

Temperature Information for use in the Small Parcel Environment

The United Parcel Service small parcel environment is a vibrant and dynamic system that uses many methods of transportation, types materials handling and loads of information to deliver the highest quality service at the most competitive rates.

The physical environment that a package travels through is a very efficient system of mechanical methods (conveyors, slides, divertors, vans, airplanes, etc.) and physical procedures (lifting, stacking, loading, vibration and shock, temperature and humidity). The small parcel environment is not temperature or humidity controlled, and, in most situations, the packages flowing through the system can experience a wide range of temperature and humidity variation.

General Temperature information

ASTM D 4332 package test conditioning methods
 US standard = **73.4° F** (23° C) @ **50 % Rh** for **72 hours**.

Special Temperatures and Atmospheres:

<u>Environment</u>	<u>Temperature, F (C)</u>	<u>Rh %</u>
Cryogenic	-67 +-6 (-55 +-3)	
Frozen food storage	0 +-4 (-18 +-2)	
Refrigerated storage	41 +-4 (5 +-2)	85 +-5
Temperate, high Rh	68 +-4 (20 +-2)	85 +-5
Tropical	104 +-4 (40 +-2)	85 +-5
Desert	140 +-6 (60 +-3)	15 +-2

United Parcel Service Statistics

Chartered Aircraft: 302

Daily Flight Segments: Domestic: 995
 International: 559

Airports Served: Domestic: 391
 International: 219

Air Hubs:

United States:

Louisville, KY (Main US Air Hub)

Philadelphia, PA

Dallas, TX

Ontario, CA

Rockford, IL

Columbia, SC

Hartford, CT

Europe: Cologne/Bonn, Germany

Asia Pacific: Hong Kong; Singapore; Taipei; Taiwan

Latin America and Caribbean: Miami, Fla. USA

Canada: Hamilton, Ontario; Montreal, Quebec

Truck Norms:

The following information has been prepared to help answer questions regarding the UPS Ground environment and typical exposure levels during flight and ground modal segments.

<u>Vehicle Type</u>	<u>Temperature Range (F)</u>	<u>Pressure Range</u>
Cargo Area:	Ground equipment cargo areas are not controlled for temperature or pressure changes.	Cargo can experience natural pressure changes up to 12,000 feet
Feeder (28', 40', 45', 50')		
Package delivery van (100 to 1200 cubic foot capacity)	Packages will experience normal and extreme ambient temperatures as experienced throughout the year	Driving over mountainous terrain (i.e. Interstate-70 Colorado, over Loveland Pass & through the Eisenhower Tunnel bypass rd. = 12,000 ft. +)

Aircraft Norms:

The following information has been prepared to help answer questions regarding the UPS Air environment and typical exposure levels during flight segments.

Aircraft Type	Temperature Range (F)	Pressure Range
Main cargo deck: 727-100: 51 727-200: 10 747-100: 12 747-200: 4 757-200: 70 767-300: 22 DC-8-71: 23 DC-8-73: 26	Cargo area controlled at 50-85° F (10-29° C)	Pressurized to 6-8000 feet (11-14.7 psi) - or - 23.09-22.23 inches of mercury - or - 781.92-752.79 millibars of mercury Flying at altitudes of 10,000 to 45,000 feet
Lower cargo deck: 727-100: 51 727-200: 10 747-100: 12 747-200: 4 757-200: 70 767-300: 22 DC-8-71: 23 DC-8-73: 26	Some insulation possible, but usually not controlled, 0-90°	Pressurized to 6-8000 feet (11-14.7 psi) - or - 23.09-22.23 inches of mercury - or - 781.92-752.79 millibars of mercury Flying at altitudes of 10,000 to 45,000 feet
Feeder Aircraft: Piper, Cessna, Lear, etc.	Some insulation possible, but usually not controlled, 0-90°	May not be pressurized, (9.3 to 8.3 psi) Flying at altitudes of 10,000 to 16,000 feet
Commercial Passenger Aircraft	Passenger area controlled at 65-85° F (10-29° C)	Pressurized to 6-8000 feet (11-14.7 psi) Flying at altitudes of 30 to 40,000 ft.