



Ertalyte® PET-P

Nacelle Yawing Slide Pad

Challenge

Ensure smooth and silent yawing of the wind turbine nacelle, over long lifetime, in all possible weather conditions.

Yawing Slide Bearing System allows the Wind Turbine Nacelle to head perfectly into the wind, which is required for optimum Energy Generation and to prevent blade fatigue.

The system supports the full weight of the turbine (= Nacelle + Rotor), and wind forces exerted in any weather condition.

The system is based on a yawing ring and a number of calipers, which act as a large slew bearing. The calipers hold the slide pads in position while sliding over the yawing ring. Grease is usually applied in order to reduce noise and to prevent corrosion of the metal yawing ring.

Our Recommendation:

- Ertalyte® Natural PET-P
- **NEW** Ertalyte® SLP Blue PET-P
- Ertalyte® TX PET-P



Key Requirements

- Low to very low wear, to minimize need for replacement during lifetime
- Low stick-slip, so low noise
- Medium friction, to provide some part of required break torque
- High creep resistance
- No brittle break at concentrated load (in case of tilting nacelle or extreme weather conditions)
- Typical minimum lifetime 10 years

Customer Benefits

- High reliability of the yawing system, due to extensive proven performance and functional test data provided
- Cost savings up to 20% versus roller bearing concept
- Cost savings through longer time between service intervals

Why Ertalyte® PET-P?

Ertalyte® PET-P is developed for parts in both structural and dynamic use. Due to its extremely low wear rate, combined with high stiffness, it is considered as one of the best materials for highly loaded slide pads.

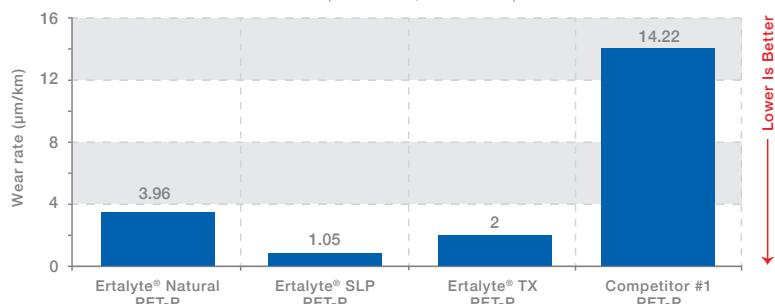
Ertalyte® PET-P is not only proven by many functional laboratory tests, but also has a >25 year track record in Wind Energy yawing systems.

Mitsubishi Chemical Advanced Materials Added Value

- Driving the market of materials for yawing, by detailed knowledge of the molecular structure and processing techniques
- Functional testing data, really relevant to this industry, such as:
 - Low temperature testing
 - High load tribological testing
 - Static Retained compression testing
- Technical support during development of application, and at material specification

Tribological Properties - Wear Rate - **Unlubricated**

Test method: A: "pin-on-disk", ISO 7148-2-PI-A-dr-F4-U4



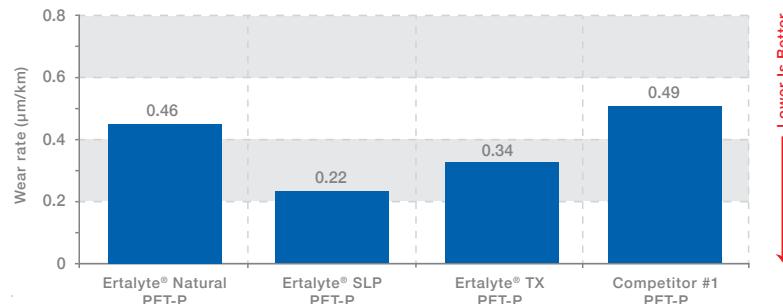
Test conditions:

- Pressure 3 [Mpa] = 435 [PSI]
- Sliding velocity: 0.33 [m/sec] = 65 [ft/min]
- Unlubricated
- Counter surface type: C35 steel

- Counter surface roughness: grinded in X direction only, to Ra 0.70 – 0.90 µm
- Ambient temperature : 23 [°C] = 73.5 [°F]
- Humidity: 50% [RH]

Tribological Properties - Wear Rate - **Lubricated**

Test method: A: "pin-on-disk", ISO 7148-2-PI-A-gr-F-U4



Test conditions:

- Pressure 12 [Mpa] = 1740 [PSI]
- Sliding velocity: 0.33 [m/sec] = 65 [ft/min]
- Lubricated: Castrol-Tribol
- Counter surface type: 42CrMo4 (EN10083)

- Counter surface roughness: turned; so grooves in circumferential direction only, to Ra 0.7–0.9 µm
- Ambient temperature: 23 [°C] = 73.5 [°F]
- Humidity: 50% [RH]

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