

Danish Advanced Manufacturing Research Center

CO₂- Alternative to conventional cooling

Based on an idea that you can achieve a better result - in production as well environmentally - we have investigated the possibility of using CO₂ as a replacement for conventional cooling lubricants. Through a series of experiments with both conventional and CO₂ cooling in some of the most used materials in the Danish industry, such as Stainless Steel, Aluminum, Cr / Ni Steel, Tool Steel and Structural Steel, we were able to provide the first documentation.

Among other things, the experiments showed that CO₂ cooling reduces the heat impact of the plate, which could clearly be seen in the difference between tool wear. For sticky materials like stainless steel, the heat is more of a decisive factor in how quickly the board is worn. The CO₂ cooling effect thus provides an optimal machining process.

The general tendency was also that the CO₂ cooling amplified that the heat produced from the machining process was moved to the chips before the plates and / or the subject. This has a very big impact on the life of the plates, whether the heat is led into them or not.



Conventional cooling



CO₂ cooling

Some of the results are

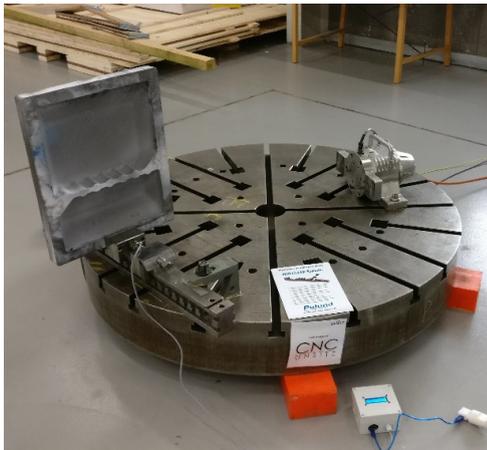
- Extension of tool life in stainless steel by 125%.
- Extension of tool life in other materials by up to 40%.

that CO₂, through the extreme cold, is as good at lubricating the process as conventional means.

- Better working conditions when using CO₂. There is no need for cleaning / blow-off of any item, tool or machine in conjunction with the work to be performed. An ultimate requirement for the use of CO₂ is the increased exhaustion.

The next steps will be to make further attempts in relation to other materials and tools as well as to investigate whether retrofitting / retrofitting of refrigeration equipment on old-age machines is possible, thus expanding the already high potential of use.

Reducing warpage with vibrations



Manufacturing of accurate items made of cast iron can be a challenge. This is often due to the internal stresses that the subjects hit when they are being processed.

In many cases it is possible to use vibration to reduce the stress level of the items before machining. This is just one of our major focus areas due to the great potential for Danish manufacturing companies

In collaboration with the Technical University of Denmark (DTU), DAMRC is developing methods for measuring these internal tensions, so it is possible to qualify the effect of the treatment.

This will provide a more precise instrument for selecting the different parameters for the treatment. Various technologies are tested and compared to increase the reproducibility of the treatment.

The project is supported by the development program for subcontractors in the wind turbine industry. You can find more about the program here: [Udviklingsprogram for underleverandører i vindmølleindustrien](#)

New members



Middelbart Business Center will use the DAMRC membership to provide their businesses with cutting-edge machining in metal, plastic, or composite focus on production growth. They can offer companies the opportunity to improve productivity through eg. reduced tool wear, increased process stability, minimization of machining time, introduction to new technology, production optimization, solved technical issues and employee competence development.



VIBORG
KOMMUNE

Viborg Municipality has subscribed for membership in DAMRC, in this way, in close cooperation with the CFI Center for Industry, to place extra emphasis on the processing industry and its competitiveness in Viborg Municipality. As a result of the membership, there will be a dramatically increased DAMRC activity in the processing companies in Viborg Municipality during 2018.



Ringkøbing-Skjern
Kommune

In continuation of an already well-function cooperation with Ringkøbing-Skjern Business Council, the Municipality of Ringkøbing-Skjern has chosen to be an independent member of DAMRC. The municipality wishes to create even greater opportunities for production i optimization in the local companies.



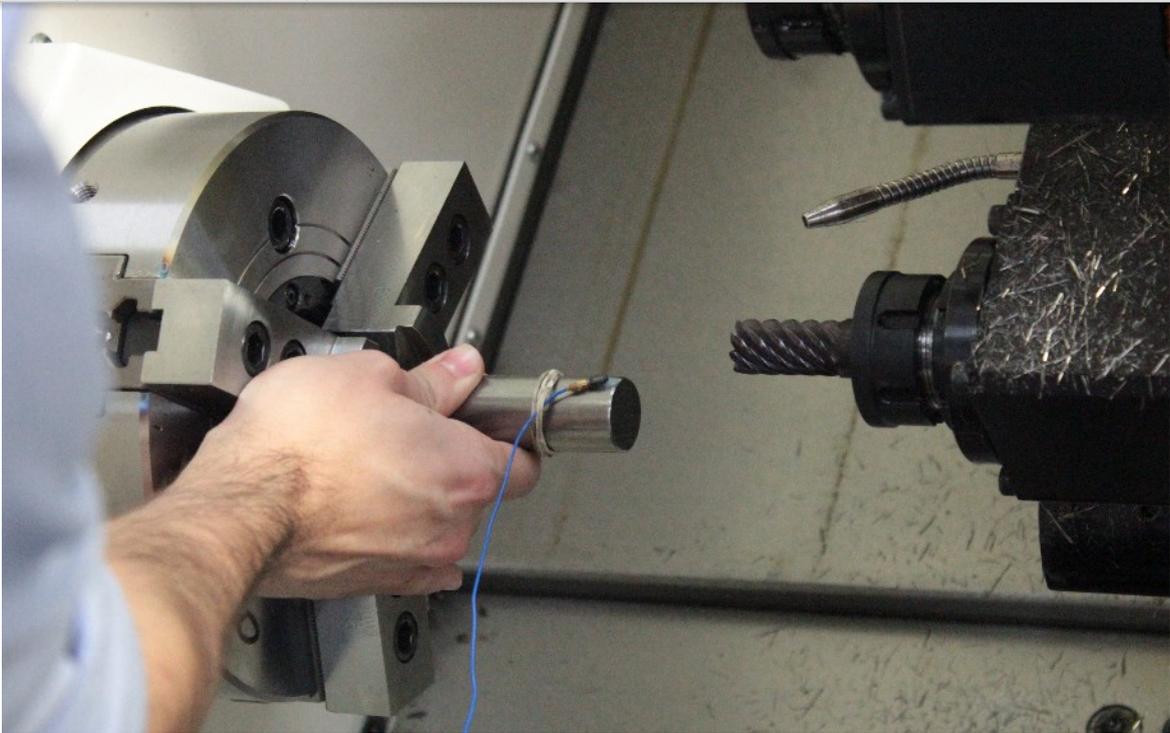
MASKINGRUPPEN

VÆRKTØJET TIL VÆKST

The whole machining industry is constantly developing, including the equipment. In this connection, Maskingruppen collaborates with DAMRC and has provided a fully automatic saw to the DAMRC Technology Center

We welcome the new members and look forward to future cooperation.

Since 2013, more than 60 companies have improved their productivity by 30% or more through collaboration with DAMRC – are you to be next? Give us a call or send us an email and let's take a non-binding dialog about how



New employee



Mette Kirstine Laursen

Mette will be the one to welcome you and do the practical arrangements concerning meetings ect.

Global Manufacturing Festival 2018

In cooperation with Business Region Midtvest, DAMRC gives you the opportunity to gain insight into the future manufacturing industry from a technological and business perspective

It will be a day where you get new knowledge about new production technologies, the latest knowledge of researchers, the experiences of local businesses, the best practices of international companies and new ways of looking at business.

When: Thursday, April 12, 2018 at. 9: 00-21: 30

Where does it start: DAMRC Technology Center in Herning

- How the German Fraunhofer Institute works with the digital conversion of production
- How the Dutch MX3D produces complicated subjects with robots like 3D printers
- Updates from researchers on digitization of production
- Experience from companies collaboration with the upcoming generation of engineers from Aarhus University in Herning concerning digitalization possibilities
- See the set up of MultiCut's new production hall

Read more and sign-up here: brmv.nemtilmeld.dk/7



We offer a wide range of courses, practical as well as theoretical. Similarly, we offer technicians, engineers, operators and students specialized courses. Most of our courses are conducted in Danish, but of course we are able to do it in English. Contact us for further information.

Do you have any ideas or wishes for courses, please contact Lene Nielsen on +45 21545054 or len@damrc.com for a non-binding dialo

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