

S700 Series Semi-Ruggedized Router Quick Start Guide

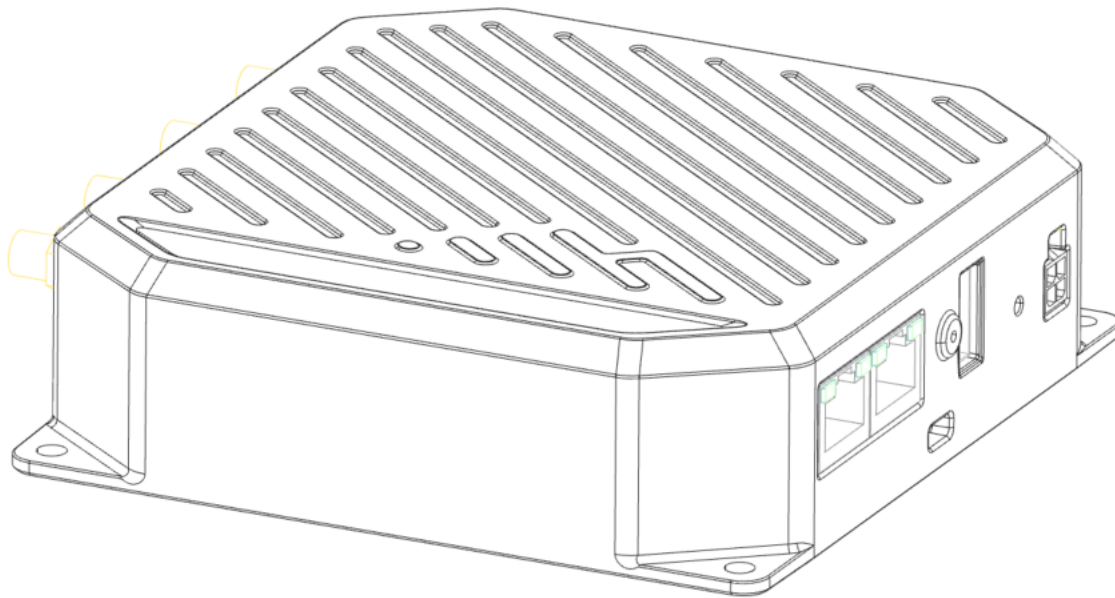


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S700 Series Semi-Ruggedized Router Quick Start Guide

Introduction

This document provides a brief overview of the Cradlepoint S700 Series Semi-Ruggedized Router, discusses what's inside the box, and provides basic setup and install instructions.



NOTE

The Verify app includes many of the same instructions with an alternate order. This document supports the Verify app instructions.

Use the Navigation section below to locate the topics most applicable to troubleshooting your setup issues. For additional setup support, contact a professional installer or [Cradlepoint Support](#).

Intended audience

This guide is intended for professional networking hardware installers. It provides basic knowledge and should be used only as a reference guide for installing the hardware. Due to the unique nature of each product customers must have a professional install their hardware.

Navigation

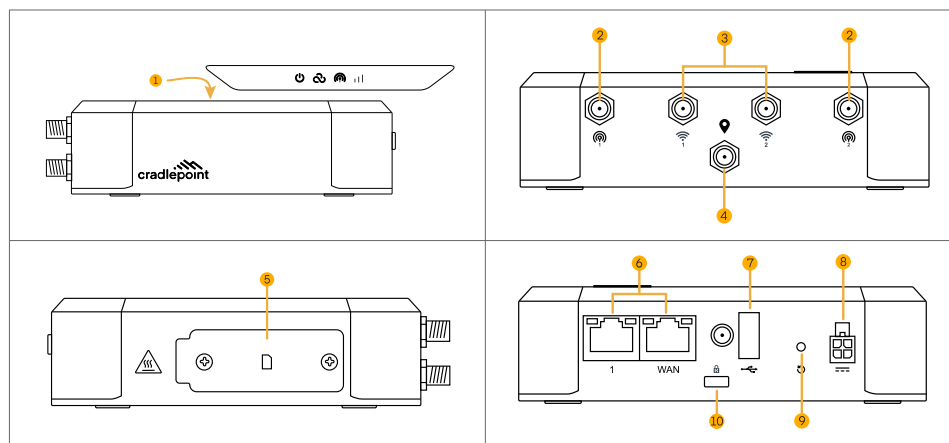
TBD

S700 Series Semi-Ruggedized Router models

S700 Series	Model
S700-C4D	S5A246A
S750-C4D [†]	S5A251A
S700-C4E	S5A245A

[†]This model does not include Wi-Fi capability.

External device components of the Cradlepoint S700 Series Semi-Ruggedized Router



1	LED Panel
2	Cellular Antenna Connectors (Female SMA)
3	Wi-Fi Antenna Connector (Female RP-SMA) (Not present on S750)
4	GNSS Antenna Connector
5	SIM Door (SIM Slots behind)
6	Ethernet Ports
7	Locking USB 2.0 Port
8	DC Power Port
9	Reset Button
10	Kensington Lock Port

Before You Begin

Read the following before setting up the router.

Location Considerations

The S700 Router is built for installation in a variety of environments. Cradlepoint recommends having a professional install the router to ensure proper signal reception and usage.

To ensure the router operates efficiently, following are best practices for determining the installation location:

- Ensure the device is positioned to receive optimal cellular and Wi-Fi signal reception.
- Ensure that the mounting surface is flat.
- Avoid positioning near concrete walls, metal or reflective surfaces, or any other objects that may interfere with the antennas, RF reception, or cables.
- Ensure plenty of airflow for ventilation. Avoid installing the device in enclosed spaces.
- Do not install the device in direct sunlight or in locations where it may be exposed to the elements. Extreme heat or cold can and will impact the router's performance.

- Keep the device out of reach. It is required that the endpoint be installed behind a locked/gated enclosure to restrict unauthorized access. The S700 Router is designed to work in elevated ambient temperatures which may cause the surface of the device to become too hot to safely touch.
- Mount the device in a location compliant with the Safety, Regulatory, and Warranty Guide, included in the product shipping box.

For mobile installations, refer to the [Vehicle Installation Guide for Mobile Routers](#) for more information.



IMPORTANT

The S700 Router requires increased separation distances between the Cradlepoint hardware and human beings. The recommended minimum separation distance is listed on the Safety, Regulatory, and Warranty guide included in the shipping box. Therefore, Cradlepoint requires that all 5G devices be installed by a professional installer. For assistance with installation or in locating a professional installer, contact [Cradlepoint Sales and Support](#).

SIM Card for Wireless Connectivity

A wireless broadband data plan must be added to the router for wireless broadband connectivity. Wireless broadband data plans are available from network operators. The SIM card must be activated and provisioned by the network operator. Contact your network operator for details about selecting a data plan and about the process for provisioning the SIM.

Router Communication and Data Usage

The factory default configuration of the router is set to communicate with Cradlepoint and other resources at regular intervals to access the latest NetCloud OS and modem updates, clock synchronization (NTP), and NetCloud Manager. Such communication may result in data usage and applicable charges regardless of whether the router uses a wired or wireless Internet connect. To avoid such data usage and potential charges, refer to [Router Communication/Data Usage](#) for more information.

Setup

The following instructions walk you through basic setup of the router. For more advanced setups, contact a professional installer.

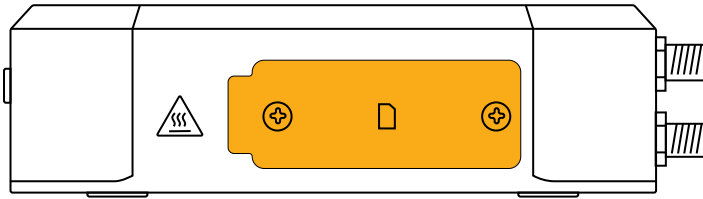
STEP 1: Check box contents.

Prior to installing the S700 Series Router, open the box and ensure that all items are present based on your ordering choice:

Model	Standard orders include	Orders with Accessories include
S700-C4D	<ul style="list-style-type: none"> • [1] Cradlepoint S700 Series Semi-Ruggedized Router • [1] GPIO Cable • [1] Getting Started Insert Card • [1] Safety, Regulatory, and Warranty Guide 	<ul style="list-style-type: none"> • [1] Cradlepoint S700 Series Semi-Ruggedized Router • [1] GPIO Cable • [1] Getting Started Insert Card • [1] Safety, Regulatory, and Warranty Guide • [1] Power Supply (with regionally appropriate plug) • [2] Cellular Antennas • [2] Wi-Fi Antennas (not included for S750-C4D) • [1] Small Accessories Kit, including: <ul style="list-style-type: none"> • [4] Rubber Feet • [4] Wall Mount Screws • [4] Surface mount anchors
S750-C4D		
S700-C4E		

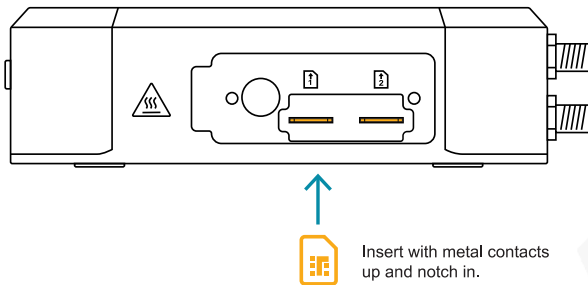
STEP 2: Remove the SIM door.

Unscrew and remove the SIM door from the router.

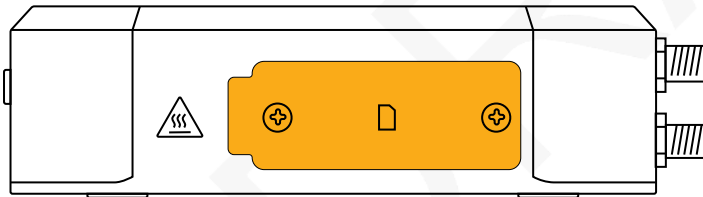
**STEP 3: Insert an activated SIM card.**

Insert an activated 4FF-sized SIM card into the SIM1 slot. The SIM card clicks into place.

Optionally, insert an activated 4FF-sized SIM into the SIM2 slot with the same orientation.

**STEP 4: Reinstall the SIM door.**

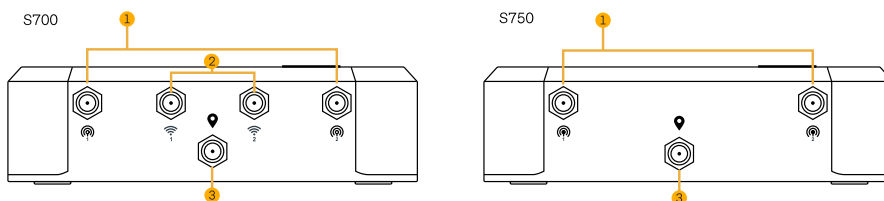
Replace the SIM cover and secure with the SIM door screws.

**STEP 5: Attach the antennas.**

If you ordered the router with accessories, attach the antennas as appropriate.

When attaching (paddle) antennas or compatible coaxial cable antenna:

- Hold the antenna straight and twist the base to thread onto the connector.
- Tighten with fingers only (maximum torque not to exceed 4 in-lbs). Do not over-tighten.



1	Attach cellular antennas to the Cellular Antenna Connectors (Female SMA).
2	S700-C4E and S700-C4D only: Attach Wi-Fi antennas to the Wi-Fi Antenna Connectors (Female RP-SMA).
3	Attach a GNSS antenna to the GNSS Connector (Female SMA - Not included.)

STEP 6: Mount the router.

The S700 Series router may be mounted in a number of ways and should be completed by a professional installer.

Refer to the following for best practices:

- Mark the desired mounting location on the ceiling, wall, kiosk, using a pen or marker.
- Ensure the mounting location is away from RF interfering materials and objects such as reflective surfaces, brick and concrete, microwaves, and so on.
- Pre-drill holes for the mounting screws.
- Use anchors and other screw-securing accessories to ensure the device is securely mounted in place. Refer to the [Location Considerations \[4\]](#) section of this document.

Additional mounting option: DIN rail

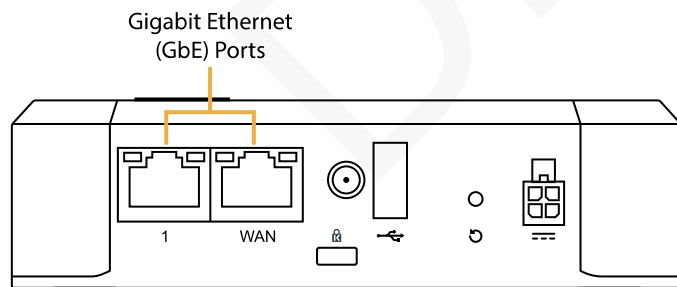
An optional DIN rail mounting bracket is available (ordered separately) for the S700 Series router. The DIN rail mounting bracket enables installation in either left or right orientation, and holds the router vertically. The mounting bracket not only enhances your mounting options, but also saves space inside of racks or cabinets.

Product	Part number
DIN Rail Mounting Bracket	170904-000

See the *DIN Rail Mounting Bracket Installation and Mounting Guide* for more details. (LINK TBD)

STEP 7 (Optional): Connect an Ethernet cable.


If you are using a wired Ethernet WAN connection, connect the Ethernet cable to the WAN port on the S700 Router. Connect the other end to your WAN source.



STEP 8: Power up the router.

1. Connect the power supply to the router and then plug the other end into an electrical outlet.
2. The router will automatically power up. Allow one minute for the router to run through the bootup sequence.

The 4-pin GPIO cable socket is configured to allow for using a 4-wire/GPIO cable to hardwire power for DC connections, or for using GPIO. Refer to the following for pin configuration when making a custom cable:

Socket	Pin	Wire Color	Definition	Details
	1	Black	Ground	Ground
	2	Red	Power	9-33V DC
	3	Orange	Input	<ul style="list-style-type: none"> General purpose input Protected to 36V in
	4	Blue	Output	<ul style="list-style-type: none"> General purpose output 36V tolerant



NOTE

The table diagram shows to view looking into the socket on the router. Be sure to take this into account when building a custom cable.

Positioning the antennas

Proper antenna positioning helps your Cradlepoint router send and receive the best cellular and Wi-Fi signals. See the following best practices and choose the best arrangement for which your installation has space.

About antenna coupling

Antennas that are placed close together can *couple* to each other since they are designed to maximize electromagnetic radiation and reception. This can have the effect of changing the antenna frequency performance, changing the antenna patterns, increasing cross-talk, and reducing MIMO performance (multiple input multiple output). The following positioning guidance helps reduce antenna coupling (also known as *decoupling*) and optimize antenna performance.

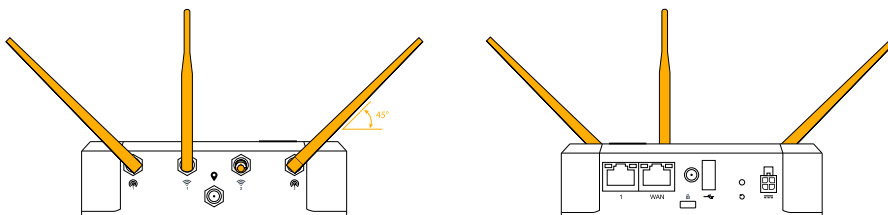
Positioning antennas for highest performance

This antenna position configuration consists of:

- Cellular antennas angled out 45° from upright.
- One Wi-Fi antenna straight upright, and one Wi-Fi antenna straight outward.

This antenna positioning:

- Provides optimum cellular antenna low-frequency efficiency performance,
- Decouples the cellular antennas from the WiFi antennas and provides excellent polarization diversity (good for MIMO performance).
- Decouples the straight-out Wi-Fi antenna from the adjacent cellular antenna, *and* from the other WiFi antenna, to maximize antenna efficiency and MIMO performance.



Positioning antennas for good performance

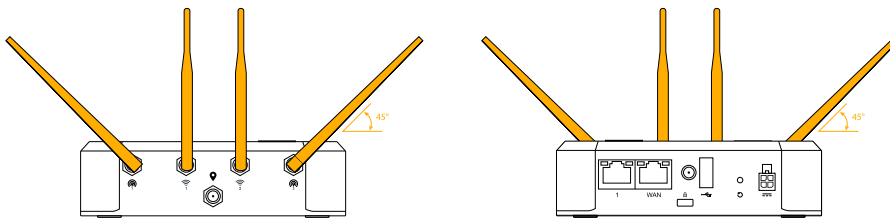
This antenna position configuration consists of:

- Cellular antennas angled out 45° from upright.
- Wi-Fi antennas straight upright.

This antenna positioning:

- Optimizes cellular antenna low-frequency efficiency performance.
- Decouples the antenna from the Wi-Fi antennas and provides excellent polarization diversity (good for MIMO performance).

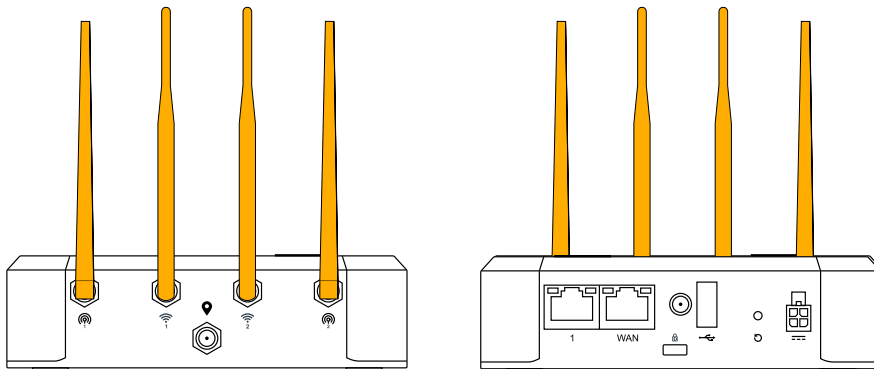
Both Wi-Fi antennas upright and parallel is a generally accepted antenna positioning option that can help save space in your chosen installation site. This position does result in some coupling between the Wi-Fi antennas, particularly for the 2.4 GHz band. This can result in a little lower MIMO performance but can still function well.



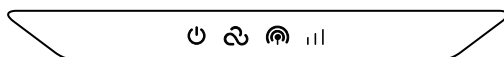
Antenna positioning to avoid

This antenna position configuration consists of the cellular antennas and the Wi-Fi antennas all straight upright and parallel.




















This antenna positioning creates significant coupling and spatial blockage (energy being blocked) between the antennas resulting in degraded antenna impedance matching, efficiency, pattern coverage, and MIMO performance.



Understanding LEDs



Refer to the following table for information about LED indicators.

Status Indicator	Behavior	
	POWER: Detects that the unit has power.	
		No Light = Not receiving power. Check the power switch and the power source connection.
		Solid White = Powered on.
	NETCLOUD MANAGER STATE: Detects whether the device is able to connect to NCM	
		No Light = Unable to connect to Netcloud Manager.
		Solid White = Connected to NetCloud Manager.
	EMBEDDED MODEM STATE: Indicates information about the integrated modem.	
		No Light = Modem not detected
		Solid Green = Modem has established an active connection
		Flashing Green = Modem is connecting
		Solid Yellow = Data connection error.
		Flashing Yellow = Modem is in the process of resetting
		Solid Red = Carrier reject
		Flashing Red = No SIM or SIM Door Open
	CELLULAR HEALTH: Indicates the health of the primary cellular modem's signal.	
		No Light = No cellular connection
		Solid Green = Cellular health is excellent/good
		Solid Yellow = Cellular health is fair
		Solid Red = Cellular Health is poor
	NOTE: Cellular Health indicates the signal health for the connected modem, whether it is the embedded or modular modem. If both modems are active, then this LED shows the status of embedded modem.	

Troubleshooting

If the device takes longer than five minutes to connect to the Internet, log into the local UI of the device to make configuration changes or to start the troubleshooting process. You must be physically co-located with the device to do this. Refer to [No Internet or Connection Issues](#) for more information.

Once the device connects to the Internet, it should then connect to your NetCloud Manager account and start its configuration download.

Resources

[LINK TBD]

[LINK TBD]

Help and Support

[Cradlepoint Connect Customer Community](#)

[Cradlepoint Support Services](#)

[Contact Us](#)

Terms of Service

[Terms of Service & License Agreement](#)

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Professional installation instructions

1. Installation personnel
This product is designed for specific application and needs to be installed by qualified personnel who have RF and related rule knowledge. The general user shall not attempt to install or change the settings.
2. Installation location
The product shall be installed at a location where the radiating antenna can be kept 41 cm from nearby person in normal operation condition to meet regulatory RF exposure requirement.
3. External antenna
Use only the antennas which have been approved by the applicant. Non-approved antenna(s) may produce unwanted spurious or excessive RF transmitting power which may lead to the violation of FCC/IC limit and is prohibited.
4. Installation procedure
Please refer to the Quick Start Guide for details.
5. Warning
Please carefully select the installation position and make sure that the final output power does not exceed the limit set forth in relevant rules. The violation of the rules could lead to serious federal penalty.

Instructions d'installation professionnelle

1. Installation
Ce produit est destiné à un usage spécifique et doit être installé par un personnel qualifié maîtrisant les radiofréquences et les règles s'y rapportant. L'installation et les réglages ne doivent pas être modifiés par l'utilisateur final.
2. Emplacement d'installation
En usage normal, afin de respecter les exigences réglementaires concernant l'exposition aux radiofréquences, ce produit doit être installé de façon à respecter une distance de 41 cm entre l'antenne émettrice et les personnes.
3. Antenne externe.
Utiliser uniquement les antennes approuvées par le fabricant. L'utilisation d'autres antennes peut conduire à un niveau de rayonnement essentiel ou non essentiel dépassant les niveaux limites définis par FCC/IC, ce qui est interdit.
4. Procédure d'installation
Consulter le manuel d'utilisation.

5. Avertissement

Choisir avec soin la position d'installation et s'assurer que la puissance de sortie ne dépasse pas les limites en vigueur. La violation de cette règle peut conduire à de sérieuses pénalités fédérales.

Restriction of Hazardous Substances (RoHS) Information

Following is information on the RoHS compliance for available S700 Router models:

- S700-C4D with accessories:**

Substance Name	Symbol	Maximum Concentration
Cadmium	Cd	0.01% or 100 PPM
Lead	Pb	0.1% or 1000 PPM
Mercury	Hg	0.1% or 1000 PPM
Hexavalent Chromium	Cr+6(V1)	0.1% or 1000 PPM
Poly Brominated Biphenyls	PBB	0.1% or 1000 PPM
Poly Brominated Diphenyl Ethers	PBDE	0.1% or 1000 PPM
Butyl Benzyl phthalate	BBP	0.1% or 1000 PPM
Dibutyl phthalate	DBP	0.1% or 1000 PPM
Di-(2-ethylhexyl) phthalate	DEHP	0.1% or 1000 PPM
Di-isobutyl phthalate	DIBP	0.1% or 1000 PPM

- S700-C4D 及配件：**

物質名稱	化學名稱代號	最大濃度
鎘	Cd	0.01% or 100 PPM
鉛	Pb	0.1% or 1000 PPM
汞	Hg	0.1% or 1000 PPM
六價鉻	Cr+6(V1)	0.1% or 1000 PPM
多溴聯苯	PBB	0.1% or 1000 PPM
多溴二苯醚	PBDE	0.1% or 1000 PPM
鄰苯二甲酸丁苯甲酯	BBP	0.1% or 1000 PPM
鄰苯二甲酸二丁酯	DBP	0.1% or 1000 PPM
鄰苯二甲酸二(2-乙基己基)酯	DEHP	0.1% or 1000 PPM
鄰苯二甲酸二異丁酯	DIBP	0.1% or 1000 PPM

• **S700-C4E with accessories:**

Substance Name	Symbol	Maximum Concentration
Cadmium	Cd	0.01% or 100 PPM
Lead	Pb	0.1% or 1000 PPM
Mercury	Hg	0.1% or 1000 PPM
Hexavalent Chromium	Cr+6(V1)	0.1% or 1000 PPM
Poly Brominated Biphenyls	PBB	0.1% or 1000 PPM
Poly Brominated Diphenyl Ethers	PBDE	0.1% or 1000 PPM
Butyl Benzyl phthalate	BBP	0.1% or 1000 PPM
Dibutyl phthalate	DBP	0.1% or 1000 PPM
Di-(2-ethylhexyl) phthalate	DEHP	0.1% or 1000 PPM
Di-isobutyl phthalate	DIBP	0.1% or 1000 PPM

• S700-C4E 及配件:

物質名稱	化學名稱代號	最大濃度
鎘	Cd	0.01% or 100 PPM
鉛	Pb	0.1% or 1000 PPM
汞	Hg	0.1% or 1000 PPM
六價鉻	Cr+6(V1)	0.1% or 1000 PPM
多溴聯苯	PBB	0.1% or 1000 PPM
多溴二苯醚	PBDE	0.1% or 1000 PPM
鄰苯二甲酸丁苯甲酯	BBP	0.1% or 1000 PPM
鄰苯二甲酸二丁酯	DBP	0.1% or 1000 PPM
鄰苯二甲酸二(2-乙基己基)酯	DEHP	0.1% or 1000 PPM
鄰苯二甲酸二異丁酯	DIBP	0.1% or 1000 PPM

• **S750-C4D with accessories:**

Substance Name	Symbol	Maximum Concentration
Cadmium	Cd	0.01% or 100 PPM
Lead	Pb	0.1% or 1000 PPM
Mercury	Hg	0.1% or 1000 PPM
Hexavalent Chromium	Cr+6(V1)	0.1% or 1000 PPM
Poly Brominated Biphenyls	PBB	0.1% or 1000 PPM
Poly Brominated Diphenyl Ethers	PBDE	0.1% or 1000 PPM
Butyl Benzyl phthalate	BBP	0.1% or 1000 PPM
Dibutyl phthalate	DBP	0.1% or 1000 PPM
Di-(2-ethylhexyl) phthalate	DEHP	0.1% or 1000 PPM
Di-isobutyl phthalate	DIBP	0.1% or 1000 PPM

• S750-C4D 及配件:

物質名稱	化學名稱代號	最大濃度
鎘	Cd	0.01% or 100 PPM
鉛	Pb	0.1% or 1000 PPM
汞	Hg	0.1% or 1000 PPM
六價鉻	Cr+6(V1)	0.1% or 1000 PPM
多溴聯苯	PBB	0.1% or 1000 PPM
多溴二苯醚	PBDE	0.1% or 1000 PPM
鄰苯二甲酸丁苯甲酯	BBP	0.1% or 1000 PPM
鄰苯二甲酸二丁酯	DBP	0.1% or 1000 PPM
鄰苯二甲酸二(2-乙基己基)酯	DEHP	0.1% or 1000 PPM
鄰苯二甲酸二異丁酯	DIBP	0.1% or 1000 PPM