

Pumpable Cement Grouts



Solutions from Materials Technology

Minova USA Inc.



Customer Service

Minova USA Inc. has been serving the mining industry for over 30 years with products designed to handle a wide range of applications, from basic roof support to strata control problems requiring the implementation of an innovative solution. Minova's mining experience spans five continents, serving customers ranging from global conglomerates to small, family-owned-and-operated businesses.

Our mission is to respond to the ground control and ventilation needs of our customers for products or assistance regardless of geographic location. Quality customer service is achieved through our network of manufacturing facilities, warehouses, distributors, and field support staff, all strategically located to provide immediate response.

Minova's dedication to customer service is the driving force behind our **Total Quality** effort. We consistently strive to provide products of superior quality to our customers that enhance the efficiency and safety of their operations. Through innovation in product development, manufacturing and application, we aim to provide effective materials technology solutions for the most challenging problems.

This degree of industry cooperation and commitment to innovation has established Minova USA Inc. as your ideal partner in the pursuit of an improved working environment and, ultimately, improved productivity.

Product Innovation

Minova was instrumental in the introduction of resin cartridges. From our founding in 1971, we introduced resin cartridges to the U.S. mining industry and are now the largest manufacturer of resin cartridges in the world. Minova USA Inc. has expanded its product offerings to provide a wide range of options to help solve numerous ground control and ventilation problems.

This long list includes a wide range of bolts and plates, anchoring products, pumpable cribs and pumpable high yield cementitious grouts for underground construction projects, and an extensive line of sealants, liners and coatings for almost any application.

Our experienced staff includes Ph.D.s recognized as leaders in ground control, mining engineers and experienced miners. Our materials specialists in polymer and cement technology have over 20 years experience. There are few problems in ground control or ventilation for which Minova's experienced staff cannot offer a solution.

Please contact your Minova USA Inc. representative for more information on the latest in problem solving through materials technology innovation.



Tekseal®



Pumpable Cement Grouts

The Pumpable Cement Grouts product line includes a range of cementitious-based products for use in ventilation, cavity filling and underground construction projects. With the exception of Tekpak P, each product is specifically designed to be used in conjunction with the Minova Placer Machine. The use of Minova's Pumpable Cement Grouts decreases labor and material handling costs while providing safer working conditions for employees. The product is packaged in a convenient one-bag mix which helps alleviate material handling problems - no additives or blending necessary. The powdered product is mixed with water by the placer machine, which then pumps the material into a pre-constructed form. Depending upon the product, the placer machine can be positioned in a convenient location which allows pumping over 1,000 feet from the construction site and can be pumped down boreholes from the surface, thus further minimizing set-up time and material handling.

Tekseal®

The Tekseal® pumpable permanent ventilation seal is a simple, innovative and cost-effective solution. Tekseal®, evaluated and accepted by MSHA, eliminates the need for hitching the seal construction site. Well over 15,000 Tekseal® seals have been installed across the U.S. Tekseal® seals have performed well in over 18 inches of convergence of ground movement. To install a Tekseal® seal, simply erect two fence-like walls lined with brattice cloth and pump Tekseal® between them. A typical Tekseal® seal can be constructed in eight hours with four men.

Tekseal®, the world's premier pumpable seal system, minimizes your costs and provides the maximum performance available in a permanent ventilation seal. Ground movement around the seal site actually improves the Tekseal®. The superior materials technology available in Tekseal® is immune to acid mine water attack down to pH 3, as confirmed by independent testing.



Tekfoam

Tekseal® is approved by MSHA for Main Line and Gob Seal applications at both 50 psi and 120 psi overpressures.

A slower setting version, Tekseal® LD, enables a longer pumping distance with a high pressure placer pump.

Tekfoam

Tekfoam is a foamed cement for use in cavity filling and backfilling. Although the primary use for Tekfoam is filling cavities from roof falls, other popular uses include backfilling over a set of arches to provide contact against the roof, filling a cavity to prevent dangerous methane buildup, filling auger holes in surface mine highwalls and as a cushion against falling debris over false roofs.

Like Tekseal®, Tekfoam is easy to use and has many safety advantages. It can quickly and safely stabilize large and potentially dangerous cavities and roof falls. It can be

pumped over 1000 feet and cast over 20 feet through our Minova Placer Machine. Pumping rates of up to 15 cubic yards an hour are typical and as few as 4 bags of Tekfoam will yield a cubic yard. This decreases time spent in hazardous areas and slashes material handling costs.

Not only does Tekfoam provide a safer working environment, it can also increase longwall mining production by reducing downtime due to roof falls. Tekfoam sets in less than an hour, thus allowing your longwall to advance much sooner and almost completely eliminating the tedious and risky work of building wooden cribs for unsupported roofs.

A slower setting version, Tekfoam LD, may be pumped over 1500 feet.



Tekpak P



Tekpak P

It is often difficult and expensive to transport conventional crib supports such as timber crib blocks to remote areas of underground mines. For this reason, a crib material that can be pumped down a borehole or ventilation shaft a considerable distance underground is attractive. Tekpak P, a patented pumpable crib material, was developed to enable this type of remote application. The only item required underground is a lightweight crib bag to hold the Tekpak P mixture.

The two-component grout consists of Tekcem P powder and Tekbent P liquid. Each component is mixed separately with water in twin batch paddle mixers that permit continuous pumping. The Tekcem P slurry has a three-day pumping life, and the Tekbent P slurry has an indefinite pumping life.

Typically the pumping equipment is sited on the surface and the grouts pumped through two separate small diameter hoses down an existing ventilation shaft or borehole and then up to 12,000 feet to the area it is wished to support. Cylindrical reinforced bags to hold the grout are prehung from the mine roof. The two slurries are then pumped underground into a static mixer just prior to entering the crib bags. Setting of the cribs is extremely rapid and over 150 tons of loadbearing capacity can be achieved once the Tekpak P mixture is cured.

Tekgrout

Tekgrout is a non-foamed fast setting high yield grout. Tekgrout is ideal for the consolidation of fractured strata or loose rock and gravel, and can also be used to control some water flows.

Tekrok

Tekrok was developed in response to customer demand for a high strength pumpable cement suitable for underground construction projects. Tekrok is perfect for small to medium sized jobs including platforms for belt drives and belt heads, footers for airlock doors and track switches, shop floors, sump holes in longwall gate entries, and crusher stations.

Tekrok was specifically designed for use in the Minova Placer Machine. This fiber-reinforced product can exceed 3000 psi in strength and can be pumped over 150 feet. For underground projects or when the convenience of a pumpable cement is desired, Tekrok makes the job easier.

Tekrok SCR

Tekrok SCR is similar to Tekrok with the exception that its special formulation is sulphate- and chloride-resistant. This makes Tekrok SCR perfect for water bulkheads or other projects where the risk of thermal cracking may exist. Tekrok SCR develops over 3000 psi in strength and is also pumped through the Minova Placer Machine.

Please consult your local Minova USA Inc. representative for additional application information.



Minova Placer Machine and Water Heater



The Minova Placer Machine is an AC powered pump fully equipped to properly meter, mix and place many of Minova's cementitious products including **Tekseal®**, **Tekfoam**, **Tekrok**, **Tekrok SCR** and **Tekgrout**. Some products in certain conditions require the use of the Minova Water Heater.

Minova Placer Machines and Water Heaters are available for sale, lease or rental. All replacement parts are available through Minova.

Equipment Specifications

Placer

- Length:** 11.75 feet
- Width:** 2.25 feet
- Height:** 3.5 feet
- Weight:** 1700 pounds
- Motor:** 15 hp AC; full load amps - 21 at 460V, 18 at 575V.
- Cable Size:** #6

Water Requirements: 30 gpm at 50 psi; 100 psi if water heater is used.

Output Pressure: 300 psi

Heater

Dimensions: Typical dimensions are 3'2" x 3'4" x 3'10". Low height model available.

Weight: 1200 pounds when full.

Power: 90 amps @460V, 110 amps @ 575V

Cable Size: #2

Product Uses

USE	Tekseal®	Tekfoam	Tekrok	Tekrok SCR	Tekgrout	Tekpak P
Permanent Ventilation Seals	✓					
Longwall Ventilation Stoppings	✓	✓				
Longwall Face and Gate Cavity Filling	✓	✓				
General Cavity Filling	✓	✓				
Back Filling Arches	✓	✓	✓			
Canopy Cushion		✓				
General Construction			✓			
High Strength Pads			✓			
Bulkheads	✓			✓		
General Fill	✓	✓	✓		✓	
Emergency Ventilation Control	✓	✓				
Consolidation of loose or broken rock					✓	
Pumpable Cribs						✓



Minova USA Inc.

150 Carley Court
Georgetown KY 40324 USA

Phone 502 863 6800

Fax 502 863 1374

Email sales.info@minovaint.com

Website www.minovausa.com



A member of the Orica Group

Important Note: Warranty

Minova USA Inc. warrants that its products, at the time of shipment, conform to the applicable descriptions set forth in the invoice and are free from defects in material and workmanship. NO OTHER WARRANTY, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING ANY WARRANTY OF MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE, SHALL EXIST IN CONNECTION WITH THE SALE OR USE OF ANY MINOVA USA INC. PRODUCT, AND ALL SUCH WARRANTIES ARE HEREBY EXPRESSLY DISCLAIMED AND EXCLUDED.

All claims under this warranty must be made in writing to Minova USA Inc. within 15 days after discovery of the defect, and within 90 days of the date of shipment by Minova USA Inc. of the product claimed defective. Upon timely receipt of a claim, Minova USA Inc. shall have the option either to inspect the product while in Buyer's possession or to request Buyer to return the product to Minova USA Inc. for inspection. Claims not made as provided above and within the applicable time period will be barred. All warranties shall be null and void if the products have not been stored and used in accordance with procedures recommended by Minova USA Inc.

Minova USA Inc. shall, at its option, either replace the nonconforming or defective product or refund to Buyer its purchase price. The foregoing constitutes Buyer's sole and exclusive remedy for any breach or warranty.