

Model Rocket Launch Information Packet



**Keller Fire-Rescue Fire
Prevention Division**

Guidelines for Model Rocket Launches

The Keller Fire-Rescue allows model rocket launches in accordance with the 2021 International Fire Code (IFC) as amended and adopted and other applicable laws, codes, and standards.

Model Rockets may include but are not limited to:

Estes or equivalent model rockets using approved model motor types **A through E**. A model rocket has structural parts made of paper, wood, and breakable plastic; it has a means for its return to the ground so it can be flown again; and its primary use is for purposes of education, recreation and sporting competition.

Permit:

A **permit** for group, club or organization model rocket launches is required; no Fee is required. Special considerations can be applied during a Burn Ban and will be reviewed on a 'per event' basis.

- 1. If the launch site is located on City of Keller Park property, approval for use of the Park is required from the Keller Parks and Recreation Department Director (or designee) prior to issuance of a launch Permit (see Page 5).**
2. After receiving approval from the Parks and Recreation Department the Applicant shall submit a permit request to Keller Fire-Rescue a minimum of seven (7) days prior to the requested launch date.
- 3. All submittals shall include product information sheets on the engines and igniters, a site layout which includes the launch pad, safety zone, spectator area, streets, buildings and other location hazards. Also required is a written authorization from the property owner for launch activity.**
4. Application may be disapproved based upon site conditions and/or weather conditions.
5. The permit requires that a qualified Launch Control Officer (LCO) is on site during the launch.
6. The LCO shall conduct a pre-launch safety inspection of all rockets and understand the provisions of the permit, Safety Guidelines and Precautions.
7. Model rockets shall be launched during daylight hours only.
8. Launches shall occur in safe weather conditions with **wind speeds no greater than 20 miles per hour**. The LCO shall be responsible for evaluating weather conditions.
9. The fire department shall have the authority to revoke or restrict a permit approval to conduct a model rocket launch. This may include but is not limited to site location, adverse weather, traffic, communications, security, or other safety issues.
10. Violation of the permit may result in a cease and desist order, revocation of permit, fine up to and including \$2,000.00.
11. After approval for the launch is received, a copy of the Fire Department issued Permit shall be provided to the Parks and Recreation Department by the Applicant.
12. Sign the Model Rocket Safety Code (Pg. 6) and return with your application (a copy will be provided to you).

For additional questions, please contact the Fire Prevention Division at 817-743-4400.

Plan reviews are performed in accordance with 20121 International Fire Code (as amended and adopted) and other applicable laws, codes, and standards specifically NFPA 1122, Code for Model Rocketry, 2018 Edition

4.8 Model Rocket Launch Site. A model rocket shall be launched outdoors in a cleared area, free of tall trees, power lines, buildings, and dry brush and grass.

4.9 Model Rocket Launch Site Size. The launch site shall be at least as large as specified in Table 4.9

Table 4.9 Minimum Launch Site Dimensions

Installed Total Impulse (N-sec)	Equivalent Motor Type	Minimum Site Dimension*	
		m	ft
0–1.25	1/4 A and 1/2 A	15	50
1.26–2.50	A	30	100
2.51–5.00	B	61	200
5.01–10.00	C	122	400
10.01–20.00	D	152	500
20.01–40.00	E	305	1000
40.01–80.00	F	305	1000
80.01–160.00	2F (or 1G)	305	1000
160.01–320.00	4F (or 2G)	457	1500

4.9.1 For a circular area, the minimum launch site dimension shall be the diameter; and for a rectangular area, it shall be the shortest side.

4.9.2 Type G motors with an installed total impulse of more than 80 N-sec (18 lb-sec), but not more than 160 N-sec (36 lb-sec), shall be permitted to be used by individuals 18 years of age and older.

4.9.4 As an alternative to the minimum launch site dimensions of Table 4.9, the size of the launch site shall meet one of the following criteria:

- (1) It shall be not less than one-half the maximum altitude as stated by the manufacturer for the model rocket and motor(s) combination being flown.*
- (2) It shall be of a size approved by the AHJ based on flight demonstration or data required to substantiate the anticipated altitude.*

4.10 Model Rocket Launchers. A model rocket shall be launched from a stable launch device that provides rigid guidance until it has reached a speed adequate to ensure a safe flight path.

4.11 Model Rocket Launcher Eye Safety.

4.11.1 To prevent accidental eye injury, the launcher shall be placed so the end of the rod is above eye level, or the end shall be capped when approaching it.

4.11.2 The launch rod shall be capped or disassembled when not in use and shall not be stored in an upright position.

4.12 Model Rocket Launch Safety.

4.12.1 The launcher shall have a blast deflector device to prevent the motor exhaust from hitting the ground directly.

4.12.2 The area around a launch device shall be cleared of brown grass, dry weeds, or other easy-to-burn materials

4.13 Model Rocket Ignition System.

4.13.1 The system used to launch a model rocket shall be remotely controlled and electrically operated.

4.13.2 The system shall have a launching switch that returns to the "off" position when released.

4.13.3 The system shall be equipped with a removable safety interlock in series with the launch switch.

4.14 Spectator Distances.

4.14.1 All persons shall remain at least 4.6 m (15 ft.) from the model rocket during ignition of a model rocket motor with an installed total impulse of 30 N-sec (6.7 lb.-sec) or less.

4.14.2 All persons shall remain at least 9 m (30 ft.) from the model rocket during ignition of a model rocket motor with an installed total impulse of more than 30 N-sec (6.7 lb.-sec).

4.14.3 Mass Launches. When more than 10 rockets are being launched simultaneously, the minimum spectator distance shall be set to 1.5 times the highest altitude expected to be reached by any of the rockets, and one or more spotters shall be positioned to monitor the potential landing area to restrict unauthorized entry and to identify and report hazards.

4.15 Spectator Notification.

4.15.1 All people in the launch area shall be made aware of the pending model rocket launch.

4.15.2 An audible 5-second countdown to launch shall take place.

4.16 Model Rocket Misfires. If a model rocket misfires, no person shall approach the launcher until 1 minute has elapsed and the safety interlock has been removed or the battery has been disconnected from the ignition system.

4.17 Model Rocket Launch Conditions.

4.17.1 A model rocket shall not be launched in winds of more than 20 mph.

4.17.2 A model rocket shall not be launched into a cloud.

4.17.3 A model rocket shall not be launched near an aircraft in flight.

4.17.4 A model rocket shall not be launched at an angle greater than 30 degrees from vertical.

4.18* Model Rocket Retrieval Safety. No attempt shall be made to retrieve a model rocket from a power line or other life-threatening area.

4.19 Model Rocket Motor Requirements.

4.19.1 Only commercially manufactured, certified model rocket motors or motor reloading kits or components as specified in NFPA 1125, *Code for the Manufacture of Model Rocket and High Power Rocket Motors*, shall be used.

4.19.2 No person shall dismantle, reload, or alter a single-use model rocket motor.

4.19.3 No person shall alter the components of a reloadable model rocket motor or use the contents of a reloadable rocket motor reloading kit for a purpose other than those specified by the manufacturer's instructions for the reloadable rocket motor or reloading kit.

Rocket Launch Permit Requirements

Day and Date of Launch: _____

Start Time: _____ End Time Estimate: _____

Name: _____

Address: _____ City: _____

State: _____ Zip: _____

Phone #: _____ Cell # for event: _____

Email: _____

Number of People: _____ Number of Vehicles: _____

Rocket Motor Size(s): _____ Approx. Number of Launches: _____

Fire Suppression Equipment in Possession: _____

If the launch request is for a City of Keller Parks and Recreation location, approval is required from the Parks and Recreation Department prior to issuance of a Permit. This document must be signed and returned to the Fire Department before a Permit is issued.

Signature: _____

Date: _____

Fire Marshal's Office Representative

Signature: _____

Date: _____

Parks and Recreation Department Representative

LAUNCH SITE DIMENSIONS

Installed Total Impulse (N-sec)	Equivalent Motor Type	Minimum Site Dimensions (ft.)
0.00–1.25	1/4A, 1/2A	50
1.26–2.50	A	100
2.51–5.00	B	200
5.01–10.00	C	400
10.01–20.00	D	500
20.01–40.00	E	1,000
40.01–80.00	F	1,000
80.01–160.00	G	1,000
160.01–320.00	Two Gs	1,500

Model Rocket Safety Code

1. **Materials.** I will use only lightweight, non-metal parts for the nose, body, and fins of my rocket.
2. **Motors.** I will use only certified, commercially-made model rocket motors, and will not tamper with these motors or use them for any purposes except those recommended by the manufacturer.
3. **Ignition System.** I will launch my rockets with an electrical launch system and electrical motor igniters. My launch system will have a safety interlock in series with the launch switch, and will use a launch switch that returns to the "off" position when released.
4. **Misfires.** If my rocket does not launch when I press the button of my electrical launch system, I will remove the launcher's safety interlock or disconnect its battery, and will wait 60 seconds after the last launch attempt before allowing anyone to approach the rocket.
5. **Launch Safety.** I will use a countdown before launch, and will ensure that everyone is paying attention and is a safe distance of at least 4.6 m (15 ft.) away when I launch rockets with D motors or smaller, and 9.1 m (30 ft.) when I launch larger rockets. If I am uncertain about the safety or stability of an untested rocket, I will check the stability before flight and will fly it only after warning spectators and clearing them away to a safe distance.
6. **Launcher.** I will launch my rocket from a launch rod, tower, or rail that is pointed to within 30 degrees of the vertical to ensure that the rocket flies nearly straight up, and I will use a blast deflector to prevent the motor's exhaust from hitting the ground. To prevent accidental eye injury, I will place launchers so that the end of the launch rod is above eye level or will cap the end of the rod when it is not in use.
7. **Size.** My model rocket will not weigh more than 1500 g (53 oz.) at liftoff and will not contain more than 125 g (4.4 oz.) of propellant or 320 N-sec (71.9 lb.-sec) of total impulse. If my model rocket weighs more than 1 lb. (453 g) at liftoff or has more than 4 oz. (113 g) of propellant, I will check and comply with Federal Aviation Administration regulations before flying.
8. **Flight Safety.** I will not launch my rocket at targets, into clouds, or near airplanes, and will not put any flammable or explosive payload in my rocket.
9. **Launch Site.** I will launch my rocket outdoors, in an open area at least as large as shown in Table B.1, and in safe weather conditions with wind speeds no greater than 20 mph. I will ensure that there is no dry grass close to the launch pad, and that the launch site does not present risk of grass fires.
10. **Recovery System.** I will use a recovery system such as a streamer or parachute in my rocket so that it returns safely and undamaged and can be flown again, and I will use only flame-resistant or fireproof recovery system wadding in my rocket.
11. **Recovery Safety.** I will not attempt to recover my rocket from power lines, tall trees, or other dangerous places.

I _____ understand these rules as described.
(Printed Name)

(Signature)

(Date)

Launch Site Diagram

