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Sommario/riassunto	The physical design of cavity and magnetron injection gun (MIG) for a realistic, DEMO-compatible, coaxial-cavity 238 GHz 2 MW CW fusion gyrotron is developed in this work, having auxiliary frequencies at 170 GHz and 204 GHz. Novel systematic approaches towards multi-frequency mode selection, magnet requirements, and MIG design are presented. Mode deterioration and voltage depression variation due to insert misalignment versus cavity wall and/or versus electron beam are studied.