

COST Action CA18120

Reliable roadmap for certification of bonded primary structures

Certbond meetings

General Meeting

WG Meetings

MC Meeting

24-25 May 2022

Patras, Greece

Practical Information Guide Technical Programme

(v2022.05.12)

Table of Contents

ABOUT COST	3
COST ACTION CA18120	4
ACTION MANAGEMENT COMMITTEE	5
ACTION WORKING GROUPS.....	6
AGENDA (TENTATIVE)	7
ABOUT PATRAS.....	8
VENUE	9
MEALS & ACCOMMODATION	14

About COST

The European Cooperation in Science and Technology (COST) is a funding organisation for the creation of research networks, called COST Actions. These networks offer an open space for collaboration among scientists across Europe (and beyond) and thereby give impetus to research advancements and innovation.



COST is bottom up, this means that researchers can create a network – based on their own research interests and ideas – by submitting a proposal to the COST Open Call. The proposal can be in any science field. COST Actions are highly interdisciplinary and open. It is possible to join ongoing Actions, which therefore keep expanding over the funding period of four years. They are multi-stakeholder, often involving the private sector, policymakers as well as civil society.

Since 1971, COST receives EU funding under the various research and innovation framework programmes, such as Horizon 2020.

COST funding intends to complement national research funds, as they are exclusively dedicated to cover collaboration activities, such as workshops, conferences, working group meetings, training schools, short-term scientific missions, and dissemination and communication activities. For more information, please go to the Funding section of the COST website (<https://www.cost.eu/>).

The COST Association places emphasis on actively involving researchers from less research-intensive COST Countries (Inclusiveness Target Countries, ITC¹). Researchers from Near Neighbour Countries and International Partner Countries can also take part in COST Actions, based on mutual benefit. For more information, please visit the global networking page (<https://www.cost.eu/>).

¹ Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Macedonia, Hungary, Latvia, Lithuania, Luxembourg, Malta, Montenegro, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Turkey

COST Action CA18120

With the increasing pressure to meet unprecedented levels of eco-efficiency, aircraft industry aims for superlight structures and towards this aim, composites are replacing the conventional Aluminium. The same trend is being followed by civil, automotive, wind energy, naval and offshore industry, in which the combination (or replacement) of steel with composites can increase the strength-to-weight ratio. However, the joining design is not following this transition. Currently, composites are being assembled using fasteners. This represents a huge weight penalty for composites, since holes cut through the load carrying fibres and destroy the load path.

Adhesive bonding is the most promising joining technology in terms of weight and performance. However, its lack of acceptance is limiting its application to secondary structures, whose failure is not detrimental for the structural safety. In primary (critical-load-bearing) structures, fasteners are always included along bondlines, as “back-up” in case the bond fails. The main reasons for this lack of acceptance are the limited knowledge of their key manufacturing parameters, non-destructive inspection techniques, damage tolerance methodology and reliable diagnosis and prognosis of their structural integrity.

The Action aims to deliver a reliable roadmap for enabling certification of primary bonded composite structures. Despite the motivation being aircraft structures, which is believed to have the most demanding certification, it will directly involve other application fields in which similar needs are required. This Action will tackle the scientific challenges in the different stages of the life-cycle of a bonded structure through the synergy of multi-disciplinary fields and knowledge transfer.

General information

Start of Action: 04/04/2019

End of Action: 03/04/2023

Main Contacts

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Domain website: <https://www.cost.eu/actions/CA18120>

Action Management Committee

Action Chair	Sofia TEIXEIRA DE FREITAS
Action Vice Chair	Anastasios P. VASSILOPOULOS
WG 1 - Adhesive and interface chemistry	Ana MARQUES (ana.marques@tecnico.ulisboa.pt)
WG 2 - Design phase	Konstantinos TSERPES (kitserpes@upatras.gr)
WG 3 - Manufacturing phase	Nicolas CUVILLIER (nicolas.cuvillier@safrangroup.com)
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WG 5 - Disassembly phase	Laurent BERTHE (laurent.berthe@ensam.eu)
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Training Schools Coordinator	Chiara BEDON (chiara.bedon@dia.units.it)
Database Coordinator	Michal BUDZIK (mibu@eng.au.dk)

Action Working Groups

<p>WG 1 - Adhesive and interface chemistry Leader: Ana MARQUES Vice-leader: Åsa LUNDEVALL</p> <ul style="list-style-type: none"> • Evaluate current common practice in industry: adhesive chemistries and surface treatment processes for bonded joints. • Collect the requirements and needs of the stakeholders and certification agencies, in terms of regulations (REACH). • Propose novel non-toxic and environmentally friendly surface treatment processes and adhesive chemistries. • Evaluate the quality of the new proposed eco-friendly solutions. 	<p>WG 2 - Design phase Leader: Konstantinos TSERPES Vice-leader: Norbert BLANCO</p> <ul style="list-style-type: none"> • Explore new design concepts (geometrical configurations and new crack arresting design features). • Compare testing procedures for bondline characterization and models validation (under static, fatigue and impact loading, creep phenomena, imperfect bonding and environmental effects). • Evaluate different design methodologies for the structural behaviour and progressive damage analysis of adhesively bonded structures.
<p>WG 3 - Manufacturing phase Leader: Nicolas CUVILLIER Vice-leader: Rūta RIMAŠAUSKIENĖ</p> <ul style="list-style-type: none"> • Specify and select the key-parameters that influence the manufacturing process on an industrial scale. • Evaluate destructive and non-destructive testing for quality control of manufacturing process. • Propose novel embedded sensing solutions for the evaluation of adhesion strength. • Evaluate of the effect of different manufacturing defects on the bondline performance. 	<p>WG 4 - In-service life phase Leader: Wieslaw OSTACHOWICZ Vice-leader: Theodoros LOUTAS</p> <ul style="list-style-type: none"> • Propose diagnostic tools for the structural integrity assessment of the bonded structure. • Propose prognostic tools for the remaining useful life of the bonded structure. • Develop guidelines towards bonded repairs application.
<p>WG 5 - Disassembly phase Leader: Laurent BERTHE</p> <ul style="list-style-type: none"> • Description of the state-of-the-art about disassembly technologies. • Evaluation of the technologies and selection of the most promising technology. 	<p>WG 6 - Certification Leader: Thomas KRUSE-STRACK Vice-leader: Ranko PETKOVIC</p> <ul style="list-style-type: none"> • Define common nomenclature for all WG's activities and deliverables. • Integrate the outcomes and build the roadmap. • Establish contact with relevant certification bodies and large industry manufacturers in naval, civil, offshore, automotive and wind energy and disseminate the progress of the Action and the roadmap.

Agenda

24 May 2022		
10:00	Welcome, aim meeting & general project overview	Chair
10:05	Presentations of selected STSMs'	Lucas Adamos Damjan Klobcar Nicola Perkovic Aleksija Djuric Rosemere Lima Maria Teresa Romero
11:20	Coffee break	--
11:35	Presentation invited speaker	Maxim Olive (RESCOLL)
12:20	Wrap-up & closure of day 1	Chair
12:30	Lunch	
14:00	Visit to the Laboratory	K. Tserpes – Host
16:00	Core Group Meeting	Restricted to CG members
20:00	Diner @ Ναύτ-οικο (+30 261 099 5992) https://goo.gl/maps/QVfLtPSdWassiRYy7	

25 May 2022		
09:00	Welcome & aim of the day	Vice-Chair
09:10	Parallel WG meetings (5 or 6 parallel meetings)	WG Leaders
10:40	Coffee Break	
11:00	Continuation WG meetings (5 or 6 parallel)	WG Leaders
12:30	Lunch Break	
14:00	Outcome WG meetings (plenary) (10 min each)	WG Leaders
15:00	Wrap-up	Chair
15:15	Drinks	
15:30	MC meeting	Chair
17:00	Closure of MC meeting	Chair

About Patras

Patras is the **third largest city of Greece**, after Athens and Thessaloniki. It is the capital of the Prefecture of Achaia on the Peloponnese and the western gateway into the country as it receives plenty of ferry connections from Italy. The city is built at the foothills of Mount Panachaikon in an area which combines the seaside together with a mountainous landscape. **Patras is a student city** as it is home to the fourth largest - **University of Patras** - and second largest (Hellenic Open University) universities of Greece. It is the home city of the School of Engineering of the University of the Peloponnese. Patras is a city that offers numerous cultural options and entertainment as well as a wide variety of historic sites (mostly Olympia and Delphi) and is certainly worth exploring.



Venue

Conference and Cultural Centre of the University of Patras

University of Patras – Department of Mechanical Engineering and Aeronautics

Panepistimioupolis Rion

26500 Patras

GREECE

LOCAL HOST (contact details): Konstantinos TSERPES (kitserpes@upatras.gr)

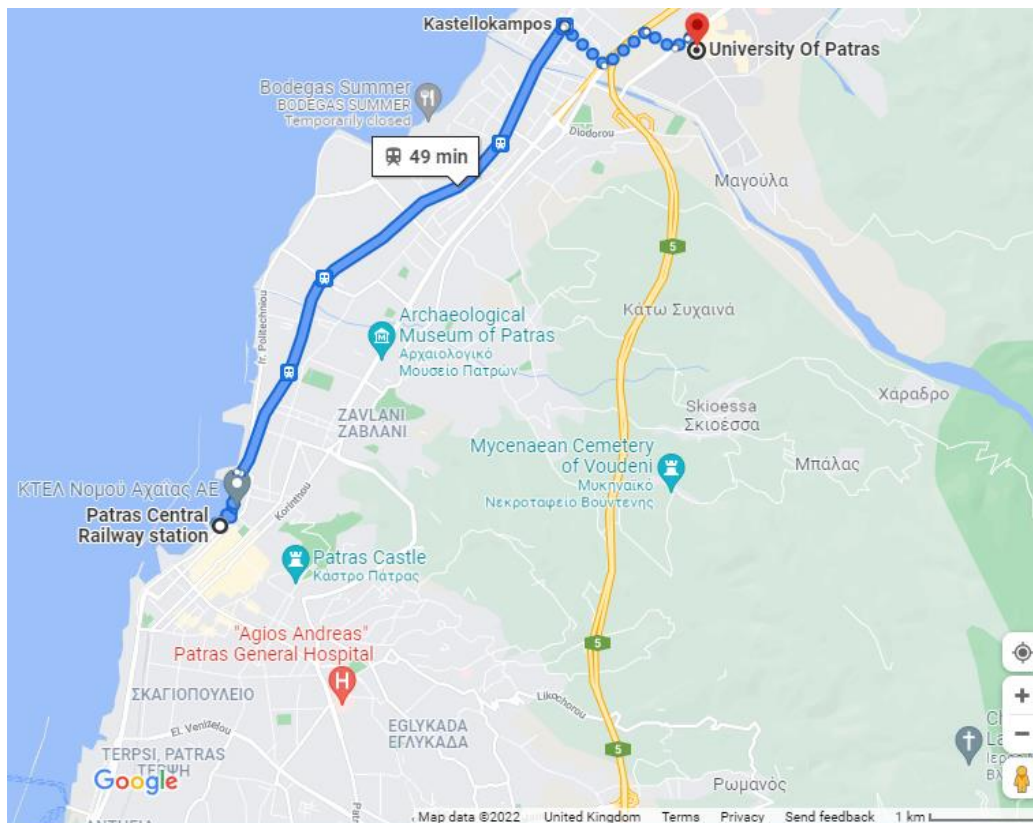


UNIVERSITY OF
PATRAS
ΠΑΝΕΠΙΣΤΗΜΙΟ ΠΑΤΡΩΝ



How to reach the Venue from the Patras train station

The venue can be easily reached by using public transportation. From the main suburban railway of Patras: Train from Patras to Kastelokampos and then immediate connection with bus line to University. ([ΔΡΟΜΟΛΟΓΙΑ-Κ.ΑΧΑΙΑ-Α.ΑΝΔΡΕΑΣ-ΠΑΤΡΑ-ΡΙΟ-ΓΙΑ-ΕΠΙΒΑΤΕΣ-17.05.2021 -final 2-1.pdf \(trainose.gr\)](#)), ([Χάρτης-Προαστιακής Γραμμής Πάτρας-new-v6.pages \(trainose.gr\)](#))



(Patras Central Railway station to University Of Patras - Google Maps)

How to reach Patras

You can reach Patras from abroad by plane via Athens International Airport.

Athens International Airport

Athens International Airport (www.aia.gr) is the best solution for reaching Greece / Patras from abroad, as there are regular flights from all over Europe and overseas. The distance from Athens airport to Patras is 230 km. There are four ways to reach Patras from Athens International Airport: **a) by bus, b) by combination of train and bus, c) by car rental and d) by taxi.**

A) BUS

The first option is to get on a bus from **Kifisos Bus Station** (KTEL), which is the main bus station in Athens. There are buses to Patras approximately every thirty minutes and the journey duration is 2.5 hours (Express Buses) and 3 hours (Normal Buses). An approximate price for one-way trip is 20 EURO (return ticket can also be purchased).

<u>Athens to Patras</u> Express Buses - Daily Timetable	<u>Athens to Patras</u> Normal Buses - Daily Timetable
10.30	05.30
14.30	07.00
16.30	08.00
19.30	09.00
	10.00
	11.00
	12.00
	13.00
	14.00
	15.00
	16.00
	17.00
	18.00
	19.00
	20.15
	21.30

Telephone Number for reservations: 0030 210 5147310

Site: www.ktelachaias.gr

There are two alternatives to reach **Kifisos Bus Station** (KTEL) from Athens International Airport. Firstly, is to take a taxi and go directly to Kifisos Bus Station (KTEL), the taxi will cost you about 45-50 EURO. Secondly, is to use the bus number **X93** which will take you directly to Kifisos Bus Station (KTEL) and will cost you 6,00 EURO (you can buy the ticket from the driver of the bus). There are frequent services from Athens International Airport, approximately every 30-40 minutes. More information can be found at www.athensairportbus.com.

B) TRAIN AND BUS COMBINATION

In this option you will have to take the suburban railway (Proastiakos) from Athens airport to Kiato (distance about 120 km and duration: 1h30) and then the direct connection by bus from Kiato to Patras (duration: 1h30). The timetables below will help you in order to reduce the waiting time between arrivals and departures.

From Athens Airport to Patras

Airport -> Athens metro/ Piraeus -> Kiato -> Patras						
Airport departure	Doukissis Plakentias (Connection to the Athens metro)	Piraeus arrival	Piraeus departure	Kiato arrival	Kiato departure	Patras arrival
05:52	06:10		06:17	07:55	08:30	10:00
06:09	06:27	07:09	07:17	08:55	10:30	12:10
06:52	07:10		08:17	09:55	12:30	14:00
07:09	07:27	08:09	09:17	10:55	13:30	15:10
07:52	08:10		10:17	11:55	14:30	16:00
08:09	08:27	09:09	11:17	12:55	16:30	18:10
08:52	09:10		12:17	13:55	17:30	19:00
09:09	09:27	10:09	13:17	14:55	18:30	20:10
09:52	10:10		14:17	15:55	19:30	21:00
10:09	10:27	11:09	15:17	16:55	20:30	22:00
10:52	11:10		16:17	17:55		
11:09	11:27	12:09	17:17	18:55		
11:52	12:10		18:17	19:55		
12:09	12:27	13:09	19:17	20:55		
12:52	13:10		20:17	21:55		
13:09	13:27	14:09	21:17	22:55		
13:52	14:10		22:17	23:55		
14:09	14:27	15:09				
14:52	15:10					
15:09	15:27	16:09				
15:52	16:10					
16:09	16:27	17:09				
16:52	17:10					
17:09	17:27	18:09				
17:52	18:10					
18:09	18:27	19:09				
18:52	19:10					
19:09	19:27	20:09				
19:52	20:10					
20:09	20:27	21:09				
20:52	21:10					
21:09	21:27	22:09				
22:09	22:27					
22:50	23:10	23:13				





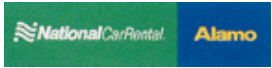

The price for the suburban railway (Proastiakos) is 14 EURO (for one-way trip).

The price for the bus (Kiato-Patras) is 16 EURO (for one-way trip).

C) CAR RENTAL (THE MOST CONVENIENT OPTION)

The third option to get to Patras is to rent a car. You can rent a car at Athens International Airport. The distance is 230 km and it is approximately 2.5-3 hours driving.

Six car rental companies currently operate at Athens International Airport with offices located at the Arrivals level. The car rental area is within walking distance from the Main Terminal Building, located at the northern side of the building.

<u>COMPANY</u>	<u>WEB SITE</u>	<u>TELEPHONE</u>
	http://www.avis.gr	(+30) 210 3530578-9 & 210 3531432
	http://www.budget.gr	(+30) 210 3530553-5
	http://www.europcar-greece.gr	(+30) 210 9735000
	http://www.hertz.gr	(+30) 210 3534900
	http://www.nationalcar.gr	(+30) 210 3533323-4 & 210 3533354
	http://www.sixt.gr/en/	(+30) 210 3530576 & 210 3530556

D) TAXI

Final option in order to get to Patras is to take a taxi from Athens International Airport directly to Patras. This option is the most expensive, as the one-way cost is about 250 EURO.

Meals & Accommodation

Meals & coffee breaks

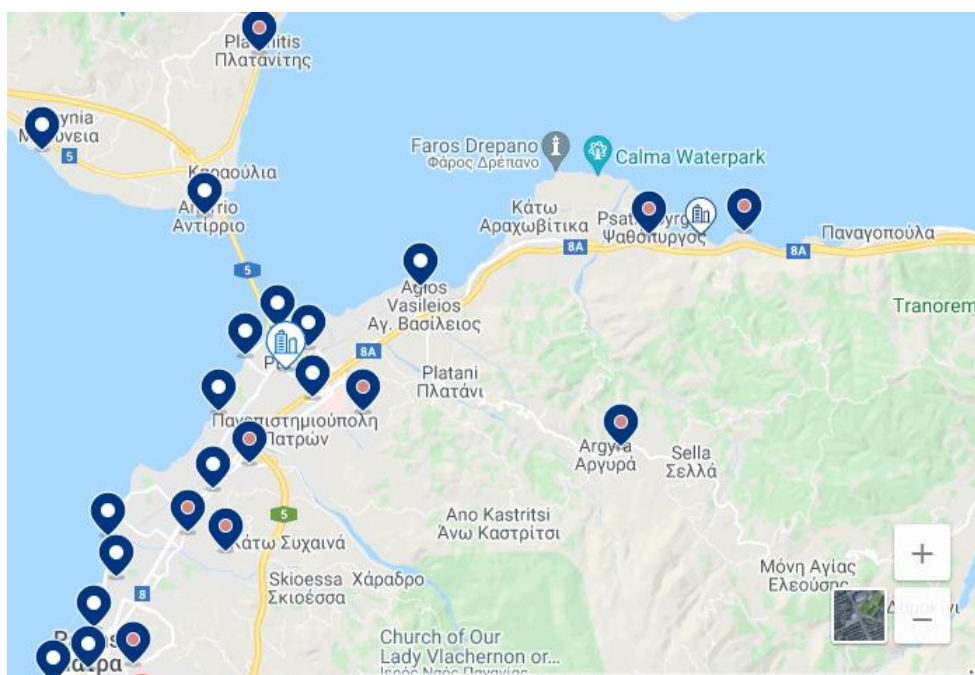
Lunches, drinks and coffee breaks will be provided by the local organiser.

Note: if you have any restrictions (e.g. any dietary preferences and/or allergies), please take care of these details when filling the online form.

Accommodation

The University Campus is located in the area of Rio.

Accordingly, the venue is well connected by public transportation. Several accommodations are conveniently located near the University Campus.



(Booking.com: Hotels in Rio. Book your hotel now!)

For your convenience, you may find underneath a list of suggested hotels for your stay in Patras.

Kallirroe Hotel

Hotel Kallirroe is situated on Old National Athinon-Patras 67 A, at the entrance of the city Patras from the east, close to the University and Regional University Hospital of Rio. Kallirroe Hotel was completely renovated and refurbished in 2007, aiming at providing all high standard comforts at its customers. Hotel offers 34 rooms with a total capacity of 70 beds. Its rooms are comfortable, modern and tasteful, gaining all our customers trust and acceptance. All its newly refurbished rooms offer all modern comforts, making Kallirroe Hotel a perfect choice, as a stay at the city of Patras is concerned, to both business people but also to vacationers, travelers and families.



Information: info@kallirroehotel.gr, <https://www.kallirroehotel.gr>

Castello Hotel

The full renovated Hotel Castello is located at Rio, 5km away from the center of Patras, really close to the University Hospital and the new Conference and Cultural Center, and only 1km from the Ch. Trikoupi Bridge. Castello opened in 1998 and consists of 37 fully renovated and equipped rooms (mini bar, A/C, TV stereo, etc). All areas are stylish and well-appointed to meet all personal needs and include high technology equipment. Right next to the hotel you can find all kinds of shops that cover all needs of its guests.



Information: castellopatra@gmail.com, <https://www.castellohotel.gr>

Porto Rio Hotel

Porto Rio Hotel spreads in a vast and picturesque area overlooking the sea. Only just 15 minutes away from the city of Patras, it is your ideal choice for your business meetings, your holidays and relaxation time.

Information: info@portoriohotel.gr, <https://www.portoriohotel.gr>



Achaia Beach Hotel

Ideally located, 4km from the city of Patras, with free parking Achaia Beach Bauhaus building on the beach front, offers amazing view at sea of Rion Bridge and the mountains. The hotel, reinvents in a unique way the concept of business through pleasure. For its guests, there is a fitness center and also

a play room for its little guests. The hotel has 85 rooms in 4 floors with exceptional sea and mountain view. The pale shades of white and red and the minimal style of the furniture convey an amazing sense of relaxation. Achaia Beach offers the ideal accommodation for your vacation break or even pause during your business trip.

Information: reservations@airotel.gr,
<https://www.airotel.gr/en/Achaia-Beach-792.htm>



Tzaki Hotel

Tzaki Hotel is located at Proastio, in the suburb of Patras, located in a quiet location, near the sea with breathtaking views and fresh air, one kilometer from the Rio and just four from the city center. In 2003 there was a complete renovation of rooms, restaurant and various conference rooms, adjusting them to modern needs and requirements. The hotel rooms are spacious with modern decoration. Every little detail marks its presence via its aesthetic and functional fibre composing a harmonious, comfortable and hospitable ambience that reflects leisure and high accommodation standards. All its rooms have a balcony with a view to the sea and many of them to the gorgeous Rio – Antirrio Bridge. The restaurant is found in the Hotel's central building and it can accommodate up to 350 people and there is also a bar that is open all day long. The spirit of hospitality, entertainment and service is diffused everywhere. Together with a team of dedicated professionals it is ready to respond immediately to your needs.

Information: htzaki@otenet.gr, <https://www.hoteltzaki.gr>



Galaxy City Center Hotel

Galaxy City Center Hotel, in Patras at 9, Ag. Nikolaou Street is fully renovated, though “hides” a long history, since it first operated in 1970. It soon became a reference point for the city’s high society, while well-known personalities would choose it as the place to stay. Today, four decades later, the hotel has passed from generation to generation and has been fully renovated to meet the requirements of the modern traveler.

Information: info@galaxyhotel.com.gr, <https://www.galaxyhotel.com.gr>



Moxy Hotel

Located less than a 15 minute walk from the Patra city center, the brand new Moxy Patra Marina combines a smart, fast technological environment with a contemporary living style. The vibrant hotel in Patra embodies the bubbly and engaging lifestyle for which Patra is known. While at the hotel, guests can continue their daily workout routines by visiting its fitness center or swimming in its outdoor pool. Work will also be easy to complete when using its extremely fast WiFi services. When it's time to explore, guests will find themselves at a fantastic starting point for a tour of the Peloponnese, one of the most beautiful mainland regions of Greece.



Information: info@moxypatra.com, <https://www.marriott.com/hotels/travel/gpaox-moxy-patra-marina>

My Way Hotel

Privileged location where the city's heart beats. 'MY WAY - Hotel & Events', is housed in an imposing, renovated and upgraded building in the coastal zone, next to the city center and is an excellent choice of hotel in the urban area of Patras for someone visiting the city for business or leisure. The guests of this five star hotel can enjoy all the comforts they might seek in a warm and welcoming environment. All rooms have air conditioning, plasma TV with satellite channels, a private balcony, a minibar and a fridge. A welcome drink awaits all its guests upon the arrival to make them feel even more welcome. The free wi-fi provided in all areas ensures seamless communication, while meeting rooms provide the right conditions for business meetings. If you want to keep it more casual, the hotels elegantly decorated cozy lobby can host any social or business meeting along with tasty coffee or a glass of wine.



Information: info@mywayhotel.gr, <https://www.mywayhotel.gr>

Astir Patras Hotel

Strategically positioned in the center of Patras, on the quay, right next to the bus and train stations and at an easy walking distance from the Patras port, Astir Patras Hotel, one of the finest Patras Hotels, is the ideal choice for your stay in the city of Patras, whether you are on business or holiday, as it can provide the best Patras accommodation. Surrounded by shops, cafes and buzzing Patras nightlife,

there is always something to see and do. Enjoy the view of Patras Gulf or the Medieval Castle from one of its 120 tastefully decorated rooms in Patras. With an average size of 26 m², these ample Patras rooms are fully equipped with individual air conditioning, mini bar, hair dryer, wireless internet access and T.V. with Pay T.V and satellite channels.

Information: astir@pat.forthnet.gr,
<http://www.hotelastirpatras.gr>



Maison Grecque

In a historical building of city that was completed in 1890, residence of old bourgeois family of city, it was created maison grecque Patras. The characterized as preservable work of art, building, was renovated according to the initial drawings, restoring deteriorations and discomforts of one and henceforth century and was equipped with all the modern systems and infrastructures. Have been observed with conformity and social responsibility all the specifications of environmental care, making maison grecque absolutely friendly with the environment. Each room maison grecque is separate, offering a unique experience of hospitality. Basic element of each room they are impressive roof painting, every a unique work of art. The aesthetic care of hotel has the distinguished Greek interior designer Aggelos Aggelopoylos.

Information: info@mghotels.gr, <https://mghotels.gr>



<https://certbond.eu/>



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