**Soyuz-FG**

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| **Soyuz FG (Soyuz-FG/Fregat)** | |
| The launch of Soyuz TMA-9 atop a Soyuz-FG rocket. | |
| **Function** | Orbital carrier rocket |
| **Manufacturer** | TsSKB-Progress |
| **Country of origin** | Russia |
| **Size** | |
| **Height** | 49.5 m for Soyuz-FG and 42.5 m for Soyuz-FG/Fregat |
| **Diameter** | 10.3 m |
| **Mass** | 305,000 kg (672,000 lb.) |
| **Stages** | 2 (Soyuz FG) or 3 (Soyuz-FG/Fregat) |
| **Capacity** | |
| **Payload to LEO** | 7,100 kg for Soyuz-FG and 7,800 kg for Soyuz-FG/Fregat |
| **Payload to 800km SSO (only for Soyuz-FG/Fregat)** | 4,500 kg (9,900 lb.) |
| **Associated rockets** | |
| **Family** | R-7 (Soyuz) |
| **Launch history** | |
| **Status** | Active |
| **Launch sites** | LC-1 (Soyuz-FG) & LC-31 (Soyuz-FG/Fregat), Baikonur |
| **Total launches** | 29 (**FG:** 20, **FG/Fregat:** 9) |
| **Successes** | 29 |
| **Maiden flight** | **Soyuz-FG:** May 20, 2001 **Soyuz-FG/Fregat** June 2, 2003 |
| **Notable payloads** | Soyuz-TMA Progress spacecraft |
| **Boosters (Stage 0)** | |
| **No boosters** | 4 |
| **Engines** | 1 RD-117 |
| **Thrust** | 1,021.097 kN |
| **Specific impulse** | 310 sec |
| **Burn time** | 120 seconds |
| **Fuel** | LOX/RP-1 |
| **First stage** | |
| **Engines** | 1 RD-118 |
| **Thrust** | 999.601 kN (224,719 LBf) |
| **Specific impulse** | 311 sec |
| **Burn time** | 286 seconds |
| **Fuel** | LOX/RP-1 |
| **Second stage** | |
| **Engines** | 1 RD-0124 |
| **Thrust** | 294 kN (66,093 LBf) |
| **Specific impulse** | 359 sec |
| **Burn time** | 300 seconds |
| **Fuel** | LOX/RP-1 |
| **Third stage (Optional) - Fregat** | |
| **Engines** | 1 S5.92 |
| **Thrust** | 19.6 kN (4,406 LBf) |
| **Specific impulse** | 327 sec |
| **Burn time** | 877 seconds |
| **Fuel** | N2O4/UDMH |

The **Soyuz-FG** launch vehicle is an improved version of the Soyuz-U, from the R-7 family of rockets, designed and constructed by TsSKB-Progress in Samara. It made its maiden flight on May 20, 2001, carrying a Progress M1-6 cargo spacecraft to the International Space Station (ISS).

Since October 30, 2002 the Soyuz-FG has been the only vehicle used by the Russian Federal Space Agency to launch Soyuz-TMA manned spacecraft to the ISS. As of December 2009 Soyuz-FG has performed 20 flights, bringing to the ISS 3 Progress-M1 and 17 Soyuz-TMA spacecraft, with its last launch on December 20, 2009. All launches have been successful.

Another version of the Soyuz-FG is the **Soyuz-FG/Fregat** with Fregat as its 3rd stage, developed and produced by Lavochkin Association in Khimki. A European-Russian company Starsem owns all rights to launches using this version. As of April 2008 there have been 9 launches of Soyuz-FG/Fregat with commercial payloads. Its maiden flight occurred on June 2, 2003.

The analog control system of this spacecraft significantly limits its capabilities, however, and it will eventually be replaced by the Soyuz-2 launch vehicle.

The Soyuz-FG is launched from the Baikonur Cosmodrome, Launch site LC-1 for Soyuz-FG and LC-31 for Soyuz-FG/Fregat.



A Soyuz-FG is rolled out to the launch pad at Baikonur Cosmodrome.

**Launch history**

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| **Date and Time**  **(GMT)** | **Configuration** | **Serial Number** | **Launch Site** | **Result** | **Payload** | **Remarks** |
| May 20, 2001 22:32 | Soyuz-FG | F15000-001 | LC-1, Baikonur | Success | Progress-M1 6 | ISS Logistics |
| November 26, 2001 18:24 | Soyuz-FG | F15000-002 | LC-1, Baikonur | Success | Progress-M1 7 | ISS Logistics |
| Kolibri 2000 |  |
| September 25, 2002 16:58 | Soyuz-FG | E15000-003 | LC-1, Baikonur | Success | Progress M1-9 | ISS Logistics |
| October 30, 2002 16:58 | Soyuz-FG | E15000-004 | LC-1, Baikonur | Success | Soyuz TMA-1 | Manned flight with 3 Cosmonauts ISS escape craft |
| April 26, 2003 03:53 | Soyuz-FG | 15000-006 | LC-1, Baikonur | Success | Soyuz TMA-2 | Manned flight with 2 Cosmonauts ISS Expedition 7 |
| June 2, 2003 18:24 | Soyuz-FG/Fregat | E15000-005/ ST-11 | LC-31, Baikonur | Success | Mars Express[1] | Mars orbiter |
| Beagle 2 | Mars lander Launched successfully but later failed |
| October 18, 2003 05:38 | Soyuz-FG | D15000-007 | LC-1, Baikonur | Success | Soyuz TMA-3 | Manned flight with 3 Cosmonauts ISS Expedition 8 |
| December 27, 2003 21:30 | Soyuz-FG/Fregat | D15000-008/ ST-12 | LC-31, Baikonur | Success | AMOS-2 | Communications satellite |
| April 19, 2004 05:19 | Soyuz-FG | D15000-009 | LC-1, Baikonur | Success | Soyuz TMA-4 | Manned flight with 3 Cosmonauts ISS Expedition 9 |
| October 14, 2004 03:06 | Soyuz-FG | Zh15000-012 | LC-1, Baikonur | Success | Soyuz TMA-5 | Manned flight with 3 Cosmonauts ISS Expedition 10 |
| April 15, 2005 00:46 | Soyuz-FG | Zh15000-014 | LC-1, Baikonur | Success | Soyuz TMA-6 | Manned flight with 3 Cosmonauts ISS Expedition 11 |
| August 13, 2005 23:28 | Soyuz-FG/Fregat | Zh15000-011/ ST-13 | LC-31, Baikonur | Success | Galaxy 14 | Communications satellite |
| October 1, 2005 03:54 | Soyuz-FG | Zh15000-017 | LC-1, Baikonur | Success | Soyuz TMA-7 | Manned flight with 3 Cosmonauts ISS Expedition 12 |
| November 9, 2005 03:33 | Soyuz-FG/Fregat | Zh15000-010/ ST-14 | LC-31, Baikonur | Success | Venus Express | Venus orbiter |
| December 28, 2005 05:19 | Soyuz-FG/Fregat | Zh15000-016/ ST-15 | LC-31, Baikonur | Success | GIOVE-A | Navigation satellite |
| March 30, 2006 02:30 | Soyuz-FG | P15000-018 | LC-1, Baikonur | Success | Soyuz TMA-8 | Manned flight with 3 Cosmonauts ISS Expedition 13 |
| September 18, 2006 04:08 | Soyuz-FG | ?15000-023 | LC-1, Baikonur | Success | Soyuz TMA-9 | Manned flight with 3 Cosmonauts ISS Expedition 14 |
| April 7, 2007 17:31 | Soyuz-FG |  | LC-1, Baikonur | Success | Soyuz TMA-10 | Manned flight with 3 Cosmonauts ISS Expedition 15 |
| May 29, 2007 20:31 | Soyuz-FG/Fregat |  | LC-31, Baikonur | Success | Globalstar | Comsat |
| Globalstar | Comsat |
| Globalstar | Comsat |
| Globalstar | Comsat |
| October 10, 2007 13:22 [1] | Soyuz-FG |  | LC-1, Baikonur | Success | Soyuz TMA-11 | Manned flight with 3 Cosmonauts ISS Expedition 16 |
| October 20, 2007 20:12 | Soyuz-FG/Fregat |  | LC-31, Baikonur | Success | Globalstar | Comsat |
| Globalstar | Comsat |
| Globalstar | Comsat |
| Globalstar | Comsat |
| December 14, 2007 13:17 | Soyuz-FG/Fregat |  | LC-31, Baikonur | Success | RADARSAT-2 | Earth observation |
| April 8, 2008 11:16 | Soyuz-FG |  | LC-1, Baikonur | Success | Soyuz TMA-12 | Manned flight with 3 Cosmonauts ISS Expedition 17 First South Korean in space. |
| April 26, 2008 22:16 | Soyuz-FG/Fregat |  | LC-31, Baikonur | Success | GIOVE-B | Navigation satellite |
| October 12, 2008 07:01 | Soyuz-FG |  | LC-1/5, Baikonur | Success | Soyuz TMA-13 | Manned flight with 3 Cosmonauts ISS Expedition 18 |
| March 26, 2009 11:49 | Soyuz-FG |  | LC-1/5, Baikonur | Success | Soyuz TMA-14 | Manned flight with 3 Cosmonauts ISS Expedition 19 |
| May 27, 2009 10:34[2] | Soyuz-FG |  | LC-1/5, Baikonur | Success | Soyuz TMA-15 | Manned flight with 3 Cosmonauts ISS Expedition 20 |
| September 30, 2009 07:14 | Soyuz-FG |  | LC-1/5, Baikonur | Success | Soyuz TMA-16 | Manned flight with 3 Cosmonauts ISS Expedition 21 |
| December 20, 2009 21:52 | Soyuz-FG |  | LC-1/5, Baikonur | Success | Soyuz TMA-17 | Manned flight with 3 Cosmonauts ISS Expedition 22 |



The [Soyuz TMA-13](http://en.wikipedia.org/wiki/Soyuz_TMA-13) spacecraft arrives at the launch pad at the [Baikonur Cosmodrome](http://en.wikipedia.org/wiki/Baikonur_Cosmodrome) in [Kazakhstan](http://en.wikipedia.org/wiki/Kazakhstan) October 10, 2008.

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