

Orion (rocket stage)

Orion is a series of American solid-fuel rocket stages, developed and manufactured by a joint venture between Hercules Aerospace and Alliant Techsystems (now Northrop Grumman Innovation Systems). They were originally developed for use as all three stages on the Pegasus rocket, first flown in 1990. Orion is available in several configurations for a variety of use scenarios. All stages in this family are fueled by a mixture of QDL-1, HTPB, and 19% aluminium, with the exception of the yet-unflown Orion 32, which uses QDL-2, HTPB, and 20% aluminium.^[1]

Versions

Orion stages are numbered to indicate their configuration. The first number, either 38 or 50, indicates the diameter of the stage. This is followed by various letters. S indicates a stretched, first stage variant. XL indicates an additional stretch. G indicates a ground-launched stage, with a shorter nozzle. T indicates a strengthened skirt.

Orion Stage Family								
Stage	Orion 38	Orion 50 (50T)	Orion 50S	Orion 50S XL	Orion 50ST	Orion 50S XLT	Orion 50S XLG	Orion 50 XL (50 XLT)
Diameter	38 inches (97 cm)	50 inches (130 cm)	50 inches (130 cm)	50 inches (130 cm)	50 inches (130 cm)	50 inches (130 cm)	50 inches (130 cm)	50 inches (130 cm)
Length	53 inches (130 cm)	105 inches (270 cm)	349 inches (890 cm)	404 inches (1,030 cm)	333 inches (850 cm)	389 inches (990 cm)	372 inches (940 cm)	122 inches (310 cm)
Gross mass	1,966 pounds (892 kg)	7,428 pounds (3,369 kg)	29,554 pounds (13,405 kg)	35,656 pounds (16,173 kg)	29,554 pounds (13,405 kg)	35,672 pounds (16,181 kg)	35,720 pounds (16,200 kg)	9,520 pounds (4,320 kg)
Burnout mass	243 pounds (110 kg)	715 pounds (324 kg)	2,098 pounds (952 kg)	2,408 pounds (1,092 kg)	2,098 pounds (952 kg)	2,408 pounds (1,092 kg)	2,456 pounds (1,114 kg)	824 pounds (374 kg)
Burn time (sec)	67.7	75.6	75.3	69.1	75	68.4	68.4	69.7
Used on	Pegasus , Pegasus XL , Antares , Minotaur-C (formerly known as Taurus) third stages, Minotaur I , and Minotaur IV fourth stages	Pegasus second stage	Pegasus first stage	Pegasus XL first stage	Minotaur-C first stage	Taurus XL first stage	Taurus Lite first stage	Minotaur third stage , Pegasus XL , Taurus Lite , Taurus XL second stage

References

- "ATK Catalog May 2008" (https://web.archive.org/web/20180730082316/http://www.ltas-vis.ulg.ac.be/cmsms/uploads/File/DataSheetSolidATK.pdf) (PDF). Alliant Techsystems. Archived from the original (http://www.ltas-vis.ulg.ac.be/cmsms/uploads/File/DataSheetSolidATK.pdf) (PDF) on 2018-07-30. Retrieved 2016-01-02.

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