

Driving productivity and automation in new industries



Figure 1. Example of industries ABB Robotics products operate.

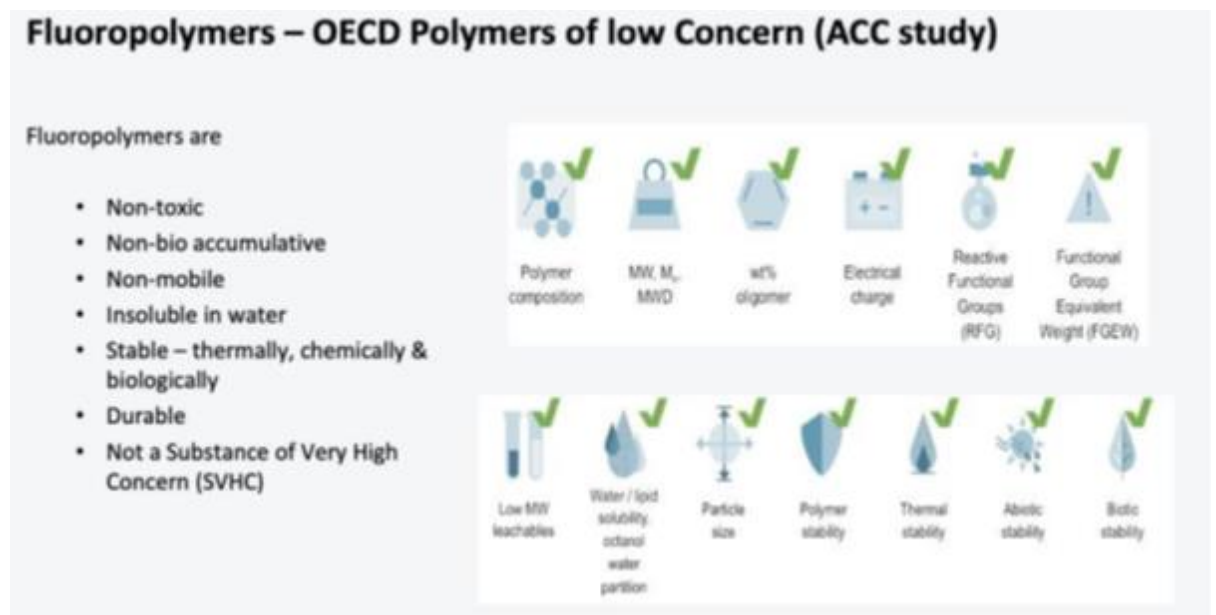


Figure 2. Criteria for polymers of low concern according to OECD



Figure 3. Equipment in a food-processing facility (washdown)



Figure 4. Examples of robot and motor in washdown environment

List 1 – Functional uses of Fluoropolymer seals

There are two types of fluoropolymer seals which are required for hygienic purposes.

1. Fluoroplastic seals for dynamic robot joint

Fluoroplastic seals serve several key functions for dynamic robot joint:

- One important function of the dynamic seal is to protect the robot joints against the high-pressure waterjet, such as an IP69K water ingress level, which is common to clean the robot. The seal protects the key component such as the motor or gearbox from corrosion.
- Resistant/compatible with harsh detergents including strong acid, strong alkaline, and disinfectants. Which needs to be used in a hygienic environment. Fluoropolymer is excellent here and beat all other polymer materials.
- In addition to being corrosion-resistant, it also needs to have low friction. In hygienic environments it is often necessary to run the robot without any lubrication on the joints. This means that there needs to be very small friction even with a harsh robotic motion and torsional load. PTFE is currently the best material for this because it has a lower friction coefficient than any other plastic material.

2. Fluoroelastomer seals for static robot joint

Fluoroelastomer seals serve several key functions for static robot joint:

- Sealing the metal to metal joint against high pressure waterjet, protecting the key components such as motor and gearbox inside the robots from corrosion. Compared to plastic material, elastomer materials is vulnerable against hydro erosion from high pressure waterjet. Here fluoroelastomer has much better resistance compared to other elastomer materials.
- Resistant/compatible with harsh detergents including strong acid, strong alkaline, and disinfectants which needs to be used in a hygienic environment. Fluoropolymer is excellent here and beat all other polymer materials because other plastic materials will corrode or age much faster, resulting in a very poor service lifetime.
- No gap with metal counterpart, allowing easy to clean, meeting design guideline of EHEDG (European Hygienic Engineering and Design Group)