



## Forming Tooling Life Issues

Are you seeing cracking, peeling, aggressive die wear or other issues causing early failure of your cold forming tooling? The MMRI can help by diagnosing the root causes in early failure of costly cold forming tools by applying our years of materials and tooling research, combined with state-of-the-art research equipment.



**Utilize the full life of your tool and prevent early failure**

**Identify and Correct Issues in your Cold Forming Process:**

- Overloading of Dies
- Material Flow Causing Wear
- New or Reground Tool Quality Issues

**Utilize tool improvements tailored to your tool's specific issue and surface treatments to improve life and productivity**

- Wear resistant DLC Coatings
- Ultra-Thin Low Friction Coatings
- Advanced Surface Treatments
- Hardness and Toughness Optimization
- Heat Treatment Optimization
- Wear Analysis

**Increase Life and Reliability of Costly Forming Tooling**

The McMaster Manufacturing Research Institute (MMRI) opened for business in May 2001. The MMRI is one of the largest university based manufacturing research institutes in Canada, supporting a wide range of academic programs related to Manufacturing. Founded by Dr. Mo Elbestawi, now McMaster's vice-president of Research and International Affairs, and directed by Dr. Stephen Veldhuis, the 20,000-sq.-ft. of research space houses a wide range of lab scale research tools and industrial scale manufacturing equipment, designed to meet the sophisticated research and development needs of leading manufacturers in the polymer, automotive, power generation and aerospace, as well as the tooling and die/mold industries.

## HOW TO WORK WITH THE MMRI

The MMRI supports research projects in the following categories:

### I. Basic, Pre-Competitive Research

Long term, pre-competitive and fundamental research. The duration of these research projects will typically average three (3) years or longer. These projects generally benefit from the Federal Government's Natural Science and Engineering Research Council (NSERC) and Ontario Centres of Excellence (OCE) grants.

### II. Applications Engineering

Research and development projects sponsored by industrial partner(s), with a typical duration of three (3) years or less. The research focus, milestones, and deliverables are all specified in close consultation with the industrial partner(s). Whenever appropriate, effort will be made to attract matching support from relevant programs at OCE and/or NSERC.

### III. Industrial Process Development

Typically projects of this nature will have a timeline on the order of one year. Research initiatives will respond to industry needs for advanced manufacturing process development and/or current process enhancement. These efforts may be funded entirely by the participating industrial partner or in conjunction with funding available through federal and/or provincial organizations such as the National Research Council's Industrial Research Assistance Program (NRC-IRAP).

## Funding Opportunities

For most projects, matching funding can be obtained through various Government sponsored programs, through Ontario Centres for Excellence (OCE), National Sciences and Engineering Research Council (NSERC), and other organizations. These programs offer cash incentives to offset the costs of collaborative projects.

For more information on these programs, contact the MMRI.



Centre for Advanced Polymer Processing & Design (CAPPA-D)



Machine Systems Laboratory (MSL)



Metal Forming Laboratory (MFL)



Robotics and Manufacturing Automation Laboratory (RMAL)



Thermal Processing Laboratory (TPL)



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