

Improvement actions: Cooling fan

according to ISO/DIS 14955-1

No.	Requirements on	Description	Relevant for machine type	Estimated Energy savings
1	Discontinuous operating pumps, adjustable pressure for cooling lubrication, controlled flow rate	Active mode of cooling lubricant system depends on demand	Metal cutting	3,7 – 4,5%
2	Minimal quantity lubrication (MQL) when advantage	Consider energy consumption of compressed air	Metal cutting	4,6 – 5,5%
3	Thermal management of machine tool and all components (e.g. cooling devices, ...)	Optimized concept for thermal management of all machine tool components regarding:;1. Minimization of thermal power losses;2. If thermal power loss is not avoidable, it has to be dissipated by air or water cooling; for reuse of thermal energy water is given a preference compared to air; further reuse of thermal energy has to be checked/discussed with customer (e.g. via standardized interface);3. Controlled ventilation (fan)	Metal cutting	4,6 – 5,5%
4	Apply direct cooling of components depending on process (cooling at the source)	Temperature controlled	Metal cutting	3,7 – 4,5%
5	Demand dependend cooling	E.g. substituting line connected motors by inverter motors	Metal cutting	3,7 – 4,5%
6	Consideration of applied sub-systems with regard to synergies	To obtain the maximum possible energy savings it is often not sufficient to only look at the individual components and modules that are used for the individual functions. In addition it must be checked if it possible to extend the use of a supply unit (e.g. hydraulic), particularly during idle periods where other machine functions could be supplied or driven by it. In addition to the increase in the total efficiency of the supply unit due to the improved utilisation, a complete drive unit can be omitted (e.g. generation of high pressure coolant) and a large part of the previous energy requirement saved (avoidance of electrical, mechanical and volumetric losses).	Metal cutting	