



EXPANSION JOINTS

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BRAIDED METAL HOSES



Metal braided hoses are extensively utilized in high-pressure, high-temperature, and corrosive environments, where conventional soft hoses may fail. These hoses are designed to manage significant thermal gradients and mitigate thermal expansion issues. They also provide vibration damping and noise reduction within the system. The integration of single or multi-layer braiding significantly enhances the hose's pressure containment capabilities.

The braiding not only reinforces the hose's pressure resistance but also shields it from mechanical damage and chemical degradation from external factors. This makes metal braided hoses suitable for demanding applications, including technical gases, hydraulic and pneumatic systems, vacuum technology, HVAC systems, and steam conveyance. Their sanitary properties have increasingly led to their adoption in the food and beverage industry.

In the food sector, metal braided hoses are employed in both liquid and solid food processing systems due to their hygienic advantages. We possess numerous country-specific certifications and approvals for various applications, including gas and potable water systems. Our ongoing commitment to meeting both customer requirements and regulatory standards drives the continuous acquisition of new certifications for our metal hoses.

DUAL EXPANSION JOINTS



A double gimbal expansion joint consists of two single gimbal expansion joints connected by an intermediate pipe. This configuration allows for the absorption of significant lateral movement in any plane at each end of the joint.

Construction and Functionality:

- **Components:** The double gimbal expansion joint is made up of two separate gimbal joints linked by a common connector. The common connector is secured to a rigid structure or anchor support base. The availability of expansion joints with or without an anchor support base depends on the specific requirements and preferences of the customer.
- **Purpose:** Double expansion joints are employed when the movement to be absorbed exceeds the capacity of a single expansion joint. The design facilitates the accommodation of large displacements by distributing the movement between the two bellows.
- **Intermediate Anchor:** An intermediate anchor, located centrally within the connecting pipe, divides the movement between the two bellows. This ensures that each bellow absorbs a proportionate share of the total movement, enhancing the overall effectiveness and longevity of the expansion joint.
- **Placement:** Typically installed in the middle of a pipe run, double expansion joints are positioned such that both ends experience equal levels of movement. Both ends are equipped with the same number of corrugations to ensure uniform movement absorption and system stability.

**Application:**

Double gimbal expansion joints are crucial in applications where substantial lateral displacement needs to be managed, providing both flexibility and durability in complex piping systems.



EPDM RUBBER EXPANSION JOINTS



Rubber Expansion Joints:

Rubber expansion joints are versatile components used in various applications to manage movements and absorb vibrations within piping systems. Their design allows them to accommodate movement in all directions, providing flexibility and reducing stress on connected structures.

Construction and Features:

- **Flexibility and Vibration Absorption:** Rubber expansion joints are engineered to absorb movements in all directions due to their high flexibility. This flexibility makes them effective at dampening vibrations, which helps in protecting both the joints and surrounding infrastructure from damage.
- **Reinforcement:** The strength and durability of the rubber bellows are enhanced by nylon reinforcement wires. These wires provide additional structural support, ensuring that the expansion joint can withstand operational stresses.

EPDM Expansion Joints:

EPDM (Ethylene Propylene Diene Monomer) expansion joints offer several distinct advantages:

- **Temperature Resistance:** EPDM expansion joints are capable of withstanding temperatures up to 110-130°C, making them suitable for high-temperature applications.
- **Chemical Resistance:** They are resistant to diluted acids and bases, ensuring durability in a variety of chemical environments.



- **Weather and UV Resistance:** EPDM rubber is designed to resist UV rays and weathering, making it appropriate for outdoor applications where exposure to the elements is a concern.

Application and Benefits:

- **Thermal and Mechanical Stress Relief:** EPDM expansion joints are commonly used in piping systems to alleviate thermal, extension, and contraction stresses. They help to prevent damage to the surrounding structures by accommodating the movements caused by temperature fluctuations and changes in the composition of materials or gases passing through the system.
- **Maintenance Cost Reduction:** By absorbing movements and reducing the risk of damage, EPDM expansion joints help to minimize maintenance costs. This is because they prevent issues such as pipe or duct separation, buckling, and leaks, which can be costly to repair or replace.

Conclusion:

Rubber expansion joints, particularly those made from EPDM, are essential for managing movement, vibration, and thermal stress in various piping and duct systems. Their flexibility, durability, and resistance to environmental factors make them a reliable choice for both indoor and outdoor applications, contributing to the overall efficiency and longevity of the system.



EXTERNALLY PRESSURIZED TYPE EXPANSION JOINTS



Overview:

Compensating for large thermal expansions using axial expansion joints can be challenging, as increasing the number of corrugations in the bellows enhances their capacity for thermal expansion but simultaneously increases the risk of torsional stresses. Although inner sleeves can mitigate torsion, they can also reduce the movement capability of the expansion joints. Ayvaz's externally pressurized expansion joints offer an optimal solution for handling significant axial movements.

Key Features and Advantages:

1. External Pressurization:

- **Column Stability:** Externally pressurized expansion joints are designed to handle large axial movements by applying pressure to the bellows from the outside. This approach eliminates concerns related to column instability that can occur with traditional bellows.
- **Enhanced Torsion Resistance:** By pressurizing the bellows externally, the design effectively increases resistance to torsion and high-pressure forces, thereby improving the structural integrity and performance of the expansion joint.

2. Protective Features:

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- **External Cover:** The external cover serves to protect the bellows from external environmental elements, ensuring durability and longevity.
- **Internal Liner:** The inside pipe acts as a liner, shielding the bellows from the flow medium. This configuration not only protects the bellows but also streamlines the flow, reducing turbulence and improving overall system efficiency.

3. Flow Management:

- **Directional Control:** Externally pressurized expansion joints are engineered to change the direction of the flow effectively. This design allows for the efficient conveyance of pressure to the bellows, optimizing performance and reliability.

Application and Performance:

Externally pressurized expansion joints are particularly suitable for applications involving large thermal expansions and high-pressure conditions. Their robust construction and advanced design make them ideal for managing substantial movements safely and effectively, ensuring that the expansion joints maintain their functionality and structural integrity under demanding conditions.

Conclusion:

Externally pressurized expansion joints represent a sophisticated solution for handling significant axial movements and high-pressure environments. By providing external pressurization and protective features, these joints enhance resistance to torsion and pressure, making them a reliable choice for applications requiring large-scale thermal expansion compensation and flow management.

FABRIC EXPANSION JOINTS



Flexible Ducting Element:

A very low-pressure flexible ducting element typically comprises round or rectangular fabric bellows sections and accompanying end connections. This design allows for extensive movement and flexibility, accommodating various motions and ensuring efficient airflow in systems where space and flexibility are crucial.

Asphalt Expansion Joint:

The asphalt expansion joint is engineered from a composite of asphalts, vegetable fibers, and mineral fillers, which are formed under heat and pressure between two asphalt-saturated liners. This joint exhibits the following characteristics:

- **Waterproof and Permanent:** It provides a reliable seal that resists water ingress, ensuring long-term durability.
- **Flexible and Self-Sealing:** Its inherent flexibility allows it to accommodate thermal expansion and contraction while sealing itself to prevent leaks.

Fibre Expansion Joint:

The fibre expansion joint is known for its versatility and resilience. Key properties include:

- **Flexibility:** Allows the joint to adapt to various movements without losing its sealing capability.
- **Non-Extruding:** Ensures that the material remains in place and does not migrate out of the joint space.



Expansion Joint Use:

An expansion joint, also referred to as a movement joint, serves several essential functions:

- **Absorbing Expansion and Contraction:** Designed to accommodate the thermal expansion and contraction of construction materials due to temperature fluctuations.
- **Vibration Absorption:** Helps to mitigate vibrations and movement, which can affect structural integrity.
- **Movement Accommodation:** Facilitates adjustments due to ground settlement, seismic events, or structural shifts.

Application in Bridges:

Bridges, primarily constructed from steel, undergo significant thermal expansion and contraction. An expansion joint is crucial in these structures to:

- **Manage Temperature-Induced Movement:** Bridges may expand or contract several inches throughout the year. Expansion joints prevent structural damage by accommodating these movements.
- **Prevent Structural Damage:** Without expansion joints, bridge butt joints could suffer from crushing and buckling in hot weather or pull apart in cold weather.

Concrete Slab Protection:

In concrete construction, expansion joints are used to protect slabs from cracking caused by temperature-induced expansion and contraction. These joints are placed in the cracks or joints between concrete slabs, helping to maintain structural integrity and extend the lifespan of the construction.

Building Construction:

In building construction, expansion joints are strategically placed to:

- **Relieve Stress:** Alleviate stress on building materials caused by thermal expansion and contraction, wind sway, and seismic activities.
- **Accommodate Building Movement:** Ensure the building structure remains intact and functional despite external forces and temperature changes.

These various expansion joints are essential for maintaining structural integrity and performance across a range of applications, from low-pressure ducting to high-stress bridge and building construction.



FAN COIL FLEXIBLE METAL HOSES



Overview:

TME's fan-coil connection hose is a highly versatile and durable assembly designed to handle demanding applications with exceptional flexibility. Available in both braided and unbraided configurations, this hose is engineered to resist high pressure and temperature fluctuations, making it ideal for various industrial and commercial uses.

Application Areas:

- **Fan-Coil Systems:** Suitable for connecting fan-coil units in HVAC applications.
- **Heating, Air Conditioning, and Ventilation:** Effective in systems requiring reliable and flexible connections.
- **Chemical and Petrochemical Plants:** Designed to withstand harsh chemical environments.
- **Oil and Gas Processing:** Durable under the rigorous conditions of oil and gas operations.
- **Shipbuilding and Drilling:** Engineered for use in marine and offshore environments.
- **Food Processing:** Ensures compliance with hygiene standards in food production facilities.

Advantages:

- **Flexible Design:** The hose's flexible construction allows for direct connections between collectors and pumps without additional fittings (e.g., elbows), thereby reducing installation time and costs.

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- **Enhanced Service Life:** Provides reliable, quick, and secure connections while minimizing vibration and noise due to its inherent flexibility.
- **Corrosion Resistance:** The special welding process used in the hose assembly helps prevent corrosion caused by moisture at connection points.
- **Insulation and Protection:** Features insulation and a protective welding cover that addresses potential issues related to improper earthing.

Design and Construction:

- **Hose Type:** Standard corrugated metal hose according to DIN EN ISO 10380.
- **Hose Material:** Stainless Steel AISI 316L (AISI 304 and 321 available upon request).
- **Braiding Material:** Stainless Steel AISI 304.
- **Temperature Range:** Capable of operating from -270 °C up to 600 °C.
- **Fittings Materials:** Carbon Steel St.37.2 or Stainless Steel, depending on the application requirements.

Key Features:

- **Economical Solutions:** Offers cost-effective solutions for overcoming the challenges associated with rigid connections.
- **Prevention of Corrosion:** The welding technique ensures durability and longevity of the hose, mitigating the risk of corrosion.
- **Insulation Integrity:** The hose includes insulation and a protective cover to handle potential issues related to grounding and external conditions.

TME's fan-coil connection hose is designed to meet the rigorous demands of various industrial sectors, providing reliable performance, flexibility, and resistance to extreme conditions. Its innovative design ensures efficient and durable connections across a broad range of applications.

FIXED FLANGE TYPE



Flange Connections: An Overview

Flanges are a critical component in piping systems, second only to welding in terms of usage. They offer a crucial advantage in scenarios where joints need to be disassembled for maintenance, thereby providing flexibility and ease of access. Flanges facilitate the connection of pipes to various equipment, valves, and other system components. Break-up flanges are particularly beneficial in pipeline systems that require routine maintenance during plant operations.

Components of a Flanged Joint:

A typical flanged joint consists of three primary and interrelated components:

1. **Flanges:** These are the flat, circular discs that are bolted together to form the joint.
2. **Gaskets:** Positioned between the flanges, gaskets ensure a seal that prevents leakage.
3. **Bolting:** The bolts secure the flanges and gaskets in place, creating a tight and reliable connection.

Each of these components must be carefully selected and applied to achieve a joint with acceptable leak-tightness. Proper handling and installation by the fitter are essential to ensure the effectiveness of the joint.



Considerations and Limitations:

- **Underground Piping:** Flange connections are generally not recommended for underground or buried piping due to potential issues with maintenance and leak management.
- **Leakage and Safety:** Flanges are a common source of leaks and potential fire hazards in process plants. Therefore, regular inspection and maintenance are crucial to mitigate these risks.

Classification of Flanges:

Flanges can be classified based on several criteria, including:

1. Types of Connection:

- Weld Neck
- Slip-On
- Blind
- Threaded
- Socket Weld
- Lap Joint

2. Flange Facing Types:

- Flat Face (FF)



- Raised Face (RF)
- Ring-Type Joint (RTJ)
- Male and Female

3. Pressure-Temperature Ratings:

- Standard pressure ratings (e.g., ANSI/ASME classes)
- Temperature ratings that specify the flange's maximum operational temperature

4. Material Types:

- Carbon Steel
- Stainless Steel
- Alloy Steel
- Plastic
- Non-metallic materials

Conclusion:

Flanges play a vital role in the assembly and maintenance of piping systems, offering flexibility and accessibility for routine service. While they are indispensable for many applications, their use in underground or high-risk environments must be carefully considered. Understanding the various classifications and proper application of flanges ensures reliability, safety, and efficiency in pipeline operations.

FLEXIBLE METAL HOSES



Introduction: A metal hose is a highly flexible metal conduit designed to handle a variety of demanding applications. These hoses are engineered for their robustness and flexibility, providing critical functions in numerous industrial systems.

Types of Metal Hoses:

1. Stripwound Hoses:

- **Strength:** Offers high mechanical strength, including tensile and tear resistance.
- **Applications:** Suitable for environments where high durability and resistance to mechanical stresses are required.

2. Corrugated Hoses:

- **Pressure Resistance:** Capable of withstanding high pressures while ensuring maximum leak-tightness.
- **Applications:** Ideal for applications demanding high pressure and tight seals.

Functions:

- **Liquid Line Connection:** Ensures reliable transfer of fluids in various systems.
- **Vibration Absorption:** Absorbs vibrations to protect connected equipment.
- **Stress Absorption:** Compensates for thermal and mechanical stresses in pipelines.



Durability Factors: The operational lifespan of a flexible metal hose is influenced by:

- **Working Pressure:** Maximum pressure the hose can handle.
- **External Pressure:** Impact from external forces or environmental conditions.
- **Temperature:** The range of temperatures the hose can endure.
- **Installation Conditions:** How the hose is installed and used in the system.

Design Enhancements: To enhance strength against pressure and external effects, metal hoses are often manufactured with double-layer braids.

Materials:

- **Hose:** AISI 316L Stainless Steel
- **Braid:** AISI 304 Stainless Steel
- **Fittings:** Available in Carbon Steel or Stainless Steel

Connection Types:

- **Floating Flanged**
- **Butt-Weld**
- **Screwed**

Nominal Diameter Range:

- **DN 6 (1/4") to DN 300 (12")**

Application Areas:

- **Heating and Air-Conditioning Systems:** Used in HVAC systems for flexible connections.
- **Chemical and Petrochemical Facilities:** Handles harsh chemicals and high pressures.
- **Aircraft Industry:** Provides flexible and durable connections in aerospace applications.
- **Food Processing Plants:** Ensures hygienic and efficient fluid transfer in food production.

Conclusion: Metal hoses are essential components in many industrial systems, offering flexibility, strength, and reliability. Their ability to withstand extreme conditions and provide effective vibration

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and stress absorption makes them indispensable in various applications, from heating systems to chemical processing and beyond.



FLEXIBLE SPRINKLER HOSES



Overview:

A hose is a flexible hollow tube designed to transport fluids from one location to another. Unlike rigid pipes, hoses are characterized by their flexibility, making them suitable for various applications, including those requiring movement or vibration absorption.

Product Description:

The stainless steel hose and mounting bracket system is ideal for suspended ceiling installations. This system simplifies the installation process, significantly reducing both time and labor costs. It is also adaptable for attachment to studs and gypsum board ceilings.

Components:

- **Flexible Hose:** Constructed from AISI 316L stainless steel and braided with AISI 304 stainless steel for enhanced durability. Available in lengths ranging from 500 mm to 2000 mm.
- **Branch Line Connection Nipple:** Facilitates connection to the main pipeline.
- **Sprinkler Reducing Nipple:** Designed for use with 1/2" or 3/4" sprinkler heads.
- **Mounting Bracket System:** Allows secure installation and flexibility in positioning.



Features:

- **Flexibility:** The braided stainless steel hose offers flexibility, allowing the sprinkler to be installed in any position within the circular area defined by the hose length.
- **Seismic Movement Absorption:** The flexible structure of the hose accommodates seismic movements, reducing the risk of damage during earthquakes.
- **Quick Installation:** The system is designed for rapid installation, saving time and labor.

Applications:

- **Fire Sprinkler Systems:** These hoses are used to connect sprinklers to fire pipelines, enabling effective fire suppression. The system automatically sprays water to extinguish fires and prevent their spread. The ceiling-mounted design ensures comprehensive coverage.
- **General Use:** Suitable for various fluid transport applications where flexibility and vibration absorption are required.

Materials:

- **Hose:** AISI 316L Stainless Steel
- **Braid:** AISI 304 Stainless Steel
- **Fittings:** Available in Carbon Steel or Stainless Steel

Connections:

- **Main Pipeline Side:** Nipple
- **Sprinkler Side:** Threaded special parts for sprinklers
- **Fixing Parts:** Carbon Steel

Hose Diameter:

- **DN25 (1")**

Certifications:

- **FM Approval:** The braided models are FM approved, ensuring compliance with industry standards for fire protection systems.



Conclusion: The stainless steel hose and mounting bracket system provides a flexible, durable, and efficient solution for connecting sprinklers in fire protection systems. Its design accommodates seismic movements, offers easy installation, and enhances overall system performance.

FLOATING FLANGED TYPE



Functionality:

Flanges are critical components used to absorb thermal expansions and dampen vibrations within a piping system. The corrugated sheet on the flange allows for easy rotation and alignment of bolts, facilitating simple installation and maintenance. Additionally, the shim in floating flanged expansion joints promotes laminar flow and enhances the operational speed of the bellows.

Types of Flanges:

1. **Welding Neck Flange:** Designed for welding directly to a pipe, offering strong support and alignment.
2. **Long Welding Neck Flange:** Similar to the welding neck flange but with an extended neck, providing additional strength and alignment.
3. **Slip-On Flange:** Slides over the pipe and is welded on both the inside and outside for a strong, reliable connection.
4. **Socket Weld Flange:** Features a socket for the pipe to fit into, with a fillet weld around the top for added strength.
5. **Lap Joint Flange:** Used with a stub end, allowing for easy alignment and adjustment.
6. **Threaded Flange:** Has internal threads to connect to a pipe with external threads, enabling easy assembly and disassembly.
7. **Blind Flange:** Covers the end of a pipe, used for sealing off a pipe or vessel.



Specialty Flanges:

- **Weldoflange/Nipoflange:** Custom flanges designed for specific applications, offering unique benefits in terms of fitting and performance.
- **Elboflange:** Features an elbow design, integrating flange and elbow functionalities.
- **Swivelflange:** Allows rotation around the flange axis, useful for alignment adjustments.
- **Expander/Reducer Flange:** Facilitates transitions between different pipe sizes, either increasing or decreasing the diameter.
- **Orifice Flange:** Equipped with a built-in orifice plate for flow measurement and control.

Applications:

- **Machines**
- **Pumps**
- **Motors**
- **Gas Lines**
- **Steam Lines**
- **Compressed Air Lines**
- **Exhaust Applications**
- **Hot and Cold Water Systems**
- **Superheated Water Systems**
- **Hot Steam Systems**
- **Hot Oil Systems**

These flanges are essential for maintaining the integrity and functionality of various systems, providing reliable connections across a wide range of industrial and utility applications.

GIMBAL EXPANSION JOINTS



Description:

Gimbal expansion joints are engineered to accommodate angular movements in any plane, providing flexibility and control in complex piping systems. Unlike hinge-type expansion joints, which allow deflection in a single plane, gimbal joints use a gimbal ring and multiple hinges to enable multi-plane angular rotation.

Configuration:

Typically, gimbal expansion joints are used in pairs or combined with a hinged expansion joint for more complex systems. A standard configuration includes two gimbal expansion joints or a combination of two gimbal and one hinged expansion joint.

Advantages:

- **Multi-Plane Flexibility:** Allows for angular movement in any plane, accommodating complex movement requirements.
- **Elimination of Pressure Thrust:** Effectively absorbs pressure thrust loads, protecting adjacent equipment from damage.
- **Load Distribution:** Transmits external loads such as wind and shear forces, reducing stress on pipe anchors.
- **Reduced Installation Costs:** Eliminates the need for expensive main anchors and minimizes guiding requirements.



- **Torsion Prevention:** Prevents twisting or torsion of the expansion joint.
- **Internal Flow Liners:** Equipped with internal flow liners to address velocity issues.
- **Dead Weight Support:** Provides support for the dead weight of intermediate piping.

Key Features:

- **Angular Movement:** Permits angular movement in any plane.
- **Pressure Thrust Elimination:** Removes the impact of pressure thrust forces.
- **Load Transmission:** Handles shear and wind loads, reducing forces on pipe anchors.
- **No Main Anchors Required:** Reduces the need for main anchors in the system.
- **Torsion Prevention:** Prevents torsion and twisting of the expansion joint.
- **Flow Liners:** Includes internal flow liners to mitigate velocity problems.
- **Minimal Guiding:** Requires minimal guiding, focusing on absorbing spring forces.

Limitations:

- **Space Requirements:** Requires more space compared to axial expansion joints.
- **Directional Changes:** May necessitate changes in pipe direction.
- **System Complexity:** Typically requires two or more gimbal expansion joints to function effectively as a system.

Applications:

- **Engines**
- **Steel Mills**
- **Petrochemical Industry**
- **Power Generation**
- **Shipbuilding**
- **Water Treatment Facilities**
- **Cement Plants**
- **Paper Industry**

Gimbal expansion joints are essential for managing complex movement and thermal expansion in various industrial applications, offering flexibility, durability, and effective load management.



LENS EXPANSION JOINTS



Description:

Lens expansion joints are single-walled metal expansion joints designed for applications requiring robust construction with lower expansion capabilities. These joints feature one or several semi-circular sections welded into corrugated peaks and troughs with circular seams. They are typically used in both single and multi-shaft configurations.

Construction:

Lens expansion joints are constructed from one or more semi-circular segments welded into corrugated peaks and troughs. They can be supplied as half convolutions, full convolutions, or as complete bellows, depending on the application requirements. These joints can be delivered pre-welded or assembled on-site.

Material and Thickness Considerations:

- **Material Thickness:** For applications requiring a single-layer bellows with a thickness greater than 4 mm, standard bellows are often unsuitable. In such cases, lens expansion joints offer an optimal solution.
- **Custom Requirements:** Lens expansion joints are particularly advantageous when custom specifications necessitate a single-layer bellows. While multilayer bellows can address issues of material thickness, they may not be acceptable for all applications or by all customers.

Advantages:

- **High Pressure and Temperature Tolerance:** Lens expansion joints are ideal for industries using pressurized equipment and heat exchangers where high pressure and temperature demands require thicker materials.

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- **Robust Construction:** The single-layer design provides a robust solution for high-stress environments, ensuring durability and reliability.
- **Customizable:** Lens expansion joints are tailored to meet specific application requirements, particularly where standard bellows cannot accommodate the necessary thickness.
- **Versatility:** They can be delivered in various configurations (half convolution, full convolution, or complete bellows) and can be welded together either pre-delivery or on-site, offering flexibility in installation.

Applications: Lens expansion joints are commonly used in industries involving pressurized systems and heat exchangers where robust, high-thickness material solutions are needed. They are particularly suitable for environments with higher pressure and temperature conditions that demand a single-layer bellow configuration.

Lens expansion joints offer a specialized solution for challenging applications requiring significant material thickness and robust construction, ensuring effective expansion management in demanding environments.



RECTANGULAR EXPANSION JOINTS



Description:

Arcflex rectangular metal expansion joints are engineered to accommodate movement in all three directions: axial, lateral, and angular. These joints are primarily used in low-pressure applications, such as ducts, exhaust systems, and ventilation systems.

Design and Manufacturing:

- **Movement Absorption:** Rectangular expansion joints are designed to absorb a combination of axial and lateral movements. For significant lateral movement, a twin-bellows arrangement is often employed.
- **Customizable Designs:** These joints can be manufactured with single or multi-convolution bellows. They can be produced in sections to accommodate transport constraints and reassembled on-site, allowing for virtually unlimited size options.
- **Corner Configurations:** Various corner arrangements are available, including single and double mitre corners, and rounded corners if required.
- **Material Choices:** The frames and bellows are available in a range of materials, including austenitic stainless steels (300 series), duplex, aluminum, titanium, and high-nickel alloys such as Inconel, Incoloy, Hastelloy, and Monel.

Applications:

- **Ducting Systems:** Rectangular expansion joints are custom-designed for use in rectangular ducting systems to manage expansion and contraction.
- **Ventilation and Exhaust Systems:** They are ideal for applications requiring movement absorption in ventilation and exhaust systems.

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Insulation Features:

- **High and Low-Temperature Tolerance:** For environments with high internal temperatures (up to 1000°C) and low external temperatures (down to 90°C), a special flow liner can be incorporated.
- **Flow Liner and Insulation:** The flow liner, often made from materials like 1.4845, includes expansion gaps to accommodate thermal expansion without buckling. The void in the flow liner is filled with a high-temperature insulating material, reducing the surface temperature to approximately 90°C.

Advantages:

- **Versatility:** Designed to handle multiple types of movement, making them suitable for a wide range of applications.
- **Custom Solutions:** Tailored to meet specific customer requirements, including size, material, and corner configurations.
- **Thermal Management:** Equipped with advanced insulation options to handle extreme temperature variations effectively.

Summary:

Arcflex rectangular expansion joints provide a versatile and customizable solution for managing movement in rectangular ducting and other low-pressure applications. With a wide range of design options, materials, and insulation features, these joints are engineered to meet the specific needs of each application, ensuring effective performance in demanding environments.

SEISMIC EXPANSION JOINTS



Seismic Joints:

Seismic joints are critical structural components used to accommodate and manage the movement between adjacent buildings or between different sections of the same building. They are designed to absorb the stresses induced by seismic activity and other dynamic forces, helping to maintain the structural integrity of the buildings during and after an earthquake.

- **Purpose:** Seismic joints provide a separation between adjacent structures or different parts of a building, including walls, floors, and roofs. This separation allows for the independent movement of these parts, preventing damage and ensuring that seismic forces are absorbed and managed effectively.
- **Applications:** These joints are often implemented in both new construction and retrofits, particularly in seismic-prone regions. They can also be used within a single building to accommodate movement in piping, HVAC ducts, and other systems that need to remain functional during seismic events.

Expansion Joints: Expansion joints, also known as movement joints, are essential in construction to accommodate the expansion and contraction of materials due to temperature fluctuations, shrinkage, creep, and other factors.

- **Purpose:** Expansion joints are designed to safely absorb the temperature-induced movements of construction materials, reducing the risk of structural damage and maintaining the integrity of the building. They also absorb vibrations, help hold parts together, and allow for movement caused by ground settlement or other forces.



- **Functionality:** By incorporating expansion joints into a building's design, engineers can ensure that materials have the necessary flexibility to adjust to environmental changes without causing cracks, deformation, or other issues.
- **Applications:** Expansion joints are commonly used in a wide range of structures, including bridges, pavements, and large buildings. They are crucial for accommodating thermal expansion and contraction in concrete slabs, metal structures, and other materials exposed to varying temperatures.

Key Features of Seismic and Expansion Joints:

- **Design:** Both seismic and expansion joints are designed to provide flexibility and resilience, allowing structures to accommodate movement without compromising safety or functionality.
- **Materials:** These joints are constructed from various materials, including elastomers, metals, and composites, chosen based on the specific requirements of the application and the environmental conditions.
- **Installation:** Proper installation and regular maintenance are crucial to ensure the effectiveness of seismic and expansion joints. This includes ensuring proper alignment, sealing, and integration with adjacent building elements.

Summary:

Seismic and expansion joints play a vital role in maintaining the structural integrity and functionality of buildings and infrastructure. Seismic joints address the challenges posed by seismic forces and dynamic movements between adjacent structures, while expansion joints accommodate thermal and environmental changes, ensuring the long-term durability and safety of construction projects.

VIBRATION ABSORBERS



Rubber as Vibration Absorbers:

Rubber is widely used as a vibration absorber due to its unique material properties. In its unstretched state, the molecular structure of rubber consists of coiled chains that can be easily stretched. When subjected to vibrations, rubber can store vibrational kinetic energy within its structure and release it gradually. This property is attributed to its elastic hysteresis, where the material can absorb and dissipate energy efficiently.

- **Elastic Hysteresis:** Rubber's ability to absorb and release vibrational energy is due to its elastic hysteresis. As vibrations pass through the rubber, the material deforms and stores energy, which is then slowly released, reducing the overall amplitude of vibrations.
- **Vibration Absorption Efficiency:** Rubber is effective in absorbing vibrations because it can dampen and isolate vibrational forces. This makes it an ideal material for applications requiring vibration isolation and shock absorption.

Dynamic Vibration Absorbers:

In vibration analysis, a dynamic vibration absorber, also known as a vibration neutralizer, is a specialized device designed to mitigate or eliminate vibrations in a system. It typically consists of a tuned spring-mass system that counteracts the vibrations generated by harmonically excited systems.

- **Purpose:** Dynamic vibration absorbers are used to address issues related to rotational imbalances in machines such as engines, motors, and pumps. These imbalances often cause unwanted vibrations that can lead to operational inefficiencies and equipment damage.
- **Function:** The absorber is tuned to match the frequency of the vibrations produced by the system. By doing so, it can effectively counteract and neutralize the vibrations, thereby enhancing the stability and performance of the equipment.



Sorbothane as a Vibration Absorber:

Sorbothane is a high-performance visco-elastic material known for its exceptional vibration absorption capabilities. It is used in various industrial applications due to its ability to simultaneously absorb, isolate, and reduce vibrations.

- **Performance:** Sorbothane can absorb nearly 95% of shock energy and reduce more than 50% of vibration energy. Its visco-elastic nature allows it to effectively dampen vibrations and shocks, providing a high level of protection for sensitive equipment and structures.
- **Applications:** Due to its versatility and effectiveness, Sorbothane is utilized in a wide range of industrial applications where vibration control and shock absorption are critical.

Summary:

Rubber and dynamic vibration absorbers play crucial roles in managing and reducing vibrations in various systems. Rubber's elastic properties make it an excellent material for vibration absorption, while dynamic vibration absorbers are engineered solutions designed to counteract specific vibrational frequencies. Sorbothane, as a high-performance visco-elastic material, offers superior vibration and shock absorption capabilities, making it suitable for demanding industrial environments.



VICTAULIC GROOVED EXPANSION JOINTS



Expansion Joints:

Expansion joints are essential components in piping systems designed to accommodate movement and expansion due to thermal changes, vibrations, or mechanical shifts. They typically consist of a combination of grooved couplings and short nipples arranged in tandem to provide increased expansion capacity. The nipples are engineered with precise grooves to allow full linear expansion at each joint.

- **Purpose:** Expansion joints absorb and manage the thermal and mechanical movements within the piping system, preventing stress and potential damage to the infrastructure.
- **Design:** The integration of grooved couplings and short nipples ensures flexibility and a precise fit, enabling the system to handle significant expansion and contraction.

Grooved Pipe Couplings and Fittings:

Grooved pipe couplings and fittings are widely used to join pipes in both wet and dry systems. They offer flexibility in movement and deflection, enhancing the adaptability of the piping system.

- **Historical Context:** The concept of grooved couplings was pioneered by Victaulic in 1925, introducing the first mechanical coupling design. This innovation revolutionized the way pipes are joined, facilitating easier installation and maintenance.
- **Applications:** Grooved couplings and fittings are employed in various systems, including those involving water distribution, brackish or seawater intake, and membrane assembly for reverse osmosis and ultra-filtration systems.



Victaulic Couplings:

Victaulic couplings are designed to streamline the installation and connection of piping systems, significantly reducing field man-hours. Available in various styles and gasket types, these couplings cater to different operational requirements.

- **Style 75:** A flexible coupling suitable for moderate pressures up to 34.5 bars. It is designed to provide flexibility while handling moderate pressure applications.
- **Style 77:** Recommended for systems with working pressures up to 69 bars, this style allows for greater flexibility and movement absorption within the system.

Summary:

Expansion joints and grooved couplings are critical components in modern piping systems, facilitating flexibility, movement, and efficient installation. Expansion joints manage thermal and mechanical stresses, while grooved couplings, initially developed by Victaulic, simplify the joining process and accommodate various system pressures. Victaulic couplings, including Styles 75 and 77, offer versatile solutions for different applications, from water intake to membrane assembly.

WELL END TYPE EXPANSION JOINTS



Overview:

Well End Type expansion joints are specialized components designed to accommodate axial, lateral, and angular movements in piping systems. These joints are crucial in maintaining system integrity by absorbing thermal expansions, vibrations, and other mechanical stresses. They are particularly suited for applications where space constraints and system flexibility are critical.

Design and Construction:

- **Configuration:** The Well End Type expansion joint features a unique design that includes a well-defined end configuration, allowing for easy integration into various piping systems. This configuration often includes a combination of flanged ends and bellows, which are constructed to handle substantial movements and pressures.
- **Material:** Typically constructed from high-quality stainless steel or other durable materials, these expansion joints are engineered to withstand harsh operational conditions, including high temperatures, corrosive environments, and mechanical stresses.

Applications:

- **Piping Systems:** Ideal for use in pipelines where space limitations or specific installation conditions require a compact and efficient solution for movement absorption.
- **Industrial Settings:** Commonly utilized in industries such as chemical processing, power generation, water treatment, and HVAC systems, where reliable performance and durability are essential.



Advantages:

- **Compact Design:** The Well End Type expansion joint's design allows for efficient space utilization while still providing significant flexibility and movement absorption.
- **Enhanced Performance:** By accommodating a range of movements (axial, lateral, and angular), these joints help prevent damage to the piping system and associated equipment.
- **Durability:** Constructed from robust materials, these expansion joints offer long-term performance in demanding environments.

Installation and Maintenance:

- **Installation:** Well End Type expansion joints are designed for straightforward installation, often featuring flanged ends or other connection types that facilitate quick integration into existing systems.
- **Maintenance:** Regular inspection and maintenance are recommended to ensure optimal performance and longevity. This includes checking for signs of wear, leaks, or other issues that could impact the joint's functionality.

Summary:

Well End Type expansion joints are essential components for managing movement and stress in piping systems, offering a compact and efficient solution for a variety of industrial applications. Their robust design and high-quality materials ensure reliable performance and durability, making them a valuable choice for systems requiring precise movement control and flexibility.