

Rail degradation: mechanisms and control

Michael Steenbergen

Learning Objectives:

After following this module, you:

1. can qualitatively describe and reproduce the contact stress field in the moving wheel-rail contact, distinguishing each component and its role in the wheel motion;
2. can distinguish stress contributions due to steady, transient and dynamic rolling conditions;
3. are familiar with the concepts of friction and slip in relation to stress for moving contacts;
4. can describe the subsurface stress response as a function of contact stress;
5. are informed globally of the rail materials and their micro-metallurgical properties;
6. are familiar with the different wear categories, including rolling contact fatigue, and their control parameters;
7. are familiar with typical failure modes of the surface and their long-term development as a function of the life cycle;
8. are aware of critical control parameters that govern the quality of maintenance interventions of the rail surface (surface conditioning) and their effect on the lifecycle of the rail.