

2nd edition, August 2003

*Translation*

# R

## Recommendations for management of rails

*Recommandations pour la gestion des rails*

*Empfehlungen zur Bewirtschaftung der Schienen*



UNION INTERNATIONALE DES CHEMINS DE FER  
INTERNATIONALER EISENBAHNVERBAND  
INTERNATIONAL UNION OF RAILWAYS



**Documents**

Document Sharing Hub

---

## Leaflet to be classified in Volume:

VII - Way and Works

## Application:

With effect from 1 January 1990

All members of the International Union of Railways

## Record of updates

### 1st edition, January 1990

First issue

### 2nd edition, August 2003

Retyped in FrameMaker

Important: The points in this leaflet have been renumbered in the new edition. Point 1 becomes Summary. The first digit of each point has been decreased by one (i.e. 2 becomes 1, 3 becomes 2, and so on). Please take account of this when using cross-references from other leaflets.

*The person responsible for this leaflet is named in the UIC Code*

# Contents

|                                                                            |          |
|----------------------------------------------------------------------------|----------|
| <b>Summary .....</b>                                                       | <b>1</b> |
| <b>1 - Optimisation of the useful life of rails .....</b>                  | <b>2</b> |
| 1.1 - Choice of rail .....                                                 | 2        |
| 1.1.1 - Grade and structure of steel .....                                 | 2        |
| 1.1.2 - Rail profile .....                                                 | 2        |
| 1.2 - In-situ rail inspection .....                                        | 2        |
| 1.3 - Lubrication .....                                                    | 3        |
| 1.4 - Grinding .....                                                       | 3        |
| 1.5 - Rail repair .....                                                    | 4        |
| <b>2 - Rail renewal - Rail reconditioning .....</b>                        | <b>5</b> |
| 2.1 - Rail renewal .....                                                   | 5        |
| 2.1.1 - Rail wear .....                                                    | 5        |
| 2.1.2 - Withdrawal for economic reasons .....                              | 5        |
| 2.2 - Rail reconditioning .....                                            | 5        |
| 2.3 - In-situ welding .....                                                | 6        |
| <b>Appendix A - Table comparing the three reconditioning methods .....</b> | <b>7</b> |
| <b>Bibliography .....</b>                                                  | <b>9</b> |

## Summary

Rails account for a large proportion (from 30% - 50%) of the cost of new infrastructure. Management of this asset, its maintenance and renewal costs play a key role in the optimisation of track maintenance costs.

Rails are also the track components which are directly subject to stresses and undergo direct wear by rolling stock. They are subjected to loads and dynamic forces, which they transfer to the infrastructure through sleepers and ballast, possibly amplified by the effect of surface defects in the rails. Consequently, there are two aspects to optimisation of rail maintenance:

- optimisation of the useful life on a given site depending on the loads carried and speeds, also bearing in mind the effect on track maintenance of other components such as sleepers and ballast,
- optimisation of maintenance operations relating to surface condition in order to reduce corrective work on sleepers and on track geometry, and to minimise overall expenditure for maintenance of superstructure, infrastructure and bridges.

These different factors are clearly interdependent.

The service life of a rail depends especially on the loads sustained and the speeds operated on the different lines; consequently, it is highly desirable that the railways use the classification of *UIC Leaflet 714*, which is highly representative of actual traffic on the lines.

Furthermore, since rail maintenance policy depends on changes in the condition of materials and, in particular, changes in internal and surface defects, it is recommended that a system of monitoring statistics of rail breaks and damage be introduced in order to be able to assess the residual value of materials at any given time.