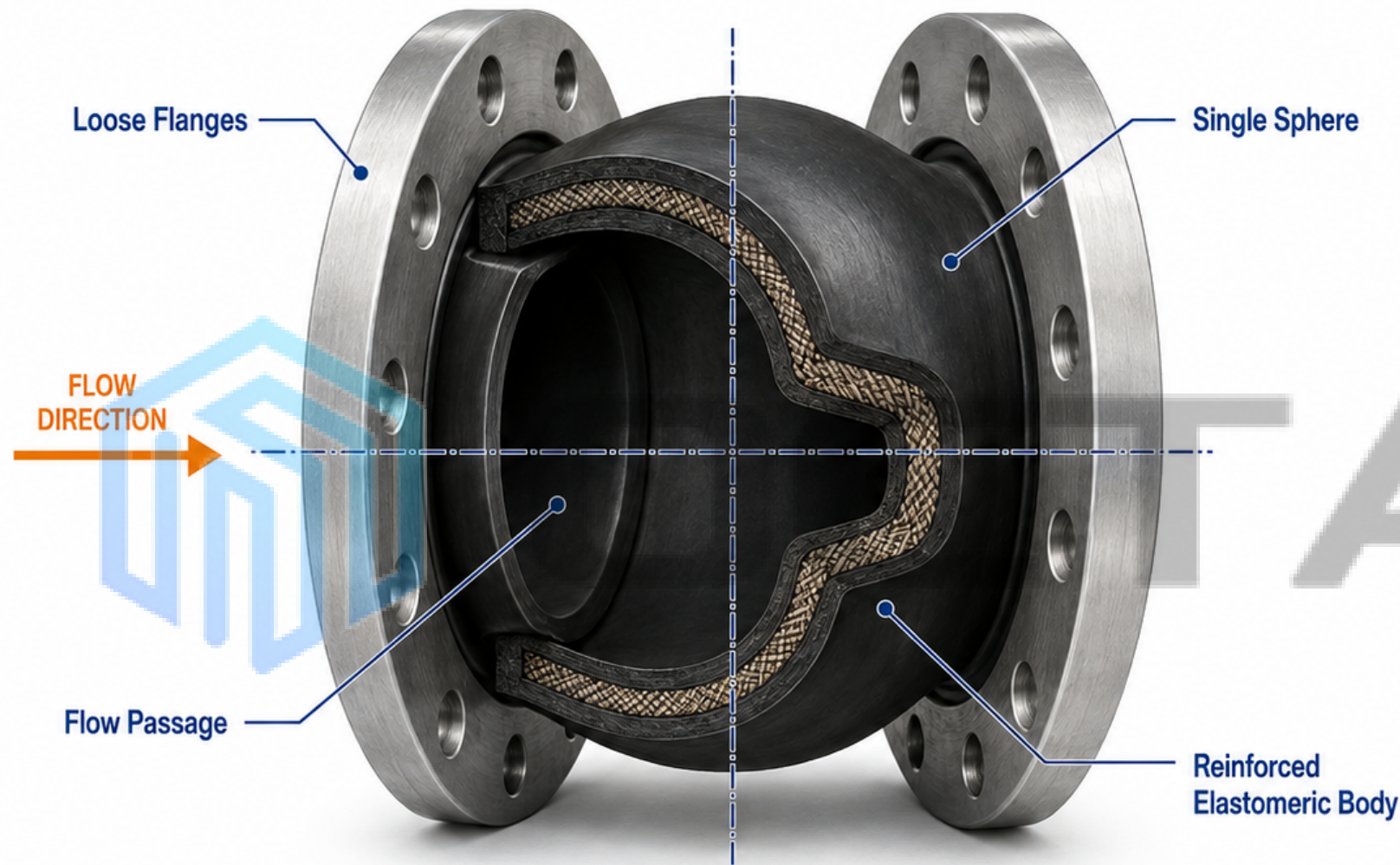
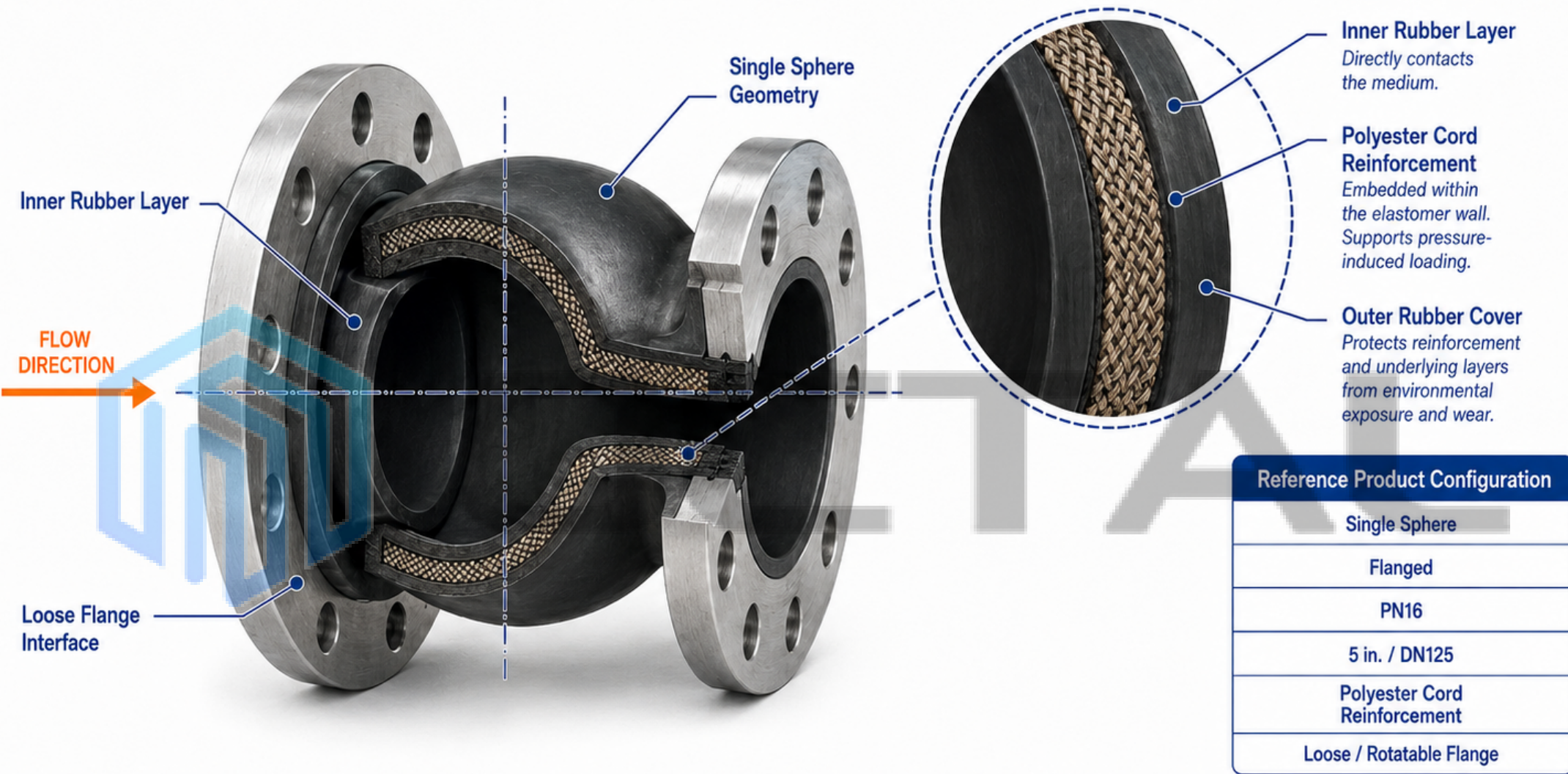




Reference Product Configuration
Single Sphere
Flanged
PN16
5 in. / DN125
Polyester Cord Reinforcement
Loose / Rotatable Flange

This is a reference product configuration and does not represent the complete supply range.





Medium Contact Layer
Inner rubber layer is in direct contact with the process medium.



Reinforcement Support
Polyester cord reinforcement embedded in the elastomer wall provides strength and supports pressure loading.

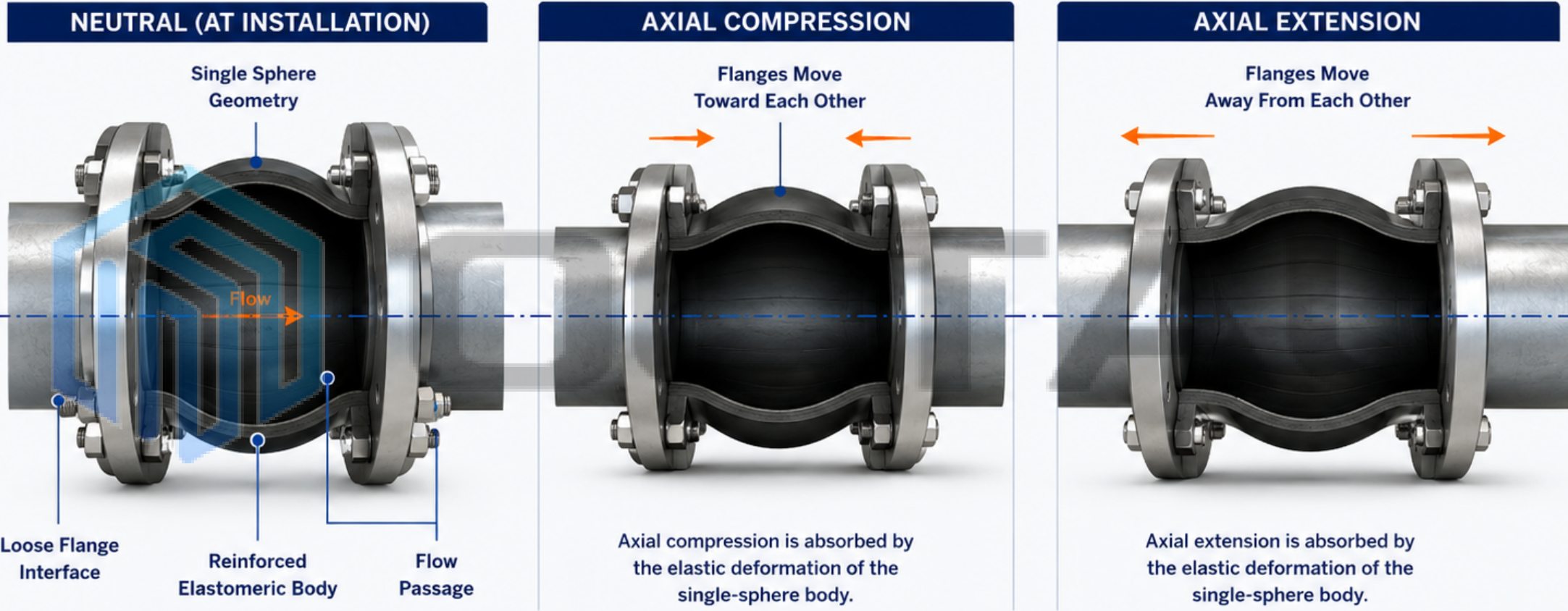


Outer Protection
Outer rubber cover protects the reinforcement and inner layers from abrasion, aging and environmental factors.

3. AXIAL COMPRESSION AND EXTENSION

Single Sphere Flanged Rubber Expansion Joint

Axial movement is accommodated by the elastic deformation of the single-sphere body. The joint is installed at its neutral position to maximize available movement in both directions.



FLEXIBLE CONNECTION

Elastomeric body connects and seals the pipeline.



CONTROLLED DEFORMATION

Elastic deformation accommodates axial movement.



MOVEMENT ACCOMMODATION + VIBRATION ISOLATION

Protects piping and equipment from movement and vibration.

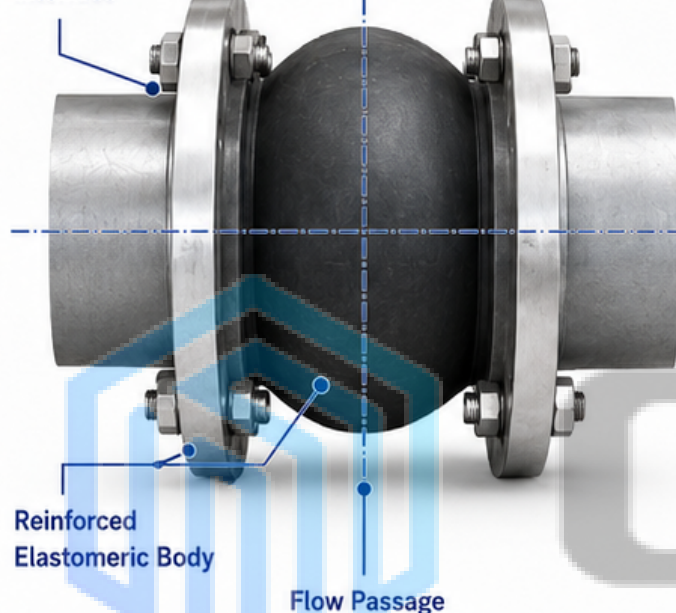
NOTE Allowable movement depends on the actual joint configuration and operating condition.

4. Lateral and Angular Movement

NEUTRAL (AT INSTALLATION)

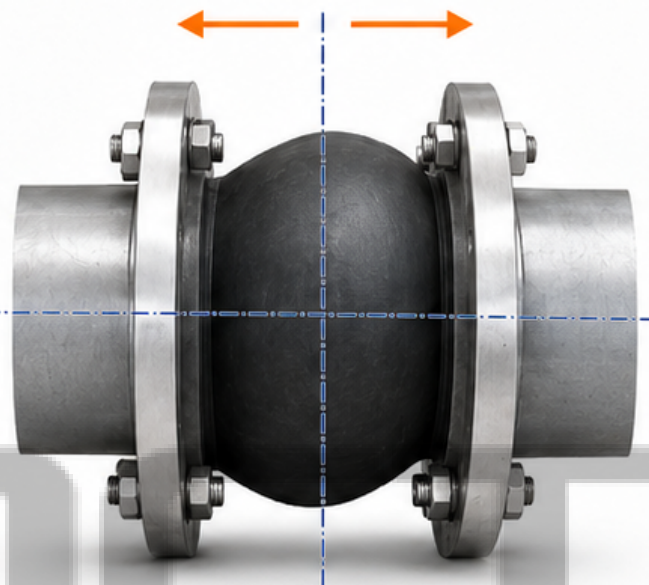
Single Sphere
Geometry

Loose Flange
Interface



LATERAL MOVEMENT

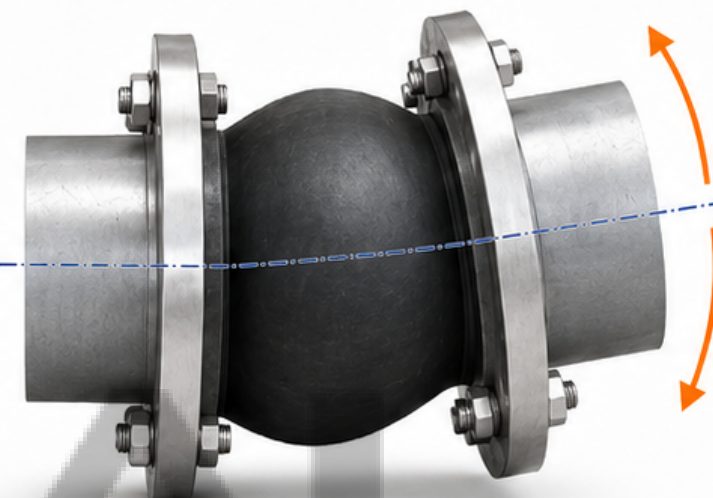
Flanges Move
Side to Side



Lateral movement is accommodated by the elastic deformation of the single-sphere body.

ANGULAR MOVEMENT

Flanges Rotate
Relative to Each Other



Angular movement is accommodated by the elastic deformation of the single-sphere body.



FLEXIBLE CONNECTION

Elastomeric body connects
and seals the pipeline.



ACCOMMODATES MOVEMENT

Lateral and angular movement
are absorbed by elastic
deformation.



PROTECTS THE SYSTEM

Reduces stress and vibration
caused by pipeline movement
and misalignment.

NOTE Designed movement is different from correcting severe installation misalignment.

5. VIBRATION ISOLATION AND PRESSURE-THRUST BOUNDARY

Rubber Expansion Joint in Pump Piping System

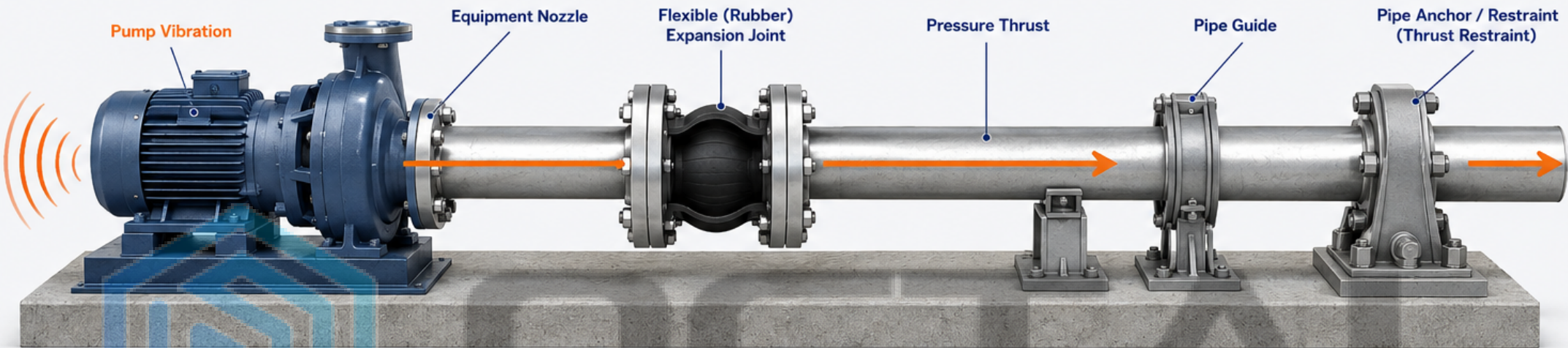
System Overview

- The rubber expansion joint isolates mechanical vibration from the pump and connected equipment.
- Internal pressure creates axial thrust that is transmitted through the piping system to the restraints.

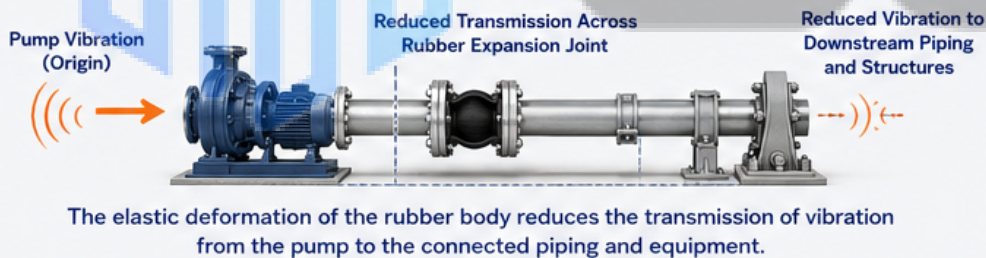


Important Engineering Principle

Vibration isolation does not eliminate pressure thrust. Anchors, guides and restraints are still required to control pressure thrust and piping loads.



VIBRATION TRANSMISSION PATH



PRESSURE-THRUST LOAD PATH



Key Takeaways

- ✓ Rubber expansion joints effectively reduce vibration transmission.
- ✓ They do not eliminate pressure thrust.
- ✓ Proper anchors, guides and restraints are essential for safe system operation.
- ✓ Follow project specifications and industry piping design practice.



Flow / Pressure Thrust Direction



Mechanical Vibration



Pipe Support (Guide)



Pipe Anchor / Restraint

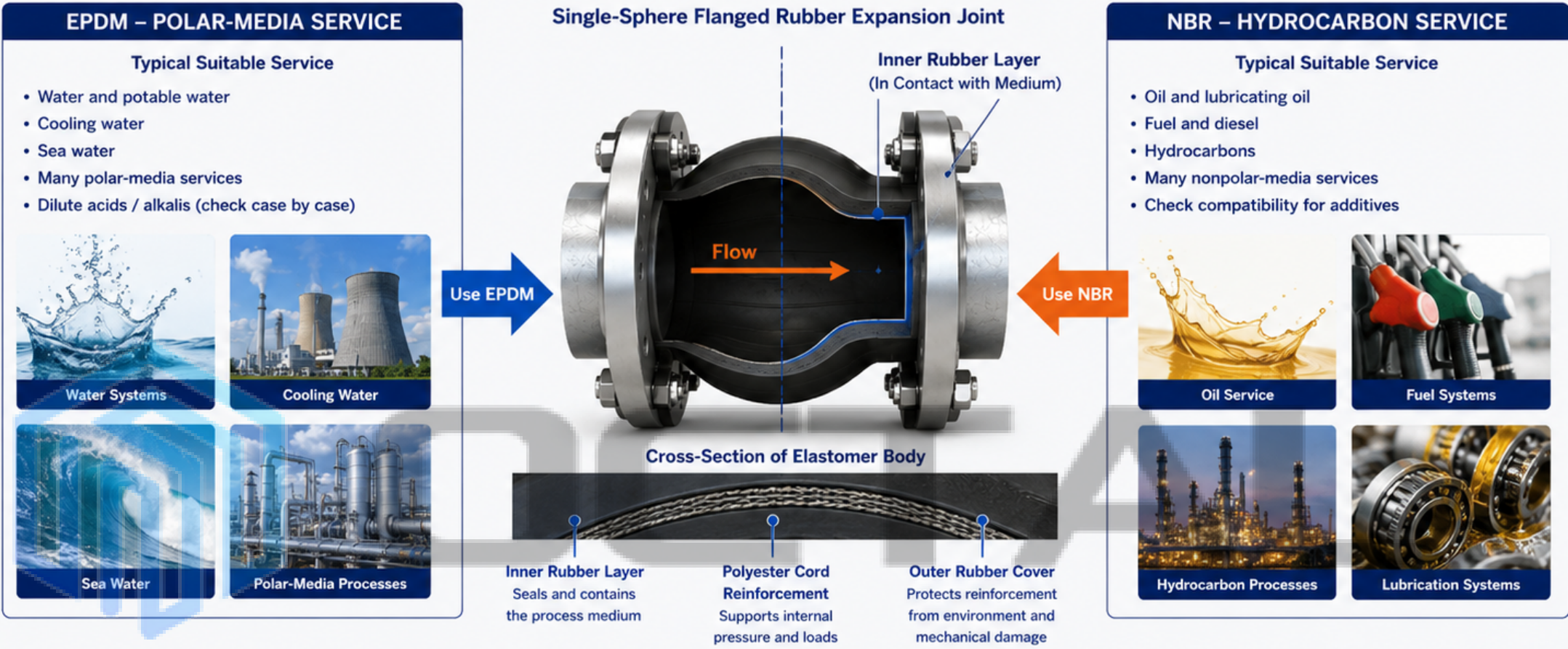


Rubber Expansion Joint

6. EPDM AND NBR MATERIAL SELECTION

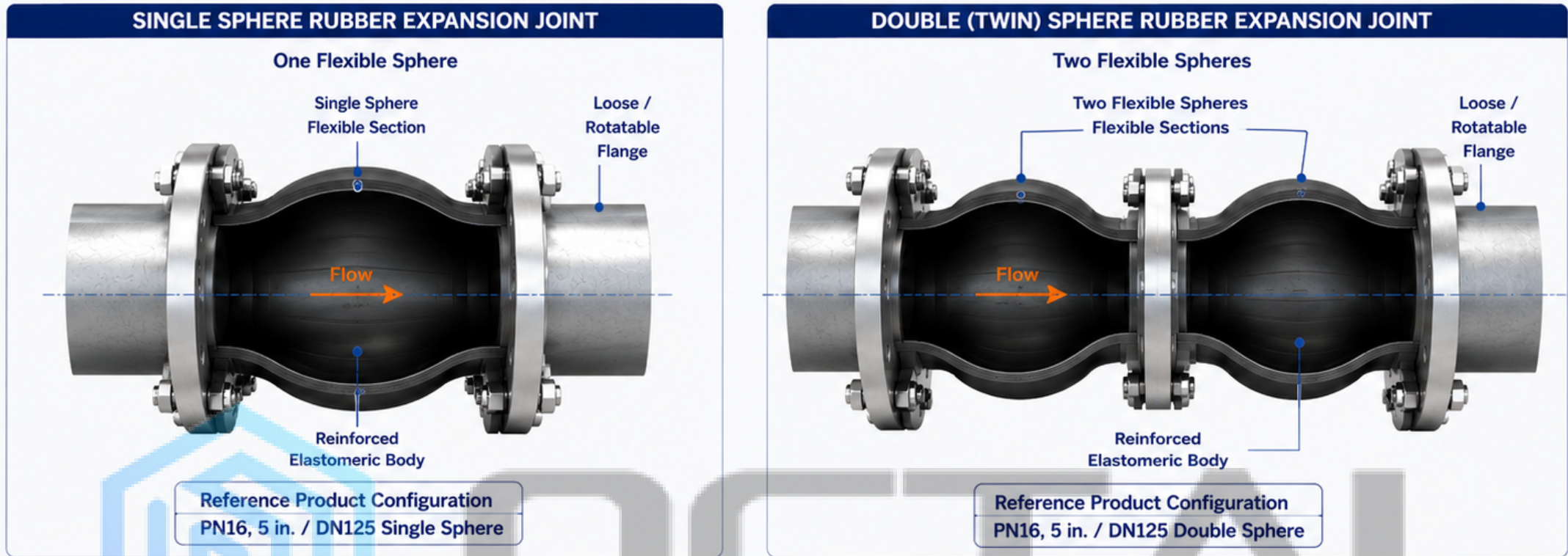
Rubber Expansion Joint – Inner Elastomer Selection by Service Medium

The inner rubber layer is in direct contact with the process medium.
Selecting the proper elastomer is essential for reliable service life and system integrity.



7. SINGLE SPHERE AND DOUBLE SPHERE DESIGN COMPARISON

Rubber Expansion Joints – Construction, Configuration and Selection Considerations



COMPARISON ASPECT	SINGLE SPHERE	DOUBLE (TWIN) SPHERE
Flexible Sections	One flexible sphere	Two flexible spheres
Face-to-Face Arrangement	Shorter overall face-to-face	Longer overall face-to-face
Movement Capability	Accommodates axial, lateral and angular movement within the rated design	Accommodates axial, lateral and angular movement within the rated design May provide greater total movement capacity depends on rated design
Piping Stability Consideration	Piping system must be properly aligned and restrained	Piping system must be properly aligned and restrained Commonly used where longer movement stroke is anticipated
Selection Logic	Based on required movement, piping layout, working conditions and project specifications	Based on required total movement, piping layout, working conditions and project specifications

i Both single-sphere and double-sphere rubber expansion joints are designed for movement accommodation and vibration isolation. The final selection depends on the required movement, piping system design, restraints and project specifications.

Comparisons are qualitative and depend on specific product design and rating.