



Underground Mining Solutions



Friction Bolts Manufacturer

www.splitsetturkiye.com



**SPECIALIZED IN THE
DEVELOPMENT, MANUFACTURE
AND DISTRIBUTION OF
INDUSTRIAL PRODUCTS USED IN
TUNNELS AND UNDERGROUND MINING**

About Us

PEKTAŞ Endüstri Otomasyon Makine Sanayi Ticaret Limited Şirketi has been supplying technical materials to their partners since 1977, adhering to principles of delivering the highest quality service through a skilled and experienced team. The products supplied and marketed are successfully utilized across various industries, including food processing, chemical production, cement, paint, paper, mining, shipping, pharmaceuticals, water treatment (drinking and waste), heating, cooling, and petrochemical sectors.

In 2015, the company expanded its operations by launching the production of split sets (friction bolts) under the "Splitset Türkiye" brand in Balıkesir. With a 1600m² facility, consisting of 800m² of covered and 800m² of open space, this initiative has introduced a new product to the local market, where such resources are scarce, while also creating employment opportunities.

The split sets produced by SplitsetTürkiye have achieved world-class standards in both capacity and quality, using premium-grade sheet metals such as S355, S420, and S500. The primary advantage of utilizing Splitset Türkiye products lies in their high efficiency and low application waste rates, positioning them ahead of other manufacturers. Additionally, the company's competitive pricing policy has enabled clients in the mining and construction sectors to reduce stock costs significantly.

Upon request, split sets (friction bolts) can also be produced with a hot-dip galvanized coating process, providing added durability and customization for specific project needs.



Total Area:
1600 m²

Production Capacity:
350 tons per month

Export Markets:
8 Countries

Steel Grades Processed:
S355 - S420 - S500



Our Values

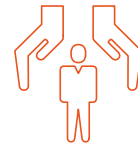
At the core of operations lies an unwavering commitment to delivering exceptional quality products and services that meet the highest industry standards, ensuring reliability and superior performance across all projects. A strong focus on customer relationships drives the company to understand and address the unique needs of each client, with a dedicated emphasis on their success. Innovation is embraced as a catalyst for growth, with continuous improvement ingrained in processes to maintain leadership in an ever-evolving market. Integrity and transparency form the foundation of every business interaction, fostering trust among partners, customers, and employees. Sustainability is prioritized through responsible practices, with a deep commitment to environmental stewardship and the well-being of communities. Collaboration is encouraged, cultivating a work environment where teamwork thrives and individual contributions are recognized. In every engagement of the production line customers receive unparalleled service and expertise, creating long-lasting value in every partnership



Reliability



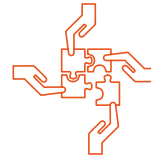
Global



Safety



Progress



Precision





Certificated

The company holds ISO 9001, ISO 14001, and CE certifications, reflecting its commitment to quality, environmental responsibility, and compliance with international safety standards. ISO 9001 ensures that the company consistently delivers high-quality products and services, while ISO 14001 demonstrates a dedication to sustainable and environmentally conscious practices. The certification signifies that the products meet essential European health, safety, and environmental protection requirements, ensuring reliability and regulatory compliance in global markets. These certifications highlight the company's ongoing commitment to excellence and responsible manufacturing.



Split Set / Friction Bolts

Split Sets are an efficient installation fortification element that works by friction and offers immediate support. It consists of a longitudinally grooved tube, with one end tapered for easy insertion into the borehole.

The Split Set is inserted into a hole with a diameter smaller than its outer diameter by impacting the bolt.

When the bolt is inserted into a smaller hole, forces are generated against the walls of the borehole, creating frictional resistance along the entire length of the bolt.



Advantages of its use

- Process automations
- Easy and fast installation
- Very simple process automations
- Immediate support load after installation
- Low manufacturing cost

Plates

Plates are fastening accessories designed to support the anchoring bolt against the rock or other elements such as mesh.

The plate must control and distribute deformation by generating a confinement action, as the bolt is subjected to tension and therefore acts as a support element for rock deformation.

Distribution plates may have hot dip galvanized coating to offer greater durability in environments that cause steel corrosion. Commonly used in support bolts, SPL Splitset Türkiye offers a wide variety of distribution plates.

Hot Dip
Galvanized



Advantages of its use

- Provides uniform bolt support
- Can secure other elements such as mesh
- Controls ground deformation
- Facilitates bolt installation when they are not aligned perpendicular to the ground

Technical Properties

Standart Bolts PL39	Plate 150x150x4
Standart Bolts PL46	Plate 150x150x4
Split Set Bolts BPL39	Splitset Plate 300x300x2
Double Plate DPL39	Double Plate 300x300x2+4

Quality Control

At Splitset Turkey, the safety of customers and employees is of paramount importance. Recognizing that quality is crucial for ensuring safety in underground operations, the company is dedicated to providing superior products that adhere to the highest industry standards and regulations.

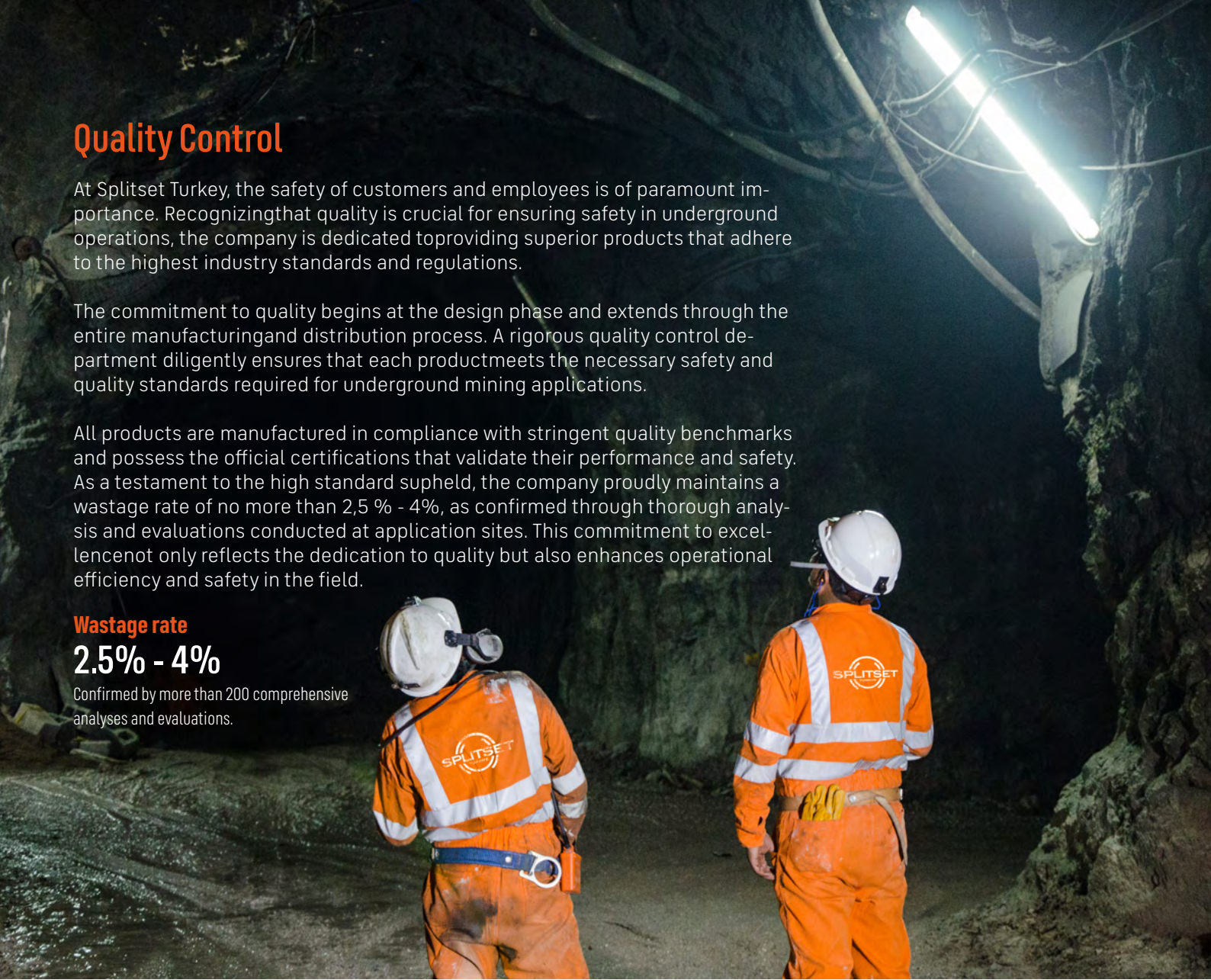
The commitment to quality begins at the design phase and extends through the entire manufacturing and distribution process. A rigorous quality control department diligently ensures that each product meets the necessary safety and quality standards required for underground mining applications.

All products are manufactured in compliance with stringent quality benchmarks and possess the official certifications that validate their performance and safety. As a testament to the high standard upheld, the company proudly maintains a wastage rate of no more than 2,5 % - 4%, as confirmed through thorough analysis and evaluations conducted at application sites. This commitment to excellence not only reflects the dedication to quality but also enhances operational efficiency and safety in the field.

Wastage rate

2.5% - 4%

Confirmed by more than 200 comprehensive analyses and evaluations.



Capacity, Shipment, Order and Inventory Tracking

At Splitset Turkey, the integration of 47 years of industry experience with cutting-edge technology allows for continuous enhancement of production capacity and professional management of all operational processes. The order and inventory tracking systems are meticulously maintained by skilled teams utilizing advanced software solutions, ensuring accuracy and efficiency at every stage.

This robust approach enables the company to meet customer demands promptly and comprehensively while facilitating fast and reliable shipments. The strength of the infrastructure supports a long-standing partnership with numerous prominent brands both in Turkey and internationally, reinforcing the company's reputation as a trusted solution provider in the industry.



S500 Steel Processing

Our ability to manufacture splitting sets using S500 grade steel underlines our commitment to quality and performance in ground support solutions. S500 steel is known for its exceptional strength and durability, making it an ideal choice for demanding applications in mining and tunneling. By using this high quality material, we ensure that our splitting sets offer superior resistance to deformation and failure and provide reliable support in harsh underground environments.

The use of S500 grade steel not only improves the structural integrity of our products, but also reduces the wastage rate minimizing overall operating costs for our customers. Our manufacturing processes adhere to strict quality standards, ensuring that every separation set meets the stringent demands of the industry. Our commitment to using premium materials, such as S500 grade steel, strengthens our position as a leading provider of innovative and reliable ground support solutions.



Friction Stabilisers

Friction stabilizers have been a trusted solution in the metalliferous mining and tunneling industry for decades, recognized for their simplicity and cost-effectiveness in providing ground support

Constructed from high-tensile steel, these stabilizers feature a roll-formed tubular design with a continuous longitudinal opening along the length of the tube. A steel ring is securely fixed to the collar end, which, when installed onto the stabilizer plate, establishes a compressive force against the surrounding rock.

The combination of the ring and pull collar allows for effective load testing once the stabilizer is in place. The tapered end facilitates easy insertion into drilled holes, while options without tape renable direct installation into paste. The unique tubular shape generates a load transfer from the steel to the rock, with the compression of the bolt into a slightly smaller diameter hole enhancing contact between the steel and rock. This design creates radial pressure, resulting in friction resistance against the pull-out load.

For applications requiring additional load-bearing capacity, friction stabilizers can be grouted, further enhancing their effectiveness. After installation, load pull-out capacity can be assessed by attaching a pull collar to the steel ring and measuring with a pull testing unit. These stabilizer bolts can be installed using handheld or mechanized equipment, such as Jumbos.

Stabilizers produced by Splitset Türkiye are manufactured to exceed Turkey's rigorous quality standards, undergoing comprehensive quality testing both in-house and in situ.

Friction Stabiliser Range

Split Set Turkey's friction stabilizers are available in diameters of 36.23 mm, 36.25 mm and 46.30 mm and lengths typically ranging from 600 mm to 3000 mm. Special lengths and special products can also be requested to meet specific requirements. Friction stabilizers can be supplied galvanized or non-galvanized. 250 Pieces per Pallet for 39 mm stabilizers and 150 Pieces per Pallet for 46 mm stabilizers are available.



39.23_{mm}

SPL 39.23 mm Stabiliser

SPL-39,23mm products are manufactured from S355 (2.3mm) grade steel to provide a price and weight advantage.

A 39 mm stabilizer is primarily used to stabilize the net by attaching it to an existing 39 mm Friction Stabilizer along with a smaller plate. Longer lengths are also used as primary ground support when drilling smaller diameter holes.



39.25_{mm}

39.25 mm Stabiliser

The premium SPL-39,25mm products are manufactured from S500 (2.5mm) grade steel.

A 39 mm stabilizer is primarily used to stabilize the net by attaching it to an existing 39 mm Friction Stabilizer along with a smaller plate. Longer lengths are also used as primary ground support when drilling smaller diameter holes.



46.30_{mm}

46mm Stabiliser

SPL-46.30mm products are manufactured from 3mm to 3.2mm thick S420 grade steel.

Pull Testing Collars

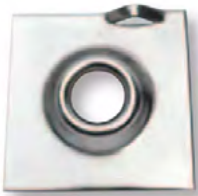
The tensile collar is an essential component of the friction stabilizer assembly, designed to ensure the load capacity of the bolt undergoes a tensile test. This process verifies the effectiveness of the friction stabilizer upon completion of assembly and enables periodic testing over time to maintain performance standards.

Manufactured by Splitset Türkiye, these collars are hollow and precision-turned from solid shaft material to fit 39 mm and 46 mm diameter friction stabilizers. They are available in untreated or hot-dip galvanized finishes, offered in convenient packs of 20 or 50 units.



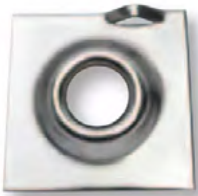
Stabiliser Plates

Splitset Türkiye offers a diverse range of stabilizer and double plates designed for use with friction stabilizers, crimp bolts, and cable bolts. These plates are engineered in-house and undergo rigorous quality testing to ensure they meet high load capacity standards, providing optimal surface support in various ground conditions. Stabilizer plates are available to accommodate all bolt types and diameters.



Ø39 - 150x150x4

The 150 stabilizer plate serves as a versatile general-purpose solution, crafted from 39 mm material to fit both 4 mm and 46 mm friction stabilizers. Its design includes a dome that aids in aligning the stabilizer while enhancing overall strength. Additionally, the integrated suspension shoe offers reliable support for service products.



Ø46 - 300x300x4

A special plate, the 300 stabilizer plate, is also manufactured from 2 mm material. The 300 stabilizer plate was developed as a cost-saving alternative to the duplex plate. However, because it is made entirely of 2 mm material, it provides a higher degree of coverage over a larger surface area than the larger 1.9 mm material area of the duplex plate. The plate is designed to deform during the installation process to prevent damage to the sheet mesh and minimize point loading of the ring. The 300 plate is typically used with a 46 mm stabilizer but can also be used with a 39 mm friction stabilizer. The suspension shoe provides support for service products.



300 Plate

Constructed from lighter gauge 2 mm material, the 300 plate is ideal for applications requiring greater surface coverage in fractured ground. Featuring four pressed rib sections along its outer perimeter, this plate delivers added strength despite its lighter construction. The 300 plate is compatible with any size bolt and can be effectively combined with smaller diameter plates.



300 Double Stabiliser Plate

The 300 double stabilizer plate combines a 4 mm thick 150 stabilizer plate with a 2 mm thick 300 x 300 mm sheet plate, resulting in a total thickness of 6 mm after welding. The plate features pressed rib sections that provide additional strength and minimize deformation during installation. This double plate is particularly advantageous for increasing surface coverage when supporting netting or when applied directly to rock surfaces.

Stabilizers SPL39

Specifications and performance

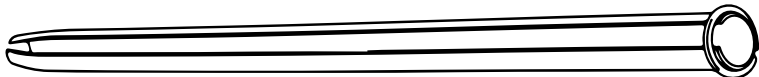
The Split Set stabilizer is constructed as a slotted steel tube, featuring a tapered end for seamless insertion into drill holes. The opposing end is equipped with a welded ring flange designed to securely hold the bearing plate in position.

During installation, the stabilizer is inserted into a hole that is slightly smaller in diameter than the tube itself, utilizing a simple driver tool attached to the drill. As the tube is driven into the hole, its diameter compresses, causing the slot to partially close. This action generates radial forces along the contact length with the rock, creating the friction necessary for stabilizing the surrounding material. The driving force from the drill effectively loads the bearing plate against the rock, enhancing overall stability. The Split Sets incorporate an innovative Ring Indexing feature, enabling precise determination of the length of the installed stabilizer.

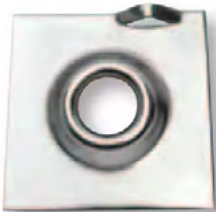
Both tubes and plates are available in standard or galvanized finishes, manufactured in strict compliance with industry standards to ensure reliability and performance



Model SPL-39 Split Set stabilizers are 1.5 inches (39 mm) in diameter. Stabilizers up to 120 inches (3048 mm) are packaged 6 per pack and 250 per pallet. For production capability orders of 126 inches and above, please contact the sales team.



SPL-39 Tube		Standard		Galvanized	
Lengths Inches	mm	Weight Lb. (approx.)	Kg (approx.)	Weight Lb. (approx.)	Kg (approx.)
30	762	3.1	1.4	3.3	1.5
36	914	3.7	1.7	3.9	1.8
42	1067	4.3	2.0	4.6	2.2
48	1219	4.9	2.2	5.2	2.4
60	1524	6.1	2.7	6.5	3.0
66	1676	6.7	3.0	7.2	3.3
72	1829	7.3	3.3	7.8	3.6
84	2134	8.5	3.9	9.1	4.1
96	2438	9.7	4.4	10.4	4.7
108	2743	10.9	5.0	11.7	5.3
120	3048	12.1	5.5	13.0	5.9



SPL-39 Plate		Standard		Galvanized	
Dimensions Inches	mm	Weight Lb. (approx.)	Kg (approx.)	Weight Lb. (approx.)	Kg (approx.)
6x6x0.16	150x150x4	1.6	0.7	1.7	0.8

Domed Bearing Plate

The Split Set domed bearing plates are engineered to uniquely combine high strength with light weight properties, making them integral components of the Split Set system. These plates are designed to provide optimal load distribution and alignment, enhancing the effectiveness of the stabilizer during installation and operation.

Bit Selection and Drilling

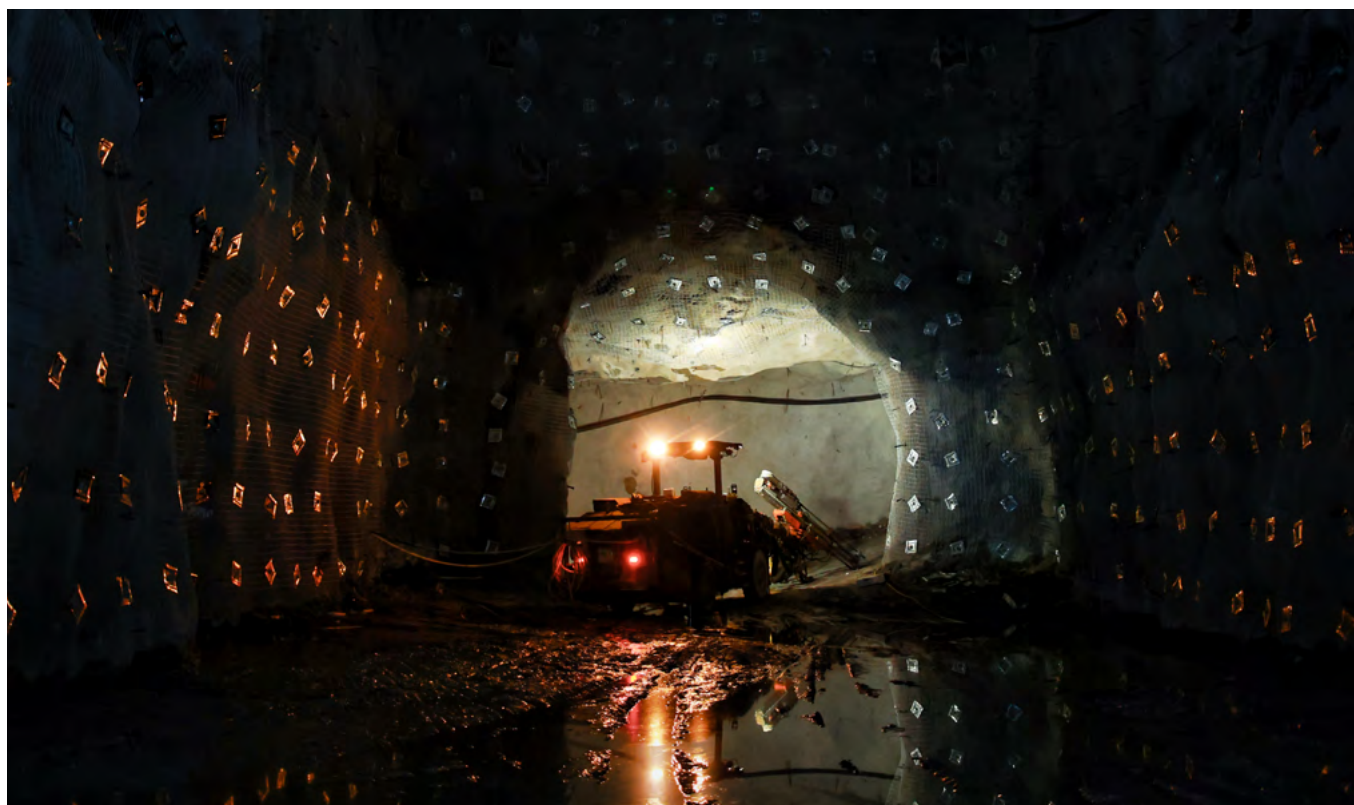
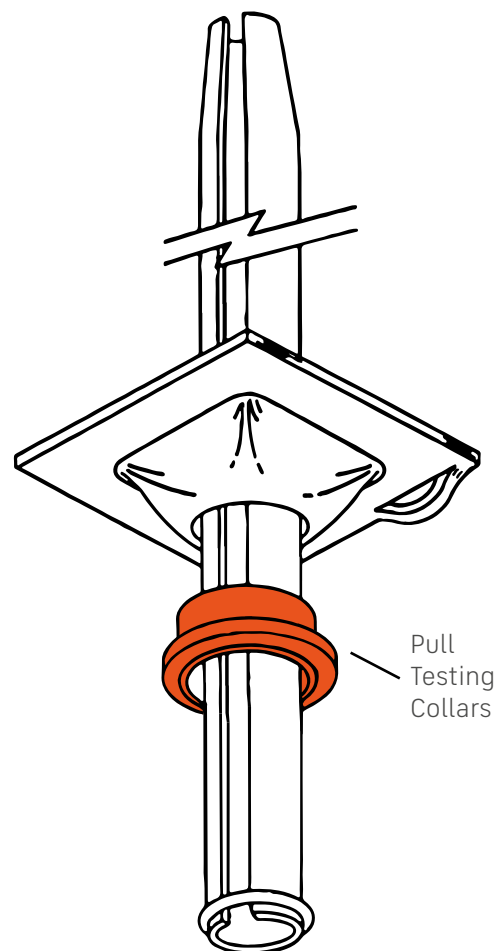
To ensure optimal initial anchorage of 3 to 6 tons, it is essential to select the appropriate drill bit diameter. Begin by drilling several holes with bit diameters ranging from 1-3/8 to 1-1/2 inches (35 to 38 mm), ensuring each hole is at least 2 inches (5 cm) longer than the length of the bolt. Number each hole and meticulously record the corresponding bit size used.

It's important to note that in soft ground, a drill bit may create a hole larger than its actual diameter, while in hard, abrasive ground, the hole may closely match the diameter of the bit. After drilling, insert an SPL-39 Split Set stabilizer fitted with a pull collar and spacer into each hole, as illustrated. Record the driving time for each stabilizer and observe the degree of slot closure within each stabilizer after insertion.

SPL-39 Pull Collar	Weight Lb. (approx.)	Kg (approx.)
	1.10	0.5

To evaluate anchorage, conduct a pull test. Align the pull tester with the stabilizer and gradually pressurize it until the stabilizer slips in the hole. It is crucial to confirm that the slippage is indeed occurring at the stabilizer and not due to other factors. During the buildup of the pull load, be aware that adjustments may happen, such as realignment of the tester housing, settling of the bearing plate, or localized rock crushing. These occurrences should not be misinterpreted as slippage of the tube.

Once slippage of the bolt has occurred, continue to pressurize the tester pump until the bolt slips again. The same pull load should consistently result in subsequent slippage, indicating reliable anchorage performance.



Interpreting Test Data

After completing the pull tests, it's crucial to analyze the results to optimize future drilling operations. To do this, construct two graphs:

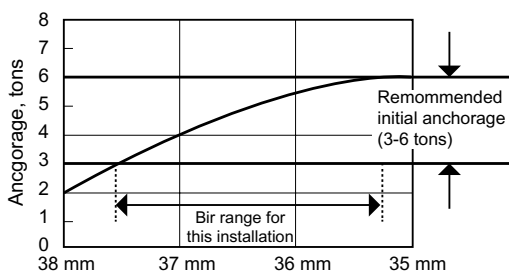
(a) Anchorage versus Bit Diameter:

This graph allows you to visualize the relationship between the anchorage achieved and the bit diameter used in your drilling operations. By analyzing this graph, you can identify the ideal bit size for your specific ground conditions. Keep in mind that as the bit wears down, the hole will become smaller, leading to increased friction until either the bit is replaced or the drill can no longer effectively drive the bolt to completion.

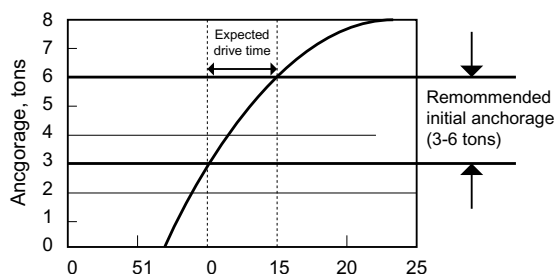
(b) Anchorage versus Driving Time:

This second graph illustrates the correlation between the anchorage achieved and the time taken to drive the stabilizer into the hole. By evaluating this data, you can determine the appropriate driving time needed for the specific ground conditions and bolt length. With a consistent bit size, drill, bolt length, rock characteristics, and constant pressure, the insertion time will be directly proportional to the initial anchorage achieved.

Establishing and maintaining this data is vital for future spot checks. By routinely referencing these graphs, you can ensure that proper installation techniques are consistently employed, ultimately enhancing the efficiency and effectiveness of your anchorage systems.



Decreasing bit diameter ►
(a) Anchorage versus bit diameter



Driving time, sec.
(b) Anchorage versus driving time

Installing the SPL-39 Stabilizer

The SPL-39 stabilizer features a nominal outside diameter of 1.5 inches (39 mm). When selecting the length of the stabilizer, it is recommended to match it with other types of rock bolts, adhering to the same installation spacing requirements. The installation process utilizes the same drill that was employed to create the hole.

Split Set stabilizers can be effectively installed using a variety of equipment, including jacklegs, stopers, jumbos, and automatic bolting machines. Additionally, nearly any hydraulic drill or percussive air drill with a bore size of 2-5/8 inches (66 mm) and operating at a pressure of 90 psig (6 bar) will provide the necessary impact force for successful installation.

Ensuring that the correct installation practices are followed will maximize the stabilizer's effectiveness and performance in providing support within underground environments

SPL-39 Drivers Standard	Shank Size (Inches)	Shank Size (mm)	Weight Lb. (approx.)	Kg (approx.)
Short-nose	7/8 x 4-1/4	22x108	2.9	1.3
Short-nose	1x4-1/4	22x108	3.1	1.4
Long-nose	7/8 x 4-1/4	22x108	3.2	1.5
Long-nose	1x4-1/4	22x108	3.4	1.6

SPL-39 Utility Hangers

Split Set utility hangers are designed for versatility and are available in tube lengths of 18 and 24 inches (46 and 61 cm) to effectively support light loads, including cables, ventilation tubing, and pipes.

These utility hangers can be easily installed by driving them into already installed Split Set stabilizers. By aligning the hanger slot with the corresponding slot on the stabilizer, installation becomes streamlined, facilitating the efficient attachment of mesh after the ground has been securely stabilized. This design not only enhances operational efficiency but also ensures that utility management within underground environments is optimized.

SPL-39 Utility Hangers			
Lenght In.	mm	Weight Lb.	kg
Standard			
18	457	1.9	0.8
24	610	2.5	1.1
Galvanized			
24	457	2.0	0.9
18	610	2.7	1.2



Stabilizers SPL46

Specifications and performance

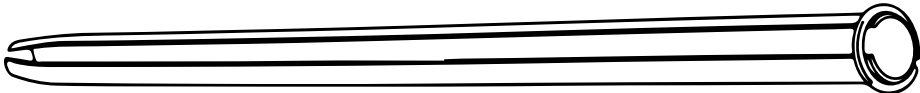
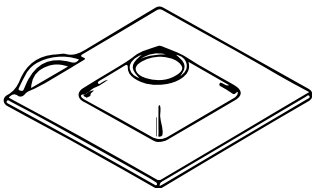
The SPL46 Split Set stabilizer is engineered as a slotted steel tube, featuring a tapered end for seamless insertion into drill holes. The opposite end is equipped with a welded ring flange designed to securely hold the bearing plate.

When the stabilizer is inserted into a pre-drilled hole that is slightly smaller in diameter than the tube, it utilizes a simple driver tool attached to the drill. As the stabilizer is driven in, its diameter compresses, causing the slot to partially close. This action generates radial forces along the length of contact with the surrounding rock, which provides the necessary friction to effectively stabilize the rock mass. The driving force exerted by the drill further loads the bearing plate against the rock, enhancing stability.

Both the tubes and plates are available in standard or galvanized finishes, manufactured to meet stringent quality standards. This ensures optimal performance and durability in various geological conditions.



The SPL-46 Split Set stabilizers are 1.8 inches (46 mm) in diameter and are available in lengths up to 144 inches (3658 mm), packaged in sets of 6 per pack and 150 per pallet. For lengths exceeding 144 inches, please contact our sales team for production capabilities and assistance.



SPL-46 Tube		Standard		Galvanized	
Lengths Inches	mm	Weight Lb. (approx.)	Kg (approx.)	Weight Lb. (approx.)	Kg (approx.)
36	914	5.7	2.6	6.0	2.7
42	1067	6.6	3.0	6.9	3.1
48	1219	7.6	3.5	7.9	3.6
60	1524	9.4	4.3	9.9	4.5
72	1829	11.3	5.1	11.8	5.4
78	1981	12.2	5.5	12.8	5.8
84	2134	13.1	6.0	13.8	6.3
90	2286	14.1	6.4	14.8	6.7
96	2438	15.0	6.8	15.7	7.1
102	2591	15.9	7.2	16.7	7.6
108	2743	16.8	7.6	17.7	8.0
114	2896	17.8	8.1	18.7	8.5
120	3048	18.7	8.5	19.6	8.9
126	3200	19.6	8.9	20.6	9.4
132	3353	20.6	9.4	21.6	9.8
138	3505	21.5	9.8	22.6	10.3
144	3658	22.4	10.2	23.5	10.7

SPL-46 Plate		Standard		Galvanized	
Dimensions Inches	mm	Weight Lb. (approx.)	Kg (approx.)	Weight Lb. (approx.)	Kg (approx.)
6x6x0.16	150x150x4	1.7	0.8	1.8	0.8

Domed Bearing Plate

Split Set domed bearing plates are designed to provide a unique blend of high strength and light weight construction, making them essential components of the Split Set system.

Bit Selection and Drilling

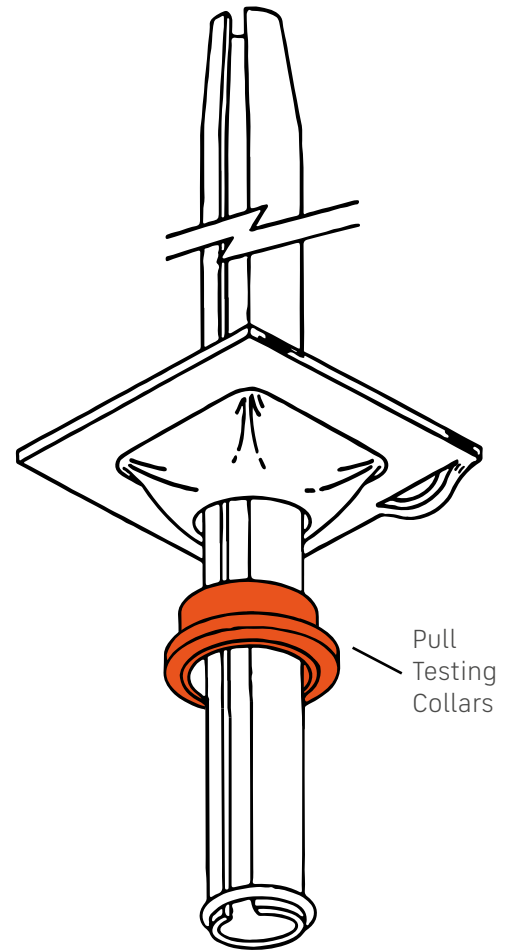
To ensure the recommended initial anchorage of 6 to 9 tons, drill several holes using bit diameters between 1-5/8 to 1-3/4 inches (41 to 45 mm). Each hole should be at least 2 inches (5 cm) longer than the bolt length. Number each hole and record the corresponding bit size.

In softer ground, bits may create larger holes, while in hard, abrasive ground, the holes may match the bit diameter.

Insert an SPL-46 Split Set stabilizer, fitted with a pull collar and spacer, into each drilled hole. Record the driving time for each stabilizer and observe the amount of slot closure after insertion.

SPL-46 Pull Collar	Weight Lb. (approx.)	Kg (approx.)
	1.10	0.5

To assess anchorage, conduct a pull test by aligning the pull tester with the stabilizer and applying pressure until the stabilizer slips. Ensure that the slippage is from the stabilizer, not due to adjustments like realignment of the tester housing, bearing plate settling, or localized rock crushing. After the initial slip, continue to pressurize the tester pump until the bolt slips again, confirming that the same pull load should trigger subsequent slippage.



Interpreting Test Data

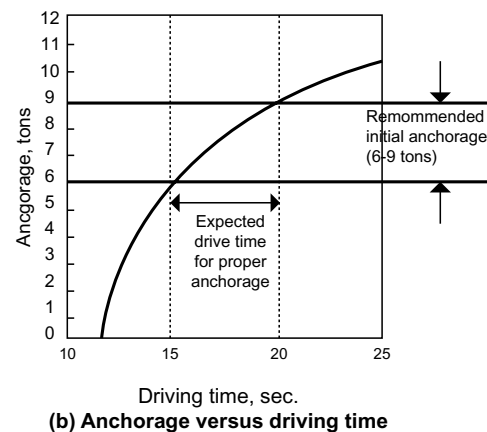
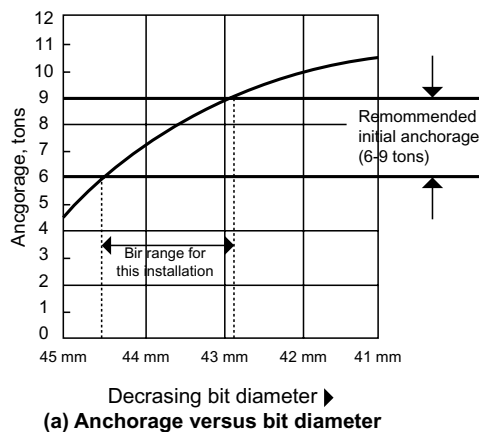
After completing the pull tests, create two graphs:

- (a) Anchorage versus bit diameter
- (b) Anchorage versus driving time

Use the first graph to identify the appropriate bit size for your specific ground conditions. As the bit wears down, the hole diameter will decrease, increasing friction until either the bit is replaced or the drill cannot fully drive the bolt.

The second graph will help you determine the correct driving time needed for the specific ground and bolt length. Given the bit, drill, bolt length, rock characteristics, and constant pressure, insertion time will correlate with initial anchorage.

This data is crucial for future spot checks to ensure proper installation techniques are consistently applied.



Installing the SPL-46 Stabilizer

The SPL-46 stabilizer features a nominal outside diameter of 1.8 inches (46 mm). Select a length consistent with other rock bolts and maintain the same spacing during installation. Use the same drill used to create the hole for installation.

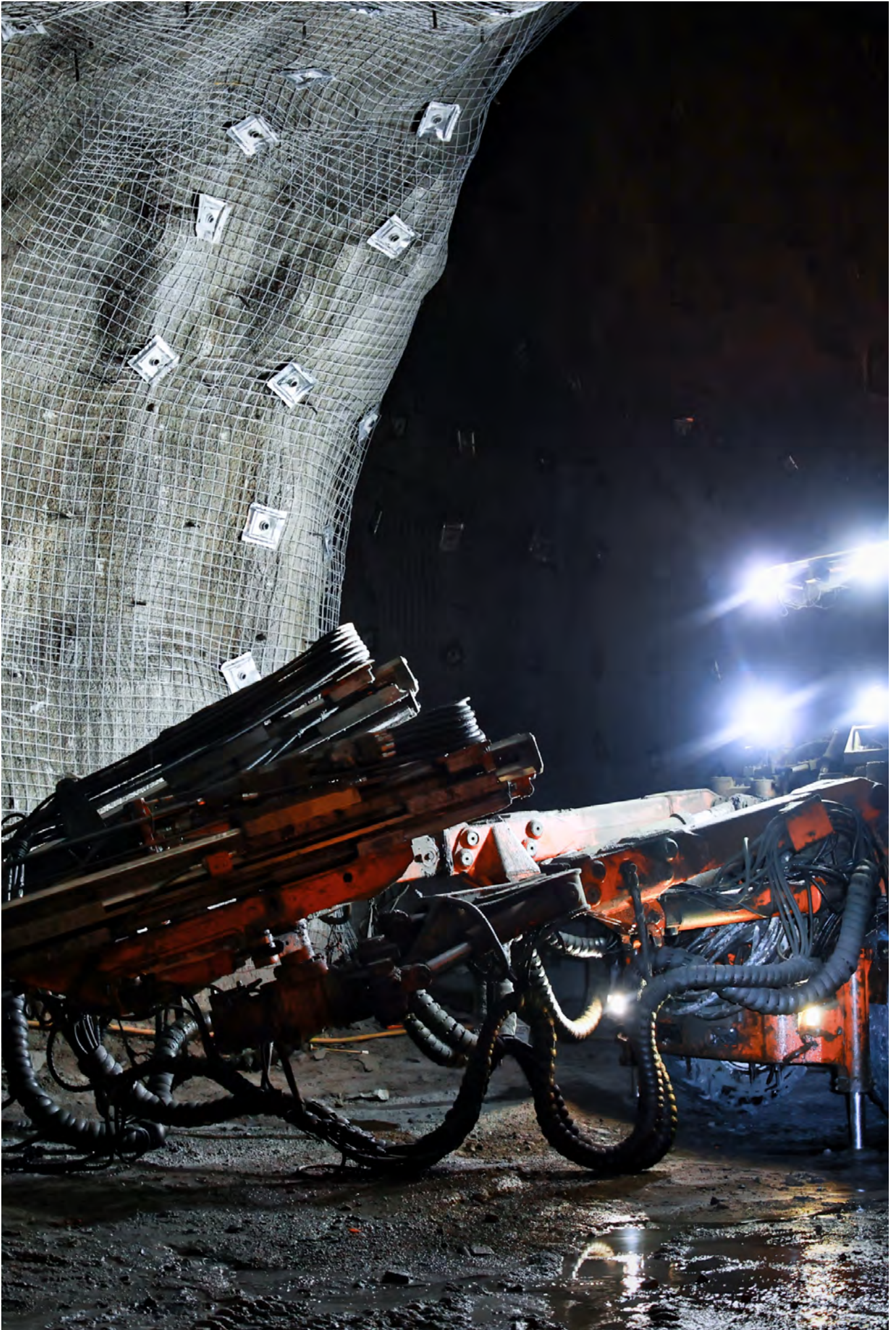
Model SPL-46 Split Set stabilizers are typically installed with jumbos. Most mounted percussive or hydraulic drills provide adequate impact power for effective installation of the SPL-46 stabilizers.

SPL-46 Drivers Standard	Thread Size (Inches)	Thread Size (mm)	Weight Lb. (approx.)	Kg (approx.)
	1-1/4	32	4.4	2.0
	1-1/2	38	4.4	2.0
	T-38	38	5.0	2.3

SPL-46 Utility Hangers

Split Set utility hangers come in 18-inch (46 cm) and 24-inch (61 cm) tube lengths, designed to support light loads such as cables, vent tubing, and pipes.

SPL-46 Utility Hangers			
Lenght In.	mm	Weight Lb.	kg
Standard			
18	457	3.0	1.4
24	610	3.9	1.8
Galvanized			
24	457	3.1	1.4
18	610	4.1	1.9













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