

OPTIMISATION OF PARAMETERS FOR THE FLASH WELDING OF MILL HEAT TREATED RAIL

The report follows a series of welding trials at Castleton Flash Welding Depot to optimise the welding conditions for MHT rail. Appropriate machine settings were altered in order to obtain the best welding conditions. The optimised flash welding conditions for MHT rail are given.

It was also concluded that

- Welds produced in Mill Heat Treated rail using the described welding machine settings exceeded the acceptance criteria used for the manufacture of long welded BS11 Grade A rail in terms of bend testing, fatigue testing and heat affected zone widths.
- Welds produced in Mill Heat Treated rail using the described welding machine settings failed the acceptance criteria used for the manufacture of long welded BS11 Grade A rail in terms of hardness. The weld hardness is significantly lower than the hardness of the MHT parent metal. This was not unexpected as no post welding cooling operation was employed.

It is recommended that as an interim measure, long welded MHT rail can be manufactured on the flash welding machine at Castleton Depot. However, it should be noted that in traffic, preferential wear of the welded region is likely to occur due to its reduced hardness. Dependent upon the future extent of usage of this type of rail, a post weld cooling operation may have to be developed in order to counter the preferential wear of the welded regions.