SADE

**Project ID:** 213442  
**Funded under:** FP7-TRANSPORT

## Smart High Lift Devices for Next Generation Wings

**From** 2008-05-01 to 2012-10-31, closed project

### Project details

<table>
<thead>
<tr>
<th>Total cost:</th>
<th>Topic(s):</th>
</tr>
</thead>
<tbody>
<tr>
<td>EUR 7 093 862</td>
<td>AAT-2007-1.1-01 - Flight Physics</td>
</tr>
<tr>
<td></td>
<td>AAT-2007-1.1-02 - Aerostructures</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EU contribution:</th>
<th>Funding scheme:</th>
</tr>
</thead>
<tbody>
<tr>
<td>EUR 4 969 975</td>
<td>CP-FP - Small or medium-scale focused research project</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Coordinated in:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
</tr>
</tbody>
</table>

### Objective

All aerodynamic concepts for significant reduction of drag such as laminarisation require slim high-aspect-ratio wings. However, state-of-the-art high lift systems will suffer from the reduced construction space and do not cope with the required surface quality. Thus, SADE (Smart High Lift Devices for Next Generation Wings) develops suitable 'morphing' high lift devices: The seamless ‘smart leading edge device’ is an indispensable enabler for laminar wings and offers a great benefit for reduction of acoustic emissions, the ‘smart single slotted flap’ with active camber capability permits a further increased lift. Due to versatile usability both devices also offer aerodynamic benefits by shape adaption in cruise flight. Morphing devices imply the integration of drive systems into tailored lightweight structures and therefore reduce complexity and mass. Furthermore, focussing on electric actuators the energy consumption can be reduced. However, the high elasticity required for efficient adaptability of the morphing structure is diametrically opposed to the structural targets of conventional wing design like stiffness and strength. To find the optimum compromise precise knowledge on target shapes for maximum high lift performance and sizing loads is mandatory. Therefore, SADE comprises all relevant disciplines for the investigation of morphing wings and operates a state-of-the-art virtual development platform. Nevertheless, the focus is clearly set on adaptive structures. SADE builds on available promising concepts for smart structures. The technological realisation and optimisation of these concepts towards the special requirements of full scale systems is the most essential challenge for morphing today. Another challenge results from the aeroelastic condition the structural system is optimised for. Hence, a realistic full scale section of a morphing wing will be manufactured and tested in the TsAGI T101 wind tunnel.

### Related information

| Report Summaries | Final Report Summary - SADE (Smart high lift devices for next generation wings) |
## Coordinator

**DEUTSCHES ZENTRUM FUER LUFT - UND RAUMFAHRT EV**  
Linder Hoehe  
51147 KOELN  
Germany  

**EU contribution:** EUR 1 048 904

**Activity type:** Research Organisations

**Administrative contact:** Felicitas Kutz  
Tel.: +49 531 295 2348  
Fax: +49 531 295 2875  

Contact the organisation

---

## Participants

**AIRBUS OPERATIONS GMBH**  
KREETSLAG 10  
21129 HAMBURG  
Germany  

**EU contribution:** EUR 191 319

**Activity type:** Private for-profit entities (excluding Higher or Secondary Education Establishments)

**Administrative contact:** Wolfgang Dressel  
Tel.: +49 40 7437 3640  
Fax: +49 40 7437 4615  

Contact the organisation

---

**AIRCRAFT RESEARCH ASSOCIATION LIMITED**  
MANTON LANE  
MK41 7PF BEDFORD  
United Kingdom  

**EU contribution:** EUR 129 850

**Activity type:** Other

**Administrative contact:** Moira Maina  
Tel.: +44 1234 324672  
Fax: +44 1234 328584  

Contact the organisation
CENTRO ITALIANO RICERCHE AEROSPAZIALI SCPA
Via Maiorise 1
81043 CAPUA - CASERTA
Italy
EU contribution: EUR 384 765

Activity type: Research Organisations
Administrative contact: Antonio Formisano
Tel.: +390823623214
Fax: +390823623835
Contact the organisation

CRANFIELD UNIVERSITY
College Road
MK43 0AL CRANFIELD - BEDFORDSHIRE
United Kingdom
EU contribution: EUR 396 425

Activity type: Higher or Secondary Education Establishments
Administrative contact: Shijun Guo
Tel.: +441234754628
Fax: +441234758203
Contact the organisation

AIRBUS DEFENCE AND SPACE GMBH
WILLY-MESSERSCHMITT-STRASSE 1
82024 TAUFKIRCHEN
Germany
EU contribution: EUR 548 242

Activity type: Private for-profit entities (excluding Higher or Secondary Education Establishments)
Administrative contact: Susanne Steinbicker
Tel.: +49 89 60728661
Fax: +49 89 60731001
Contact the organisation

TOTALFORSVARSETS FORSKNINGSINSTITUT
Gullfossgatan 6
164 90 STOCKHOLM
Sweden
EU contribution: EUR 402 750

Activity type: Research Organisations
Administrative contact: Peter Eliasson
Tel.: +46 8 55503225
Fax: +46 8 55503397
Contact the organisation
PIAGGIO AERO INDUSTRIES SPA
VIALE CASTRO PRETORIO 116
00185 ROMA
Italy
See on map

**Activity type:** Private for-profit entities (excluding Higher or Secondary Education Establishments)

**Administrative contact:** Alessandro Morando
Tel.: +390106461304
Fax: +390106481366
Contact the organisation

---

RHEINISCH-WESTFAELISCHE TECHNISCHE HOCHSCHULE AACHEN
TEMPLERGRABEN 55
52062 AACHEN
Germany
See on map

**Activity type:** Higher or Secondary Education Establishments

**Administrative contact:** Rolf Henke
Tel.: +49 241 80 96800
Fax: +49 241 80 92233
Contact the organisation

---

SMR ENGINEERING & DEVELOPMENT SA
DUFOURSTRASSE 109B
2502 Bienne
Switzerland
See on map

**Activity type:** Private for-profit entities (excluding Higher or Secondary Education Establishments)

**Administrative contact:** Silvio Merazzi
Tel.: +41 32 345 21 21
Fax: +41 32 345 21 20
Contact the organisation

---

FEDERAL STATE UNITARY ENTERPRISE THE CENTRAL AEROHYDRODYNAMIC INSTITUTE NAMED AFTER PROF. N.E. ZHUKOVSKY
Zhukovsky str 1
140180 ZHUKOVSKY
Russia
See on map

**Activity type:** Research Organisations

**Administrative contact:** Natalia Miroshnichenko
Tel.: +7 495 777 63 31
Fax: +7 495 777 63 32
Contact the organisation
TECHNISCHE UNIVERSITEIT DELFT
STEVINWEG 1
2628 CN DELFT
Netherlands

**EU contribution:** EUR 409 500

See on map

**Activity type:** Higher or Secondary Education Establishments

**Administrative contact:** Elleke Koornneef
Tel.: +31 15 2787931
Fax: +31 15 2786403

Contact the organisation

VYZKUMNY A ZKUSEBNI LETECKY USTAV A.S.
Beranovych 130
19905 PRAHA-LETNANY
Czechia

**EU contribution:** EUR 143 400

See on map

**Activity type:** Research Organisations

**Administrative contact:** Jiri Cecrdle
Tel.: +420 225 115 123
Fax: +420 283 920 018

Contact the organisation

Last updated on 2019-07-16
Retrieved on 2019-09-15


© European Union, 2019