

**Drones in the port of Rotterdam:
'the safest port to fly'**



Rotterdam is an extremely safe port and will remain so even when drones are deployed for companies and organisations in the port area. For drone operators, this means that they can fly in the port area provided they meet the specified conditions.

This document is intended for companies and organisations in the port as well as drone operators. The document describes the opportunities that the Netherlands and the Port of Rotterdam offer for drone flights and the way safety is guaranteed.

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As a port manager, the Port of Rotterdam Authority has decided to grant access only to professional drone operators that fly in the 'Specific' category. This category defines requirements not just for the drone organisation and the pilot but also for drone operation and is only possible with a permit from

ILT (the Dutch Human Environment and Transport Inspectorate). You can find more information on this subject below. The 'Open' category, which does not require a permit, is not permitted in the port.

This document provides an overview of the legislation on which drone operations in the port are based. It also provides a perspective on the opportunities for future drone operations. In consultation with the competent authorities, for future operations we are investigating whether and to which extent additional regulations are required for specific geographical areas, but also for subjects such as privacy and cybersecurity.

Today's drone operations will make way for more complex situations in the coming years, such as longer distances, heavier drones, automatic flights out of sight of the pilot, autonomous flights without a pilot on the ground, drone flights above crowds, drone flights with packages and in the longer term unmanned drone flights with cargo and passengers. This means that in the years to come, the permits will be expanded from:

- the current VLOS (Visual Line of Sight: the drone must remain in sight) and
- EVLOS (Extended Line of Sight) flights to
- BVLOS (Beyond Line of Sight: the drone flights out of sight or even autonomously, entirely without a pilot) flights.

Permits are currently issued sporadically for 'Extended Line of Sight', which means that flights can be flown within a radius of 1 to 1.5 km. A drone-friendly port cannot function without a high degree of security. This means that expansions of the possible options will be introduced step by step.

The Port of Rotterdam Authority is following the European legislation in this regard. This article is an interpretation of that legislation, and no rights can be derived from it. The official regulations are available on the websites of the [Central Government](#) or [ILT](#).

Drones and legislation

The European legislation for drone flights came into force in all the EU Member States on 31 December 2020. These regulations provide greater scope than ever in terms of drone applications over longer distances, remote control and more autonomy in flights. The process is divided into phases:

- Phase 1: distance from people, buildings, CTR (before 2019)
- Phase 2: above crowds and contiguous buildings (since 2020)
- Phase 3: beyond line of sight (BVLOS)
- Phase 4: airspace that is now exclusively reserved for manned aviation will be opened up to unmanned aviation. This will require specific agreements, protocols, software and hardware such as transmitters.

We are currently between Phase 2 and Phase 3. Corridors are now being opened step by step to make safe BVLOS flights possible.

The EU Member States are responsible for applying the European regulations for drones in their individual countries. In the Netherlands, this is the task of the Dutch Ministry of Infrastructure and Water Management. This Ministry is also responsible for the register in which all drone pilots and the exams for drone pilots are recorded.

Starting point: different risk levels

The EU regulations are divided into 3 risk levels: low, medium and high.

- Low-risk flights = Open category. The Open category is not permitted in Dutch seaports. The seaports have recommended this zoning to the Ministry because of the low numbers of commercial applications in the port in the Open category, the limited requirements for this category and the absence of a permit requirement. With this measure the airspace can be kept optimally accessible for commercial applications and developments.
- Medium-risk flights = Specific category. The following explanation only relates to flights with a medium risk, the Specific category. The risk relates to the flight itself and the weight of the drone, but also to the conditions and the flight area. For example, for medium-risk flights:
 - it is permitted to fly above people (but not above crowds)
 - flights near aerodromes are permitted
 - drones heavier than 25 kilos and with a wingspan of up to 3 metres may be flown
 - drones may be flown inside the built environment
 - drones may be flown higher than 120 metres
 - drones are permitted to drop material – for example, spraying crops
 - it is permitted to fly outside direct view, beyond visual line of sight (BVLOS)
- High-risk flights = Certified category: this is the category in which people are transported – but also dangerous substances that can pose a high risk to others in the event of an accident. Drones that are longer than 3 metres and are designed to fly over gatherings of people also fall into this category.
Not all the requirements for the Certified category have yet been defined. It is therefore not yet possible to fly in this category. EASA, the European Aviation Safety Agency, is still developing regulations for this category.

EASA has decided to split the operations in the Certified category into several phases and to first tackle the following three types of operations:

1. Operations type #1: International flights of certified cargo drones conducted in accordance with instrumental flight regulations (IFR) in airspace classes A-C and take-off and landing at aerodromes within the scope of EASA. For example, an unmanned A320 that transports a cargo from Paris to New York.
2. Operations type #2: Drone operations in urban or rural environments that use predefined routes in airspace in which U-space services are provided. This includes operations of

unmanned drones carrying passengers or cargo. For example, air taxi or parcel delivery services that come directly to your balcony or the roof of your building or front garden.

3. Operations type #3: Operations as in type #2, but then conducted with an aircraft with a pilot on board. This is actually expected to relate to the first type of air taxi operations, where the pilot will be on board. In a second phase, the aircraft will be controlled remotely.

For the source and for more information, see the [website of EASA](#).

Issue of permits, supervision and enforcement

The issue of permits for the Specific and Certified categories is the responsibility of the ILT. The ILT also monitors the correct use of the permits and the certificates of the pilot, aircraft and operator, where necessary. Operational enforcement is the task of the police. Pilots and drone operators must be registered with RDW (the Dutch vehicle approval and information authority). Violations can be heavily fined and can lead to seizure or even recovery of revenue earned for the service.

The legislation is risk-based, and it is up to the drone operators to demonstrate how they deal with risks before they receive a flight permit from ILT. The core of the regulations is: the more risk a drone flight entails, the higher the requirements to be met by the operator, the pilot, the drone and the flight operation.

Professional drone operators are welcome in the port. A professional drone operator works with an operating permit for the Specific category.

Who is permitted to be a drone operator?

To make a drone flight in the Specific category, you must:

- Register as an operator by requesting an operator number from RDW. The operator owns one or more drones and is ultimately responsible for the flight. RDW registers operators and pilots and shares this data with the other European countries. This is part of the intended open market in Europe for drone operators.
- The pilot must apply for a pilot's licence. The pilot is the person who flies his own or someone else's aircraft. In addition to the A1/A2/A3 pilot licences, additional competences are required for the Specific category. These competences can be tested at a number of designated flying schools in the Netherlands.
- The operator number must be visibly attached to the drone so that it is traceable. Transmission of the operator number is not yet required, but this will be mandatory in Europe in the future (2023/2024).
- Have obtained an operating permit from the ILT, or a LUC (Light UAS operator Certificate). With a LUC, permit-holders are permitted to perform risk assessments and operations without prior approval from ILT.
- Be at least 16 years old.

How to apply for a flight authorisation

Operating permit

For a flight in the Specific category, an 'operating permit for unmanned aircraft' must be requested from the Dutch Human Environment and Transport Inspectorate (ILT) by means of an application form. The party applying for an operating permit must be registered as an operator with RDW. A risk assessment must be conducted before the application. The applicant must enclose the following with the application:

- The assessment of the flight operation risks. This may be a Specific Operations Risk Assessment (SORA) or a Pre-defined Risk Assessment (PDRA)
- A Concept of Operations (CONOPS), a description of the type of aerial work.
- An Operational Handbook (OH) that is specifically tailored to the organisation, aerial work and risk analysis.

ILT assesses the application for completeness and may request additional information. There is a charge for the operating permit; this charge is specified in Article 19 of [the Dutch Aviation Tariffs Regulation 2008 in Article 18a](#). The cost of applying for a permit varies from €1,248.00 to €7,488.00 and depends on the risk profile.

The risk assessment is required in order to apply for a permit once for an operation type and a range of drones. The permit is then valid for an indefinite period. ILT conducts audits at the offices of these operators. Examples of 'operation types' include:

Description	UAS sign	Airspace	Max. altitude	OPS type	Ground surface
Inspections in sparsely populated areas, agricultural areas, nature reserves, no airports	<700J, <1 metre, <4kg	Uncontrolled (G)	120 m. AGL	BVLOS	Lightly populated
Above densely populated areas with persons concerned during inspections within 30 m. of object/building		Uncontrolled (G)	120 m. AGL	VLOS	Populated, controlled territory

Light UAS Operator Certificate (LUC)

The Light UAS Operator Certificate (LUC) gives organisations the opportunity to assess the risks of their flights themselves. An approval from ILT for conducting (new) flights is then no longer necessary. With an LUC, an organisation can approve its own flights; for example, as part of a standard scenario (STS), a SORA or a Pre-defined Risk Assessment (PDRA). The process of becoming a LUC operator is quite complicated. It is preceded by a long period in which ILT gains confidence in the organisation through audits. A LUC is issued up to a certain risk profile. The operator then enjoys privileges and can independently develop and deploy new SORAs and PDRAs.

For more information and to submit an application, see; [Light UAS Operator Certificate \(LUC\) - ILT](#)

Standard Scenarios (STS) and PDRAs

Standard Scenarios (STS) or PDRAs can be used to reduce the workload for drone operators. Both PDRAs and Standard Scenarios are based on the risk analysis that has been agreed in Europe: the SORA. Operators then do not have to make a new risk assessment for each type of flight, except if a flight presents a risk that is not yet included in the standard scenario. Standard Scenarios differ from PDRAs in that the former are fully European. They apply to all countries. PDRAs can be either national or European. The Netherlands can therefore develop national PDRAs and declare them applicable that are not necessarily usable in other countries.

There are currently four European PDRAs available and deployable and one national PDRA (NL-PDRA-01 Remote Operations). The European Standard Scenarios may only be declared from 2 December 2023. They will be published on the EASA website in the [Easy Access Regulations](#).

A number of national PDRAs may still be developed, such as for autonomous flights in heavy industrial areas. These PDRAs make it easier for drone operators and mean that there is no need to 'reinvent the wheel'. This type of standardisation also makes drone operations safer. In addition, further guidelines may be drawn up for certain zones, as has already been done for the Natura 2000 areas.

As the Port of Rotterdam Authority, we are happy to support these developments by developing the guidelines and/or conditions for seaports together with the government, seaports and operators.

The principle behind flight permissions

If a drone operator wants to fly into the port, it must declare a PDRA or perform a specific operations risk assessment (SORA) himself. This is a method that is laid down in EU law, which prescribes in detail the precise risks of the intended flight operation and what the operator is doing to reduce those risks to an acceptable level. It is therefore not based on prescribed regulations that drones must follow but on safety objectives that must be achieved.

What makes the flight of a drone safe or not is determined, among other things, by the risk of accidents the moment a drone crashes. Drones flying in the port are subject to certification requirements for the suppliers. Drone operators perform test flights in advance and are careful with software updates. However, sometimes things go wrong: drones are not manufactured as technically redundant as in manned aviation, and the software can sometimes contain errors. However, the majority of accidents in recent years have been caused by human error, such as the pilot being distracted by a nearby accident. Due to the relatively low weight, the risk of damage or injury is fortunately small. For this reason, drones are classified into different weight classes. The heavier the drone, the greater the measures required to prevent damage on the ground.

The second risk factor is a mid-air collision with a manned aircraft. This risk is reduced by means of agreed procedures for flying in military and civilian airspace. In both cases, there is contact between air traffic control and the drone operator. Without this contact, flying in the so-called CTRs is high-risk.

More about the SORA methodology

The methodology for describing the extent of the risks and the method of mitigation has been largely standardised by the EU and is called the 'Specific Operations Risk Assessment'. Drone operators use this methodology to perform their risk assessment for operations in the Specific category. The outcome determines the risk class of the intended drone operation. A SORA is required when applying for an operating permit from ILT.

The SORA method has 10 prescribed steps and starts with the technical description and weight of the aircraft and the exact description of the intended flight operation. The ground risk class (GRC) and air risk class (ARC) are determined on the basis of this information. They are then combined to calculate the risk class of the flight, which is indicated in a SAIL class (Specific Assurance and Integrity Level). SAIL classes run from I to VI and determine the Operational Safety Objectives (OSOs) that are set for the operation and the operator; less robustness is required for a low SAIL than for a high SAIL.

In the final step for the SORA, the risk to areas that border on the operational volume on the ground and adjacent airspace must be examined in the event of a possible loss of control over the flight operation.

The SAIL class is the starting point for the application for flight permission to ILT and already gives an indication of how successful that application will be. In general, the higher the SAIL class, the more measures must be taken in order to perform the flight safely.

So far, only flights up to SAIL class IV are eligible for approval. SAIL classes V and VI will only be permitted after U-space (air traffic control system) is operational, but SAIL class II is sufficient for the vast majority of current drone operations.

Support for risk assessments and requests for permission

There are a number of companies that can help operators write a SORA and apply for a permit:

- [Drone consultancy](#)
- [Airhub](#)
- [Dutch Drone Academy](#)
- [Drone Flight Company](#)
- [Airpass](#)

Several companies have developed a tool to determine the SORA. In all cases, the operator must independently provide evidence in order to receive approval from ILT. A tool speeds up the process, but it is not enough to be able to use a SORA for an application.

Tools are provided by [Airhub](#), [EUROUSC](#) and [SAMWISE](#).

Operational regulations for flying over industrial areas and ports

There are currently no European 'agreements' in the form of PDRAs or STSs for flying over industrial areas in ports. In the Netherlands, however, drone operators use similar procedures for these areas. These procedures have been approved by ILT but may differ for each operator. In general, it can be concluded that operators must contact the manager/owner of the land as well as the party responsible for safety in the Operational Volume.

Given the new method of risk-based regulation, there are therefore no firm agreements about the maximum flight altitude or the distance that must be maintained from critical infrastructure or areas with hazardous substances. The details depend on the Operational Manual and the operator's permit. However, procedures for flying in secured airspace (CTRs) have been agreed with the LVNL (Air Traffic Control the Netherlands) and [MLA \(Military Aviation Authority\)](#).

The port of Rotterdam also has Natura2000 areas. In these areas, specific conditions based on nature conservation regulations apply in certain seasons. To fly in a Natura2000 area, permission from the site manager is required. A special flyer has been developed for these areas, which can be downloaded [here](#).

Permission for take-off and landing

If the drone takes off and lands from a public area, the Port of Rotterdam Authority must grant permission for that area to be used for that purpose. Permission can be requested at toestemmingsverlening@portofrotterdam.com; the applicant will be asked to produce a number of documents.

Notification to the Port Coordination Centre

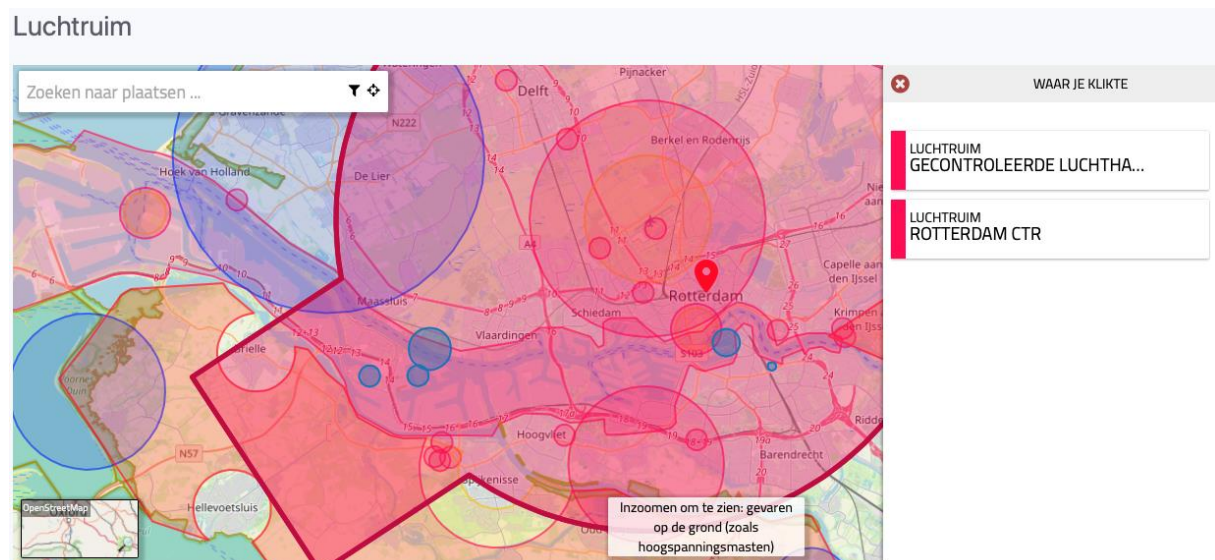
Drone flights can be reported to the HCC, Port Coordination Centre, on tel.no. +31 (0)10 2521000 or at HCC@portofrotterdam.com. This notification is not aimed at seeking permission, but it does ensure that questions about the flights arriving at the HCC can be answered in the affirmative. Plannable deployment preferably 24 hours in advance by e-mail. Deployment for incidents by telephone. Useful information: where, when and for which purpose is the drone being flown, which operator is making the flights and for which client.

The airspace above the port of Rotterdam - CTR

On the GoDrone website and app developed by LVNL, the drone map of the Netherlands shows the location of the no-fly zones for the Open category. GoDrone also includes information about restrictions and/or exceptions that apply in a certain area.

A large part of the port of Rotterdam is located in an airport area, the CTR, which is controlled by Air Traffic Control (LVNL). In this area, contact with the LVNL is required for permission to fly a drone

professionally. Drone operators should also check whether there is a temporary airspace closure, as displayed in blue on the map below.



Professional drone operators can use GoDrone to submit an application for a drone mission in the CTR. Half of the port of Rotterdam falls outside the CTR, the other half inside it.

Almost the entire port of Rotterdam is accessible for drone operations. Only a small part of the port (near Schiedam) is (still) completely prohibited, due to CTR requirements.

There are still a number of additional requirements for a flight operation in the CTR.

- An exemption for flying without a transponder and the use of the procedure in the Operational Manual.
- Two-way radio contact during the drone operation. Here, the use of a 10-metre antenna is recommended to improve the quality of the signal from a low altitude.

Difference between automatic and autonomous flights

The legislation makes a distinction between automatic and autonomous flights.

An autonomous drone can perform a safe flight without the intervention of a pilot. It does this using artificial intelligence, which permits it to deal with all kinds of unforeseen and unpredictable emergencies. This is different to automatic operations, where the drone flies predetermined routes that are defined by the drone operator before the flight starts. For these types of operations, it is essential that the remote pilot takes over control of the drone in order to intervene in the event of unforeseen events for which the drone has not been programmed.

Automatic drones are permitted in all categories. For automatic flights, the pilot continues to oversee the flight and can still intervene if something goes wrong. In the future, autonomous drones will only be permitted in the Specific and Certified category.

Drone certification

Up to now, the certification of drones was mandatory in the Netherlands. This is different under EU regulations. Up to SAIL class II, an examination is not required to fly in the Specific category. The risk profile is low enough for this, and the risk is sufficiently compensated by other measures. It is not yet possible to say specifically which devices will or will not receive an EASA type certification (T/C). That depends on the SAIL class, which in turn depends not only on the weight but also on the airspeed and the wing-span and type of operation. From SAIL class III upward, ILT may request this through EASA. Important: this is not done through the operator but through the supplier of the drone.

Operators flying in the Specific category will have to submit a declaration to the ILT about the reliability of their aircraft.

Insurance

For flying with a drone, according to Regulation EC 785/2004, liability insurance for physical or material damage to third parties of at least €750,000 is mandatory. Drone operators take out special drone insurance for this, because normal insurance policies do not cover drones. In the Netherlands, a number of insurers specialise in drones, such as Coverdrone.

When applying for an operating permit, ILT asks for an up-to-date insurance policy for the drone being registered.

Privacy law

Filming or photographing with a drone is only permitted in cases where this is usually also permitted with a 'normal' camera. So not in gardens, not people outside the public road, not filming from outside to indoors or above closed (business) areas. Prior permission from the owner is always required.

Interest groups

In the Netherlands, the [KNVvL](#) (Royal Dutch Aviation Association) and [DCRO](#) (Dutch Certified RPAS Operators) represent the interests of drone operators.

Regulations for drones from 2023 onward

A new traffic control system is being introduced that enables drones to be recognised and tracked: U-space. In the future, this air traffic control system will guide drones and unmanned aircraft such as flying taxis. Drones will then determine their routes with U-space (the 'U' stands for 'unmanned') to avoid collisions. Trauma helicopters or police helicopters will automatically be given priority. In addition, air traffic controllers will be able to track and land any vehicle if so required.

From 26 January 2023, new rules will apply that make it possible to recognise and track drones. This will pave the way for larger-scale drone use and pilotless flights. The use of a U-space system also involves a number of obligations, such as:

- mandatory software for new drones that controls the permitted altitude
- the mandatory automatic transmission of the drone registration number

For more information, see the [website of EASA](#).

Based on market research, we expect that the volume of drones in the port of Rotterdam will eventually make it a logical location for U-Space airspace. We can then use the broad set of regulations that have been prepared for these spaces. We plan to gain experience with a U-Space prototype: a 'Control Tower' from which the airspace in the port is managed using an Unmanned Traffic Management system. Drone service providers will register their flights through this system. In this way, we can turn the port into a controlled area in which every competent operator has authorised access and can conduct its flights safely and without any conflicts with other air traffic.