

SHIPPING SPORT ROCKET MOTORS

Sport rocket motors contain high-energy propellant and pyrotechnic materials. Because of this, they are classified by the U.S. Department of Transportation (DOT) as “hazardous materials” (HAZMAT) even though extensive testing has shown that the motors are actually extremely safe and highly resistant to accidental ignition. Shipment of sport rocket motors is subject to detailed Federal regulation, and anyone who ships them without knowing and complying with these regulations is subject to criminal prosecution. This summary of shipping regulations is provided to inform and assist rocketeers who need to get their motors from one place to another. Sport rocket motors are strictly forbidden to be carried or shipped on passenger-carrying aircraft; **DO NOT TRY TO FLY ON AN AIRLINE WITH ROCKET MOTORS.**

Shipping regulations for all modes of cargo transportation except U.S. Mail are found in the DOT’s volume of the Code of Federal Regulations (CFR) which is Part 49, Sections 170 through 173. Sport rocket motors are assigned DOT hazard classifications by the Bureau of Explosives based on the amount and type of propellant that they contain. The hazard classification determines what mode of shipping, and method of packaging and labeling, must be used. CFR 49 has very lengthy and exact regulations for packaging and labeling all forms of hazardous materials for shipment.

Sport rocket motors containing more than 62.5 grams of propellant (or reload kits made up of modules with more than 62.5 grams of propellant each) are classified as a DOT “Division 1.3” Explosive. These can only be shipped by commercial motor freight carriers, at significant expense both for the packaging and the shipping.

Sport rocket motors with 62.5 grams or less of black powder or ammonium perchlorate composite propellant are classified as Division 1.4 Explosives. Within this overall 1.4 category, motors with more than 30 grams of propellant are classified as Division 1.4C (specifically, as Model Rocket Motor NA0276), while those with 30 grams or less are classified Division 1.4S (Model Rocket Motor NA0323). Most sport rocket manufacturers have a special DOT exemption that gives them permission to ship small quantities of sport rocket motors that are classified 1.4 (62.5 grams or less of propellant) as if these items were a lower hazard category called Flammable Solid (Division 4.1, UN1325). The packaging and labeling for 4.1 materials is less burdensome than for 1.4 materials. Most motors are shipped as Flammable Solids to individuals and hobby stores by the manufacturers and their distributors. Individual rocketeers are not parties to this DOT exemption and cannot ship motors as Flammable Solid (4.1), even if they can find a carrier who will accept and ship HAZMAT.

The main shipping agencies available to consumers in the U.S. are the U.S. Postal Service (USPS), United Parcel Service (UPS), and Federal Express (FedEx). Neither UPS nor FedEx will accept HAZMAT for shipment from private individuals. They require that any shipper of HAZMAT be a commercial entity operating under a Hazardous Materials Contract Service Agreement with them. As part of this contract, the shipper must certify that their personnel who do packaging and handling of HAZMAT have completed the biennial HAZMAT training required by DOT regulations. Commercial HAZMAT shipments via UPS require payment of a surcharge of \$15 for ground transportation or \$25 for air transportation, plus extensive paperwork, and compliance with lengthy and strict packaging and labeling requirements. With UPS and FedEx generally unavailable for use by private individuals, the only motor-shipment options for individual rocketeers are USPS or commercial motor carriers. While some motor carriers may work with individuals, they must still require compliance with the DOT’s extensive paperwork, packaging, and labeling requirements.

Shipping regulations for sending sport rocket motors via the U.S. Mail are found in Postal Publication 52, "Acceptance of Hazardous, Restricted, and Perishable Matter", Section 341.22a and Appendix 1A. The USPS will accept small sport rocket motors for shipment by individuals, but only under certain limited conditions. First, they will accept only motors that are classified 1.4S/NA0323 (30 grams or less of propellant), and that are packaged and marked appropriately (see below). Second, the shipper must present to their Postmaster a "Letter of Authorization", addressed to them personally from the USPS Manager of Mail Preparations and Standards (475 L'Enfant Plaza SW, Washington, DC 20260), which authorizes them to enter these motors into the U.S. Mail. Getting such a letter requires 30-60 days, and requires the consumer to provide specific information about the motors that he plans to ship, including a dimensioned drawing and a Material Safety Data Sheet for each motor type. Once it is issued, the letter of authorization is valid only for 1 year. Estes, Quest, and Aerotech have provided this technical material to the USPS and have negotiated blanket letters for themselves and their distributors. They have to provide a complete list of all these distributors to the USPS each year in order to maintain this authorization.

USPS requirements for shipping small rocket motors are that the motors be in individual sealed packaging, well-cushioned from shock inside an outer package; that the outer package be strong and securely sealed fiberboard, no more than 25 pounds in weight; and that the package be marked "Toy Propellant Devices, Handle With Care" and "Surface Mail Only" with no HAZMAT labels. The Surface Mail requirement means that the motors must be shipped by Parcel Post, not Priority Mail or Express Mail. There is no surcharge for sending HAZMAT. If you are willing to go through the effort of getting the letter of authorization, this is the easiest and cheapest way to ship small sport rocket motors.