



**DAVID R. KLUG
& ASSOCIATES, INC.**

6000 WATERDAM PLAZA DRIVE

SUITE 120

McMURRAY, PA 15317

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INTERNATIONAL MANUFACTURER'S REPRESENTATIVE SERVICES

SPECIALIZING IN

TUNNEL & MINE CONSTRUCTION APPLICATIONS

1. PRECAST CONCRETE SEGMENTAL TUNNEL LINING MANUFACTURING COMPONENTS

- 1.1 Optimas, Sofrasar Tunnel Products, Sarreguemines, France
Website: www.optimas.com
 - 1.1.1 Steel Bolts With Plastic Sockets - Up To 38 mm Ø
 - 1.1.2 Steel Bolts With Steel Sockets - Up To 38 mm Ø
 - 1.1.3 Grout/Lifting Insert Assemblies Inclusive Of:
 - 1.1.3.1 Non-Return Valves Up To 10 Bar Resistance
 - 1.1.3.2 Sealing Screw Caps Up To 40 Bar Resistance
 - 1.1.4 Plastic Dowels For Circumferential Joint Connections
 - 1.1.4.1 Sof-Fix FD – 40kN Pull-Out & 60kN Shear for small dia. tunnels
 - 1.1.4.2 Sof-Fix Anix – Up To 250kN Pull-Out & 250kN Shear
 - 1.1.4.3 Bicones – Up to 500kN Shear
 - 1.1.5 Radial Joint Connection Systems
 - 1.1.5.1 Guide Rods – Up To 60mm Ø
- 1.2 CTS Cordes Tubes & Seals GmbH & Co. KG, Boizenbug, Germany
Website: www.cordes.de
 - 1.2.1 Standard EPDM Gaskets – Up To 44mm
 - 1.2.2 Anchored EPDM Gaskets – Up To 44mm (No Adhesive Required)
 - 1.2.3 Special Gasket Materials For Hydrocarbons
 - 1.2.4 Hydrophilic Gasket Profiles
 - 1.2.5 TBM Tunnel Starter Seals
- 1.3 Vertex, Inc., Mogadore, Ohio
Website: www.vertexseals.com
 - 1.3.1 Standard EPDM Gaskets
 - 1.3.2 Special Gasket Materials For Hydrocarbons
 - 1.3.3 Custom Gaskets for Specialty Applications
 - 1.3.4 Compliant to all Made In America Requirements

1. PRECAST CONCRETE SEGMENTAL TUNNEL LINING MANUFACTURING COMPONENTS

- 1.4 Herrenknecht Formwork Technology Steel Segment Moulds
Schwanau, Germany
Website: www.herrenknecht-formwork.de
 - 1.4.1 Precision Steel Moulds For Casting Precast Segments
 - 1.4.2 Carousel Plant Casting Systems Inclusive Of:
 - 1.4.2.1 Plant Layout And Design
 - 1.4.2.2 Concrete Handling And Vibrating Equipment
 - 1.4.2.3 Segment Curing Systems
 - 1.4.2.4 Segment De-moulding And Rollover Equipment
 - 1.4.2.5 Gasket Application Equipment

2. TUNNEL REINFORCEMENT PRODUCTS

- 2.1 Steel Rebar Reinforcement
 - 2.1.1 Standard Fabricated Rebar Gr. 60 – 75 A625
 - 2.1.2 Prefabricated Rebar Panels Gr. 60 - 75 A706
 - 2.1.3 Special Rebar Reinforcement
 - 2.1.3.1 Stainless Steel Bar
 - 2.1.3.2 FRP Bar – For Tunnel Breakout Areas
 - 2.1.3.3 Epoxy Coated Bar
- 2.2 Welded Wire Fabric Reinforcement
 - 2.2.1 Standard Welded Wire Fabric 4"x 4", 6"x6" W2.1 – W4.0
 - 2.2.2 Specialty Welded Wire Fabric Up to D36.0, Wire Spacing as Required
 - 2.2.3 Supplied in Engineered Sheet Size to Minimize Waste
 - 2.2.3.1 Supplied Flat
 - 2.2.3.2 Supplied Prebent To Specified Radius
 - 2.2.4 FRP Welded Wire Fabric
- 2.3 Fiber Reinforcement – Steel and Polypropylene
Kosteel Bundrex
Website: www.kosteel.co.kr/eng/
 - 2.3.1 Precast Segmental Lining Reinforcement
 - 2.3.1.1 Glued Fiber
 - 2.3.1.2 Loose Fiber
 - 2.3.2 Tunnel Final Lining Applications
 - 2.3.3 Shotcrete Reinforcement

3. BACKFILL GROUT – SPECIALTY MATERIALS AND ADMIXTURES

- 3.1 Anti-Washout Grout Admixture
- 3.2 Accelerators and Admixtures – Compatible with Anti-Washout
- 3.3 Polymeric Spheres – Lightweight Admixture
 - 3.3.1 Cellular Concrete Substitute
 - 3.3.2 Allows Contractor to Self-Perform with Existing Equipment
- 3.4 Special Backfill Grout Systems Using Anti-Washout and Polymeric Spheres

4. ROCK BOLTING AND ANCHORING SYSTEMS

FiReP INTERNATIONAL AG, RAPPERSWIL, SWITZERLAND

Website: www.firep.com

- 4.1 FRP (Fiber Reinforced Polymer) Rock Bolts From FiReP AG
 - 4.1.1 Solid FRP Bolts – Available in 18 – 50 mm Ø
 - 4.1.2 Self-Drilling Grouted FRP Bolts
- 4.2 FRP Special Application Bolts and Accessories
 - 4.2.1 FRP Cables Multi-Strand Cable Bolt 20m+
 - 4.2.2 FRP Tielock Form Tie Bar
 - 4.2.3 FRP Powermesh Reinforcing Fabric
- 4.3 FRP Soft-Eyes for Shaft Construction
 - 4.3.1 Polyester or Vinylester Resin Reinforcement - Straight
 - 4.3.2 Polyester or Vinylester Resin Reinforcement - Prebent

5. STEEL FORMING SYSTEMS FOR TUNNELS AND SHAFTS

EUROFORM S.R.L., GESSATE (MI) - ITALY

Website: www.euroformsrl.com

- 5.1 Steel Forms For Placement Of Tunnel/Shaft Final Linings
 - 5.1.1 Running Tunnel Lining Forming Systems
 - 5.1.2 Station And Tunnel Enlargement Forming Systems
 - 5.1.3 Shaft Lining Forming Systems
 - 5.1.4 Open Cut Tunnel Lining Forming Systems
 - 5.1.5 Special Forming Systems Designed To Meet Specific Project Requirement
 - 5.1.6 On-site Engineering Services/Consultation Available

6. SPECIALTY DESIGNER/CONSULTANT FOR TUNNEL CONSTRUCTION SYSTEMS

ROWA TUNNELING LOGISTICS AG, WANGEN, SWITZERLAND

Website: www.rowa-ag.ch

- 6.1 TBM Back-up Systems
- 6.2 Special Plants for Rock Support and Installation
 - 6.2.1 Grout Injection Plants
 - 6.2.2 Shotcrete Application Systems
 - 6.2.3 Work Platforms in Tunnels & Shafts
 - 6.2.4 Special Lifting Platforms
 - 6.2.5 Ring Beam Erectors
- 6.3 Logistics Systems for Supply and Muck Disposal
 - 6.3.1 Transportation Systems
 - 6.3.2 Rotary Dumps
 - 6.3.3 Special Locomotives for Inclines or Declines
 - 6.3.4 Special Cars for Muck, Grout, or Segments
 - 6.3.5 Wireless or Cable Train Track Surveillance Systems

7 TUNNEL SUPPORT SYSTEMS – STEEL

- 7.1 Cold Rolled Structural Rings & Arch Supports
- 7.2 Liner Plates For Tunnel & Shaft Construction
- 7.3 Special Fabricated Steel Structures & Liners
- 7.4 Lattice Girders For NATM Tunnel Construction
- 7.5 Steel Lagging & Decking
- 7.6 Corrugated Structural Plate Portal Canopies

8. SPECIALTY SERVICES

8.1 Klug Construction Systems, LLC

D.R. Klug & Associates, Inc. is the exclusive marketing agent for Klug Construction Systems, LLC, a distributor of engineered reinforcement, geotechnical and support products used in underground heavy civil and mine construction projects.

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9. CONTACT INFORMATION

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