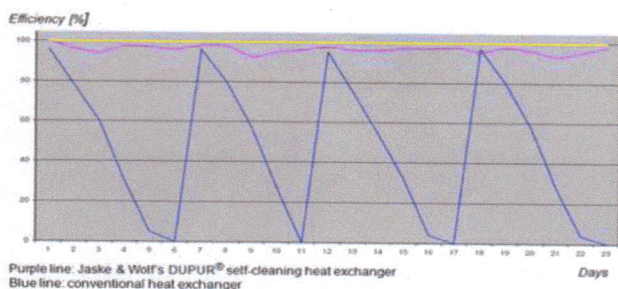


## The unnoticed niche – Permanent Pigging

A case study provided by **JOERG LIS engineering & project management**.

Conventional heat exchangers require downtimes for extensive cleaning resulting in production loss. A corrugated cardboard factory was facing downtimes of a plate heat exchanger often after only a few hours use and at best it would last for five days. The new heat exchanger system with a permanent cleaning system by running pigs was developed and patented by Jaske and Wolf GmbH an Energy & Water Solutions company in Lingen, Germany. This is a great success as no downtime is required anymore for cleaning.

Permanent pigging means that the pigs remain in the pipeline systems and will frequently run as required, e.g. every hour or every day.



The chart shows the efficiency over the first 23 days. The system is successfully proven and has already operated for over 25000 hours. Today, further heat exchangers with permanent cleaning pigs are in operation in several industries. The pig run intervals can be adjusted as needed, e.g. regulated by differential temperature. In this specific case, cleaning pigs circulate every 30 minutes. The pigs remain in the system and can be replaced quickly if required.

The DUPUR® heat exchanger with its permanent pigging system is a suitable application for petrochemical industry, food industry, biodiesel plants, paint industry, thermal oil circuits in power distribution systems, geothermal heat recovery from mine water (surface brown coal mining) for buildings and more.

The advantages are:

- No filter for pre-cleaning of the medium required (high dirt contamination can be handled)
- Surface cleaning within seconds
- Cleaning intervals adjustable in accordance to the level of debris
- Intervals can be controlled by temperature (automated control)
- Heat transfer remains steady on a high level
- Silt, crust formation, calcification and fouling in heat exchangers is effectively avoided
- No chemicals necessary for cleaning
- Elimination of redundant replacement systems and more

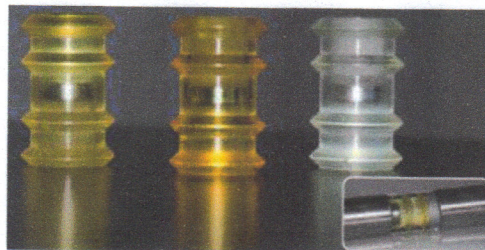


Fig. 1: permanent cleaning pigs for different conditions.

The lifetime of the pigs depends on the kind and amount of debris. Some pigs were removed after 4 weeks. Other pigs have been running for over 3 years.

Debris will be removed automatically during uninterrupted operation.



Fig.: 2 pig stations (dark grey boxes), each station controls 4 pigs in 4 different pipelines

Conclusion: a permanent pig system is successfully proven to be extreme efficient. This is a smart solution for several purposes and many industries. Joint ventures are being sought to enter the international market and new fields of application. ●

### Services PIGGING CONSULTANCY

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### Sales Offer PATENT

Electric power and drinking water produced by wind energy. Ideal application in remote areas, e.g. for sites, camps, villages, development aid and more.

### Wanted JOINT VENTURE

\*to enter the international market with self-cleaning heat exchangers by means of permanent pigging systems.

... there is always a solution ...



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