

## Study data

Title: Haptic Feedback  
Start: October 2017  
Term: 1/2 Year  
Costs: 3.500 €\*

The complete invoice is issued after confirm commitment and after reaching the minimum number of participants.

\*Member companies of the supporting organisation of the Kunststoff-Institut Lüdenscheid will have to contribute ten percent less.

### Lateral entry is possible

Even after project start a lateral entry is possible at any time.

## Information

You have access to further information on the study content and its course via our website or direct contact:

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Joint  
Study



Source: Kunststoff-Institut Lüdenscheid



# Haptic Feedback

Study on the State-of-the-Art

### Introduction

The integration of electronic functions into plastic parts, and thus the manufacture of „smart products“, is one of the most current and most innovative topics within the development progress of Industry 4.0.

There is a big trend today to replace conventional operating functions (in terms of separate components) by integrated touch fields. Via the Functional Film Insert Moulding process (FFIM), for instance, “Printed Electronics” can be brought directly into the plastic part surface in the form of buttons, sliders etc.

These are able to execute a manifold of functions - very often without giving a perceptible feedback to the user.

Integrated touch-functions are state of the art in the area of consumer electronics. There are less but growing applications in the automotive industry.

According to current researches, especially the automotive sector calls for increasing activities in the development of haptic feedback. Users should receive an assured and pleasant feedback after activating a function. To meet this demand, a lot of systems in different levels of development are already available on the market like, for instance:

- Actuators of any kind (vibrating motors, lifting elements)
- Piezo technology
- Microfluidics
- Electrostatics
- Ultrasound

### Procedure

The Kunststoff-Institut offers to participate in a comparative study. Research for systems and system providers will be carried out and the respective systems will be compared. Additionally, risks and opportunities will be rated and the level of development will be questioned. Possible applications will be differentiated. Each participant will be asked beforehand for special requests.

### Our service

- Prior survey of participants for special wishes and interests
- Results of the research, process comparisons, contacts etc. in the form of an IT-based study
- Presentation of results on completion of the study in Lüdenscheid\*, where appropriate incl. external speaker/system provider
- Language of the study will be English

\*partition by video-conference will be possible

### Target group

All companies dealing with HMI, function or control device integration in plastic surfaces and for which haptic feedback is a demand or a customer request.

#### What is a joint study?

In a joint study, the institute does comprehensive research for participating companies within innovative fields of interest. A detailed overview, incl. benchmarking, with a very practical orientation will be elaborated. The study is totally financed by participant fees.

#### Advantages of a joint study

- Cost sharing = low contributions per participant
- Participating companies save personnel and costs
- Technological market leadership
- Networking
- Interdisciplinary exchange of experience
- Employee training and qualification

Time and cost intensive investigations as well as the organisation are carried out exclusively by the institute. The involvement of company employees is, at minimum, reduced to the participation at the project meetings.

#### Secrecy

All results are treated confidentially during the project term. Results from company-specific investigations are treated confidentially.

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Study registration:  
**Haptic Feedback**

We hereby bindingly confirm our participation in the study.

Study manager: ..... Dr. Konrad Kiefer, Dominik Malecha  
Study costs: ..... 3500 €  
Study term: ..... ½ year  
Study start: ..... October 2017  
Applicable documents: ..... general terms and conditions, study flyer

Member companies of the supporting organisation of the Kunststoff-Institut Lüdenscheid will have to contribute ten percent less.

- Our purchase order number is: \_\_\_\_\_
- We will submit our purchase order number later
- The invoicing is made without purchase order number

**The purchase order number has to be submitted not later than 2 weeks after study registration!  
If no order number is available after that time, the invoice will be created without this information.**

Company*		
Street*		
Postcode/City*		
Phone		
Fax		
The following persons are likely to participate*:		phone/email*:
1.		/
2.		/
_____		_____
Date		Legally binding signature/stamp

\*required details