

GRASP Green Advanced Space Propulsion



Let's embrace space - FP7 space conference 2011, Budapest, Hungary

GRASP Motivation

Business

Engineering
Health Studies
Security
Sport



- Currently used propellants for space application are highly toxic and carcinogenic
- Handling and procurement of toxic propellants constitutes a significant cost factor
- Increasing awareness of risk potential with regard to the human operators and environment led to more and more restrictive use which further increases costs
- The costs for presently used toxic propellants and its safe handling can be a significant part of the development and qualification costs for a new propulsion system resulting in a low level of innovation and new developments.





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Today



Tomorrow



Video was kindly provided by the Swedish Defense Research Agency FOI



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GRASP goals

- Establishment of a status-quo of green propellants
- Theoretical investigation of green propellants
- Experimental investigation of green propellants on component as well as on system level

Creation of knowledge to

- \rightarrow promote/enable further investigation by the research community
- \rightarrow enable industry to make informed decision
- Safer working environment
- Lower environmental impact
- Reduction of costs
- Strengthening European competitiveness
- Creation of new high level working jobs
- Improved propulsion performance

- Increased mission applicability
- Promoting and supporting new space mission
- Education of students and young professionals
- Increased human presence in space
- etc.



GRASP at a glance

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Nature of GRASP project

- Collaborative project
- Research and development

GRASP key information

- GRASP constitutes the first European wide, comprehensive effort to investigate Green Propellants
- GRASP is funded by the EC in the FP7 program
- GRASP incorporates 12 entities from 7 European countries
- GRASP consortium consists of industry, SME, universities, and research institutes
- GRASP beneficiaries come from Austria, France, Germany, Italy, Sweden, Poland, United Kingdom
- GRASP will run from the 01.12.2008 to 01.12.2011



Review of GRASP efforts and achievements

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In the 2 ¹/₂ years GRASP is already running the following major achievements have been accomplished:

- -Establishment of a data base of more than 100 potential propellants with significantly reduced toxicity. This data base will be made available to the community
- -Theoretical assessment of all the green propellant candidates
- Experimental assessment of a selection of propellant candidates (~30)





Review of GRASP efforts and achievements

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In the 2 ¹/₂ years GRASP is already running the following major achievements have been accomplished:

- -Presently a number of 6 propellants are integrated in 8 different propulsion system and their performance is experimentally evaluated.
- -Investigated propellants are hydrogen peroxide, ethanol, kerosene, ADN, dipentene, HDPE
- -The investigated system include monopropellant, bipropellant and hybird thruster concepts in a thrust range from 1 to 200 N





DELTACAT, UK H2O2

DELTACAT, UK H2O2/Dipentene



Propulsion system test program

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Univ. of Naples, H2O2/HDPE

DELTACAT, UK H2O2, Kersoene