



C.3	European Procedure for Forest Fire Fighting
MEFISTO	Mediterranean Forest Fire Fighting Training Standardization

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European Procedure for forest fire fighting

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List of Acronyms

CEGMA	Aerial Means Management Cell
CECIS	Common Emergency Communications and Information System
CMA	Aerial Means Centre
EUFO	European Forest Fire Officer
ETA	Estimated Time Arrival
ETD	Estimated Time Departure
EU	European Union
GIS	Geographic Information System
GSM	Global System for Mobile Communications)
LO	Liaison Officer
NATRI	Nucleus of Technical Support and International Relations
PT	Portugal
POC	Contact Point
SITREP	Situation Report

Executive Summary

The main objective of this document is the definition of a set of procedures to define how to activate support between different administrations (regions, countries) in forest fire suppression.

A proposal is made for the definition of a cross-border collaboration protocol on means of suppression support, setting out the objectives of the Protocol, the territorial scope, the costs of assistance and the general terms of application.

Operational procedures are defined, in particular those relating to mutual assistance, taking into account the types of suppression means that may be triggered in support, as well as the area of the territory that the fire affects or may affect, as well as the procedures to be applied in each of them.

The procedures for receiving suppression means in initial and extended attack, regardless of their typology, have been also defined.

Moreover, the report clarifies how the command should be ensured in fires occurring in the cross-border area, as well as procedures for communication and information sharing, and clarification of the importance and functions of the European Forest Fire Officer (new figure recognized in MEFISTO project, for details see Deliverable E.1).

1. Introduction – Cross border collaboration: state of the art

Forest fires are one of the main problems that are affecting the Southern European countries, especially those in the Mediterranean Basin. In this sense, recognizing that administrative limits existing in the European territory do not constitute an obstacle to fires propagation, and taking into account that one ignition located in a certain region can affect another one at kilometres of distance, it is very important to define operational procedures between different administrations, in order to streamline the initial response, minimizing the burned area, avoiding the destruction of assets and fundamentally ensuring the safety of populations.

The great differences observed in each region in relation with fire ignition and fire spread conditions, contributes to a great heterogeneity of fire prevention and fire fighting measures, as of the entities involved in these processes. It is very important to define cross-border cooperation agreements, as the clarification of the entities with legal responsibilities on forest fires fighting involved in these agreements in order to establish and implement the procedures and responsibilities that are assumed on them.

In this context, there is a concern in some countries, especially those of the Mediterranean basin, in order to clarify action procedures related with firefighting matters. Cross-border cooperation agreements between countries and between regions already exist. Detailed information are reported in the deliverable “D_D.2 – *Definition of rights and duties between countries aimed at efficient cross-border collaboration*”. It is essential to clarify which geographical areas are covered by the agreement (only for cross-border areas or for the entire territory), as well the procedures to be used to trigger the support means, since that an ignition may occur at any point in the territory of the cooperation agreement signatories.

The great complexity of fire scenarios requires a careful analysis of the fire spread conditions, present resources, existence of sensitive points or threats, and how all these factors will affect suppression and determine the means and resources to be applied in this task. Cooperation agreements should be flexible, and comprehend the entire typology of resources (aerial and ground) according to the availability of the signatories, allowing a greater agility and scope of action in their mobilization.

In the cooperation protocols it is also very important to define who is responsible for the control of the operations according to the fire scenario/location, and also to clarify how external means are received and coordinated during extinguishing operations.

Duties and rights of the signatories should be clearly understood and defined in the cooperation agreements, as well the costs associated with external support. It is important to clarify when, why and how a signatory can refuse a request for assistance or can request the demobilization of its means which are engaged in external support. The signatories should also be aware that the commitment of fighting means in another area has

associated costs and it is fundamental that this aspect is well defined in the protocol, as well all aspects related to the logistics of the means (fuels, food and accommodation).

Moreover, it is very important to find common operative procedures to be applied during collaboration activities. In fact, as reported in MEFISTO's D_B.2 *"Similarities and differences between EU Mediterranean countries in forest fire fighting: a challenge for improvement"*, there are several differences between countries in terms of organization, techniques, procedures and fire attack during fire fighting activities. For these reasons, it is fundamental to define common procedures to allow forces coming from different countries to work safely and efficiently.

In the cooperation protocols, being fire suppression a high-risk activity, it is essential to define that all operators working outside of their normal geographical area of intervention, have to be covered by insurance, which includes all the risks associated with forest fire suppression.

Finally, in order to simplify the communication process between signatories, a set of procedures should be defined, in order to ensure that the requests for assistance and responses to such requests are clear and expeditious.

2. Procedures for Cross-Border Collaboration

2.1 Scope

The procedures for forest fire suppression collaboration between different countries or regions must be defined by standardized protocols.

The purpose of this document is to define a set of standard procedures useful for an efficient fire fighting collaboration in the Mediterranean area. In particular, these procedures will be very important in the execution of collaboration protocols, concerning forest fire fighting in cross-border areas.

The document reports the procedures to be applied during cross-border activities involving two (or more) administrations (countries/regions), included in a formal agreement. One part asks for help in case of needs, and other(s) part responds step by step formally. The procedures to be adopted and the responsibilities of each of the signatories in matters of assistance expenses, insurance coverage and technical cooperation, as well the terms validity of the collaboration protocol, are also defined.

This report describes also the protocol boundaries, defining what is included and what not. In particular, it defines rights and duties between parts both in terms of administrative and technical aspects. Regarding technical understandings, it is important to include information on the type of suppression support means, the most common applied techniques, and the definition of support duration, including initial attack or extended attack or both.

It also establishes the procedures to be followed in the hospitality of supports, according to their typology (terrestrial or aerial means), as well the definition of how the command of operations is ensured in different operational scenarios. The clear definition of the chain of command is the fundamental factor to be defined, in order to facilitate the right development of interventions.

2.2 Reciprocal Assistance

The agreement signatories undertake to inform each other about the fire risk as well of the occurrence of forest fires in border areas.

On a reciprocal basis, the involved signatories may request assistance from each other in a fire event in the border area, which may be extended to big fires in the entire regional/national territory.

The region/country receiving requests of support from other regions/countries shall examine each request and shall decide if it is possible to send resources outside its own operational area. The main aspects to be taken

into account for this decision are mainly the internal fires situation, resources availability considering their number or specific composition, and the fire risk level at the time of the request. Obviously, the decision has to be fast in order to rapidly answer to the applicant.

All assistance requests between the two signatories shall be made in accordance with the procedures described in point 3 of this document and in accordance with Annex A (Request form to forest fire suppression support means) and Annex B (Response form to the request for forest fire suppression means).

2.3 Territorial Application Scope

This Protocol is applicable in two different situations:

1. In **border areas strictly**, whose distance to borders should be defined in the collaboration agreements between the countries or regions (example: on any side 15 km from the boundary), where propagation conditions can quickly enlarge the fire from one area to another.
2. **Outside border areas** in case of big fires or special conditions of emergency that requires external support.

2.4 Exchange of knowledge and technical cooperation

In order to ensure a good coordination of fire fighting means between different regions/countries, it should be ensured that:

- I. there are exchanges outside the forest fire fighting period to present case studies, exchange of information, exchange of documentation, discussion of ideas and openness to improvements in performance;
- II. there are exchanges between technicians to increase technical knowledge and professional skills;
- III. meetings and seminars are organized to explain the protocols of collaboration and to allow the improvement and updating of the protocols;
- IV. joint exercises are carried out to validate the assumptions defined in the protocol;
- V. there are training of European Forest Fire Officers and other technicians considered important (example: civil protection personnel) on the basis of mutually approved training programs.

2.5 Term and Application

The procedures protocol it will remain in force for the duration of the collaboration agreements and can be updated if requested by one of the agreement signatories.

3. Operational Procedures

The collaboration agreement signatories, recognizing the importance of prompt intervention of the suppression means and the security of persons and property, shall reciprocally request assistance from each other within or outside the border zone whenever the fire scenario so warrants.

In forest fire fighting there are many factors affecting operations. The success of an intervention is strictly related with both the capacity of understanding the local and actual conditions, and the preparedness in facing the emergency. Considering this last point, it is clear that the *condition sine qua non* is to have well-trained operators operating following established and agreed procedures. This need is higher in activities carried out with the collaboration of other resources coming from abroad. The procedures to be adopted, should take into account a variety of factors, including the location of the fire and the type of attack. The procedures to be adopted should be based on the criteria described in the next points. Several situations have been considered, finding the best solution in order to establish procedures valid for all the Mediterranean countries involved in active collaboration in forest fire fighting. In this context, the figure of the European Forest Fire Officer becomes fundamental in order to properly apply these procedures. Moreover, the European Forest Fire Officer of the external force speaks the country language or speaks fluently English (B2 level) allowing efficient communications between local and external resources.

According with the existing agreements among countries for firefighting collaboration (see deliverable “D_D.2 – *Definition of rights and duties between countries aimed at efficient cross-border collaboration*”) two main scenarios may be considered: i) forest fire spreading in the border area (i.e. a buffer zone along the border between countries/region); ii) difficult fire scenarios outside the border area that may require support by other countries/regions.

3.1 Fire within the border areas

The most common situation in which fire fighting resources arrive from other regions/countries, is when an emergency along boundaries happens. In this case, the procedures for activating support may occur in two different situations. These situations are described below as well as the procedures that should be followed.

- a) Fire within the border area - Initial attack - detection made by local authorities;

In the event of a fire within the frontier zone, where the fire has been detected by local authorities, the person in charge for the fire fighting operations in this area can request external support according to the cross-border protocol, referring the type of means that will be adequate for the fire scenario. The request must be made at the higher level by fax or e-mail, through the form in Annex A, to the

person in charge for the means of the border area close to the territory where the fire takes place. After assessing the fire situation in the area, an answer should be given at higher level also by fax or email, indicating the availability of resources through the form in Annex B.

b) Fire within the border area - Initial attack - detection by the foreign authorities;

In the event of a fire within the border zone, which is detected by the authorities of the neighbouring area where the fire occurs, the responsible in charge the adjacent external area may dispatch means to the burning area for initial attack. Before sending means of the potential fire, local/regional/national authorities have to be informed by fax/email/phone by the responsible who decided to activate support, using the specific form (Annex B).

c) Fire within the border area – Extended Attack;

In the event of a fire started outside the border zone but whose evolution is already within the border area, the responsible in charge for this area shall ask for external support under the cross-border protocol, indicating the type and amount of resources needed for efficiently face the emergency. The request at the higher level must be made by e-mail (informal communication by phone is recommended to ensure the receipt of messages) using the specific form (Annex A), to the neighbour authority. The answer can be positive or negative, depending on the actual conditions and availability of resources. The formal answer have to be sent by email using the specific form (Annex B).

3.2 Fire Outside of the Border Area – Extended Attack

In case of big fires or difficult seasons with a high number of simultaneous fires (Megafires), it is possible to use cross-border agreement to request support also in areas far from the boundaries. In this case, it is important to give to the external administration (foreign forces) all the information for guaranteeing an efficient and rapid support. In particular, the authority who request for help have to clearly ask for number and type of means and human resources, through the specific form (Annex A). The answer to this request has to be quick and clear, both in case of positive or negative response (Annex B). The negative response should be explained by internal difficult conditions of the helper, that does not allow to reduce the resources and fire fighting capacity.

3.2.1 Reception of Terrestrial Means in Extended Attack

The European Forest Fire Officer of the external force should speak fluently the country language or English (B2 level). One of the main challenges in developing collaboration between teams arriving from different regions/countries is the management of persons and means in an efficient way. The first issue to be considered is to communicate efficiently. It is important that at least one person from support teams can speak in the language spoken in the supported area, or in English. Moreover, it is important to define several points to be considered in managing supports and mandatory information to be exchanged between all actors involved in emergency operations:

- The rendezvous point in the theatre of operations with denomination and geographical coordinates Datum WGS84;
- Information of the logistics sites during the journey and in case of need (denomination, geographic location through coordinates, distance between points, connecting element in places);
- Telephone number of the dedicated hosting European Forest Fire Officer on the operational theatre and national/regional entity responsible for national/regional coordination of suppression activities;

At the rendezvous point the following conditions must be guaranteed:

- **Reception** – a local European Forest Fire Officer should be on the operational theatre for receiving and support the foreign resources arriving on the fire event. The European Forest Fire Officer must speak fluently the language of the means that are received or, in alternative, fluently English;
- **Logistic support** - Replacement of operative capacity (fuel supply, water supply, operational feeding, hygiene and rest);
- **Communication tools** - In collaboration activities, to assure good communication between local and foreign resources is mandatory. If the devices normally used in a country can be set for the connection at the local radio network, the used frequency should be shared with the foreign resources and the proper operation of the communication devices should be verified before starting the operational activities. If the devices normally used in a country are not compatible with the others, a radio equipment should be given to the external forces.
- **Preliminary briefing** - before starting operations, it is fundamental to carry out a briefing. Teams arriving from other regions/countries have to be informed about the conditions they are going to face with. In particular, it is fundamental to inform them about i) actual fire conditions; ii) expected evolution of fire; iii) aerial and ground teams actually operating on fire; iv) real and potential risks; v) presence of high risk infrastructures such as oil and methane pipelines, etc.; vi) presence of dangerous areas (very steep terrains, gullies, landslides, etc.); vii) any other information useful for safe and efficient operations.

During forest fire fighting activities in collaboration with external resources, the local and foreign European Forest Fire Officers must be operative in order to:

- assure the connection between the Incident Command Post (Incident commander) and the external forces;
- Ensure and request all the necessary conditions for the execution of the assigned missions;
- Manage any differences in pre-established procedures between forces;
- Inform and monitor compliance with the legislation in force in the country where the intervention takes place;
- Perform a constant assessment of the external force's needs for the accomplishment of its missions and logistical maintenance;
- Record the consumptions and missions performed by the external force;
- Perform the final mission report.

During operations, the ground means arrived as external support, have to operate together in a specific sector. It is better to avoid to break external teams distributing single operator or mean in different sector. External teams should be coordinated by a technician with specific competences aimed to integrate resources in an international context, i.e. a foreign European Forest fire officer.

For the demobilization of the external force, it must be guaranteed:

- Replenishing the logistics capacity of vehicles and operational vehicles to initiate the return to their place of origin;
- The Itinerary that must take from the operations theatre to the point of exit from the country of reception;
- Information of the logistics sites during the journey and in case of need (denomination, geographic location through coordinates, distance between points, connecting element in places, and contact with the national authority).

3.2.2 Reception of Aerial Means in Initial and Extended Attack

Aerial means are an indispensable tool in forest fires suppression, mainly due to their high fire fighting capacity. Their commitment may be made both in initial or extended attack, and the procedures for activating these means will be identical to those that are used for ground forces, but a set of measures must be ensured in order to guarantee the logistics efficiency of these reinforcement means.

The request for air support can be made in two different ways, in particular through the Civil Protection Mechanism of the European Union or through bilateral collaboration protocols.

3.2.2.1 General Procedure for Requesting Aerial Means

Request for Heavy Amphibian Aerial Means through Civil Protection Mechanism of the European Union:

The entity with responsibilities on forest fires suppression in the country or region which request for support, shall submit the application in the Common Emergency Communications and Information System (CECIS) of Emergency Response Coordination Centre (ERCC), the main operational tool of the EU Civil Protection Mechanism, after duly authorized by the political authority. Moreover, EU Civil Protection Mechanism has the faculty to activate, after a Country's request, the European Emergency Response Capacity (EERC, or 'voluntary pool').

Request of Heavy Amphibian Aerial Means through Bilateral Cooperation Protocol:

The fire authority asking for support have to send the specific form (Annex A) to the other administration who can give support. The entity (i.e. institution, agency, etc.) of the country or region requesting for support, shall e-mails or fax the request, after being duly authorized by the political authority.

Independently of the means request modality, the entity responsible of forest fire fighting should give the following indications and tools:

- a) The type and number of requested means;
- b) The estimated operation period;
- c) Indication of the operative base;
- d) Question about the logistical and technical requirements on board of the airplanes and the authorization to the European Forest Fire Officer go on board during the flight,
- e) It shall provide radio equipment compatible with the needs of the receiving country;
- f) Contact Point for the mission;

3.2.2.2 Response procedures

The country or region that makes available the aerial means, informs the entity responsible for forest firefighting in the geographical area that apply the request, following the procedures:

- The information arrives via the CECIS system if the request is made through the Emergency Response Coordination Centre;
- The information arrives via e-mail if the request is made through Bilateral Cooperation Protocol.

The entity responsible for forest firefighting in the geographic area that made the request, accepts or not the offer, developing the following procedures:

- When the offer is through the EU Civil Protection Mechanism, through the CECIS system;

- If the request is made via Bilateral Cooperation Protocol, through telephone and later confirming by e-mail.

If support is accepted, the administration who sends supports have to send all the available operational information about:

- The type of available aerial means;
- Type of fuel the aerial means need;
- Number of crew members and support elements (gender, special needs, etc.);
- Identification and contacts of the European Forest Fire Officer;
- Estimated Time of Departure (ETD) and Estimated Time of Arrival (ETA);
- Start time of operation;
- Scooping points;
- Area of operation;
- Operating time prediction;
- Aircraft refuelling interval;
- End time of operation.

The communication by fax or e-mail should also contain the coordination radio frequency and air/air communications frequency.

There should be a list of scooping locations, within the border zone and in nearby areas, distinguishing their availability according to the type of aircraft.

There should also be a list of airbases, airfields or other landing sites, according to the type of aircraft, which can be used for refueling, parking or in case of need.

3.2.2.3 Logistics for the reception of aerial means

The responsible authorities of the receiving country/geographical area shall:

Make available an airport infrastructure, for the reception and base of the aerial means. The infrastructure must have the following conditions:

- a) Rest and mission preparation room for pilots and their team;
- b) Place for meals;
- c) Possibility of accommodation in conjunction with European Forest Fire Officer (EUFO);

Develop the Welcome Guide;

Prepare a summary presentation to be made at the initial briefing by the POC, with crews upon their arrival, and related with the local operational organization, aerial means used in the suppression organization and country situation point;

Guarantee car(s) characterized for displacement of the EUFO and support team;

Ensure life insurance for the site support team (mission insurance/flight insurance/suppression insurance, as appropriate);

To guarantee car renting for the transport of aircraft crews, aircraft support elements and their luggage;

The accommodations per person involved have to be planned, including meals.

In order to establish a temporary **CMA** for the ongoing mission, the team nominated by the recipient country must be equipped with the following equipment:

- At least one portable computer properly configured for:
 - Multifunction printer;
 - Internet access board;
 - E-mail (own account);
 - Google Earth with scooping sites and other relevant digital information (KMZ);
- Internet access cards (different networks);
- Multifunction printers (with 01 set of backup cartridges);
- GSM phones (different networks);
- Satellite phone;
- Radio equipment of the receiving Country Communication System;
- One cartography kit by airplane with scooping locations;
- Plastified cartography kit for the CMA with the scooping sites;
- List of important telephone contacts for the entire Operation (tower, operations, EUFO, fire service, meteorology, police unit);
- Digital camera with charger;
- All current consumer supplies required.

The chief of the detachment must receive the Operational Situation Point.

3.3 Operations Command

The operations theatre organization is fundamental for the success of the operation and for the rapid suppression of the fire. Thus in all joint operations, there will be a single command assigned according to the following criteria:

- a) When the fire develops exclusively in the territory of one signatory, the operation command will be the responsibility of the affected part, being necessary the presence of a local European Forest Fire Officer that makes the connection between the incident command post with the external support forces;

- b) When a fire affects the territory of more than one signatory, there must be a shared operation command, with an incident command post in each of the parts, and a European Forest Fire Officer of each of the signatories must be present in the incident command post of the other, to make the connection between the operations that are carried out on each side of the border.

The fire fighting means of each of the signatories work integrated in the strategic plan of action defined by the incident command post, but always on the direct orders of its natural commands.

When the fire affects both parts of the border and has been considered in mop up and the situation justify that, each signatory shall ensure in its own territory the mop up and surveillance operations with the means it deems appropriate.

None of the means, independent of their origin and geographical area in which they are working, may leave without having been duly authorized by the incident command post responsible for the joint action.

3.4 European Forest Fire Officer

In the context of cross-border cooperation, the European Forest Fire Officers (EUFOs; local and foreign) should have a very important role to ensure the integration, articulation and communication with the suppression or sustaining forces involved in the operation.

EUFOs also have the role to guarantee the articulation between all the entities involved in the operation, ensuring all the necessary requirements for the joint operation of these forces.

The European Forest Fire Officers shall speak fluently English and/or the language of the cross-border support forces and make the connection among the terrain and the Incident Command Post, with respect to the tactical commitment of those means and their mission on the fire.

When there is a command post on each side of the border, there should be a European Forest Fire Officer of each of the countries, whose mission is to receive and to share information about the fire progression, the actions taken, the forecasts of its evolution, possibility of sharing resources and carrying out joint operations.

The foreign European Forest Fire Officer regularly informs the authorities of the country of origin about updates on the fire, work in progress and possible needs.

When accompanying a force from his country that is dispatched to operate in the other country, the European Forest Fire Officer ensures communication between their forces and the other country's command post through its counterpart, i.e. the local EUFO.

The local European Forest Fire Officer can assure the reception of the external forces and guide them to the operations theatre, where they will operate, being permanently with them until their demobilization.

3.5 Contacts

A list of contacts of agencies and persons in charge to be involved in case of supporting request should be prepared and shared between countries. These contacts should be included in a list distributed in each country (See Annex D).

In addition, there should be a list of contacts of the agencies and persons in charge on each border area/region, in order to facilitate contact at a tactical level.

3.6 Communications

Problems related to communications in cross-border forest fires are mainly related to communications systems, communications equipment, communication procedures, language barriers and terminology.

The compatibility of the two countries' communications systems and the radio equipment used as system terminals should be assessed. If it is possible to establish communications with the system used in the other country, the frequencies of work to be used in joint operations should be defined, both for ground means and for aerial means.

In the absence of compatibility between systems there must be, at least, radio equipment from the other country in each operations centre of the border area to guarantee the communications by that channel. There should be radio portable equipment from the other country that will be assigned to the European Forest Fire Officer dispatched to the fire to take over the Operations Command.

Regular communications between operations centres should be maintained to keep contact and verify that systems remain operational.

Telephone communications, by e-mail and via fax, must be considered, according to the information procedures defined between the countries.

Mobile phones should be used as a redundant communications system or in cases where radio communication is not possible. Anyway, under a general perspective, mobile phones cannot be considered as a proper and sufficient communication method, due to the possible scarce signal coverage in forest areas and the low performances in terms of speed of communications. Generally, all fire fighters' teams are equipped with radio devices. It is important to inform all the parties involved about the dedicated radio channel in the operational area.

Multilingual documentation may be a very useful tool for facilitating communications, including a glossary on terminology frequently used in forest fire fighting operations, as well as forms for sharing operational information in different languages. Regarding glossary, a detailed one will be prepared in the framework of MEFISTO project (D_C.1 – *Forest fires multilingual glossary*) and it will be published and freely available.

3.7 Maps sharing

An assessment of the cartography (maps) used in each country at the forest fire fighting operations should be carried out. Similarly, GIS should be identified to assess whether they are similar or compatible.

There should be an exchange of cartographic information between countries with location of water points, hydrants, defenses, runways, etc.

Each country should ensure that it has up-to-date maps of the border region, including the geographic area of the other country where intervention under the protocol may take place.

A very important aspect to be taken into account is the forest road network. The availability of a detailed map of forest road network would be one of the best tool to operate efficiently in forest fire fighting. Aiming at efficient cross-border collaboration, the availability of information on forest road network is fundamental for a rational and efficient dislocation of operative resources. In this context, it may be an important added value the application of results and methodologies developed in the FORCIP+ project (www.forcip.eu), financed by DG ECHO. The availability of a complete and detailed map of forest road networks in fire-prone areas, together with the related public database, would be very useful in improving efficiency in cross-border collaborations.

3.8 Interoperability of equipment's

Even though it should be avoided the combination of resources from different countries in the same maneuver, it may happen that efficiency and effectiveness of suppression activities are reduced due to differences in equipment and tools used in each country.

The lack of interoperability of the equipment used in forest fire fighting may place constraints on join operations involving resources (vehicles and equipment) of two or more countries. The main reason for this problem is the lack of standardization of some pieces of equipment at European level. The lack of familiarity with other country resources is also an issue. In order to minimize the problem of water supply, there must be a sharing of connections allowing the use of hydrants in the other country. Annex E provide information and images of the connections used in each country.

4. Mutual Cooperation

4.1 Preparing activities

The organisation of technical meetings before the beginning of the fire season is fundamental for sharing useful information on the operative arrangements of each country for that year, namely the identification of the entities involved and the fire fighting resources available in each country.

It is important to share information on different types of existing resources on both countries and their operational capability for the different missions. This information should be included in documents that are shared between countries.

Another important topic of these meetings should be the sharing of contacts between the different entities and operational persons in charge of each border area or region.

Preparation activities should also include other issues related to:

- a) Definition of an annual training or updating programs for European Forest Fire Officers, from both countries, addressing the mutual assistance procedures, organization and operational command procedures of each country, communications systems, among others.
- b) Definition of an annual join exercise program that allows training at different levels:
 - Operational procedures;
 - Communication systems and procedures;
 - Coordination of aerial means;
 - Coordination of means on the ground;
 - Command post.

These exercises should be planned at national level but conducted at the local/regional level of each border area.

4.2 Evaluation activities

It is essential to conduct evaluation meetings, after each fire season, to identify lessons learned based on the study of concrete cases, that is, the analysis of cross-border forest fires that occurred in that year.

The lessons learned should serve as input in a process of continuous improvement, contributing to the improvement of future response of all stakeholders.

The result of these evaluations should be translated into concrete proposals addressed to those responsible, depending on the level of responsibility: political, operational or both.

5. Conclusions

The improvement of frequency and effectiveness in collaboration among fire-prone countries may play a key role for reducing the economic, environmental and social impacts of forest fires, especially under a changing climate. For moving towards this goal, it is very important to define a set of procedures able to facilitate and speed up the initial dispatch of means, as well as the reinforcement of means in fire operations theaters. This is especially important in fire-prone areas - formally separated by boundaries, but continuous in terms of fuel and from an operational point of view - where fires may increase their intensity and rate of spread due to a late intervention with suitable resources.

In this document a set of procedures and forms are defined. These procedure and forms may be useful as master lines to facilitate international collaboration, but they should be adapted to the reality of each geographical area.

ANNEX A



Annex A - Request Form to Forest Fire Suppression Support Means

Request Date: ____/____/____

Request Hour ____:____

Requesting			
Organization: _____			
Person who authorizes the request: _____		Adjutancy: _____	
Phone Number: _____	Fax: _____	E-Mail: _____	
Fire Localization			
Country: _____		Municipality: _____	
District: _____		Place: _____	
There are other large active fires? <input type="checkbox"/> Yes <input type="checkbox"/> No		Geographic Coordinates	
Starting Date: ____/____/____ at ____ hrs		Datum WGS84:	
		N ____° ____' ____"	
		W ____° ____' ____"	
Fire Characteristics			
Fire Size at Request Time	People and assets under threat	Fire Type	Slope
≤ than 25 hectares	Populations	Surface/creep.	Flat
26-100 hectares	Infrastructure	Smouldering	Rough
100-500 hectares	Natural Parks / Protected Areas	Running	Steep
≥ than 500 hectares	Forest settlements	Torching	Canyon ridge
	Other? <u>describe</u>	Crowning	Other:
		Spotting	
Number of Committed Means		Number of Requested Means	
Amphibian Airplane (5500L)	<input type="text"/>	Amphibian Airplane (5500L)	<input type="text"/>
Land Replenishment Airplane (3100L)	<input type="text"/>	Land Replenishment Airplane (3100L)	<input type="text"/>
Heavy Bomber Helicopter (4500L)	<input type="text"/>	Helicopter	<input type="text"/>
Medium Bomber Helicopter (2500L)	<input type="text"/>	Helitransported brigade Type B	<input type="text"/>
Light Bomber Helicopter (1500L)	<input type="text"/>	Helitransported brigade Type A	<input type="text"/>
Combat Engines	<input type="text"/>	Fire Company	<input type="text"/>
Bulldozer	<input type="text"/>	Combat Group	<input type="text"/>
Intervention Teams	<input type="text"/>	Fire Brigade	<input type="text"/>
Meeting point			
Aerial Means		Terrain Means	
Contact Person: _____		Contact Person: _____	
Contact Frequency: _____		Contact Frequency: _____	
Geographic Coordinates	N ____° ____' ____"	Geographic Coordinates	N ____° ____' ____"
WGS84	W ____° ____' ____"	WGS84	W ____° ____' ____"
Fire Update Information			
Incident Commander: _____		Phone: _____	
Liasion Officer: _____		Phone: _____	
Comments: _____		Signature: _____	

ANNEX B



Annex B - Response Form to the Request for Forest Fire Suppression Means

Date: ____/____/____

Hour ____:____

Possibility of support with reinforcement of means:

Yes ☐

No ☐

Fire Localization	
Country: _____ Municipality: _____	Geographic Coordinates
District: _____ Place: _____	Datum WGS84:
	N 0 ' ''
	W 0 ' ''

Dispatched Means						
Aerial Means						
Radio Frequency Used to First Contact: _____						
Airplane Type	Registration	Origin Base	Airplane Commander	Mobile Phone	Fuel Type	Water Capacity
AA - Amphibian Airplane (5500L); LRA - Land Replenishment Airplane (3100L); HBH - Heavy Bomber Helicopter (4500L); MBH - Medium Bomber Helicopter (2500L); LBH - Light Bomber Helicopter (1500L).						
Ground Means						
Radio Frequency Used to First Contact: _____						
Means Type	Registration	Origin Base	Responsible Person	Mobile Phone	Fuel Type	Water Capacity
IT - Intervention Team (5 elements and 1 combat engine); FT - Fire tank (2 elements and 1 tank engine - up to 6000L); FB - Fire Brigade (12 elements and 1 combat engine); CG - Combat Group (26 elements and 6 combat engines); FC - Fire Company (32 elements and 18 combat engines); HETA - Helitransported brigade Type A (17 elements); HETB - Helitransported brigade Type B (9 elements); HTT - Helitransported Team (5 elements); BD - Bulldozer.						

Country sender	
Organization: _____	
Person who authorizes: _____	Adjutancy: _____
Phone Number: _____	Fax: _____ E-Mail: _____
Comments: _____	Signature: _____

ANNEX C



Annex C - Notification of scooping operations

Date: ____/____/____

Hour ____:____

Fire Localization			
Country: _____		Municipality: _____	
District: _____		Place: _____	
		Geographic Coordinates Datum WGS84:	
		N ____° ____' ____"	
		W ____° ____' ____"	

Dispatched Aerial Means			
Primary Radio Frequency Used to First Contact		Secondary Radio Frequency Used to First Contact	
Aerial Means Type	Primary Scooping Coordinates	Secondary Scooping Coordinates	
	N ____° ____' ____"	N ____° ____' ____"	
	W ____° ____' ____"	W ____° ____' ____"	
	N ____° ____' ____"	N ____° ____' ____"	
	W ____° ____' ____"	W ____° ____' ____"	
	N ____° ____' ____"	N ____° ____' ____"	
	W ____° ____' ____"	W ____° ____' ____"	
	N ____° ____' ____"	N ____° ____' ____"	
	W ____° ____' ____"	W ____° ____' ____"	
	N ____° ____' ____"	N ____° ____' ____"	
	W ____° ____' ____"	W ____° ____' ____"	
	N ____° ____' ____"	N ____° ____' ____"	
	W ____° ____' ____"	W ____° ____' ____"	
	N ____° ____' ____"	N ____° ____' ____"	
	W ____° ____' ____"	W ____° ____' ____"	
	N ____° ____' ____"	N ____° ____' ____"	
	W ____° ____' ____"	W ____° ____' ____"	

Country sender	
Organization: _____	
Person who authorizes: _____	Adjutancy: _____
Phone Number: _____	Fax: _____ E-Mail: _____
Comments: _____	Signature: _____

ANNEX D – List of contacts

Example:

Contacts of _____ (country) 2018

Responsible Authority

Name:

E-mail:

Telephone:

Fax:

Person in charge

Name:

Position/Function:

E-mail:

Telephone:

Mobile Phone:






Fax:

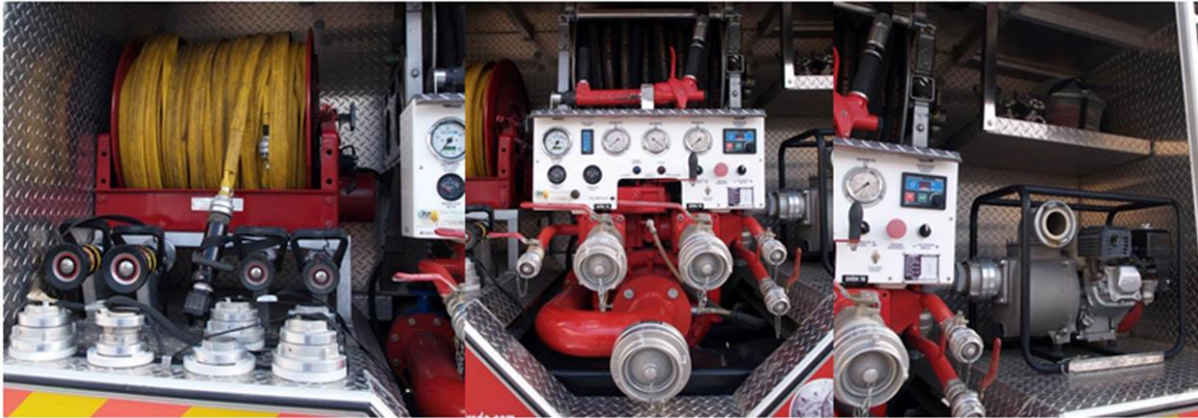
ANNEX E - Type of hose accessories used during suppression activities

Portugal



Type of accessory	Reference	Diameter	Composition	Photo
High pressure hoses	Semi-Rigid DN25	25mm	Not defined	
Low Pressure Hoses – Flexible Hoses	Flexible DN25 Storz C, DN38 Storz C e D, DN70	25mm, 38mm, 70mm	Not defined	
Water pump exit	DN25 Storz D e DN45 Storz C with blind cap. DN70 Storz B	25mm, 45mm, 70mm	Aluminium	
Low pressure connectors	Storz B, C, D	25mm, 45mm, 70mm	Stamping and machining aluminium	
High pressure couplings	Male-Female thread	25mm	Inox steel	
Low pressure nozzles	Connection Storz C	25mm, 45mm	Not defined	

Switcher	Storz tipo CxDxD Storz tipo BxCxC;	45x25x25m m 70x45x45m m	Stamping and machining aluminium	
Reducer	Storz CxD Storz BxC;	70x45mm 45x25mm	Stamping and machining aluminium	
Threaded Adapters	DN45 SI/Storz C	45mm	Stamping and machining aluminium	
Storz C and D Key	Not defined	70mm 45mm	Steel	
Pouch	Transport two hauls of Flexible Hoses DN25	Not Defined	Leather	



Pictures from Portugal Couplings



Portugal Threaded Adapters



Portugal Low Pressure Hoses – Flexible Hoses

Italy

Hydrant/hose connectors UNI 804-2007



UNI	WHEIGHT (kg)	THRHAD ISO
25	0.25	M 34x3
45	0.9	M 56x4
70	2.2	M 85x6

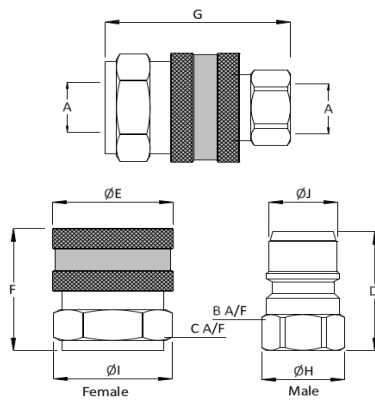


VF connectors

VVF	WHEIGHT (kg)	THRHAD ISO
45	0.48	M 56x4
70	1.65	M 85x6
100	5.2	M 115x6



Faster light and medium vehicles connectors ISO 7241-1 A series



Thread size	A	ØE	Max Working Pressure (Bar)	Burst Pressure coupled (Bar)
inch	3/8"	1/2"		
mm	10	15	350	1300

Spain

“Racor Barcelona”:

Is a type of coupling. In Spain is standardized under UNE 23.400.

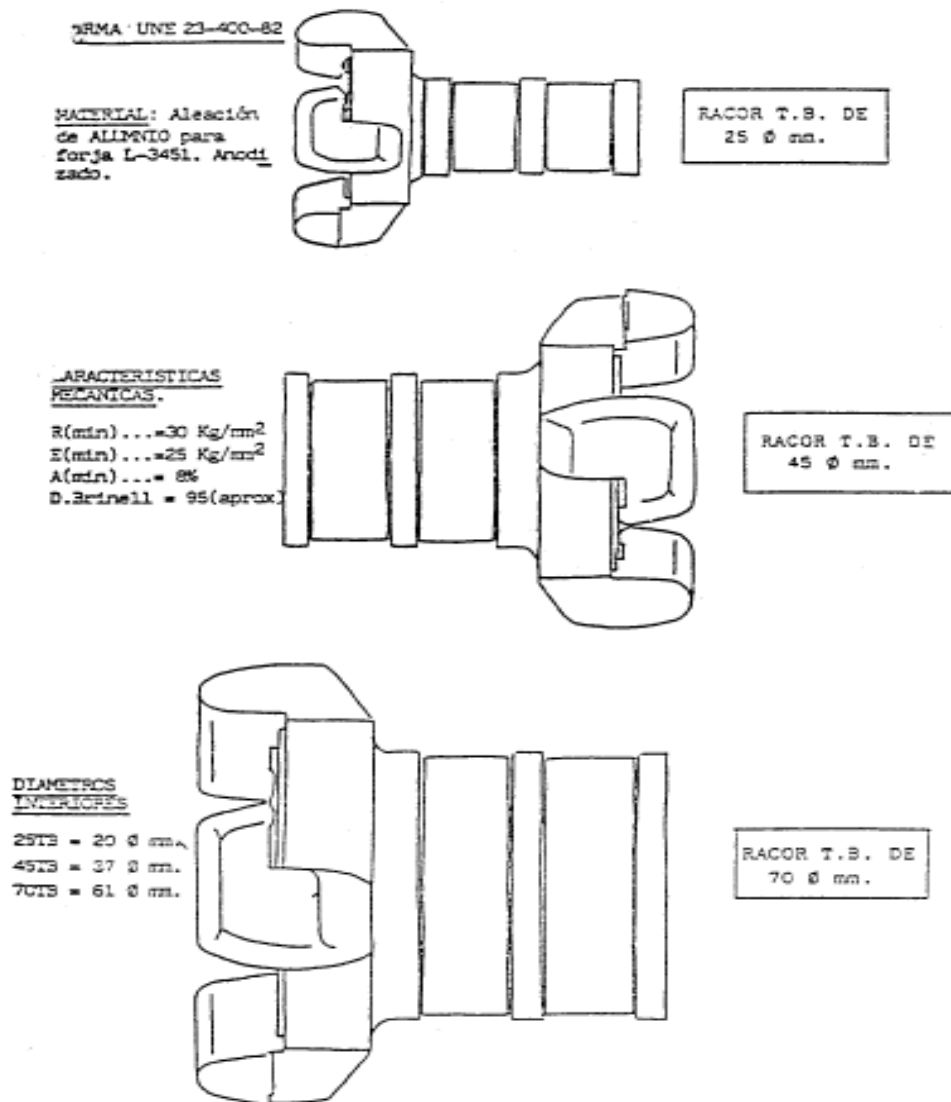
They are suitable couplings for fire systems, firefighters and other applications.

Characteristics:

Material: stamped aluminum, cast aluminum or injected aluminum

Measurements: 25 mm, 45 mm, 70 mm

Types: female, male, hose, plug and reducer



UNE 23400

RACORES



MATERIAL	ALUMINIO ESTAMPADO
	ALUMINIO FUNDIDO
	ALUMINIO INYECTADO
FABRICACION	FUNDICION, MECANIZADO
EMBALAJE	1 UNIDAD

TIPO	MEDIDAS
ROSCA MACHO	25 mm 45 mm. 70 mm.
ROSCA HEMBRA	25 mm 45 mm. 70 mm.
MANGUERA	25 mm 45 mm. 70 mm.
TAPON	25 mm 45 mm. 70 mm.
REDUCCIONES	25 mm 45 mm. 70 mm.



ROJO 21, S.L.

Tfno.: +34 945 892370

Fax: +34 945 890962

Mail: rojo21@rojo21.com

France

Characteristic for the French connectors for hoses

Dimensions: DN 20 to DN 150

Connection: female, male and ringed

Minimum temperature: - 10°C

Maximum temperature: + 80°C

Maximum pressure: 16 Bars

Characteristic: aluminum fittings

Comply with the standard NF-E 29572



Connector DN 40



Connector DN 65

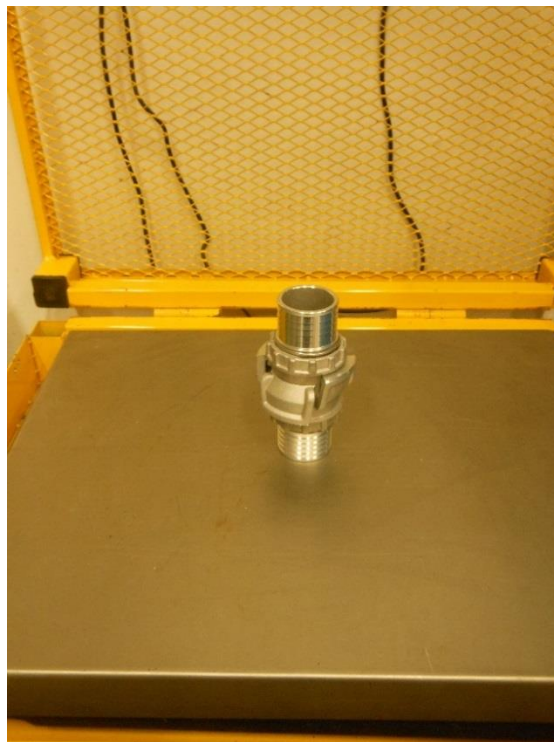


Hoses of different diameters: DN 23, DN 45, DN 70, DN 110

Pictures of connectors:



Ringed GFR 20 mm



Raccord Delieuvin Spécial Paris : DSP 40 mm



Raccord Delieuvain Spécial Paris : DSP 65 mm



Raccord Aspiration Refoulement : AR 100 mm



Raccord Guillemin : 150 mm