



EASYFLEX

ENGINEERING INDIA

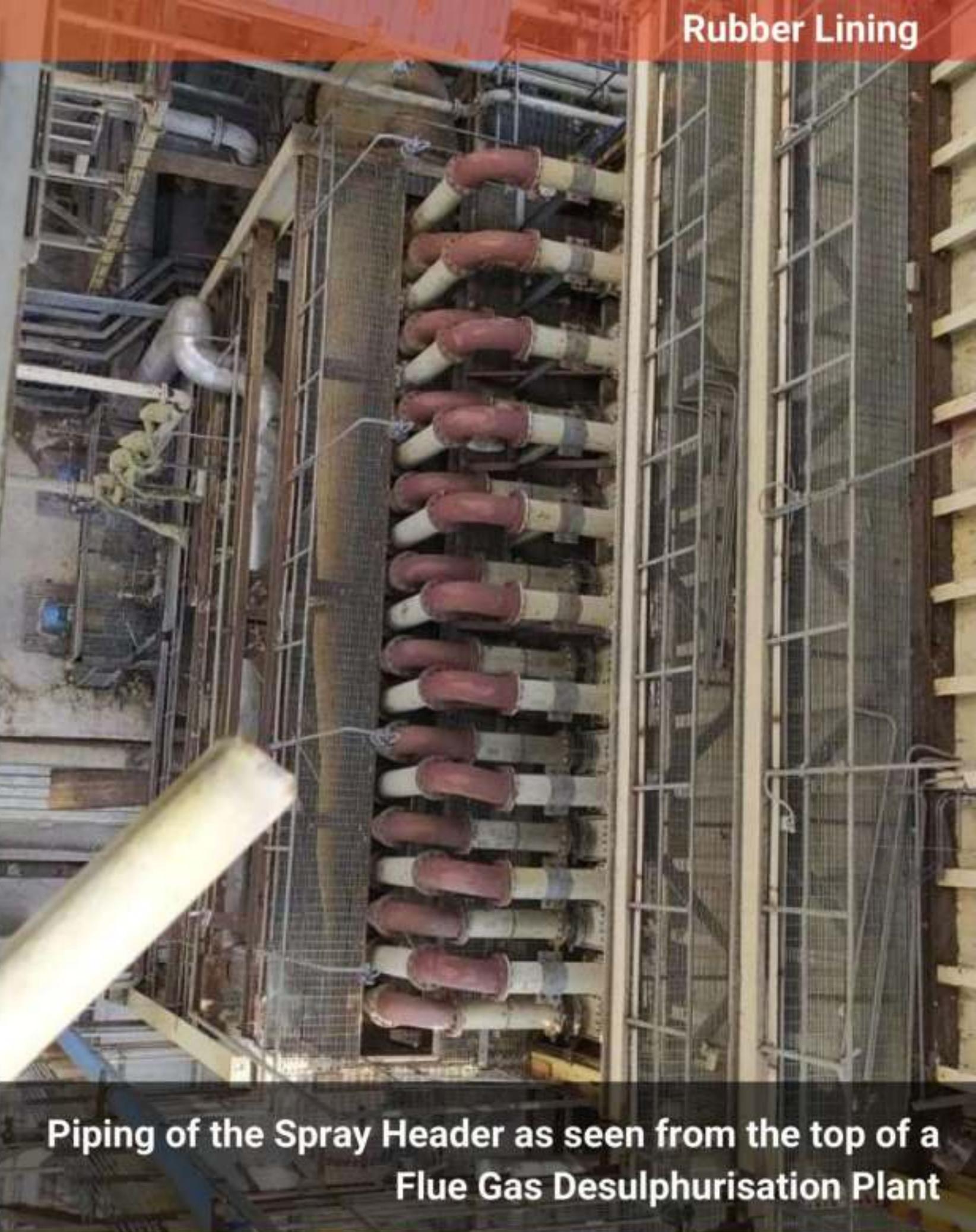
FGD Process

Developed as a response to the Exhaust / Flue gases – emanating from Industrial operations, **Flue Gas Desulphurisation** is a critical mechanism to treat and dispose Sulphur dioxide generated from a Flue gas stream.

Wet scrubbing is one of the processes to remove pollutants from a flue gas stream.

The polluted gas stream is brought into contact with the scrubbing liquid, by spraying it with the liquid so as to remove the pollutants.

Alkaline-based slurry of lime to scrub Flue gases from Power stations is the main component of the FGD System.



Piping of the Spray Header as seen from the top of a Flue Gas Desulphurisation Plant

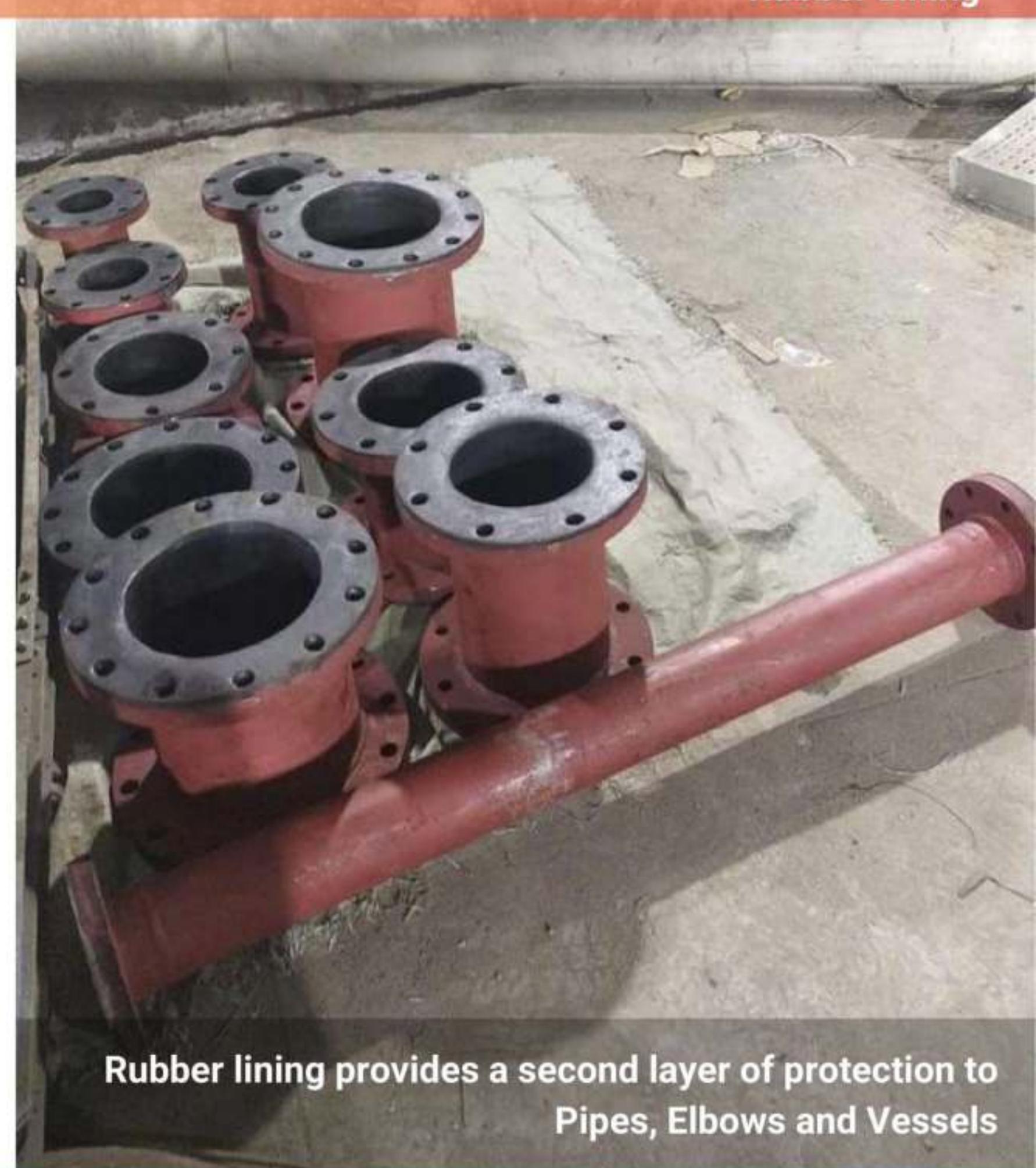
Rubber Lining

Scrubbing solutions cause corrosion of equipment due to presence and condensation of acids.

Everything from the Lime Slurry to the Acidic Gases are highly corrosive in nature and have the potential to cause serious damage to the tanks and piping systems used in the FGD Process.

Vulcanized rubber liners are specifically designed to seal pipes, elbows and tanks to

- Remove contact with harsh materials
- Reduce potential damage and
- Increase the Performance Life of the overall system.



**Rubber lining provides a second layer of protection to
Pipes, Elbows and Vessels**

Rubber Lining

Rubber Lined Equipments are used in Abrasive Slurry solutions, for Corrosive Chemicals, and to transport many other liquids from one place to another.

The resistance of various different types of rubber lining to chemicals and solvents vary greatly.

NR, Neoprene, Ebonite, Butyl, Hypalon, Nitrile, EPDM or any Synthetic Rubbers can be used depending on application and size of equipment

- **Rubber Compound Testing**
- **Hardness Testing**
- **Spark Testing**



Spark Testing is essential to detect leaks in the Rubber Lining

Rubber Test Reports

Problems in Rubber lining may arise from 3 Sources

- **The Manufactured Rubber**
- **The Installation Process**
- **Age of Equipment**

ASTM International specifies various Inspection and Testing procedures to validate the materials for use.

Various Tests to gauge Property of the manufactured Rubber as mentioned in the table outline the quality standards fit for the Rubber Lining process.

Depending on the type of Rubber being used based on the Project or customer specifications, Easyflex recommends testing through a certified Testing vendor for Quality Assurance purposes.

Material Inspection		
	Test	Test Method
1	Tensile Strength	ASTM D : 412-2016
2	Elongation at break	ASTM D : 412-2016
3	Hardness	ASTM D : 2240 - 2015
4	Density	ASTM D : 297 - 2015
5	Resistance to Bleeding	As per customer specification

Spark Testing

Before and after rubber lining is cured, it must be tested with a spark tester. **The purpose of the test is to determine the presence of pinhole leaks, punctures, cuts, etc., that expose passages to base metal of equipment.**

Inspection

Visual inspection of the surface prior to testing is essential to ensure that the area is free of moisture, dirt, or any other type of foreign matter that might interfere with testing.

Calibration

For a successful test, the spark needs to be at least twice the size of the lining you are testing. Typically a brush, T, or L shaped electrode is used in order to cover large surfaces effectively.

Selection of proper electrode and voltage is critical.

A calibration block is used to determine the necessary length of the spark.

Testing

Pass the probe over the surface of the material in a constant and interrupted manner at a speed of about 1 ft/sec, covering the entire surface until a leak is found.

Leaks are detected by the presence of white or blue sparks, while a leak free lining causes dark-blue or purple sparks.

Detected leaks can be marked for repair.

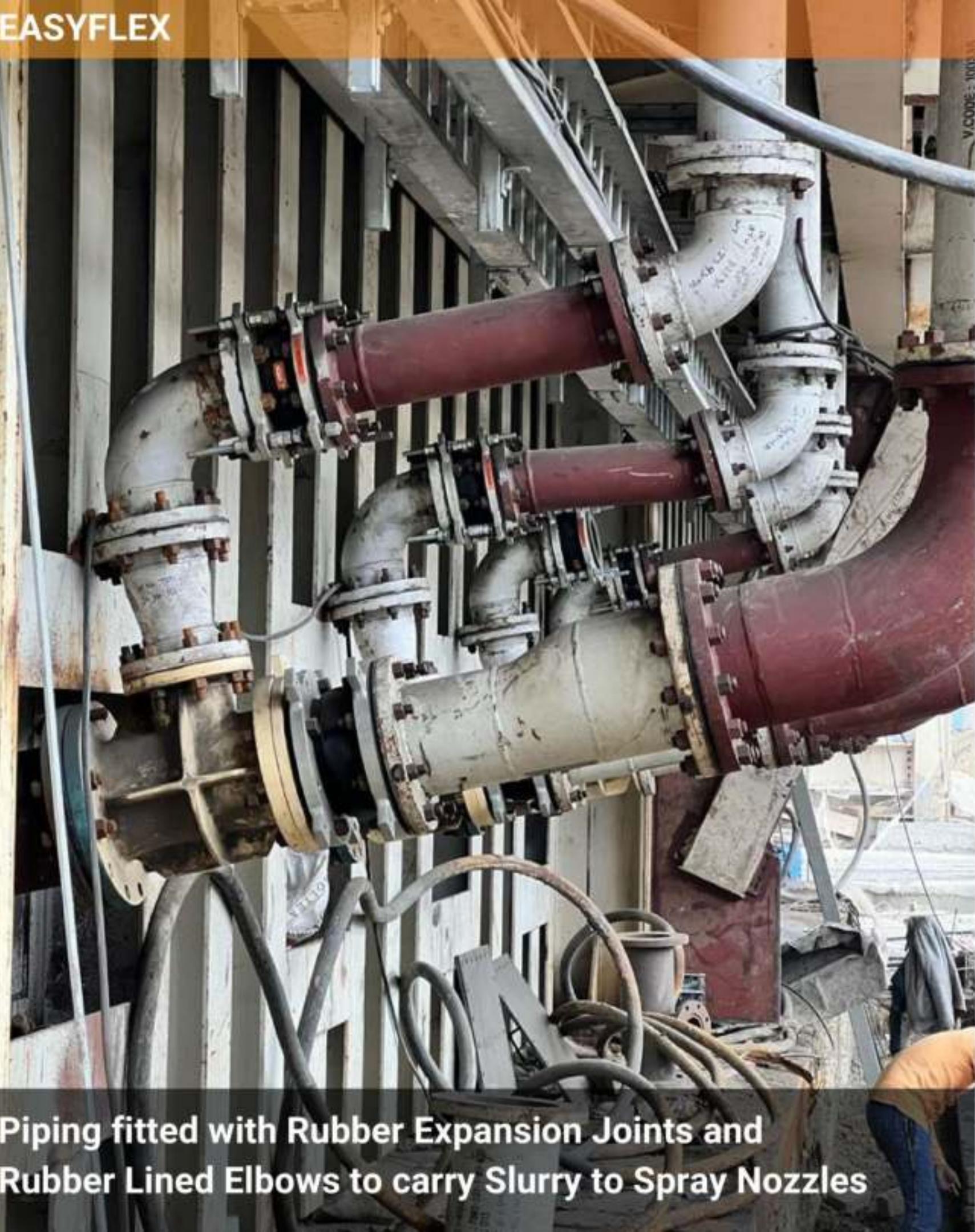


Rubber Lined Elbows





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Metallic Bellows Division**



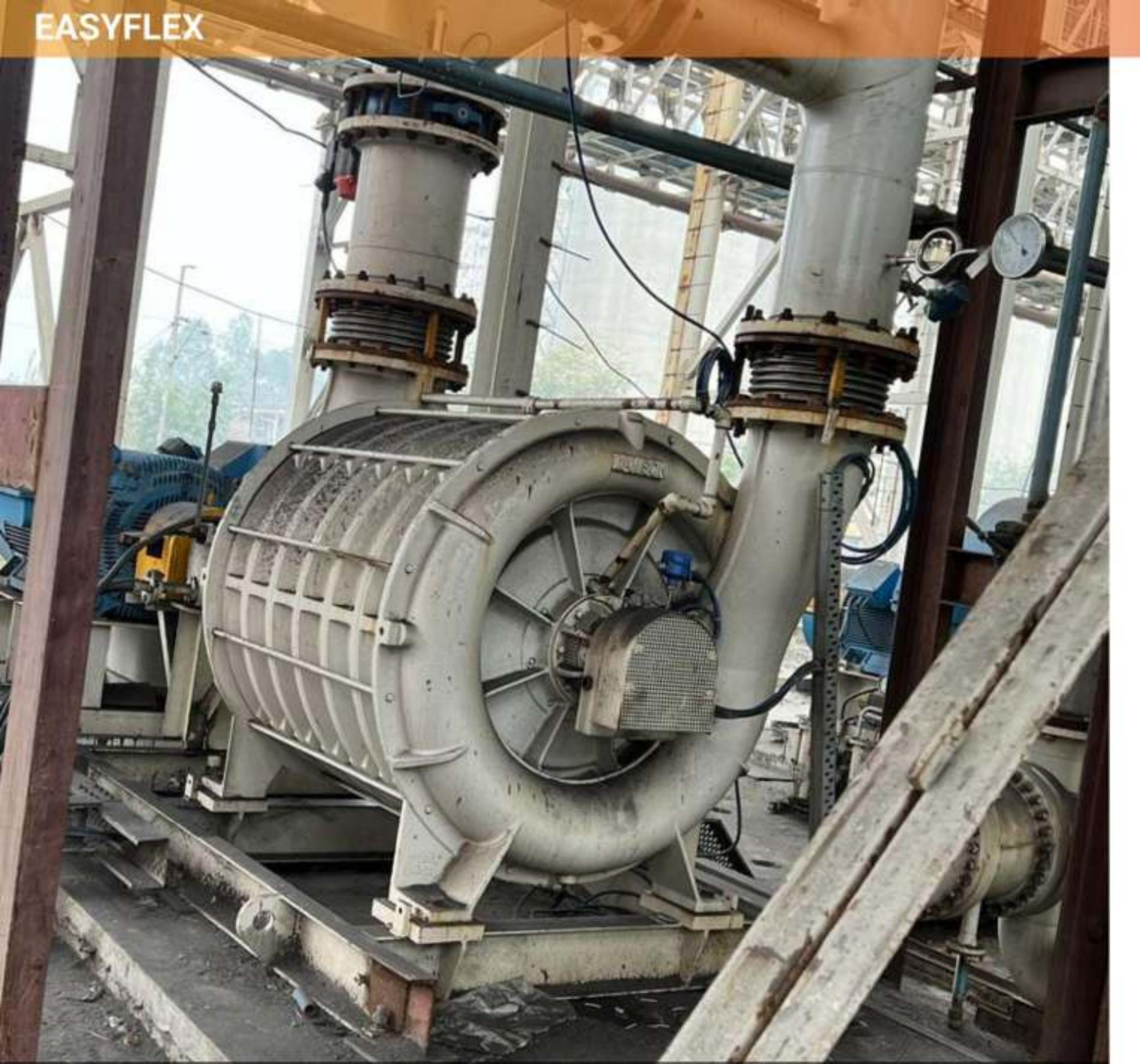
**Piping fitted with Rubber Expansion Joints and
Rubber Lined Elbows to carry Slurry to Spray Nozzles**



Rubber lined Elbows at Ground Level of FGD Tower



**Team Easyflex post completion of Retrofit Job of Rubber Lined
Equipment**



Metallic Expansion Joints fitted with Oxidation Air Blower for the Gypsum separation process at FGD Plant



Rubber Expansion Joints fitted with Centrifugal Pumps for pumping Slurry to Spray Nozzles

Easyflex

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In addition to our Manufacturing capabilities, our Design Engineers at Easyflex are equipped for

- Pipe Thermal Stress Analysis
- Finite Element Analysis
- Seismic Design & Engineering

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