

Application Report NEXANS BE

Nexans, a worldwide leader in cable production, runs a production site in Dour, Belgium, which manufactures medium and low-voltage cables as well as aerial cables.

Its metallurgical department for copper and aluminium uses 3 NIEHOFF wire drawing lines, swaging wire ropes from +/- 8 mm down to 1 to 3 mm final diameter. In order to achieve the necessary cooling and lubrication the wire as well as the drawing dies is complete immersed in high viscosity oil. Each machine has a volume of around 3.000 litres; the oil's operating temperature is 35 °C.

The swaging process causes significant abrasion of fine aluminium particles. Within a period of 8 to 12 months, depending on production load, the accumulation of solids in the oil increases up to 30 Vol.%. At that point the oil's viscosity has gone up from 650 to over 1,000 cSt, so it needs to be replaced. Each oil change requires thorough cleaning of the machine and causes a significant loss of production capacity. The total of 9.000 litres of oil needs to be disposed as special waste.

Due to the high viscosity and the very low particles size (between 1 and 20 µm), a standard filtration of the drawing oil would not be possible. Natural sedimentation would take several months due to the same reasons (see picture #1).

In order to solve this problem Nexans have applied STA's centrifugal separation technology. Tests with an STA trial system have shown that the particles are entirely removed, despite the high viscosity. The continuous cleaning in by-pass ensures an excellent purity on a steady level. The particles are separated as a solid sludge with almost no residual oil.

These encouraging results have spurred the responsible people at Nexans to purchase one of STA's centrifugal separators A-25 with automatic sludge removal, to be linked to all 3 drawing lines:

The oil is pumped towards the separator following a programmed sequence, which is adaptable to production's requirements. When passing through the A-25's rotor, the fluid gets accelerated by 2,000 times the earth gravity, making the fine particles settle on the inner drum wall and form a solid sludge layer. During the automatic regeneration sequence the rotor-mount scraper system removes the sludge, which then simply falls into a bin placed below the separator (see cross section sketch on picture #2). The purified oil is pumped straight back into the wire drawing machines.

The system was installed in late 2007, and it has been working to the customer's entire satisfaction ever since.

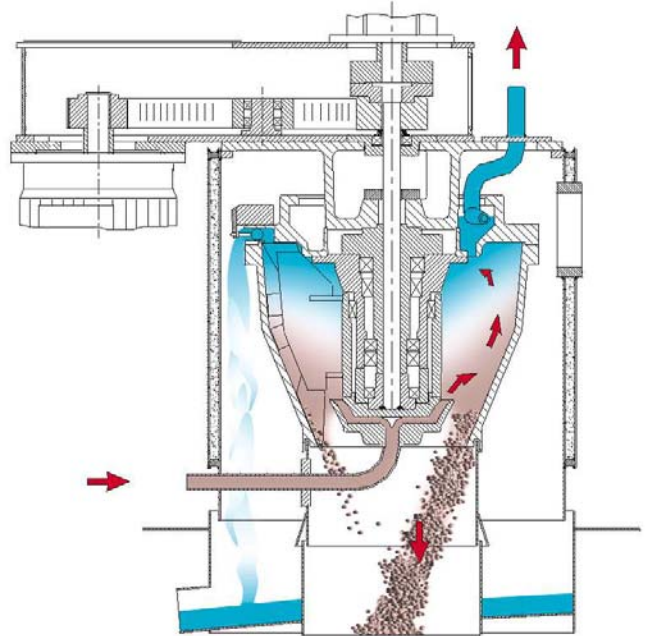


Picture #1: A Sample of polluted drawing oil after 9 months; only after a very long period the particles settle completely

-> The Centrifugal Separator makes this process go 2.000 times faster.

The benefits:

- The oil has not been changed since the start-up of the STA system – the oil consumption has been reduced to top-ups only
-> it is planned to change the oil once every 2 years
- This represents savings of 4,500 litres p.a., worth 7.500 Euros
- Saving of 4,000 Euros p.a. of costs for waste oil disposal and machine cleaning
- Gain of 9 additional production days p.a. (3 days per machine)
- The oil quality stays on a optimum level
- The parts quality is improved
- Wear on the drawing dies is significantly reduced



Picture #2: Cross section of the centrifugal separator A-25 with automatic sludge removal



Picture #3: The STA centrifugal separator, connected to 3 wire drawing machines.