

MECHANICAL ENGINEERING

MUR DM 117/Tsubaki Nakashima - Recovery, reuse and reduction of waste sludge in the production of balls and rollers for rolling bearings

Funded By	TN ITALY SpA [P.iva/CF:07802470018] MINISTERO DELL'UNIVERSITA' E DELLA RICERCA [P.iva/CF:97429780584] Politecnico di TORINO [P.iva/CF:00518460019]
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Context of the research activity	Sustainable recycling of manufacturing debris from bearing ball manufacturing. Progetto finanziato nell'ambito del PNRR - DM 117/2023 - CUP E14D23002030004
Objectives	<p>The research activity will be developed in collaboration with Tsubaki Nakashima Italy.</p> <p>Every year, 150,000 t of steel rolling elements and 15,000 t of waste (sludge) of which 7% is composed of water and the rest of metal particles. This material is handled as waste following local regulations-laws. Pathways have been active at the TN plants for years to improve the sustainability of manufacturing processes, such as the reduction of the use of oils replaced by water, the use of rainwater, the filtering and reuse of water, etc.</p> <p>As part of the multi-year collaboration between TN Italy and the Polytechnic of Turin, which has taken the form of theses, doctoral courses, commercial contracts, fits into this line of research.</p> <p>Objective of the activity is to develop recovery systems of the metal scrap contained in the sludge as well as its own treatment aiming at recycling it in the same production process, or in different fields. Another objective of the activity will be to improve production processes to reduce both usage of water and the volume of sludge produced. Finally, it will be investigated the possibility of replacing mineral oils as lubricants, inside the bearings, with oils of natural origin, with a view to reducing water and soil pollution due to dispersion of mineral oils in the environment.</p>

Skills and competencies for the development of the activity

The candidate is required to be competent in mechanical manufacturing processes, basic metallurgy, material science.
She/he will be required to operate in testing laboratory, to brainstorm on creative solution to research problems, to analyse and synthesise technical literature, to plan and execute experimental activities.
Creativity and autonomy as long as team working attitude is welcome