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## European Materials Development: Results and Perspectives

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This paper reviews the material strategy of the EU fusion roadmap and the recent progress of activities within the EUROfusion materials research program. It highlights, both, the characterization and validation of in-vessel components baseline materials, i.e. EUROFER97, CuCrZr and tungsten as well as the development and characterization of advanced structural and high heat flux materials for DEMO and beyond. In support of engineering design activities the primary focus is on compilation of data and the supply and release of material property handbooks, material assessment reports complemented with the development of design criteria and material design limits appropriate for DEMO thermal, mechanical and environmental conditions.

Data are presented and discussed with respect to DEMO operating specifications for selected subtopics, which include (a) advanced steels optimized towards low and high temperature extension of the current operational window, (b) heat sink materials, i.e. copper based alloys and composites and (c) plasma facing materials, i.e. tungsten based composites. Based on the discussion and conclusions drawn, perspectives for the required materials performance and future research and validation steps will be given.

A first glance on these perspectives, the most far-reaching progress by now in the EUROfusion materials program and the first step of a necessary and more extensive qualification program, is provided by the launch of nine neutron irradiation campaigns within the last two years. Baseline structural and high heat flux materials are irradiated up to medium neutron dose levels for continuously filling gaps in the materials property handbook and advanced material options at lower neutron fluence for screening, down-selection and increase of fundamental knowledge of n-damage. The results will guide the future materials research and validation program as well as design options for blanket and divertor components.

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