

# Creation of high-power piezoelectric polymers

New technology to modify piezoelectricity while maintaining mechanical properties of polyvinylidene fluoride (PVDF)

## Overview

Piezoelectric sensors made of piezoelectric ceramics and polymers have been developed. Among them, polyvinylidene fluoride (PVDF) is a semicrystalline polymer composed of (CH<sub>2</sub>-CF<sub>2</sub>) repeating structures. It has attracted attention because of its low cost and excellent flexibility. While further improvement of piezoelectric properties is required, improvement of materials without compromising their flexibility has been studied. However, materials that meet the needs of the industry have not been developed.

As a result of repeated research, we succeeded in developing a modified PVDF with significantly improved piezoelectric properties. The development of a new material was made possible by adding additives to the raw material PVDF. We confirmed that the piezoelectric properties of this material were increased without losing the excellent flexibility of the conventional material. This paves the way for the development of more sensitive sensors, which are expected to be applied in the medical device and robot industries.

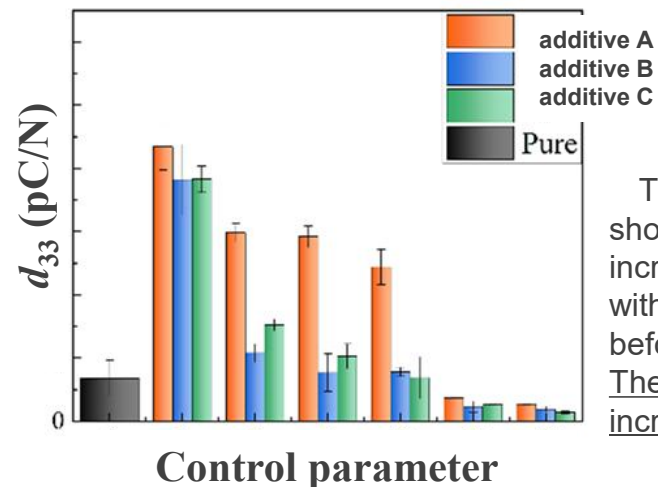
## Product Application

- E-Skin
- Force sensor
- Load sensor
- Haptic device

## IP Data

IP No. : JP2025-136549  
Inventor : Wang Zhenjin, KURITA Hiroki, Narita Fumio  
Admin No. : T25-048

## Piezoelectric constant $d_{33}$



The  $d_{33}$  of PVDF shows a large increase compared with that of PVDF before modification. The maximum increase is 6.4 times.

## Related Works

## Contact

**Tohoku Techno Arch Co., Ltd.**

Please visit [CONTACT](#) here