

## ECOLOGICAL AND ECONOMIC ASPECTS OF WATER RESOURCES SAVING IN MECHANICAL PROCESSING OF THE MODERN CENTURY

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Generally accepted technological methods for mechanical treatment, especially of accurate finishing grinding of difficult-to-work materials with increased hardness and durability, consist in use of jet irrigation with lubricating-cooling technological means (LCTM) on water or oil liquid basis [1]. LCTM use is an important factor in ensuring of technological productivity and functional quality of technologies.

In the industrialized countries of the world, a large number of liquid LCTM are used, for example in Germany and the USA up to 110 and 250 million liters per year, respectively. But the intercontinental scale of the problem of the provision of clean fresh water of vast territories in the Asian, African, Australian, American regions is globally stimulating the reduction of water consumption for industrial purposes as a permanent trend in the scientific and technological development of our civilization [2], including with regard to LCTM during machining – from minimizing the flow, for example in the form of partial microdoses, and to complete rejection [3].

The LCTM is a source of relatively high production costs associated with its preparation, transportation, operation of feed systems to the treatment area, regeneration, recovery and disposal. According to the Swiss firm Mikron SA Aqno [4], the cost of LCTM per machine is an average of \$ 50 to \$ 300 per day, taking into account the full cost of the LCTM filing systems in the treatment area, maintaining its normal condition.

Refusal of fresh water in LCTM compositions for diamond-spark grinding of difficult-to-machine materials with the use of solid lubricants allows saving significant funds and at the same time obtaining a significant environmental effect without reducing the productivity and quality of processing [5]. This is an effective response to the environmental challenge of the sustainable use of freshwater while also taking into account economic considerations.

### References:

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