

MULTI-MATERIAL ADHESIVE BONDING AND MECHANICAL JOINING LAB

JOINING & MATERIALS LAB



Location: Flanders Make - Lommel

DESCRIPTION

RESEARCH PLATFORM FOR MECHANICAL CONNECTIONS AND JOINING TECHNIQUES

Companies are increasingly looking for ways to make their products lighter, yet stronger. They want to find the right combination of materials for a specific application. Accordingly, also the way in which these materials are connected to one another must be reviewed. Durability is a crucial aspect in this assessment. In the Joining & Materials Lab, we duplicate the entire joining process in industry-relevant conditions. We map the right process parameters and optimise them. This results in a more stable and robust production process, wherever in the world it will be applied

With this lab, we also anticipate the trend towards Industry 4.0. Robot and cobot applications are gradually becoming mainstream in the industry. We perform research into the added value of automation for joining processes. We examine, for instance, how robots and cobots can support operators to improve the quality of adhesive joints in difficult or repetitive assembly tasks.

JOINING PROCESSES FOR NEVADA AND KUALA LUMPUR

Products that today are made in one part of the world must also perform correctly in another part of the world, regardless whether it is colder, hotter or wetter. This seems

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obvious. However, when it comes to adhesive bonding, this is far from self-evident. Temperature and air humidity have impact on the behaviour of adhesives. When looking for the best possible joining technique, we should therefore not only consider the selected adhesive and the specific surface or application but also the conditions in which the adhesive bond is to perform. Our climate chamber has a temperature range from 10°C to 40°C and an air humidity from 10% to 85%. In other words, from the Nevada desert to Kuala Lumpur.

ADHESIVE BONDING 4.0

We test the quality of adhesive bonds on both sample, component and system level. In our lab, parts with dimensions up to ca. 1.5m can be assembled, which is unique. This enables us to test the applicability of a specific adhesive on large surfaces. As in most factories, we have a robot to handle these larger parts. We also have disposal of a collaborative robot, which can work together with operators in a flexible way. It can assist the operator in applying plasma or in handling the laser. As such, we not only help companies to improve their joining process but also to discover new ways to automate this process.

UNIQUE IN EUROPE: LIFE SPAN TESTS FOR ADHESIVE JOINTS

Also critical applications such as structural connections in a vehicle chassis are glued. We perform pioneering research into the extent to which components are resistant to mechanical loads combined with changing temperature, humidity and sunlight conditions. This enables us to simulate the ageing process of a couple of years within a short period of time.

TECHNICAL SPECIFICATIONS

Climatised production environment

Dimensions	5 x 5 x 3m
Temperature	10°C to 40°C
Relative humidity	10% to 85%

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Industrial automation

ABB IRB4600 industrial robot	payload 60kg
Yaskawa HC10 co-robot	payload 10kg

Surface treating

Ultrasonic cleaning	
Plasma activation	400W
Laser cleaning & roughening	20W
Abrasive blasting	

Mixing & dosing equipment

- SCA 80cm³/min industrial applicators
- Delta Application Technics flexible system
- 1C or 2C adhesives up to 600Pa.s.
- Application sizes: 290 ml up to 20 l

OUR OFFER

- **Feasibility studies** for the integration of a cobot in your company.
- **Design of cobot cells** with digital work-instruction and monitoring.
- Optimisation of **task scheduling** between robots, cobots and operators.
- Design and implementation of userfriendly and intuitive **robot interfaces**.

INTERESTED?

Contact contact_ProductionS@flandersmake.be for more information.