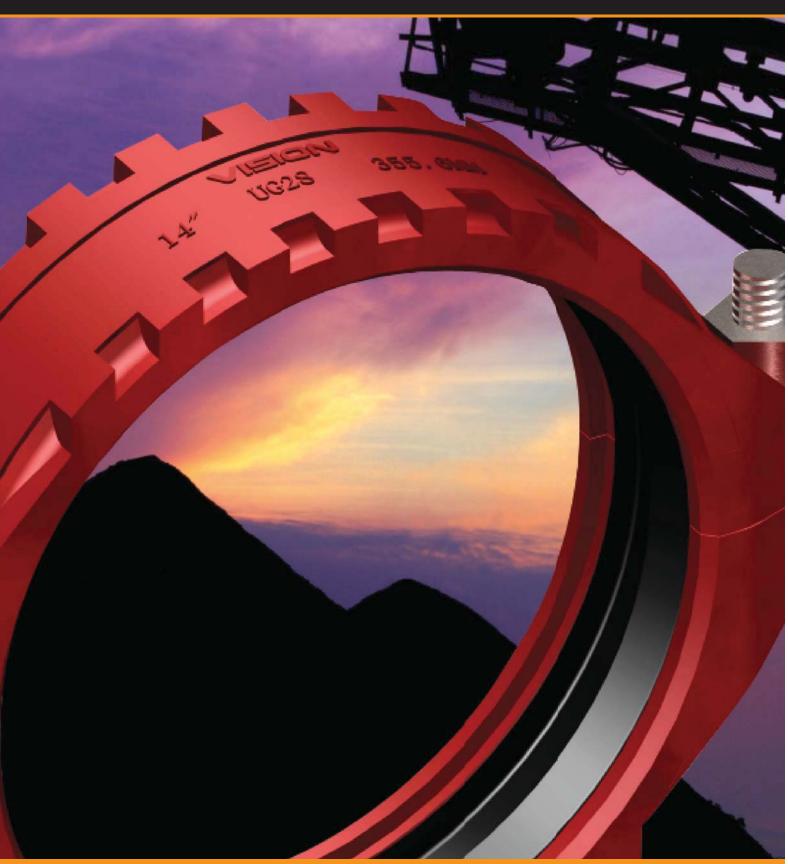


# **VISION PIPING SOLUTION**

Reliance from Professionalism



**Piping solution for Mining industry** 

#### INDUSTRY REQUIREMENTS



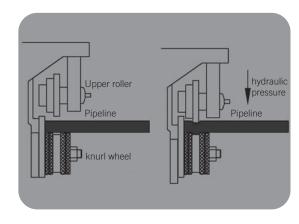
VISION is dedicated to piping solutions to every industry line, especially to colliery system for many years. It has been continuously optimizing the products and better services best suitable to pipe systems in the coal mine. Piping is our mission and highly reliable efficiency is what we always pursue.

All piping systems in the coal mine serve for mining activity, and more diverse requirements should be meet when the producing capacity is enlarging, with more and more strictly improved security standard and workers operating environment.

VISION mechanical piping system has a wide application for daily tunneling, maintenance, technical improvements enlargement and new miner's digging activities.

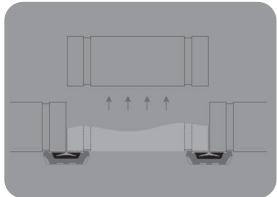
# Operations without naked flame decrease its potential fire risk.

Operation with naked flame is of severe danger with the existence of flammable and combustible gas inside the mine, and special welding technology is a must when naked flame welding operation is applied. However VISION mechanical piping systems shun this kind of problem by application of grooved connection, which shows its simplicity, efficiency and easiness to quality control, compared with the flange connection and fabrication.



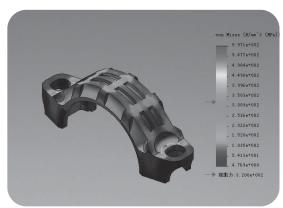
# Convenient for assembly, adaptable to tunneling side operating needs

Coal mine of high capacity needs effective supporting facilities including piping system's time oriented maintenance and supporting, including fire protection, dust sprinkle system, air compressor system and drainage system etc. Compared with flange connection, convenience shows itself more on grooved connection in the mine, which is suitable to joint pipes in the limited operating environment and installation discrepancies problem, and also easy to assembly and dismounting for recycle.



### Reliability, durable for long time operation

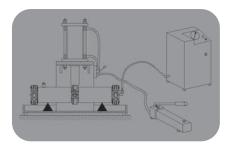
Due to potential changing pressure in the piping system in the mine, fatigue occurs at the pipe joints. VISION product greatly enhances the fatigue function from its structure to material selection, which will ensure its durability for long term operation.



### **INDUSTRY REQUIREMENTS**

#### Enhanced flexibility, for complicated geologic situation

Due to the potential risks of ground bloat and unavoidable bump which might occur on the pipe, VISION product provides the piping system with greater flexibility to its full function. It enhances the bending moment capacity by over 50% of standard requirement, and VISION flexible coupling has a good cushioning function.



#### Longer service life, for coal mine's longer programming

Unique gasket structure and polymer formula ensure the products longer service life including reuse for several times.

VISION has multiple choices of gasket material to serve variable medium like underground water, air or others. Also anti static-electricity and anti flaming gaskets are available upon request.



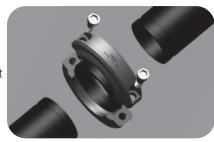
# Enhanced pressure resistant performance, for big size drainage system

With the increasing depth of coal mine drilling, pressure of drainage system rises accordingly. VISION has developed Ultra Grooved System which endures higher pressure. For instance, Style#HP30, rated working pressure reaches 10.0MPa/1,500psi and hydrostatic test pressure over 30.0MPa/4,500psi which ensures a safer operation. Style#FC36, rated working pressure 16.0MPa/2,500psi, provides more efficiency and reliability of pipe line assembly, especially with the application of V-Fab fabrication services.



# Special and individual design, for geologic grouting system requirement

Style#FC32 is specially designed for geologic grouting system, capable for various working condition. With a maximum working pressure of over 25.0MPa/3,600ps, it shows an exellent performance of safety, reliability, convenience to assembly and its reusability.

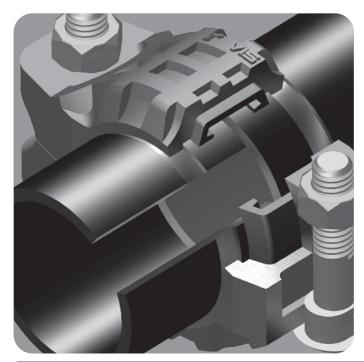


## **Applications**



- Fire protection and sprinkle system
- Air compressor and self-rescue system
- Underground drainage system
- Gas ventilation system
- Underground cooling system
- Grouting system
- Tailing system
- geologic pipe system
- water treatment system
- other piping systems

### More advantages



Apart from the basic requirements of coal mine subsurface piping system, VISION flexible grooved coupling system has more strength and features, which makes more effectiveness and efficiency as well as safety and reliability.

VISION piping products is suitable to joint seamless steel pipe, welding steel pipe, spiral welded steel pipe and HDPE tubes etc. VISION has a wide range of coupling series for choices according to different kind of pipe material, sizes, pressure rating and working conditions, with its pressure resistant capacity range from negative pressure up to 25.0MPa.

All those special couplings are designed especially for practical needs of piping systems in mining applications. It contains rich experience from VISION's accumulated hard word and its customers of many years.

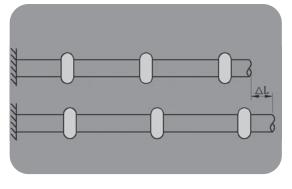
# A solution for pipe line expansion and contraction in difference temperatures

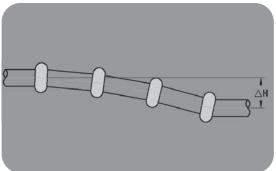
Axial movement compensation accommodated by VISION flexible grooved couplings compensates expansion and contraction of the subsurface pipe lines. VISION Style#221 series Grooved Combined Compensator is a recommended alternative if required.

For instance, the underground cooling system is working under violent temperature fluctuation. With VISION grooved flexible couplings, pipe end load can be absorbed properly.



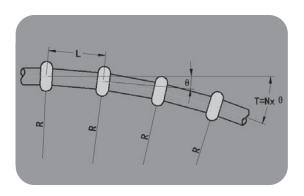
Angular deflection compensation provided by VISION grooved flexible couplings solves subsidence problem of piping system to a degree, which is proper for complex tunnel situation and strata variation.





### A solution for piping system bending needs

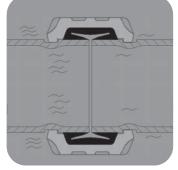
Angular deflection compensation from VISION grooved flexible couplings of proper pipe length and coupling setup meet the bending needs of piping system with simplicity and efficiency, capable for the complex tunnel situation, strata variation and continuously changing datum marks.



## More advantages

#### Absorb vibration from piping system

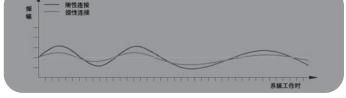
VISION grooved flexible couplings is capable to reduce vibration of piping system and extend its working life effectively. Also it provides a cushioning effect when unpredictable impact from the environment occurs. Style#221 expansion joint provides excellent performance of vibration reduction superior to application with rubber or bellow expansion joints.





#### Seismic resistant piping system solution

VISON piping system contains many unique mechanical features, which is very useful when earthquake occurs. The flexibility provided by Style#101/101H/101CL flexible couplings is capable to reduce stresses while the resilience sealing help reduces the vibration.



As in normal practice, seismic proofed pipe hangers are widely used against pipes over displacement by adjusting and inducing system movement.

As is well known, earthquake many cause system's stress. VISION grooved piping system requires hangers and supports to confine the pipe displacement to the limitation of flexibility and pipe end load in acceptable rate.





## Factory Prefabrication for pipelines



V-Fab, as a branch of VISION group companies, has always concentrated itself on Factory Prefabrication of pipelines, and tried its best to improve installation quality, reduce the costs and shorten construction period.

V-Fab, certificated by ISO9001-2008, with an annual processing capacity of 300 thousand pipe-ends and 1 million outlets, takes proud of its punctual, high-quality, and cost-effective fabrication services of cutting, curving, hole drilling, welding and surface treating of the pipes of for random length, quantity, or thickness.

VISION currently has two production bases, in Shanghai and Nantong, and plans to establish more according to the demand from customers and market

V-Fab provides one-stop service with large numbers of steel pipe stock and highly reliable efficiency. VISION tries to integrate various resources to improve product quality and reduce its cost.



\*V-Fab is a member of VISION group companies.

## **Grooved coupling**



VISION grooved piping system mainly includes grooved end coupling, grooved fittings and grooved valves, in which grooved end coupling is the key element which mainly includes rigid coupling, such as style #001, #KZ22, #HR24, and flexible coupling such as style #101, #101H and #101CL.

VISION style #001 Std. Rigid Coupling has a unique, 60° angle pad design which constricts the housing keys into the groove around the full circumference to grip the pipe rigidly. The housings slide on the angled pads rather than mating squarely. This sliding adjustment also focus the key sections into opposed contact on the inside and the outside groove edges, pushing the joint to its maximum pipe end separation during assembly.

Coupling will push the pipe ends to their maximum allowable separation which must be considered during assembly.

LIGID is a special rigid coupling with spigot and socket design, diameter between key sections is adjusted by tightening nuts, until key section grips groove bottom around the full circumference rigidly, to prevent axial movement and spinning.

Flexible grooved-Style# couplings (such as 101, 01H, 101CL,020,HP30) allow controlled angular, linear and rotational movement at each joint to accommodate expansion, contraction, setting, vibration and other piping system movement. These features provide advantages in designing piping systems but must be considered when determining hanger and support spacing and location.

## **Advantages**

#### Reliable housing design

The grooved housing, made by finite element method (FEM), thoroughly analyzed any possible stress, to make sure the housing absolutely reliable under extremely internal and external forces as well as composite forces, say extreme pressure or bending movement. In view of practical usage, start and stop of the pipe system and the pressure oscillation, Water hammer impact test is used to make sure the coupling absolutely reliable.



### **Unique Sealing Design**

Better sealing performance is achieved by finite element design of C shaped or E shaped gasket with its advantage of triple sealing effect, which ensures long time working life under circumstances of gasket deformation, temperature changing, expansion and contraction, flare, etc. Gasket compound is also unique, which ensures highly sealing effectiveness during long time working life within valid temperature range.









# **Ultra** grooved coupling

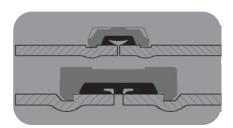
Continuous development is one of what VISION always pursue, with which VISION developed the latest Ultra grooved piping system for coal mine, with its own independent intellectual property rights. Its specification is from DN350 to DN1200 and it provides of higher security, higher stress capacity, unified ultra grooved criteria, two-piece structure convenient to assembly. It is very proper for coal mine subsurface drainage system, cooling system and gas ventilation system.

Compared with standard grooved couplings, Ultra grooved couplings show more strength for duty and more convenience to assembly.



For more info, please refer to VISION publication V-017

#### Fetures



#### Unified structure and dimensions

All two-piece structure of any dimensions make it easier to assembly, to save more operating space. It unifies dimensions of all groove specifications with no need of considerations for groove dimensional discrepancies.



#### E shaped gasket structure

Longer interface provides this product with humanistic spirit and more resilience, even if with some small defects on the steel pipe surface. Unique E shaped structure is capable to carry the stress at coupling more properly as resulted in safety coefficient.





#### Highly strengthened tightness structure

Tightness structure of one bolt at one side applied in Ultra grooved couplings DN350~600mm, makes it easy to assembly based on insured operating stress and connection rigidity

Tightness structure of two bolts at one side applied in Ultra grooved couplings DN650 and above, insures stability of connection.

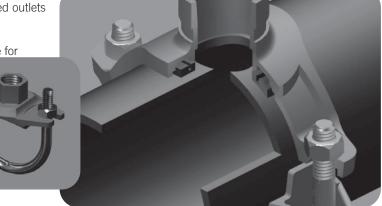
Mechanical Outlet

All bolts are of highly strengthened stress over 9.8 grade, thus enhance the coupling's bending moment

VISION Mechanical Outlet system shows its easiness and efficiency for outlet connection including grooved outlets and threaded outlets without welding process.

VISION Mechanical Tee and Mechanical Cross are suitable for hydrant system, fire sprinkler system and

compressed air system, with maximum working pressure up to 3.5MPa/500psi.



# **EASY** coupling

EASY coupling achieves high efficiency two times of normal coupling with its unique housing and gasket design and without requirement of separating shell and removing bolts.

EASY coupling Style #KZ22, #KZ26 and #KZ27 is available in VISION. For more info, please refer to page 15 coupling selection.

VISION EASY coupling applies to fire protection and sprinkler systems, compressed air system, etc.

Note: More detail about Coupling Style #KZ22, #KZ26 and #KZ27, please refer to VISION publication 06.09,  $\,$  06.12 and 06.13.



# **Snap Joint Coupling**

Articulated and self-tight connection without any bolts, the snap joint coupling is easy to assemble and disassemble, specially fit for narrow spaces of the mine,

VISION Style #S23 snap joint coupling applies to fire protection and sprinkler systems and compressed-air system, especially for tunnel pipe lines.

VISION Style #S23 maximum working pressure reaches 4.0MPa/600psi.

For more info about Style #S23, please refer to VISION publication 06.10.



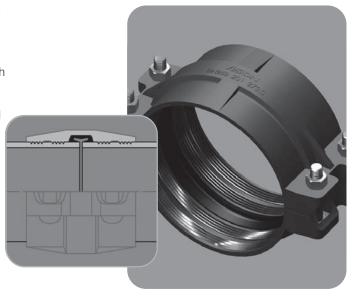
# **HDPE** pipe Coupling

Style #201 coupling is mainly designed for connection with HDPE plain end pipe, which makes it easier to assemble.

Tooth at both sides of the coupling that matches and engages with pipe HEDE effects a tight connection.

Style #201 coupling applies to HDPE pipes of DN50-DN600 in all different thickness.

Note: For more info about Style #201, please refer to VISION publication 06.23.



## **Coupling for Geological Pipe line**

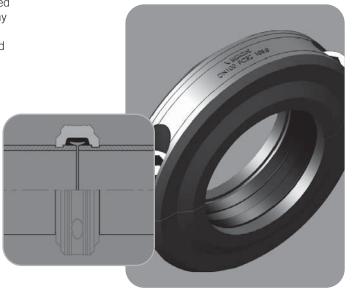
Style #FC32 coupling with steel-forged housing is specially designed for geological pipes and grouting pipes, which works well under any working pressure such as 10.0MPa/1,500psi, 16.0MPa/2,500psi, and 25.0MPa/3,500psi. Both the grooved coupling and shouldered couplings are available, suitable for roll grooved, cut grooved, or shouldered pipe ends.

For pipe system of 10.0MPa/1,500psi working pressure, rolled groove connection are recommended.

For pipe system of or above 16.0MPa/2,500psi working pressure, cut grooved ends or pipe welded with cut grooved adaptors are the best option.

VISION affords factory prefabrication of pipelines according to customers' requirement.

Note: More detail about Style #FC32, refer to VISION publication 06.25.

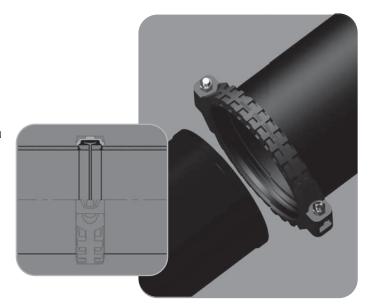


## **Shouldered Coupling**

VISION shouldered Coupling Style #T101 is specially designed for SAW steel pipe, which has a similar working principle with grooved coupling but has a bigger angular deviation, which is ideal for steel pipes with light thickness in the mine.

In all, shouldered coupling is well used for pipes that require high wear resistance, such as slurry/grout or powder medium.

Note: More detail about Style #T101 Shouldered Coupling, please refer to VISION publication 06.27.



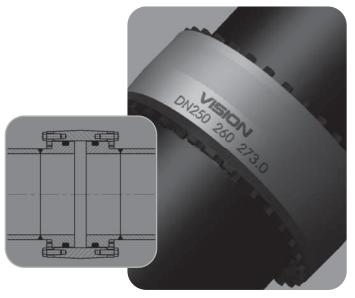
# **Compensation Joint**

VISION Style #260 Compensation Joint is designed for the piping system of large axial movement and angular deflection with maximum deflection angle of 4 degrees and maximum axial movement of 50mm/2", suitable for the occasion of potential expansion and contraction or sedimentation.

Style #260 Compensation Joint with shouldered structure and O-shape gasket at the pipe ends, can stand the maximum working pressure of 10.0MPa/1,500psi.

Note: 1. On larger axial movement occasion, VISION compensation coupling Style #ZC31 is recommended.

2. More detail about Style #260 compensation coupling, please refer to VISION publication 06.24.

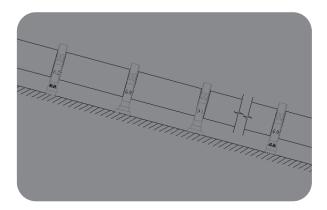


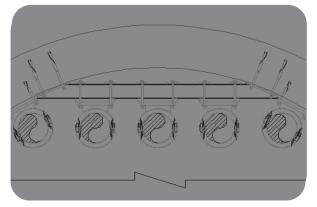
# **Special Draining Coupling**



Style #FC36 draining coupling, with maximum working pressure of 16.0MPa/2,500psi, can apply to draining pipes of underground of mine. At the same time, VISION is offering any kind of specialized draining coupling and fixed supports and guiding supports according to customer needs.

Note: More detail about Style #FC36 draining coupling, please refer to VISION publication 06.26.





# **Pipe Processing Machines**

VISION provides pipe groove machines and fabrication machines such as hole cut machines and pipe cutters, to make the pipe installation much easier and conform to VISION groove specifications. Also high safety design secured the personal and property safety.

Note: More information about pipe processing machines, please consult with VISION.







# **Pipe Supports and Hangers**

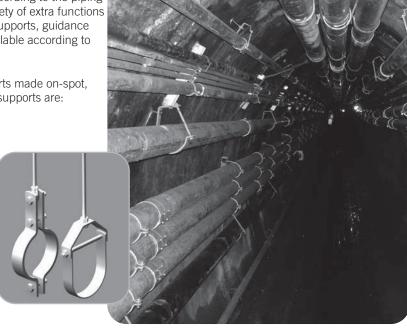
VISION Pipe Hangers and Supports are designed according to the piping system features and the correlative standards. A variety of extra functions is considered as a unique design of each hangers, supports, guidance and fasteners. Specially-made products are also available according to customer's request.

Compared with traditionally pipe hangers and supports made on-spot, the advantages of pre-assembled pipe hangers and supports are:

- Fast installation to realize efficient assembly.
- No naked flame to guarantee the safety;
- Sufficient bearing capacity to ensure good operation;
- Compact structure to cut cost;
- Applicable to various connecting circumstance such as flange, welding or threaded connection.

Layout of pipe hangers and supports in flange, welded and threaded connection, is based on current standards.

For Layout of pipe hangers and supports in the grooved piping system, please refer to VISION publication 20.01 "Design Data"



#### More Products

VISION offers various couplings and valves, include plain ends steel pipe coupling, GRIP couplings etc.

Note: For more info, please consult with VISION.





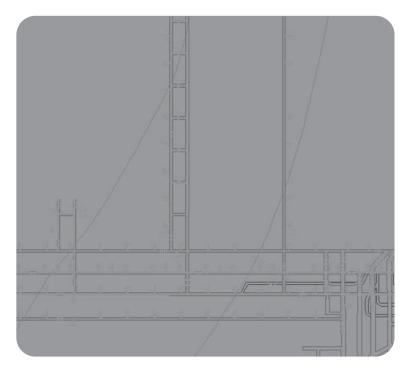


### 部分用户

- HUAINAN MINING INDUSTRY (GROUP) CO,. LTD.
- HUAIBEI MINING INDUSTRY (GROUP) CO,. LTD.
- YANZHOU COAL MINING COMPANY LIMITED
- PINGDINGSHAN COAL GROUP CO., LTD. ZHENGZHOU COAL & ELECTRIC CO., LTD.
- SHANGXI COKING COAL GROUP CO., LTD.
- YIMA COAL INDUSTRY (GROUP) CO.,LTD.
- HEBI COAL INDUSTRY (GROUP) CO.,LTD.
- YONGCHENG COAL & ELECTRICITY(GROUP) CO., LTD
- JIZHONG ENERGY FENGFENG GROUP
- ELION RESOURCES GROUP COMPANY
- JINCHENG ANTHRACITE MINING GROUP
- SHANXI FENXI MINING(GROUP) CO.,LTD.
- DATONG COAL MINE GROUP COMPANY
- SDIC DATONG ENERGY CO., LTD.
- SHANXILANHUA SCI-TECH VENTURE CO.
- .....



# Fire and Sprinkler Systems



Water supply system in mining application mainly includes hydrant water supply system, auto sprinkler system, dust-proof sprinkler system and other various water supply for equipments.

Fire protection water supply system as an important guarantee of underground safety consists of water sources, underground water pipes, and underground fire water supply net.

Dust-proof sprinkler system is a main and necessary part of the mine production to avoid pulmonary disease and prevent gas explosion or coal-dust explosion accidents

Underground fire protection sprinkler pipes usually consist of two in one networks of fire protection pipes and sprinkler pipes, or partial ring shaped pipe networks through communication tunnel. Installation is effected at each outlet and water collection spot derived from stem pipe. EASY couplings and snap joint couplings are widely accepted in these pipe lines.

Application of VISION mechanical outlets provides fire protection sprinkler system assembling work with highly reliable effectiveness and efficiency.

Style #101, 101H, S23, KZ26, KZ27 are recommended.

# **Air-compressed System**

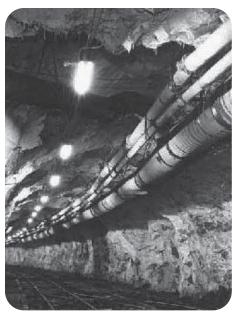
Air-compressed system is made up of air compressor, air-compressed pipe network and various gas-driven equipment and mainly used in underground self-rescue system and manufacturing system. VISION piping solution makes the assembly and disassembly quite fast and also helps guarantee the safety of the air-compressed system which is of vital importance to the air-compressed system.

Style #001, 101,S23, KZ22 are recommended.







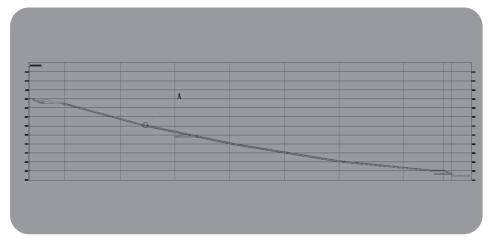


# **Underground Drainage System**

Underground drainage system is an important part of the system safety. VISION develops various coupling of big size and high pressure, which can meet the demand in the mine and is suitable for the roadway and main shaft. The installation is convenient without flame construction.

Style #1101H、HP30、FC36、204are recommended.





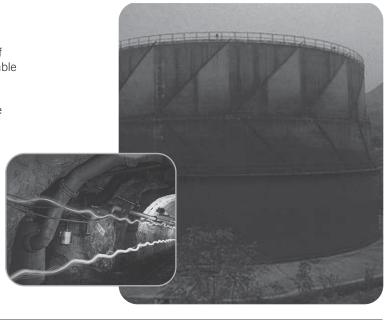


# **Gas Drainage System**

Gas drainage system is widely used in the mine especially when gas problem is rather serious. VISION piping system enjoys many advantages due to its unique piping style compared with flange, so is widely used in underground of mine. Meanwhile gasket inside of VISION coupling applicable in gas drainage system has its unique features as:

- The maximum vacuum is 0.08MPa/10psi to make sure the gas drainage system proceed smoothly under negative pressure
- The maximum electric resistance of anti-static EPDM rubber is  $10.8\Omega$ /cm to ensure there is no static electricity when the system works.
- The maximum flame-retardant level of EPDM rubber is 94V-2 to guarantee the absolute safety of the system.

Style #UG28R, #201, #205 are recommended.



# **Underground Cooling System**

Underground cooling system is necessary to improve underground working environment and to guarantee the safety of deeper or geologically special mines

VISION couplings of various styles are suitable for underground cooling system, meeting the request of good adaptation of expansion and contraction

Note more information about expansion and contraction; please refer to VISION publication 20.02.

Style #101H, UG28 and UE29 are recommended.



## **Geological pipe system**

According to coal grouting fire-fighting technology norms, grouting system must be installed for coal mine to ensure safe operations. The grouting pipe is the key point of the whole system to guarantee capacity and stability of the grouting system. VISION Style #FC32 coupling is designed for grouting pipe system.

Style #FC32 is recommended.



## More application



Coal washery



Opencast coal mine



Long-distance transmission

VISION piping system is widely used in ground operation system of coal mine, such as water supply system, fire-fighting system, heating system, technical water supply system, water treatment systems and other piping system. VISION piping system also applies to coal washery, opencast coal mine, tailing transmission system and coal chemical industry.

# **Working pressure sheet**

	ze	Max. Work Pressure (MPa)																
Nominal Dia. Actual O.D																		
mm	mm	LIGID	001	101	101H	101CL	KZ22	S23	KZ26	KZ27	UG28	UE29		260	201	FC32	FC36	T101
32	42. 4	-	5. 2	5. 2	8. 6	-	-	-	5. 2	8. 6	-	-	-	-	2. 5	25. 0	-	-
40	48. 3	-	5. 2	5. 2	8. 6	-	_		5. 2	8. 6	-	-	-	-	2. 5	25. 0	-	_
50	57. 0	-	5. 2	5. 2	8. 6	-	-	-	5. 2	8. 6	-	-	-	-	2. 5	25. 0	-	-
50	60. 3	3.5	5. 2	5. 2	8. 6	-	3. 5	2. 5	5. 2	8. 6	-	-	-	_	2. 5	25. 0	-	
65	76. 1	3.5	5. 2	5. 2	6. 9	-	3.5	2. 5	5. 2	6. 9	-	-	-	_	2.5	25. 0	-	
80	88. 9	3.5	5. 2	5. 2	6. 9	-	3.5	2. 5	5. 2	6. 9	-	-	-	-	2.5	25. 0	-	
100	108. 0	3.5	5. 2	5. 2	6. 9	-	3. 5	2. 5	5. 2	6. 9	-	-	-	-	2. 5	25. 0	-	-
100	114. 3	3.5	5. 2	5. 2	6. 9	-	3. 5	2. 5	5. 2	6. 9	-	-	-	-	2. 5	25. 0	-	-
125	139. 7	3.5	5. 2	5. 2	6. 9	-	3. 5	2. 5	5. 2	6. 9	-	_	-	_	2. 5	25. 0	16. 0	
150	159. 0	3.5	5. 2	5. 2	6. 9	-	3. 5	2. 5	5. 2	6. 9	-	-	-	_	2. 5	25. 0	16. 0	
150	165. 1	3.5	5. 2	5. 2	6. 9	_	3.5	2. 5	5. 2	6. 9	_	_	-	_	2. 5	25. 0	16. 0	
150	168. 3	-	5. 2	5. 2	6. 9	-	3.5	2. 5	5. 2	6. 9	-	-	-	-	2. 5	25. 0	16. 0	-
200	219. 1	2.8	4. 1	4. 1	5. 5	-	2. 8	2. 5	4. 1	5. 5	-	-	-	10.0	1. 6	-	16. 0	4. 1
250	273. 0	-	4. 1	4. 1	5. 5	-	2. 8	-	4. 1	5. 5	-	-	-	10.0	1. 6	-	16. 0	4. 1
300	323. 9	-	4. 1	4. 1	5. 5	-	2. 8	-	4. 1	5. 5	-	-	-	10.0	1.6	-	16. 0	4. 1
350	355. 6	-	-	-	2. 1	-	-	-	-	-	2. 5	6. 4	10.0	10.0	1. 6	-	16. 0	2. 1
350	377. 0	-	-	-	-	2. 5	-	-	-	-	2. 5	6. 4	10.0	10.0	1. 6	-	16. 0	2. 1
400	406. 4	-	-	-	2. 1	-	-	-	-	-	2. 5	6. 4	10.0	10.0	1. 6	-	16. 0	2. 1
400	426. 0	-	-	-	-	2. 5	-	-	-	-	2. 5	6. 4	10.0	10.0	1. 6	-	16. 0	2. 1
450	457. 2	-	-	-	2. 1	-	-	-	-	-	2. 5	6. 4	10.0	10.0	1. 0	-	16. 0	2. 1
450	480. 0	-	-	-	-	2. 5	-	-	-	-	2. 5	6. 4	10.0	10.0	1. 0	-	16. 0	2. 1
500	508. 0	-	-	-	2. 1	-	-	-	-	-	2.5	-	-	10.0	1.0	-	-	2. 1
500	530. 0	-	-	-	-	2. 5	-	-	-	-	2.5	-	-	10.0	1.0	-	-	2. 1
600	609. 6	-	-	-	1. 6	-	-	-	-	-	2.5	-	-	10.0	1.0	-	-	1.6
600	630. 0	-	-	-	-	1. 6	-	-	-	-	2. 5	-	-	10.0	1.0	-	-	1.6
650	660. 4	-	-	-	1. 6	-	-	-	-	-	2. 1	-	-	10.0	-	-	-	1.6
700	711. 2	-	-	-	1. 6	-	-	-	-	-	2. 1	-	-	10.0	-	-	-	1.6
700	720. 0	-	-	-	-	1. 6	-	-	-	-	2. 1	-	-	10.0	-	-	-	1.6
750	762. 0	-	-	-	1. 6	-	-	-	-	-	2. 1	-	-	10.0	-	-	-	1.6
800	812. 8	-	-	-	1. 6	-	-	-	-	-	2. 1	-	-	-	-	-	-	1.6
900	914. 4	-	-	-	1. 6	-	-	-	-	-	2. 1	-	-	-	-	-	-	1. 6

Note: more information about the working pressure of the coupling, consult VISION directly.

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For more techical information please vision.							



