

# ポリロタキサンを添加したエポキシ樹脂の接着特性 Improvement of Adhesive Strength and Ductility of Epoxy Resin Modified with Polyrotaxane

## 目的 Purpose

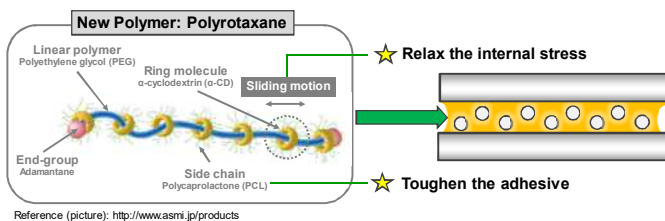
- We developed an epoxy-based adhesive modified with polyrotaxane (PR). It is expected that the sliding motion of the ring molecules in PR can relax the internal stress of adhesive and improve adhesive properties. In addition, the Polycaprolactone (PCL) side chains on the ring molecules can toughen the adhesive.

## 概要 Outline

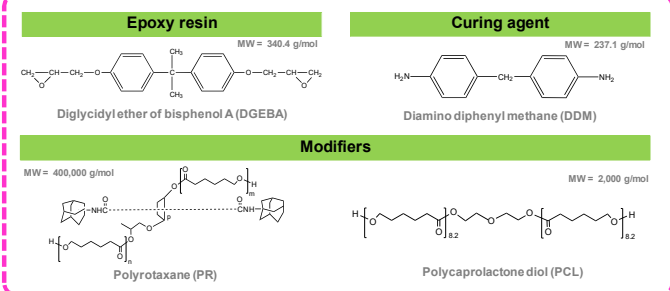
- The incorporation of PR into epoxy matrix significantly increases both strength and ductility of epoxy-based adhesive while other important characteristics such as Tg or shear modulus remain almost the same.
- Compared to PCL, the molecular structure of PR can contribute to improvements in properties of modified adhesives such as miscibility, glass transition, stress relaxation.

## ポリロタキサン強化エポキシ接着剤

### Epoxy-based adhesive with polyrotaxane

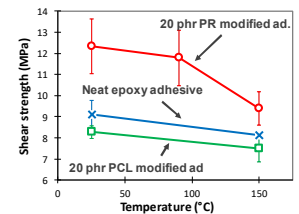
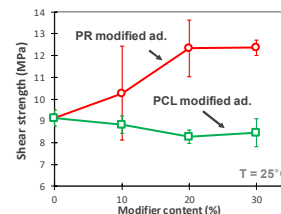
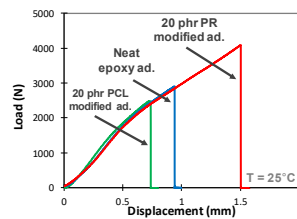


### "Chemicals"



## 力学測定結果

### Lap shear adhesion test



## 今後の展望と課題

Significant improvements in adhesive strength were achieved when there was a large difference between testing temperature and curing temperature. This indicates that incorporation of PR is promising for reducing thermal stress in epoxy adhesives.