

PROCRAFT PROJECT – NEWSLETTER N°1

NOV 2020 – NOV 2021



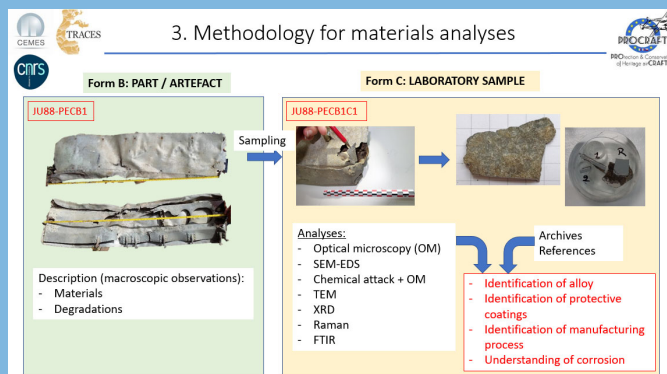
PROtection & Conservation
of Heritage airCRAFT

This project studies WWII aircraft wrecks with the aim of improving knowledge of their materials (Al alloys), determining suitable treatments for them (curative and protective treatments) and methods of preventive conservation.



COMMUNICATION

Meetings: 4 Kick off Meetings (3 video + 1 in Toulouse) + 6 for WP2 + 2 for WP6.
Communications: 2 national conferences, 7 social media posts, 5 Newsletters from Associations
6 Deliverables in 2021 / [Website](#)



WORK PACKAGE 2 – CEMES

Aircraft parts, loaned by the project partners (34 aircraft from 6 different countries) have been analyzed. Alloys and protective coatings have been identified, allowing for a better understanding of the corrosion process.

Cleaning Treatments

• Objects for WP4 – UNIFE / for WP5 – UNIBO / Arc'Antique

Selection of an object with paint residues

Selection of an object with corroded surfaces

Cleaning tests

≠ surfaces: corroded, painted, with concretions or sediments

≠ techniques: mechanical, chemical, gels

Sandblasting (al 130-160 (corroded metal Al))

11/09/2021

WP1 Meeting n°4 - PROCRAFT

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WORK PACKAGE 3 – ARC ANTIQUE

Preliminary testing of cleaning and stabilization treatments on painted and metal surfaces to be conducted. This will be the main task for the Arc'Antique Lab in 2022.

Preliminary tests performed on industrial cutin-based coatings

Cutin is the polymeric matrix of the cuticle that is layer that acts as a barrier for the cell walls of leaves and fruits.

Cutin is a natural polyester consisting of long-chain fatty acids (C16, C18) with alcohol groups linked to each other through ester bonds:

- > Fatty acids (C16, C18): 1-25%
- > O-hydroxy fatty acids (C16, C18) : 1-32%
- > Epoxy -fatty acids (C18) 0-34%
- > Polyhydroxy -fatty acids (C16-C18): 16-92%

Cutin-based polyurethane coatings

Toulouse, 13 September 2021

WORK PACKAGE 4 – UNIFE

The focus in first year was mainly on selecting protective coatings and effective corrosion inhibitors. Initial tests on protective coatings have been performed. The protective effectiveness is evaluated by electrochemical techniques during exposure in artificial acidic rain.

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Role of UNIBO

WP5: protective coating assessment (from M20 to M36)

OBJECTIVES:

- Assessment of protectiveness of innovative coatings developed in WP4 on original substrates through accelerated ageing tests;
- Identification of advantages and limits of innovative protection;
- Comparison between innovative and traditional protective coatings



Preventive conservation for aircraft heritage

- Indoor RH, T and **atmosphere corrosivity** measurement
 - with respect to exposure time and RH 40-50% at T 20-30°C including clean (filtered) air and wet/dry cycles (fluctuations between 40% and 50% RH)
- Pollution level estimation via infiltration or rule of thumb, maximum average concentration allowed (Threshold, pollution dose)
 - moisture content and the presence of chlorides are the most critical indicator for the corrosion of aluminium alloys
- Monitoring the ambient environment with remote data collection and analysis ~ decision support system development



WORK PACKAGE 5 – UNIBO

UNIBO will assess the protectiveness of coatings developed by UNIFE in WP4 through accelerated ageing (WP5). Arc'Antique will take part in WP5 by comparing the performances of the best innovative coating with traditional ones, applying them on real wrecks.

WORK PACKAGE 6 – CTU

Preventive conservation for Exhibition: Monitoring the ambient environment with remote data collection and analysis ~ decision support system development.

5 PARTNERS

This project is led by the **Arc'Antique** laboratory in Nantes (France), in collaboration with the **CEMES** of Toulouse (France), the Universities of Ferrara **UNIFE** and Bologna **UNIBO** in Italy and the Czech Technical University in Prague **CTU**, Czech Republic.

20 THIRD PARTIES

20 third parties including museums, institutes, universities, volunteer associations and conservators are collaborating on this project: **DRASSM** (Marseille, France), **DRAC Pays de Loire** (Nantes, FRANCE), **Toulouse Métropole** (Toulouse, France), **UNIWA** - University of Athens (Athens, Greece), **CIRIMAT-INP** research laboratories (Toulouse, France), **LARA** - Université de Nantes (Nantes, France), **Aeroscopia** (Toulouse, France), **Musée de l'Hydraviation** (Biscarrosse, France), **Musée de l'Air et de l'Espace** (Le Bourget, FRANCE), **Volandia** Museum of Flight (Somma Lombardo, Italy), **Air Club & Fun** (Argelato, Italy), **Museo Storicodell'Areonautica militare** (Bracciano, Italy), **The Military History Institute Prague** (Prague, Czech Republic), **Ailes Anciennes Toulouse** (Toulouse, France), **Aérocherche** (Toulouse, France), **ABSA 39-45** (Châteaubriant, France), **Aeroscope** (Bouguenais, France), **MFC** (Stockholm, Sweden), **Materia Viva** (Toulouse, France), **Aérothèque** (Blagnac, France)