

Alternative materials in the structure of reusable rockets

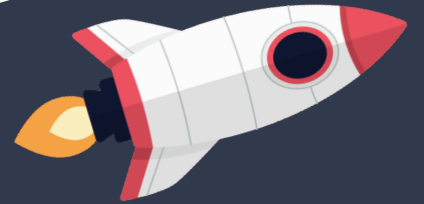


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Consortium on
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Introduction



Space exploration:

- ❖ Great **interest**
- ❖ Very **expensive**
- ❖ Implies serious **environmental consequences**

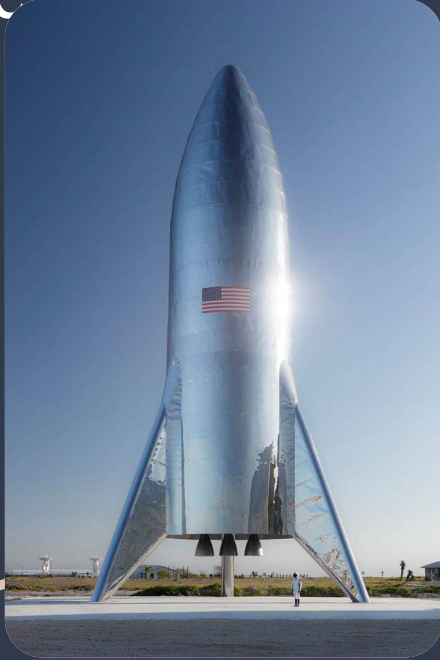
But not everything
is lost...

We can find an effective **solution...**



Selection of the proper materials to
build **reusable rockets**

Problem Description



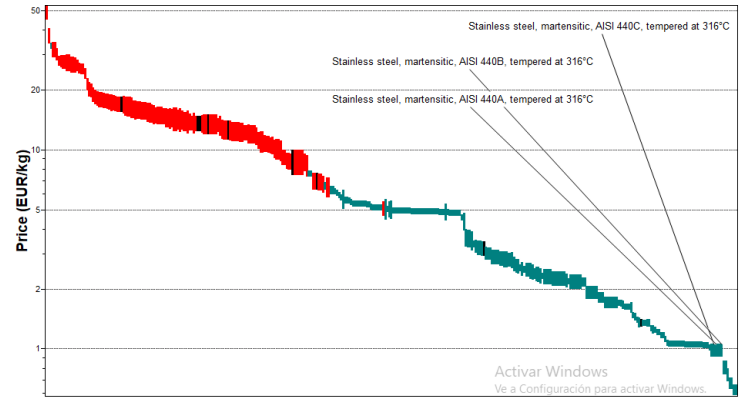
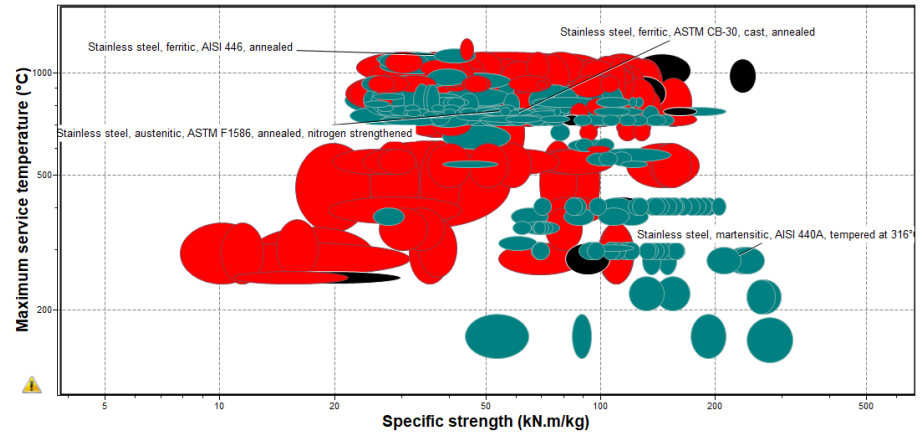
- ❖ Structural system of rockets
- ❖ Extreme conditions of space missions:
 - Cryogenic (liquid fuel)
 - Extremely high (reentry to Earth's atmosphere)
- ❖ Aluminium - Lithium alloys: strength-density ratio
- ❖ Carbon composites: light and great strength
- ❖ Stainless Steels
 - High density
 - Excellent strength and resistance to thermal conditions

Proposed Solution

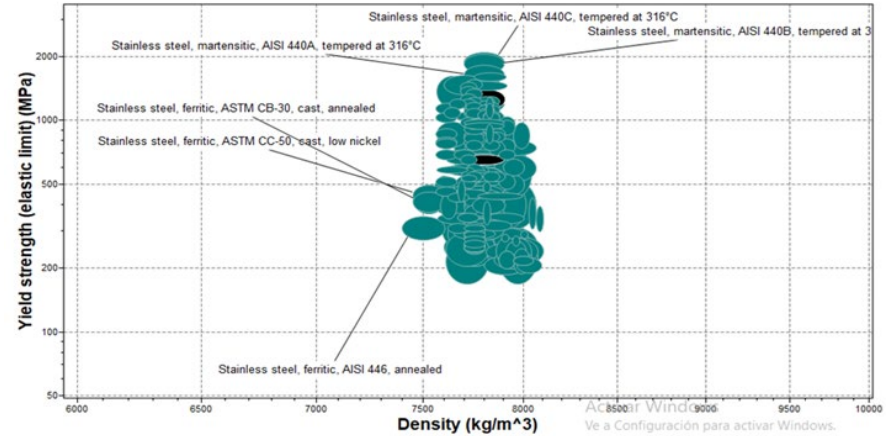
Stainless Steels VS Traditional Material Choices

- ❖ Nowadays, Al-Li alloys
 - Strength-density ratio
- ❖ Stainless Steels
 - High Ni and Co content
 - High density
 - Better resistance
 - Lower thermal conductivity
 - Advantages in rocket design

Results and Conclusions



Results and Conclusions



- ❖ **Study:** main materials used in the aerospace industry, and having highlighted their respective advantages and inconvenients
- ❖ **Conclusion :** stainless steels with a high Ni and Co content are the best alternative for the structural system of reusable rockets.

Applications

Our rockets will not be used to go to a planet B because

there is no planet B

Climate change



Health



Education



Other sectors



Thanks for your attention !



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