



SURSULF

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SURSULF (HEF Patents and Trade Mark)

A salt bath nitriding treatment, using sulphur as a catalyst, and operated at $565 \pm 5^\circ\text{C}$. For the solution of problems of: seizure/adhesion, wear/abrasion, fatigue, pitting, corrosion, on all ferrous alloys (steels, irons, sintered irons...)

ADVANTAGES

- The particular composition of the salts (Li^+ , K^+ , Na^+ , CN^- , CO_3^{2-}) ensures better chemical & thermal stability and its greater fluidity ensures less products consumption.
- The very high nitriding potential is a result of:
 - the particular composition of the regenerator salt,
 - the use of a catalyst (active sulphur) which increases the kinetics of nitrogen diffusion (fig. 1), and encourages the formation of a homogeneous layer of ϵ nitrides (fig. 2).
- The catalyst also allows the structure and thickness of this layer to be adjusted (fig. 3), to give better solutions to problems of:
 - either wear, pitting, fatigue,
 - or seizure, adhesion, scuffing.
- The process is flexible, simple to apply and to maintain, with minimum costs of running.

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PROPERTIES OF THE SURSULF TREATED COMPONENTS

Resistance to wear, abrasion and pitting (fig. 4), arising from the fact that the **single phase** compound layer is **hard & ductile** and has good **frictional** properties.

Resistance to seizure, scuffing (fig. 5), thanks to the unique structure of the surface layer, which acts to:

- **inhibit welding**,
- **avoid adhesion** by metal transfer,
- **facilitate running-in**,
- **delay the onset of breakdown** of the oil film.

Resistance to fatigue (fig. 6)

the exceptional nitriding potential of **SURSULF** results in high residual compressive stresses, which allows a considerable **increase in superficial and general fatigue resistance**.

Resistance to corrosion

the production of a single phased compact surface layer encourages **corrosion resistance** (see also **ARCOR**).

SURSULF IN OPERATION

1- STAGES OF TREATMENT (fig.7)

- degreasing,
- optional preheating,
- **SURSULF** treatment,
- cooling (in air, water, oil or salt),
- washing in cold / hot water

2- SALTS USED :

- base salt **CR4** for making up and topping up the bath,
- regenerator salt **CR2**,
- catalyst salt.

3- MAINTENANCE AND QUALITY CONTROL:

simple instructions and clear diagrams presented in a "Users' Manual" allow to guarantee the quality mastering :

- maintenance of bath chemistry,
- treatment parameters,
- metallurgical tests.

EXAMPLES OF INDUSTRIAL APPLICATIONS

The numerous customers and licensees of the **SURSULF** process decided to use it because of its : **simplicity, reliability/reproducibility, exceptional properties, low operating costs**,

They use it to treat :

- crankshafts, gears, rockers, valves...
- cylinder liners, tappets, cylinder heads, camshafts, wheels, slides, differential gear boxes...
- dies, punches, tools, moulds...

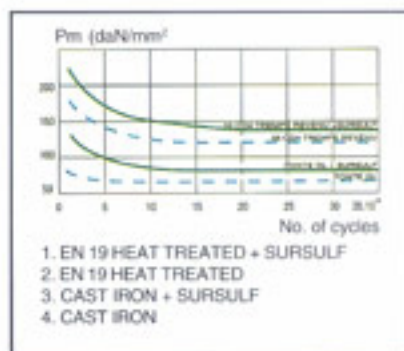
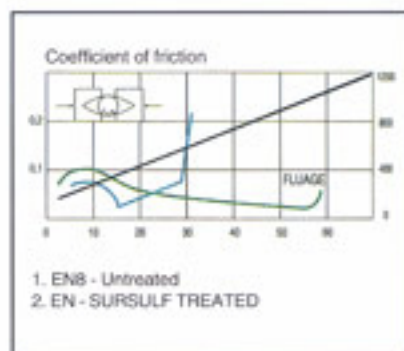
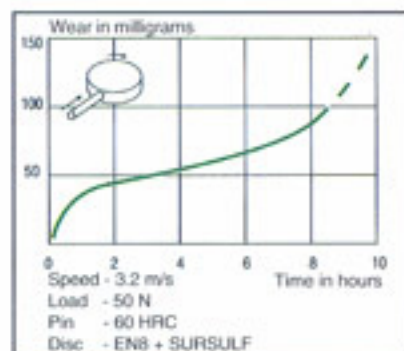
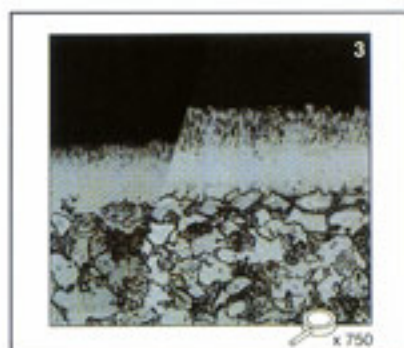
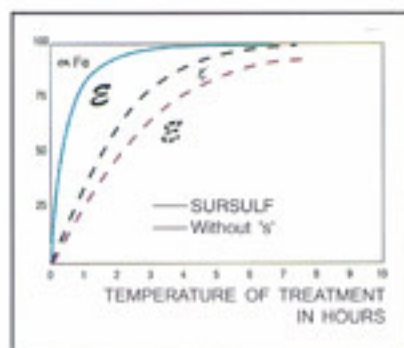
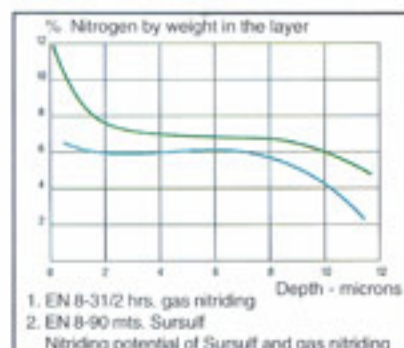
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WE OFFER YOU :

- **know how**
- **equipment**
- **salts**
- **technical assistance**.

The information given in this brochure are the result of our research and experience. It is therefore susceptible to change, and we cannot accept responsibility for any inaccuracies.



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