Université de Sherbrooke

# Postdoctoral Fellow-Temporary Bonding and Debonding Processes for Fan-Out Wafer-Level Packaging

Record number : OPR-1176

## Overview


**RESEARCH DIRECTION**

Dominique Drouin, Professeur - Department of Electrical and Computer Engineering

**INFORMATION**

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**RESEARCH CO-DIRECTION**

Serge Ecoffey, Professeur sous octroi de recherche - Department of Electrical and Computer Engineering

**INFORMATION**

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**ADMINISTRATIVE UNIT(S)**

Faculté de génie
Département de génie chimique et de génie biotechnologique
Département de génie électrique et de génie informatique
Département de génie mécanique
Institut interdisciplinaire d'innovation technologique (3IT)

**LEVEL(S)**

Stage postdoctoral

**LOCATION(S)**

3IT - Institut interdisciplinaire d'innovation technologique

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## Project Description

Context:

With the continued advancement in assembly and packaging technologies such as innovative FOWLP platforms/concepts, brought by high demand for more functionality, increased I/O count, smaller/thinner form and cost reduction, temporary bonding & debonding technology (TBD) has been further developed to address new process challenges. In this regard, temporary carrier technology transcends its traditional function of providing thinned wafer handling solutions: it becomes a key element in enabling functional diversification through heterogenous integration in the FOWLP concept. The core of the temporary carrier support system is the selection of TBD materials and the carrier. Typically, a dedicated release tapes are used to fix the dies onto a temporary carrier during molding & redistribution line (RDL) processes. Challenges include coating uniformity, appropriate mechanical properties (Tg, CTE, thermal stability) and chemical resistance. These materials must also demonstrate good adhesion to the epoxy mold compound (EMC) and RDL dielectric layer yet successfully debond without damaging the FOWLP package. Thus, we propose this project to develop temporary bonding/debonding process required for FOWLP flow’s steps.

Topic:

We are looking for a well-qualified and highly motivated student to develop new TBD processes for FOWLP to integrate heterogeneous active chips (HBM, ASIC) and passive interconnect/thermal chips using a molding approach. The successful candidate will oversee (i) conducting a literature review of methods and materials used for TBD process to understand their properties and associated challenges, (ii) selecting 2-3 candidates of commercially available release tape,(iii) developing the complete temporary bonding and debonding process

route,(iv) perform complete morphological & mechanical characterizations of the temporary release carrier to determine the quality and performance of the TBD process. Integrity validations of TBD process after the interconnection of molded chips will be targeted, considering EMC surface roughness, planarization and carrier warpage requirements. These evaluations will be performed in close collaboration with IBM engineers.

Work Supervision:

This Postdoc project will be realized under the co-direction of Pr. Dominique Drouin and Pr. Serge Ecoffey, as part of the IBM/NSERC Alliance Project on Multi-Chip Heterogeneous Integration for High Performance Computing. The work will be done mainly at the Interdisciplinary Institute for Technological Innovation (3IT) at the Université de Sherbrooke and at the MiQro Innovation Collaborative Center (C2MI) in Bromont. 3IT is a unique institute in Canada, specializing in the research and development of innovative technologies for energy, electronics, robotics and health. C2MI is an international center for collaboration and innovation in the MEMS and encapsulation field. It is the essential link between applied research and the marketing of microelectronics products. The student will thus benefit from an exceptional research environment that combines students, professionals, professors and industrialists working hand-in-hand to develop the technologies of the future.

Desired Profile:

- PhD in micro-nanotechnology, microelectronic packaging or nanomaterials
- Strengths: experience in microfabrication in clean room
- Knowledge in advanced microelectronic packaging
- Ability to communicate in English or French both orally and in writing
- Strong ability to adapt, be autonomous and work in a team
- Pronounced taste for design, experimental work in a clean room, research and development

Contact: inpaqt@usherbrooke.ca
Starting date: September 2025
Documents to provide: Cover letter, curriculum vitae and contact details of 2 references

## Discipline(s) by sector

### Sciences naturelles et génie

Génie chimique, Génie électrique et génie électronique, Génie mécanique

## Funding offered

Yes

$ 50 000 CAD per year

## Partner(s)

IBM Canada Ltée., C2MI, Institut Interdisciplinaire d’Innovation Technologique (3IT)

The last update was on 11 March 2025. The University reserves the right to modify its projects without notice.