

Surface treatment

Tumedei Anti Sticking Treatment (TAST)



Problem description

Friction coefficient, roughness and nanoscale topography of rubber made components depend from many factors (polymer, fillers, mould surface, ..) that frequently cannot be modified or improved.

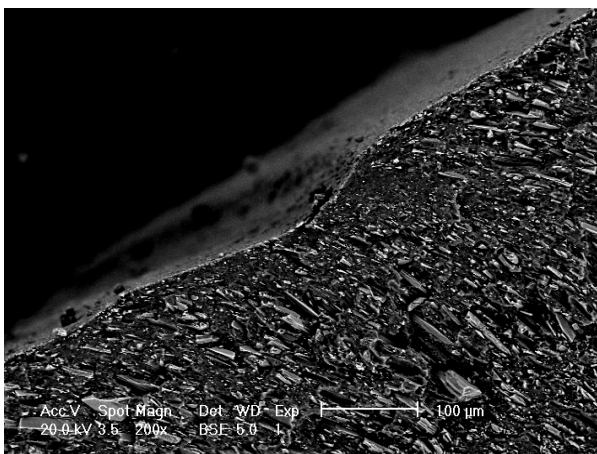
These properties can sometimes affect the performances of the rubber part.

High coefficient of friction could cause

locking of the part in automatic assembly machines.

Rubber parts can require high force in order to be separated from metal surfaces with they have been in contact for long period.

Solenoid valve performances at low temperature cannot be as good as expected because of the freezing of water droplets on the rubber or metal surface.



Tumedei proposal

Tumedei surface treatment called TAST is a PA-CVD deposition that provides the rubber surface with a stable hydrophobic, low surface energy, high contact angle layer of special polymer. Minimization of the adhesion tendency inhibits sticking and always ensures a valve's immediate response.

The typical thickness of the coating is few hundreds of nanometers so it does not affect the tolerance of the part.

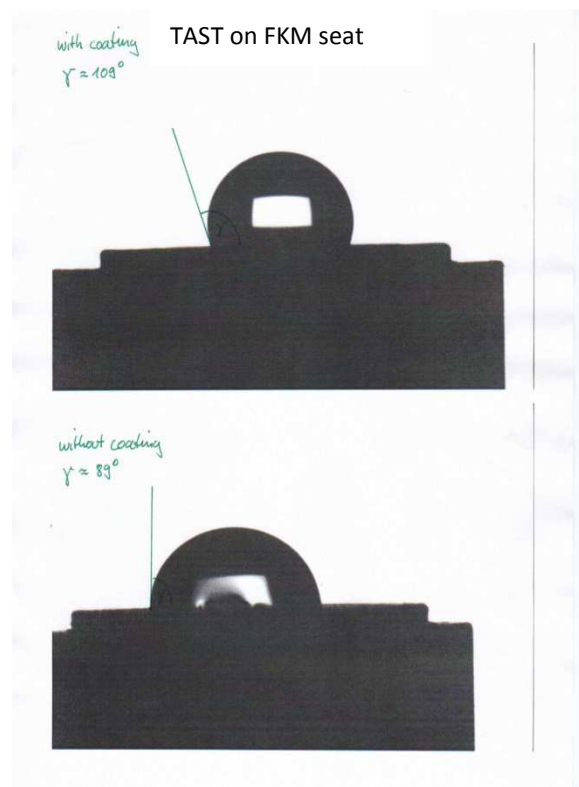
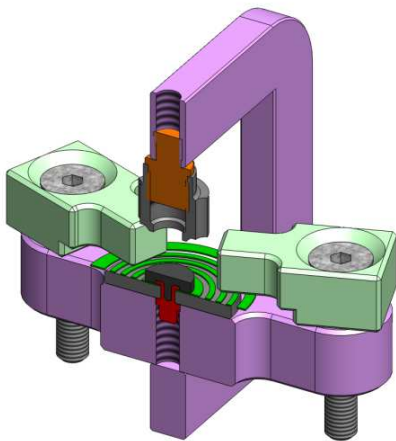
Additionally, this treatment removes from the part any trace of substances (like silicone contamination) that might impair surface wetting in coating process so the part is "pwis-free".

TAST can be done on epdm, silicone, fluorocarbon formulations provided that they are properly designed for this treatment. Some metal and plastics can also be successfully treated.

Advantages of TAST

- No sticking after long inactivity; no slip-stick effect; no adhesion of elastomer to other parts
- Increase of low temperature performance of solenoid valve at temperature as low as -30°C (typically: decrease of open time and/or decrease of minimum open temperature)
- Increase of repeatability of performance
- Reduction of friction
- Increase of lifetime of the valve
- Reduction of permeation with high molecular weight substances
- No modification of the bulk properties of the rubber is needed

Fixture for low temperature testing



TAST does NOT improve

- Abrasion resistance
- Swelling with low molecular weight substances