

In one aspect of the disclosure a vertical absorption column is disclosed, for the absorption of nitrogen oxides from a process gas comprising said nitrogen oxides into water for the production of an aqueous nitric acid solution. The absorption column comprises a liquid distributor comprising a feed box having a serrated weir for distribution of a liquid through upward-pointing serrations of the serrated weir into perforated trays of the liquid distributor and located directly above a structured packing, a structured packing, a plate packing comprising a plurality of horizontal plates, provided with cooling means, an inlet for the addition of oxygen to the lower part of the vertical absorption column, an inlet for the process gas comprising nitrogen oxides from an ammonia oxidation process at the lower part of the vertical absorption column, an inlet for an aqueous solution at the upper part of the vertical absorption column, at least one nitric acid outlet at the bottom of the vertical absorption column and an outlet for tail gas comprising nitrogen oxides at the top of the vertical absorption column. The present disclosure further relates to an absorption method for the production of an aqueous nitric acid solution by the absorption of nitrogen oxides into water in a vertical absorption column according to the disclosure. The present disclosure further relates to a method for producing nitric acid and to a method for minimizing the amount of nitrogen oxide gases in the tail gas from a vertical absorption column according to the disclosure. Finally, the disclosure relates to the use of an absorption column according to the disclosure and to the use of a structured packing in an absorption column according to the disclosure.