

4.10 Java, de Gruyter

In 1933 de Gruyter¹⁴ of the State Railways on Java (Indonesia) used Giesl's theoretical work and Young's test results as a basis for a systematic effort to improve the economics of the locomotive fleet. His contribution is translated and excerpted in Appendix A.26.

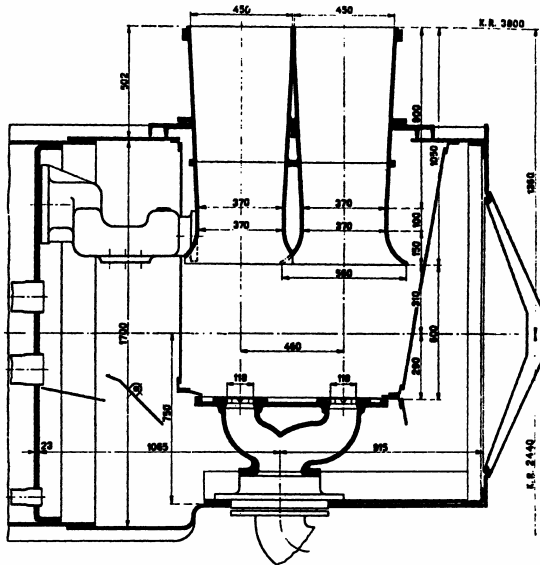
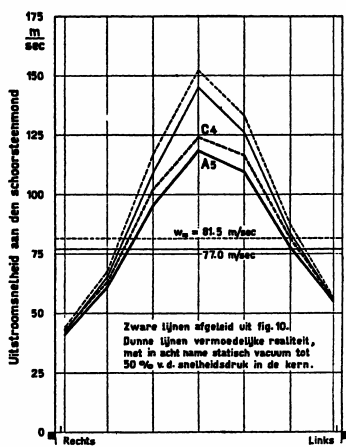


Fig. 8. 1 D + D Mallet-compound-locomotief, serie 1200/50 de, S.S. RO = 4.1 m², VO_k = 195 m², 2 · f_m · RO = 1 : 12.9, x_m = 1 : 4.97, 2 · f₁ = 2.90 = 180 cm².

In 1928-31 he had already succeeded in improving the 1250 series of heavy (2-8-0)-(0-8-0), 1DD, Mallet locomotives by installing double chimneys, Figure 4.4, and using orifices of larger areas than the single original.

The exhaust of the 4-6-4 tender locomotives of the 1300 series was also redesigned and tested¹⁵. De Gruyter also measured velocity pressures in the chimneys, Figure 4.5, corroborating Young's results on still existing non-uniform velocity profiles at the chimney exit, which he calculated.

Figure 4.4 SSJ Mallet series 1200 double chimney¹⁴



These results refute the correctness of the assumption of uniform velocity profiles at the exits of single orifice chimneys for exhaust calculations.

The tests resulted in increased power and a reduction in water and coal consumption. This allowed the Railway to offer improved services, called "Quick Four"; a fast run from Bandung to Djakarta and back four times a day. The "Quick Five" was a fast run between Surabaya and Malang five times a day. The fast services to and from Djakarta increased passenger traffic by 30% and the improvement to and from Surabaya increased the number of passengers by 90%.

Figure 4.5 Chimney exit velocity profile¹⁵

In his 1936 article de Gruyter promised a further treatise on tests with other locomotives and aspects of the work that needed additional explanation. At the beginning of WWII in the Asian theatre he had not fulfilled his intention and, unfortunately, he did not survive that war.