Polyurea elastomeric spray coatings technology is a recent of the new development of coatings in vogue particularly more suited as pipe coatings and as an anticorrosive coating or liners. Polyurea coatings combine extreme application properties such as rapid cure, even at temperatures as low as -30°C, and insensitivity to humidity, with exceptional physical properties such as high hardness, flexibility, tear and tensile strength, and chemical and water resistance. This results in good weathering and abrasion resistance. The systems are 100% solids, making them compliant with the strictest VOC regulations. Due to its specific curing profile and exceptional film properties, the polyurea spray coating technique has been introduced into many areas, including corrosion protection, containment, membranes, linings and as an effective anti-corrosion systems.

It will not be too long that polyurea will be the preferred alternative to current organic polymeric materials used for pipe coatings, due to their good corrosion resistance, imperviousness to water and air, resistant to salinity, immunity to large variations in pH and chemical and physical stabilities at moderately high temperatures and exceptional performance in combination with cathodic protection specially in buried conditions.

This article assists decision makers and provides them an argument as to why pure polyurea, distributed by Iridex Group Plastic, is the right choice as an anticorrosion system particularly as a pipe coating product. The minimum requirement is that a coating should stop corrosion for the design life of the pipeline but a more realistic objective is that the coating should stop corrosion for as long as the pipeline remains in service, as most pipelines are operated well beyond the original design life.
Inevitably coatings get damaged by external forces or by a number of long-term degradation processes that affect the constituents of the coating. Typically this results in coating defects that expose the pipe steel to the environment around the pipeline and this corrosion risk is and can be controlled by cathodic protection.

Polyurea polymers are designed to compete with tri laminate products such as FBE, 3LPP and 3LPE, providing higher performance coatings at competitive costs. The application processes required are simple and efficient and the equipment systems utilized are inexpensive when compared to the costs of systems used in the application of FBE, Tri-Laminate and similar coating technologies and not to mention about the field joints which is compatible on all of the above with added advantage of cost, speed and minimum back to service time.

Polyurea is characterized by many essential properties which make it an effective corrosion resistant coating.

Resistance to water is perhaps the most important characteristic since water, as a universal solvent, in combination with other materials can take various form and can create very corrosive environment and have a damaging effect on the steel substrates. The extremely low rates of water absorption and moisture vapor transfer are essential features which makes it an effective coating barrier which very few coating can match.

The dielectric strength is a key property of polyurea which helps in breaking the electric circuit set up during corrosion reaction and makes it suitable to be used as a corrosion resistant coating by resisting passage of electron. Polyurea has a dielectric strength of > 16 KV and this combined with low moisture absorption makes it an ideal anti corrosion coating.

Polyurea coating’s high resistance to ionic passage is a desired coating characteristic and prevents transfer or passage of chlorides, sulphides, or similar ions which accelerates corrosion. Resistance to ionic passage is a contributing factor to chemical resistance and polyurea is good for chemicals between pH 12 and pH 4 particularly the alkalis.

The strong adhesion prevents the problem caused by temperature gradient, osmosis and electro-osmosis and retains its integrity for longer time and thus enhancing the life of the coating. A strong adhesion also prevents undercutting.

A well formulated elastomeric Polyurea has a good resistance to abrasion, impact and scouring and the loss is < 6mg on C17 wheel comparable if not better than most of the anti-corrosive coatings being patronized to day.

One of the characteristics which make polyurea unique is its retention of physical property on ageing which makes it weather and age resistant and make it suitable as a coating for long term protection. A well formulated Polyurea retains more than 90 % of its physical even after ageing.

A very good external corrosion control on steel pipelines is achieved by combining polyurea distributed by Iridex Group Plastic with a cathodic protection. The coating provides the first, and major, defense against corrosion and further, in case of its damage, the cathodic protection serves to prevent pitting or general corrosion where the pipe steel is exposed by damage to the coating. Coating damage is to be expected on all pipelines using traditional coatings and the degree of damage with Polyurea is minimal or none unless these are very roughly handled and hence the degree of risk is very less.