	**(5424)**
(.75 water cement ratio)		

Yield/Coverage:	**sq.m.**	**(sq.ft)**
Per 25 Kgs of Dry Product	**4.6**	**(50)**

SAFETY PRECAUTIONS: MULTI-white® white cement paint contains Portland cement and carefully selected additives. Normal safety wear such as dust mask/respirator and rubber gloves used to handle conventional cement based products should be worn. Please refer to the Material Safety Data Sheet (MSDS) which is also available.

10. BATCH PLANTS & BULK TRANSPORT SYSTEMS

BATCH PLANTS (SHOTCRETE/CONCRETE)

BULK TRAILER TRANSPORT

BATCH PLANTS
SHOTCRETE/CONCRETE

FABRICATION OF SHOTCRETE AND/OR CONCRETE PLANTS

Multicrete continues to construct production facilities across Canada to service our many customers.

In-house design/build specialists, engineers, plant superintendents, quality control, maintenance and support personnel contribute to the set-up and implementation of successful shotcrete and concrete production facilities. At our main production facilities we can custom blend to meet project-specific requirements. Efficiency allows for over 150 metric tonnes of dry-mix pre-blended material to be produced in an 8 - hour shift.

Batch & Redi-mix Plant in Flin Flon, MB

BATCH PLANTS
SHOTCRETE/CONCRETE

FABRICATION OF SHOTCRETE AND/OR CONCRETE PLANTS

Batch & Redi-mix Plant
Thompson, Manitoba

Afton Batch Plant, Kamloops, BC
New Gold Mine

Red Lake, Ontario

Metcrete Batch Plant
Edmonton, Alberta

BULK TRANSPORT TRAILERS

FABRICATION OF SHOTCRETE AND/OR CONCRETE PLANTS

When you need a lot of material transported, this is the way to do it. Carry capacities of over 20-40 tons. Single or double trailers deliver the required material to an awaiting storage silo, or down a slick line to an awaiting underground silo.

Bulk Shotcrete Transport

Dry Pre-Mixed Concrete Transport

11. CONCRETE ACCESSORIES

ROMIX® CONCRETE PRODUCTS

ROMIX® BACK-SET CONCRETE DISSOLVER

ROMIX® RO-396 FOAM RELEASE AGENT

ROMIX® 1125 RX SPRAYER

NEW TECHNOLOGY!

ENHANCED DILUTABLE FORMULA

BACK-SET PLATINUM™

MOLECULAR CEMENT DISSOLVER

BACK-SET PLATINUM IS AN ACID ALTERNATIVE WITH NO FUMES OR ODORS. THIS SAFE, BUT EFFECTIVE ALTERNATIVE IS A NEWLY DEVELOPED CONCEPT IN CHEMISTRY. **BACK-SET PLATINUM** MOLECULARLY ATTACKS THE PORTLAND CEMENT, COMPLETELY DISSOLVING THE HARDENED MOLECULAR STRUCTURE BACK INTO RINSABLE MUD! THIS TYPE OF IONIC EXCHANGE HAS NEVER BEEN USED BEFORE IN OUR INDUSTRY. THIS PRODUCT IS ONE OF A KIND!

BACK-SET PLATINUM DOES NOT CONTAIN MURIATIC, HYDROCHLORIC, HYDROFLOURIC, SULFURIC OR PHOSPHORIC ACIDS. THE ACTIVE INGREDIENT OCCURS NATURALLY IN SUGAR CANE SYRUP.

- BIODEGRADABLE
- ACID ALTERNATIVE
- COST-EFFECTIVE
- NON-HAZARDOUS
- NON-CORROSIVE
- NON-DOT REGULATED

GREEN-DESIGNED FOR THE ENVIRONMENT!

TURNS HARD, SET UP CEMENT BACK INTO RINSABLE MUD!

BACK-SET PLATINUM is simple to use. Apply undiluted for heavy and extreme build-up removal. As a daily cleaner for light cement film, concrete splatter, grease and grime, **BACK-SET PLATINUM** may be diluted 1:1 up to 6:1. Regular use of **BACK-SET PLATINUM** never gives cement or concrete a chance to build up!

BACK-SET PLATINUM's enhanced formulation is designed to go up to 50% further than the competition, reducing both product cost and time, while preserving the environment.

BACK-SET PLATINUM removes cured concrete, cement, mortar, grout, and stucco from virtually any surface, without harm to equipment or workers, and it's available in a variety of sizes that can tackle any job.

Authorized Distributors:

Multicrete Systems Inc.
360-555 Hervo Street
Winnipeg, MB Canada R3T3L6
Phone: 204-262-5900
Sales: 306-292-6367

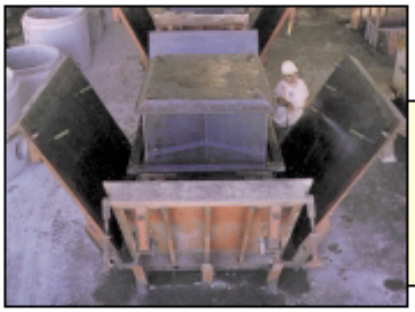
MULTICRETE

RoMix INCORPORATED
CUSTOM FORMULATORS • MANUFACTURING CHEMIST

www.multicretesystems.com

RoMix

REACTIVE • HIGH PERFORMANCE



#RO-396

FORM RELEASE AGENT

MULTI-USE FORM RELEASE AGENT, NON-HAZARDOUS AND NON-DOT-REGULATED. NON-STAINING, INCREASES FORM LIFE AND SAFE TO USE!

Ready To Use

CHARACTERISTICS:

★ CLEAN, POSITIVE STRIPPING ★ ELIMINATES BUG HOLES ★ NON-REGULATED ★ MFG. IN U.S.A.
★ NON-CARCINOGENIC ★ HIGH COVERAGE RATES ★ NON-STAINING ★ CORROSION PREVENTATIVE
★ VOC COMPLIANT ★ NON-FREEZING ★ HELPS KEEP FORMS CLEAN ★ WORKS IN ALL TEMPERATURES
★ SAFE & EASY TO USE ★ NON HAZARDOUS ★ BIODEGRADABLE

RO-396 FORM RELEASE AGENT CONTAINS AN **ACTIVE AGENT** DISSOLVED INTO A PROPRIETARY, STATE-OF-THE-ART MINERAL OIL CARRIER. **RO-396** IS SPECIALLY FORMULATED TO BE APPLIED TO CLEAN SURFACES IN A THIN FILM FOR BEST RELEASING PERFORMANCE AND ECONOMY. **RO-396** IS MOST EFFECTIVE IF SPRAYED. **RO-396** IS A READY-TO-USE PRODUCT, DILUTION IS NOT RECOMMENDED AND CAN CAUSE DIFFICULTY IN STRIPPING. **RO-396** CAN BE APPLIED MINUTES OR DAYS BEFORE A JOB.

RO-396 MEETS AND EXCEEDS EMISSION REQUIREMENTS FOR 40 CFR PART 59 FORM RELEASE (EPA LIMIT 450G/L). **RO-396** MEETS AND EXCEEDS VOC COMPLIANCE FOR THE STATE OF CALIFORNIA, REGULATION 8, ORGANIC COMPOUNDS, RULE 3, ARCHITECTURAL COATINGS (CA LIMIT 250G/L). **RO-396** MEETS AND EXCEEDS ALL VOC REGULATIONS BY HAVING A VOC CONTENT • 0.74 LBS/GAL, 88.54 G/L (TEST METHOD USED EPA-24).

COVERAGE RATES

1900-2100 sq.ft./gal. - non-porous
1400-1800 sq.ft./gal. - semi-porous
800-1600 sq.ft./gal. - highly porous
*results may vary due to conditions

TYPICAL PROPERTIES:

- PHYSICAL FORM – GOLDEN AMBER LIQUID
- SPECIFIC GRAVITY – 0.893G/ML
- LBS PER GAL. – 7.15 • ODOR – NEGLIGIBLE
- FLASH POINT –> 305°F • DOT CLASSIFICATION – NON-REGULATED • INSOLUABLE IN WATER

✓ *TEST SPOT RECOMMENDED ON RUBBER AND LATEX MOLDS.*

Toll Free: 800-331-2243
Fax: 817-685-0877
E-Mail: RoMix@sprynet.com
www.romixchem.com

RoMix
CHEMICAL and BRUSH INC.
CUSTOM FORMULATORS ★ MANUFACTURING CHEMIST

Distributed by
Authorized Distributors:

Multicrete Systems Inc.
360-555 Hervo Street
Winnipeg, MB Canada R3T3L6
Phone: 204-262-5900
Sales: 306-292-6367

www.multicretesystems.com

MULTICRETE

RoMix

#1125 RX Sprayer

RoMix's #1125 RX Sprayer is designed to apply multi-type products from cleaners to release agents!

FEATURES:

- 2.5 GALLON CAPACITY
- FUNNEL TOP FOR EASY FILLING
- POLY FLOW CONTROL WITH LOCK ON FEATURE
- REINFORCED HOSE
- VITON SEALS AND GASKETS
- BRASS & POLY NOZZLES INCLUDED

#1125 RXF Foamer

FEATURES:

- SAME AS ABOVE
- FOAM ENDUCTOR
- ALL POLY FOAM NOZZLE

RoMix's #1125 RXF Foamer is designed to apply dissolvers, soaps, and detergents. The thick foam increases product dwell time and cleaning effectiveness!

RoMix
CHEMICAL and BRUSH INC.

800-331-2243 TOLL FREE
817-685-0877 24 HR. FAX
www.romixchem.com

Distributed by:
Authorized Distributors:
Multicrete Systems Inc.
360-555 Hervo Street
Winnipeg, MB Canada R3T3L6
Ph.: 204-262-5900
Sales: 306-292-6367

MULTICRETE

www.multicretesystems.com

12. BULK SHOTCRETE SYSTEMS

BULK SHOTCRETE SYSTEMS

PORTABLE LOAD-OUT STATION

PORTABLE MIXING STATION

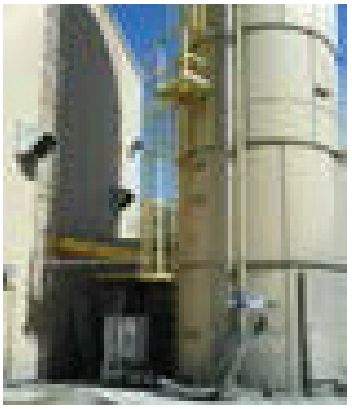
MIXING STATION

UNDERGROUND SHOTCRETE PLANTS

BULK SHOTCRETE TRANSFER SYSTEMS

BATCH PLANTS

Multicrete can build surface batch plants to produce Hybrid-Wet Shotcrete® right at the site. Less freight charges and immediate supply of materials as needed.



SURFACE STORAGE SILOS

A at-the-ready alternative for bulk material storage. With their large capacity a surface silo can be replenished as needed with integrated bulk delivery via trailers.

SHAFT or RAMP

Multicrete can work with your current configuration in under-ground mining. If shaft or ramp access is how you move your material & equipment, Multicrete can integrate their solutions to fit your setup.

SLICK LINE

If your mine currently utilizes a slick line, Multicrete can assist in integration with it's Hybrid-Wet Shotcrete® supporting solutions. Multicrete takes pride in offering the best choices for your demanding needs.

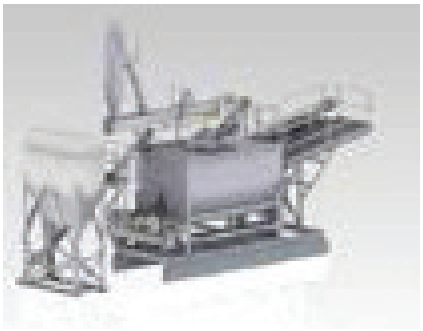
BULK SHOTCRETE LOAD-MIXING SYSTEMS

PORTABLE LOAD-OUT STATION

A totally portable load-out station capable of receiving bulk shotcrete bags or cassettes. Infeed hopper & auger move material to the feed auger for carrier loading. This unit can be quickly moved and re-assembled.

PORTABLE MIX STATION

The ideal shotcrete mixing solution for underground applications. This unit will accept dry, pre-mixed shotcrete, mix it to exact water/cement ratio and load it into a Transmixer for transport to application site.



UNDERGROUND STORAGE & MIXING STATION

Multicrete specializes in designing and manufacturing underground shotcrete storage and mixing stations which can provide solutions to your underground shotcrete needs. Whether it is a dry, wet or Hybrid-Wet® end product, Multicrete can get you up and producing.

HYBRID-WET SHOTCRETE® CARRIER

The shotcrete carrier includes a dry mix hopper, a wet/dry mix shotcrete spraying machine, and a mixing auger. This mixing auger wets the dry mix as it is conveyed from the dry mix hopper to the shotcrete spraying machine on a common mobile frame. The shotcrete spraying machine receives the wet mixed shotcrete from the mixing auger and conveys it to the pneumatic conveying line and nozzle.

MULTICRETE SYSTEMS INC.

WE SELL SOLUTIONS

As our customers' one-stop source for shotcrete application equipment, shotcrete materials, transfer systems, grouting equipment, and associated technical support, Multicrete Systems Inc. offers leading-edge project solutions to customers worldwide.

Our energetic and multi-disciplinary team of over 100 employees includes engineers, mining professionals, and construction specialists who supply the mining and tunneling industries with technical assistance focused on supporting shotcrete, grouting, and concrete programs. We have also offered expertise and solutions in several civil construction, new construction, and restoration ventures.

With the head office located in Winnipeg, MB, Canada, and six other operational branches spanning western Canada, we have developed long-term relationships with our employees, clients, and the local communities in which we operate and service. These connections are extremely important to us.

FOR MORE INFORMATION ON MULTICRETE PRODUCTS, SERVICES AND TRAINING PROGRAMS AVAILABLE, PLEASE CALL

SALES: (306) 292-6367

HEAD OFFICE: (204) 262-5900

INFO@MULTICRETESYSTEMS.COM

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