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# Rail Grinding Now Part Of

More and more railways are realising the benefits of grinding their rails to solve a number of track problems.

**R**AIL grinding is continuing to show strong growth throughout the world according to Dr Wolfgang Schoech, external affairs manager of Speno International, Switzerland. Schoech believes there are three main reasons: new markets, in particular China, the growing influence of consultants as they popularise strategies to optimise the benefits of rail grinding, and most importantly the flexibility of modern rail grinders.

"Today's machines are so adaptable, that we can find solutions almost as quickly as problems occur in the track," Schoech said. He points to sites where rail grinding is currently providing diverse benefits such as noise abatement, relief of narrow-set gauge, reduction of lateral wear in curves and, increasingly, prevention of rolling contact fatigue phenomena such as headchecks.

"These programmes can overlap the traditional sites treating longitudinal and transverse profiles, or be situated elsewhere," Schoech points out. "Either way, railways see rail grinding as a multi-application activity and are extending its use."

Railways are making determined efforts to quantify the economic benefits of rail grinding. "The extension of rail life by routine grinding is no longer in doubt," says

Schoech. "The weak point in the argument remains the absence of historical records to enable hard-figure analysis." Several railways are now documenting the cost of rail grinding per track section, and the first figures are expected shortly.

Investigation of the life-cycle cost of rail with and without rail grinding is underway. The Technical University of Hannover, which is experienced in this type of exercise, recently launched an extensive research project designed to clarify the economic advantages of rail grinding.

An interesting aspect of the increased use of rail grinding is the incorporation of the activity into global studies of track maintenance. The Technical University of Innsbruck, Austria, for example, is carrying out research into the interaction between tamping and grinding with a view to optimising a linked deployment.

## Three Types Of Grinding

Rail grinding can be broken down essentially into three different types: initial, preventive, and corrective.

Initial grinding is performed on rails that are freshly laid during new construction or after re-railing. Initial grinding corrects construction damage and adds the final touch to optimal opening conditions. "Experience has shown that grinding new rails retards the onset of track deterioration," says Schoech.

Preventive grinding involves intervening before damage has matured. The idea is to treat the rail when damage is at the embryonic stage. This approach is based

upon cyclical timing. The grinding campaigns are steered in accordance with cumulative track loading.

Corrective grinding is based on symptom-related interventions. Campaigns are directed by monitoring damage against preset levels, such as removing short pitch corrugation once it reaches 0.05mm depth.

"In general, there is a tendency to move away from corrective grinding and towards preventive grinding, partly from intuitive cost reasoning," says Schoech. "As the damage remains at lower levels when treated preventively, the cost of the remedy is less. Also, the lower magnitude of damage provokes lower damage-related costs."

"Moreover, because of the shorter intervention cycles, the impact period of these costs is reduced. It has also been suggested that maintaining the rail's shape to within a narrow band of variation may allow a review of stress loading and consequently a relaxation of wear limits."

"A corollary of the 'little and often' method of grinding is that less metal removal is required at individual grinding interventions. Nowadays, most rail grinders have more than enough power for this way of working. The priority has turned to precision."

Underpinning current discussions on grinding precision is the distribution of the draft standard by the European Committee for Standardisation (CEN) entitled *Acceptance of Rail Grinding, Milling and Planing* (prEN 13231-3), which is now at the final discussion stage. "The norm has already influenced the specifications of some re-



The RR 48 M-2 grinding train is dedicated for use by French National Railways.



# The Maintenance Routine



Speno's new 16-stone rail grinding train, the RR16 MS-2.

cent calls for tenders," Schoech revealed. "Suppliers are busy leafing through the standard to see what might be in store. General opinion is that the requirements are ambitious. Indeed, the railways claim that they are designed to provoke progress."

Mr Luca Palmieri, Speno's technical director, views today's markets as particularly challenging. He points out that Speno is both a manufacturer and user of rail grinders for service contracts. "New applications imply specialised machines," he says, "but manufacturing and fleet maintenance considerations call for standardised units."

Speno's answer has been to develop a new series of machines based on two principles. "Our new machines are standard modules that carry an improved standard

grinding trolley," Palmieri explained. "If we need a bigger machine, we couple two modules together. If a new application calls for different trolley equipment, we limit the change to modifying just the working components that are directly involved."

Speno is currently rolling out a fleet of six similar line grinders that will also grind through level-crossings. "By combining units, this series is particularly suited to one-pass grinding on high-speed lines," says Palmieri. There are two exceptions in Speno's range: switch and crossing grinders and restricted-gauge tunnel grinders, which have been designed for these specific tasks although they benefit from the use of standard components.

For Palmieri, the real problem is the growing demand for precision. Referring to the CEN pre-norm, he points out: "Our

customers are looking for kilometres of rail per hour rectified to within tenths, and even hundredths, of a millimetre. And this on a structure (the track) that is designed to be flexible."

Palmieri says this task is mechanically possible, but it implies state-of-the-art techniques of measurement and automation. The main task of the electronics is to provide information and computer assistance to the operators. Additionally, there is a requirement for extensive data logging to allow timely reception of

the work. Speno plans to push the data gathering further to include all the parameters required by the contract. The objective is to eliminate the presence of personnel on the track to check the results as this is a time-consuming and dangerous activity.

Speno says that rail grinding has become a routine maintenance operation that is still growing. "Even in times of budget cuts rail grinding holds its own because of the perception that it offers cost reductions elsewhere as well as a broad range of unquantified advantages," says Schoech. "Another sign of growing interest is the entry into the market of new competitors, some offering rail rectification by other processes. For the moment, however, rail rectification by grinding with rotating stones remains the obvious leader." **IRJ**



## SPENO INTERNATIONAL SA



***"Big grinding  
trains are  
economical on  
long sections of  
open track,  
but what I also  
need is a more  
versatile machine  
for complicated  
trackwork."***

***Who can I turn to  
for advice?"***

***"Speno"***

Speno has developed a fleet of innovative machines that can be adapted to a network's rail grinding needs. The concept is modular and allows machine combinations to suit specific grinding applications, job sizes and track possessions.

Talk to Speno!



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