EUREKA PROJECT E!640 - EUROCARE WETDRY-DEP

1. General description

Project	E! 640 - EUROCARE WETDRY-DEP	**Status**	Finished - 07-FEB-1997
Title	**Field Investigations Of Wet And Dry Deposition Of Acidifying Pollutants And Their Effects On Building Materials**		
Class	Sub-Umbrella	**Technological area**	Environment
Start date	01-JUN-1991	**End date**	01-DEC-1996
Duration	66 months	**Total cost**	1.28 Meuro
Partner sought	No		
Summary	Provide Knowledge On The Corrosion Influence Of Wet And Dry Deposited Air Pollutants For Chosen Important Building Materials In Different Positions On Buildings. Stockholm Sites And Nidaros Cathedral (Norway) Are Prime Study Objects		

Budget and duration

Phase	Budget(Meuro)	Duration (Months)
Definition phase	0	12
Implementation phase	0	54
Total	**1.28**	**66**

Member contribution

Member	Contribution	Position	Since
Sweden	**70.00%**	**Notified Finished**	**07-FEB-1997**
Czech Republic	3.00%	Notified Finished	07-FEB-1997
Spain	20.00%	Notified Finished	07-FEB-1997
Norway	7.00%	Notified Finished	07-FEB-1997

Participants

Company	Country	Type	Role
Kth - Royal Institute Of Technology/Materials Technol. Div.	**Sweden**	**Research Institute**	**Main**
Ernstroem Bygg Ab	Sweden	SME	Partner
Centro Nacional De Investigaciones Metalurgicas	Spain	Research Institute	Partner
Svuom Praha A.S.	Czech Republic	Research Institute	Partner
Svenska Staal Tunnplaat Ab	Sweden	Large company	Partner
Sintef - Division Of Metallurgy	Norway	Research Institute	Partner
Riksantikvaren (Central Office Of Historic Monuments/Sites)	Norway	Governm./Nat. Admin.	Partner
Nilu - Norwegian Institute For Air Research	Norway	Research Institute	Partner
Central Board Of National Antiquities	Sweden	Governm./Nat. Admin.	Partner

2. Project outline

Project description

Exterior building materials are affected by static and dynamic loadings and by climatic and environmental degradation factors. The degradation which occurs mostly involves complicated chemical and/or physical processes governed by a great number of weathering factors. In corrosion processes, various air pollutants play an important role. Studies of dose and the response of materials are normally performed at laboratories or through exposure of material samples at exposure stations. Very few investigations of wet and dry deposition of pollutants on exterior building materials with simultaneous studies of materials degradation have been performed.
The project aims at providing knowledge on the corrosion influence of wet and dry deposited air pollutants for chosen important building materials in different positions on buildings. 3-5 buildings in the city of Stockholm and the Nidaros cathedral in NORWAY are the prime study objects. The project part in Stockholm will be designed in a way that permits the study of the influence of pollution from vehicular traffic. The project includes certain adaptation and development of field techniques to measure wet and dry deposited pollutants as well as characterizing the micro environment. Samples of reference materials are exposed at the buildings and at reference exposure stations and possibilities for simultaneous exposure of industrial building materials are offered.

Technological development envisaged

The service life of exterior building materials and components, old as well as new, are affected by the surrounding micro environment. Improved knowledge on the corrosion influence of wet and dry deposited air pollutants on different materials is of great importance in building design, when choosing or developing repair and maintenance remedies, and in the development of laboratory test methods. Very few field investigations of wet and dry deposition of pollutants with simultaneous studies of material degradation have been performed.
The project will consist of two main parts:
1. Adaptation and a certain development of field techniques to measure wet and dry deposited air pollutants on different materials as well as other important parameters describing the micro environment, such as temperature, time of wetness, etc.
2. Field measurements of wet and dry deposited air pollutants on buildings, together with exposure of chosen important materials in different positions on buildings and at reference exposure stations. Possibilities for exposure of industrial building materials are offered.
It is of great importance for the development, protection and maintenance of exterior building materials to improve the knowledge on the influence of wet and dry deposited air pollutants. The present knowledge base is to a greatt extent founded on laboratories studies, while field

investigations on actual buildings have been fairly scarce. The verification and transfer of data gained in laboratory studies to the in-service conditions on buildings is of prime interest in striving to increase the service life of exterior building materials and components.

Markets application and exploitation

The knowledge established in the project is of great importance in the creation of design guidelines and recommendations for repair and maintenance measures for modern buildings as well as for historic monuments and listed buildings. For those materials and surface treatments envisaged, relationships may be established between the surrounding micro environment and the corrosion rate.
A comparison of corrosion rate at exposure stations and at different positions on buildings is of great importance in evaluation the possibilities to use data from field exposure sites in building design and maintenance planning
The data established through the project will give a basis for more realistic calculations of corrosion damage to buildings.
In Europe by National Heritage Trusts, building companies and Real Estate Management Bodies, building material producers, public and private administrations and research programmes.

Project codes

BSI

BA/BK	measurement
BH	physical property measurement
BKK	meteorological measurement
CIL.IC	humidity
DDT/DDU	corrosion
RXH	construction materials

NACE

265	Manufacture of cement, lime and plaster
2710	Manufacture of basic iron and steel and of ferro-alloys (ECSC)
33201	Manufacture of electronic instruments and appliances for measuring, checking, testing, navigating and other purposes, e
7310	Research and experimental development on natural sciences and engineering
9252	Museum activities and preservation of historical sites and buildings

3. Main participant

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Organisation type Research Institute
Participant role Main

Contribution to project

Definition phase share: 25% SWEDISH COUNCIL FOR BUILDING RESEARCH: 45% Swedish contribution: 0.7 MECU.

Expertise

4. Partner

Company **Ernstroem Bygg Ab**
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Contact **Mr. Hans Alstermo**
Technical Manager

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Organisation type SME
Participant role Partner

Contribution to project

Will contribute with expertise on rendering materials and will also produce, characterise and participate in the evaluation of rendering test samples. It also contributes financially to the project.

Expertise

Major Swedish company producing rendering, mortars and grout, materials for these products which also markets facade renovation systems.

4. Partner

Company

Centro Nacional De Investigaciones Metalurgicas
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Contact

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Organisation type Research Institute
Participant role Partner

Contribution to project

Expertise

4. Partner

Company

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Contact	**Mrs. Dagmar Knotkova** Project Manager Tel Fax
Organisation type	Research Institute
Participant role	Partner

Contribution to project

Czech contribution: 0.1 MECU.

Expertise

Former research institute (A. K. AKIMOV - STATE RESEARCH INSTITUTE FOR THE PROTECTION OF MATERIALS) is now an independent private organisation carrying out the following activities: * research * consulting * small production.

4. Partner

Company	**Svenska Staal Tunnplaat Ab** (Not Available), 781 84 Borlaenge Sweden Tel +46 243 700 00 Fax +46 243 849 50
Contact	**Mr. Willy Leijon** Tel Fax
Organisation type	Large company
Participant role	Partner

Contribution to project

Expertise

4. Partner

Company	**Sintef - Division Of Metallurgy** Strindveien, 2 7034 Trondheim Norway Tel +47 73 59 300 Fax +47 73 59 48 89 www.sintef.no
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Organisation type	Research Institute
Participant role	Partner

Contribution to project

Expertise

4. Partner

Company	**Riksantikvaren (Central Office Of Historic Monuments/Sites)** 0034 Oslo Norway Tel +47 22 94 04 00 Fax +47 22 33 29 22
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Organisation type	Governm./Nat. Admin.
Participant role	Partner

Contribution to project

Expertise

4. Partner

Company

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Organisation type Research Institute
Participant role Partner

Contribution to project

Norwegian contribution: 0.086 MECU.

Expertise

4. Partner

Company

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Sweden

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Contact

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Organisation type Governm./Nat. Admin.
Participant role Partner

Contribution to project

Definition Phase share: 20%

Expertise