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PAINT RESEARCH INSTITUTE TNO

The Paint Research Institute TNO is one of the institutes of the Organization for Industrial Research TNO in the Netherlands.

Since the beginning of 1965 the Institute is located in the new TNO buildings 'Zuidpolder', Schoemakerstraat 97, Delft.

The task of the Paint Research Institute is: . . . 'to promote the technical development of enterprises, active in the field of paint and varnish, including those producing, applying, employing or dealing in goods of this kind.'

In the annexed table a survey is given of the materials and techniques investigated and also of the branches of industry served by the Institute.

Its activities are related to production and application of all types of organic surface coatings (paints, lacquers, varnishes) and their raw materials. This work comprises research proper, as well as testing and supply of information.



Between the TNO-buildings 'Zuidpolder'

**Materials
and processes:**

Primary raw materials

a

Natural products:
drying and non-drying oils,
recent and fossile natural
resins

b

Products of chemical
industries:
anorganic chemicals for
manufacture of pigments

organic intermediates
for organic
pigments
binders
solvents
plasticizers
additives

**Branches
of trade and
industry**

Chemical industries:
anorganic
organic
petrochemical
carbochemical
vegetable and animal
oils and fats
fermentation industry

**Raw materials for
manufacture of paints, etc.**

Binders, mostly organic
polymers

solvents (organic)

plasticizers (organic)

pigments (anorganic and
organic)

additives

Factories of
pigments
resins and polymers
derivatives of vegetable
and animals oils and fats
plasticizers
solvents

**Manufacture of ready
mixed paints, etc.**

Cooking of oils, varnishes
and other binders

dispersion of pigments
into binders

mixing of the components
and finishing of the ready
mixed products, adapted
to their end use

Paint Industry,
Manufacturers of machinery
and apparatus for the
paint industry

Application of paint layers

Application ready mixed
paints on different
substrates e.g.

- metals
- wood
- stony materials
- plastics
- textile
- paper
- leather, etc.

by means of application
techniques e.g.

brushing

spraying: e.g.

(- electrostatically

- hot
- airless)

dipping

dipping with electrophoresis
roller-coating, etc.

Painters and Decorators
Finishing Departments of
factories making products
of all different kinds
Industries for timber and
wood furniture,
metal furniture,
hardware, structural steel,
motor vehicles
electrical apparatus
household appliances
dock yards, etc.

**Performance of paint layers
applied on substrates**

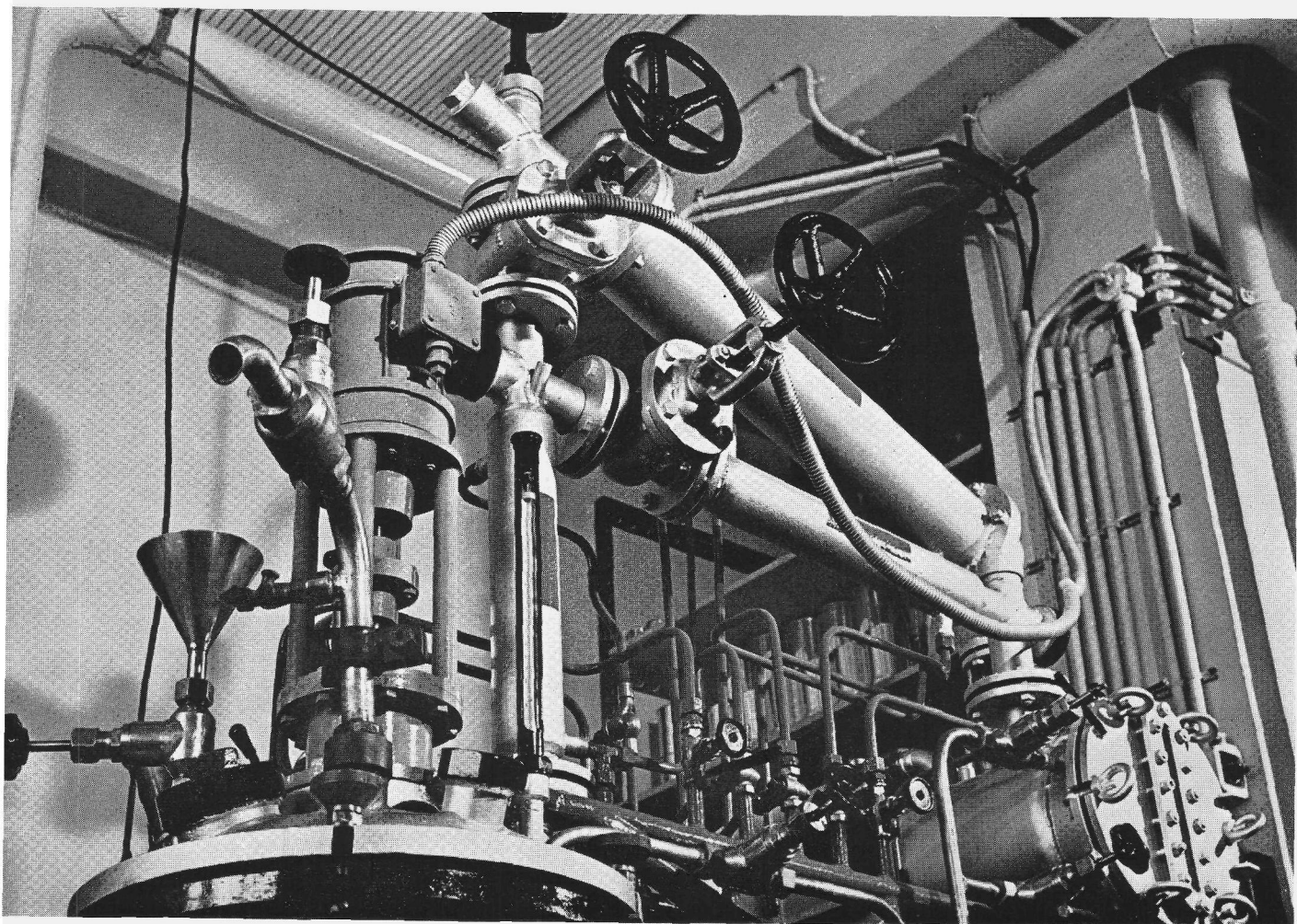
Durability of paint layers
and resistance against
different agents:
for interior and exterior use
in chemically aggressive
atmosphere
in fresh water
in sea water
in chemical fluids, etc.

Mechanical properties of
paint films and their
alterations with ageing.

Resistance against
mechanical aggression, e.g.
against impact and wear,
flexibility
hardness, etc.

Owners, managers and
suppliers of painted or
lacquered objects:
governmental offices,
private owners,
public work departments
military, navy or air force
ordnance and supply
services,
building
ship builders and ship
owners, etc., etc.

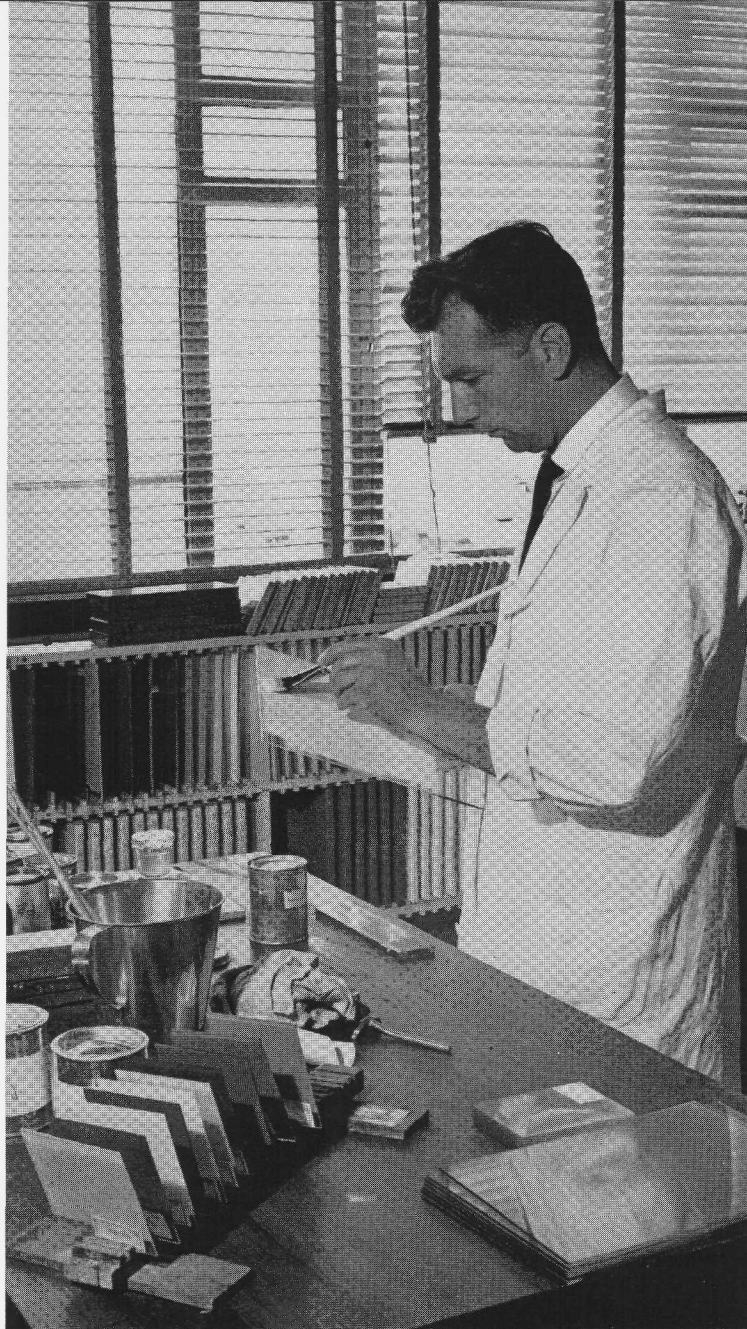
Apparatus for cooking binders



research

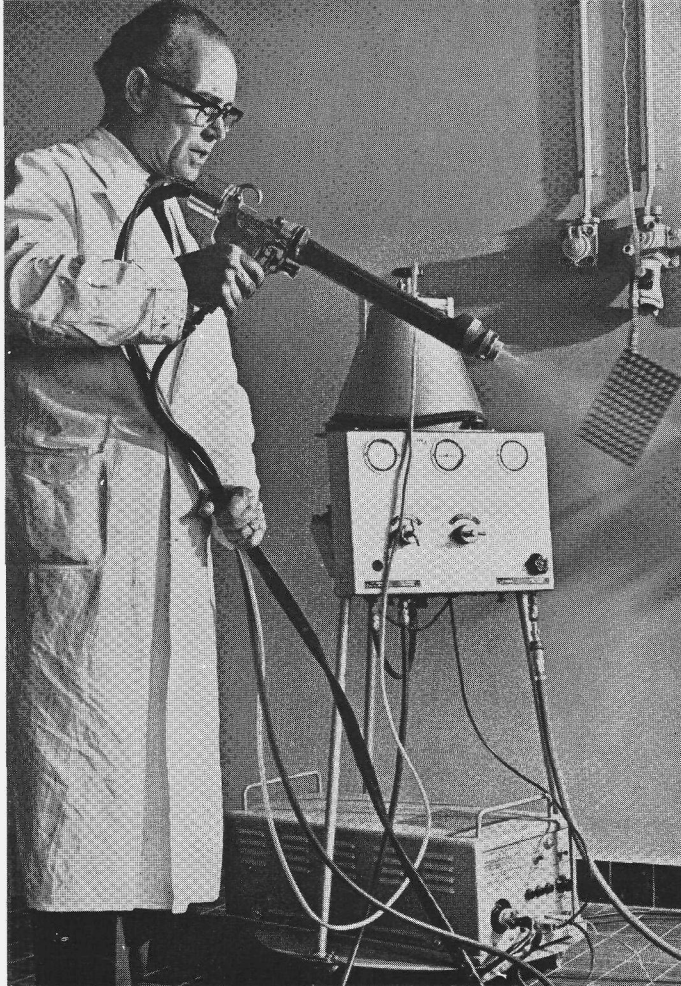
The Institute's work is carried out:

- in co-operation with research associations
- on its own initiative
- to the order of private companies resident in the Netherlands and abroad, governmental services, other TNO institutes, etc.



Application of paints

Spraying electrostatically



Its field of work includes

research on:

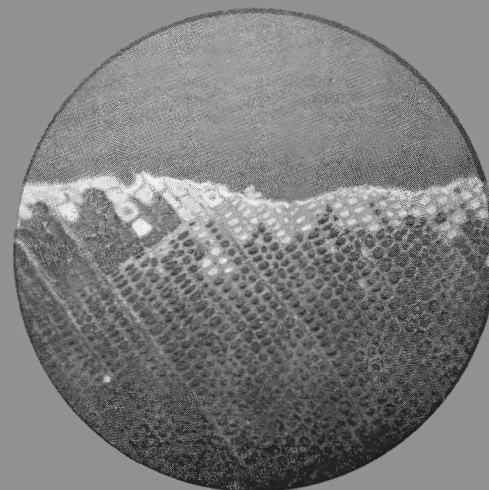
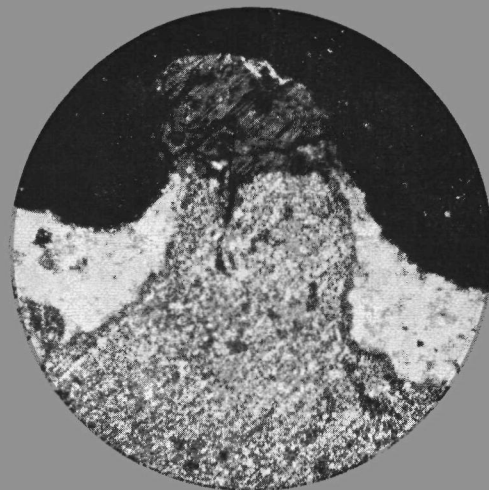
- a Primary raw materials: - products of nature and of chemical industries, to be used for the manufacturing of the raw materials proper of paints, lacquers, varnishes, etc.
- b Paint raw materials: - media (drying oils, resins etc.), pigments and extenders, plasticizers, solvents, additives, etc.
- c Paint manufacture: mixing and milling processes and machinery, fundamentals of interaction between pigment and medium colourmatching etc.
- d Paint application: - interaction between paint and substrate, e.g. wood, steel, concrete, etc.; modern application methods such as electrostatical spraying, coating by

electrophoresis, the use of a casting machine etc., the influence of the application methods and the conditions during application on the performance of paint layers etc.

- e Paint properties: - problems of film formation, paint performance during ageing, mechanical and physical properties of paints and paint films, causes of paint defects, development of physical and mechanical testing procedures and of analytical methods for paints and their raw materials.

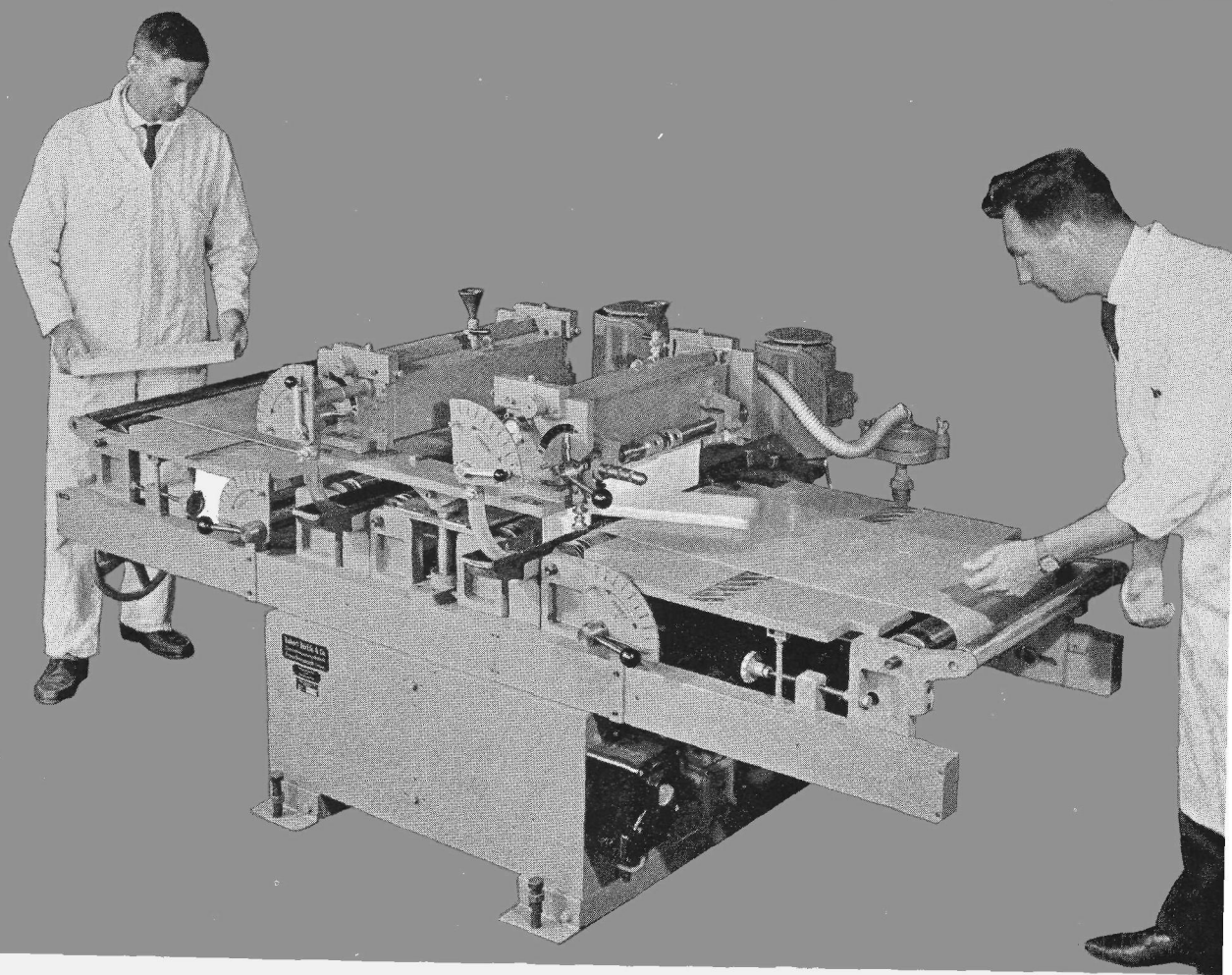
The research association and organisations sponsoring these activities represent the paint industry, the painters' and decorators' trade, the furniture industry, and a combination of shipping and shipbuilding companies, together with paint factories, interested in the protection of ships' hulls against corrosion and fouling. Many leading concerns entrust the Paint Research Institute TNO with the implementation of research projects and important investigations.

Rusted top on grit-blasted steel, coated with layer of red-lead paint



Penetration of vehicle into the wood

Lacquer curtain machine



Apparatus for determining mechanical properties of detached paintfilms

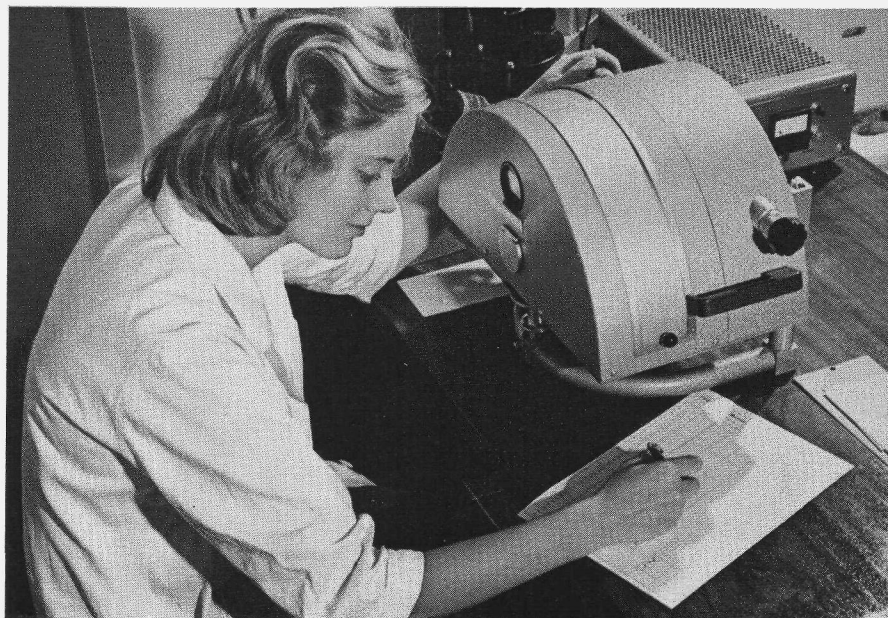


A chemical laboratory of the Paint Research Institute



Measuring the gloss

testing



Development of testing methods, drafting of specifications for official bodies and co-operation with national and international standardizing organizations are regular features of the Institute's activities.

Accordingly, tests and analyses on raw materials and ready mixed paints are carried out, for private enterprises, organizations like the Group of Paint Exporters of the Netherlands Paint Industry, civil and military authorities, etc.

information services

The Paint Research Institute TNO supplies technical information in response to numerous questions in the field of paint manufacture and application. It ensures a monthly distribution of abstracts from technical literature and maintains a comprehensive system of trade brochures and pamphlets from all over the world on paint raw materials, ready mixed paints, machinery and testing apparatus. It assists in the organizing of training courses and contributes to technical journals.

Library and documentation department



Meeting of O.E.C.D. Group in the building 'Zuidpolder'



international relations

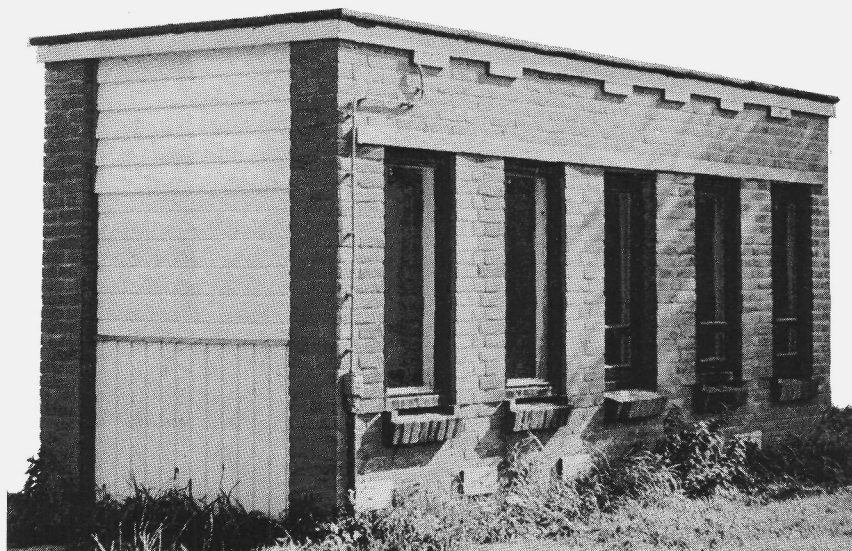
The Paint Research Institute TNO participates in many international organizations in the field, such as the Fédération des Associations de Techniciens des Industries de Peintures, etc. de l'Europe Continentale (F.A.T.I.P.E.C.), the Organic Coatings Section of the International Union of Pure and Applied Chemistry, the International Standardizing Organization (ISO/TC 35), the O.E.C.D. Group of Experts on the Preservation of Materials in Marine Environment (formerly on the Biological Fouling and Corrosion of Ships' Hulls), and the Office de Recherches et d'Essais (O.R.E.) of the Union Internationale des Chemins de Fer.

The Institute's staff members contribute to many international congresses and conferences in Europe and elsewhere.

Exposure racks



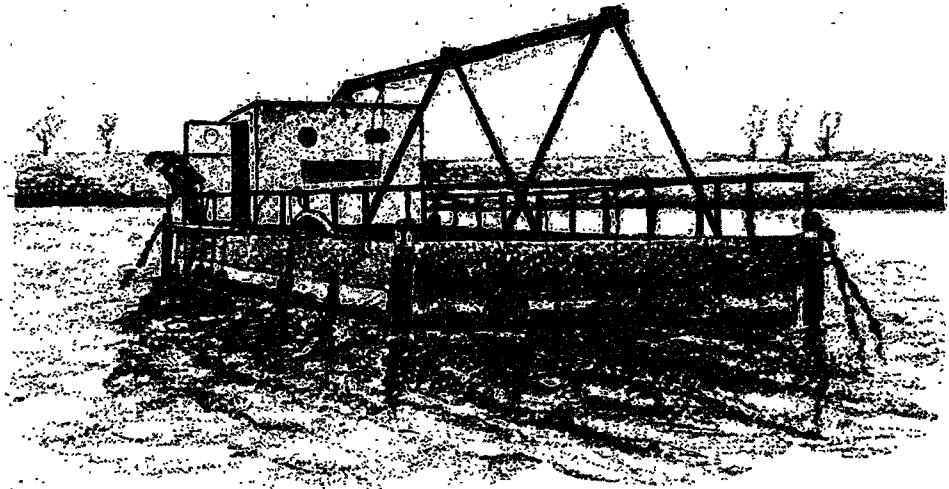
The blister cabin



equipment and facilities

The Paint Research Institute TNO owns a wide range of testing and research equipment as well as machinery for the manufacture of paints and varnishes on laboratory and semi-industrial scale. For durability tests exposure sites are available in industrial and

Test raft at Den Helder



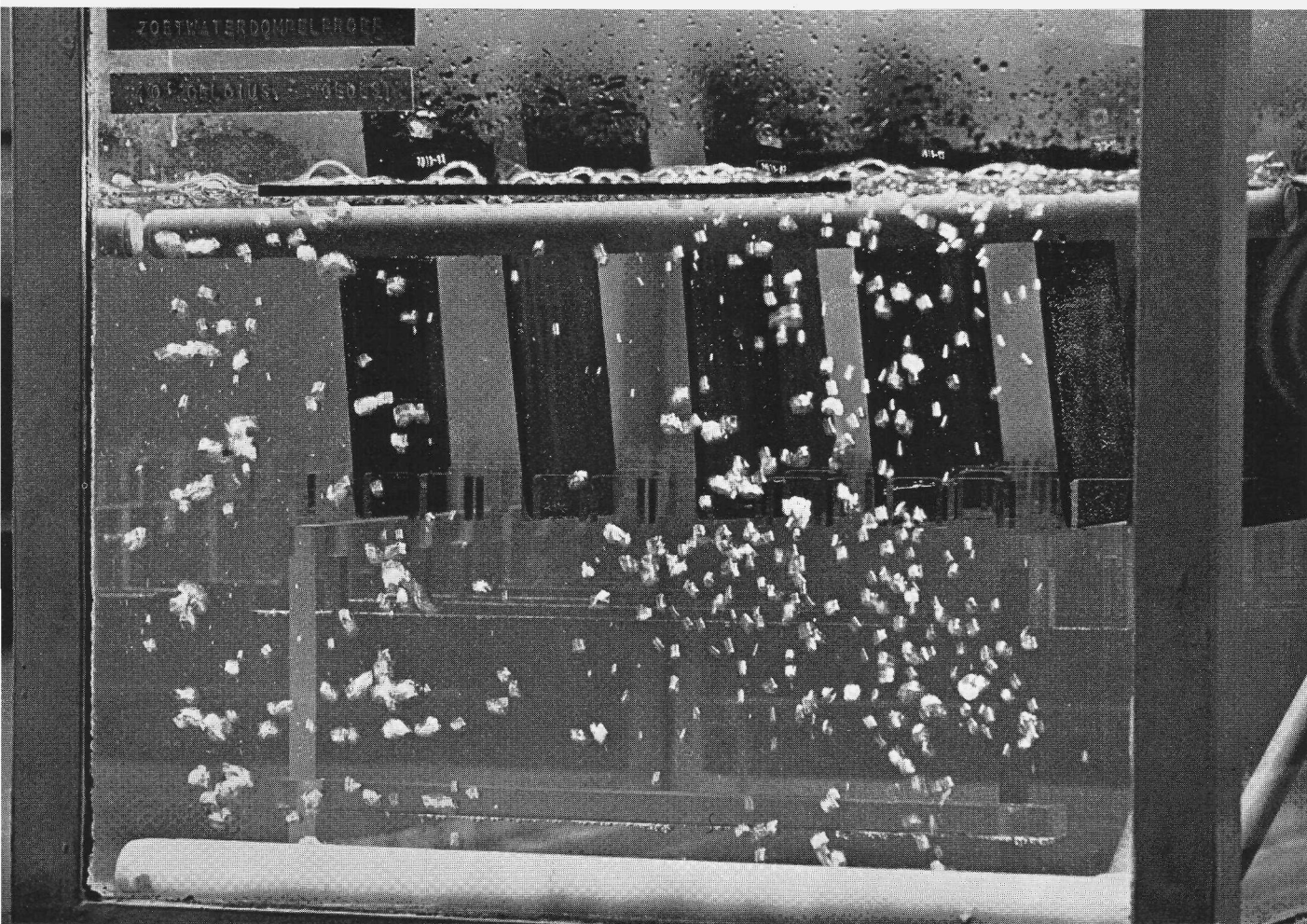
marine atmosphere, and also rafts for tests in seawater and equipment for accelerated weathering and corrosion.

The Paint Research Institute TNO belongs to the Netherlands Organization for Applied Scientific Research TNO. As and when appropriate it will rely on specialized knowledge and equipment available in the many other TNO-institutes.

Artificial weathering



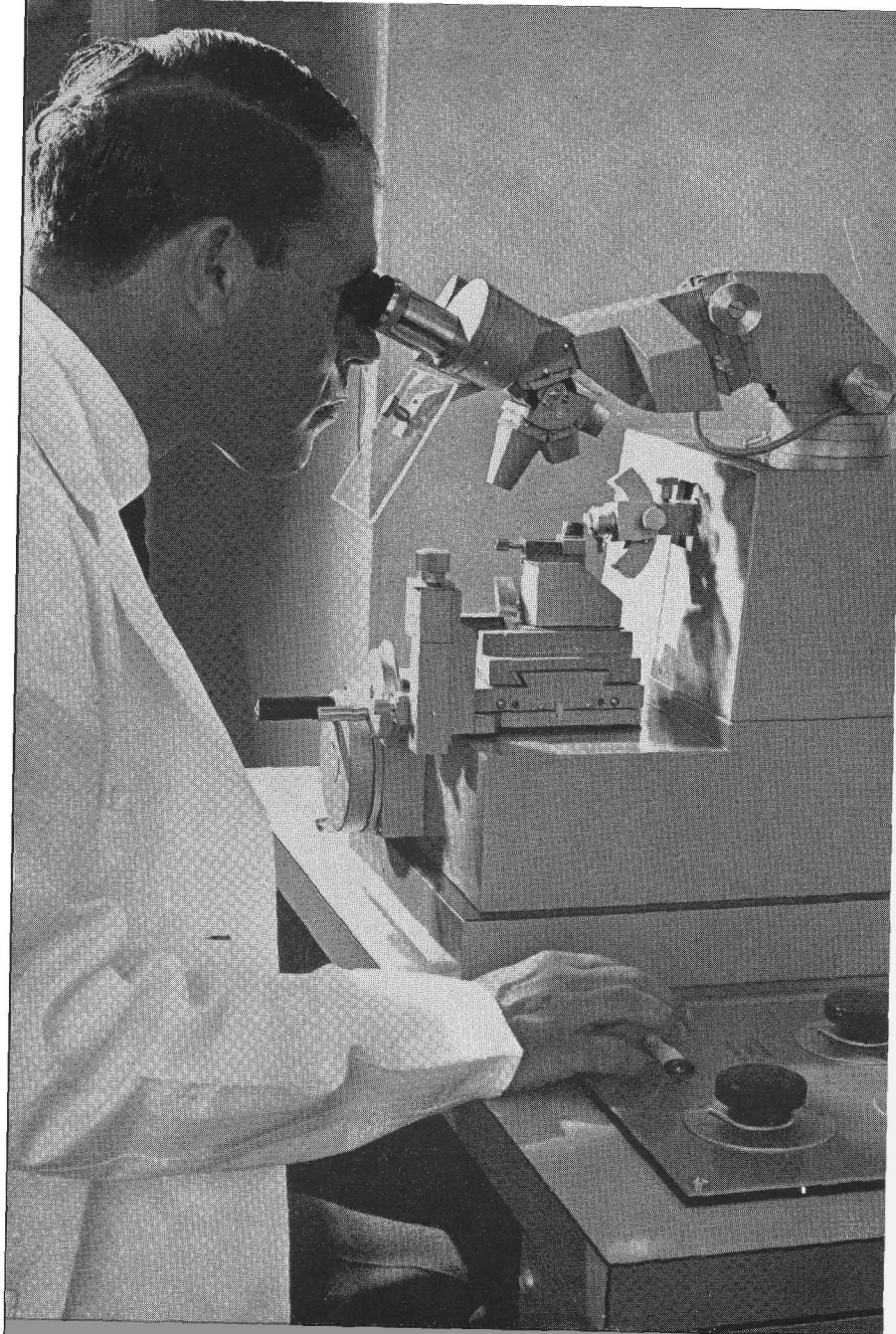
Corrosion test in aerated fresh water



E.g. the Technical Physical Department TNO and TH assists with the making of electron-microscope-photographs. The Paint Research Institute can make the preparations with the aid of a ultramicrotome for making slices of about 100 Ångström thickness and of a vapour-shadowing apparatus, the photographs are made with the electron-microscopes handled by the Technical Physical Department. The Analytical Centre of the Central Laboratory TNO gives great help with ultra-red spectroscopy and chromatography, although the Paint Research Institute is now in the possession of an apparatus



High speed impeller mixer

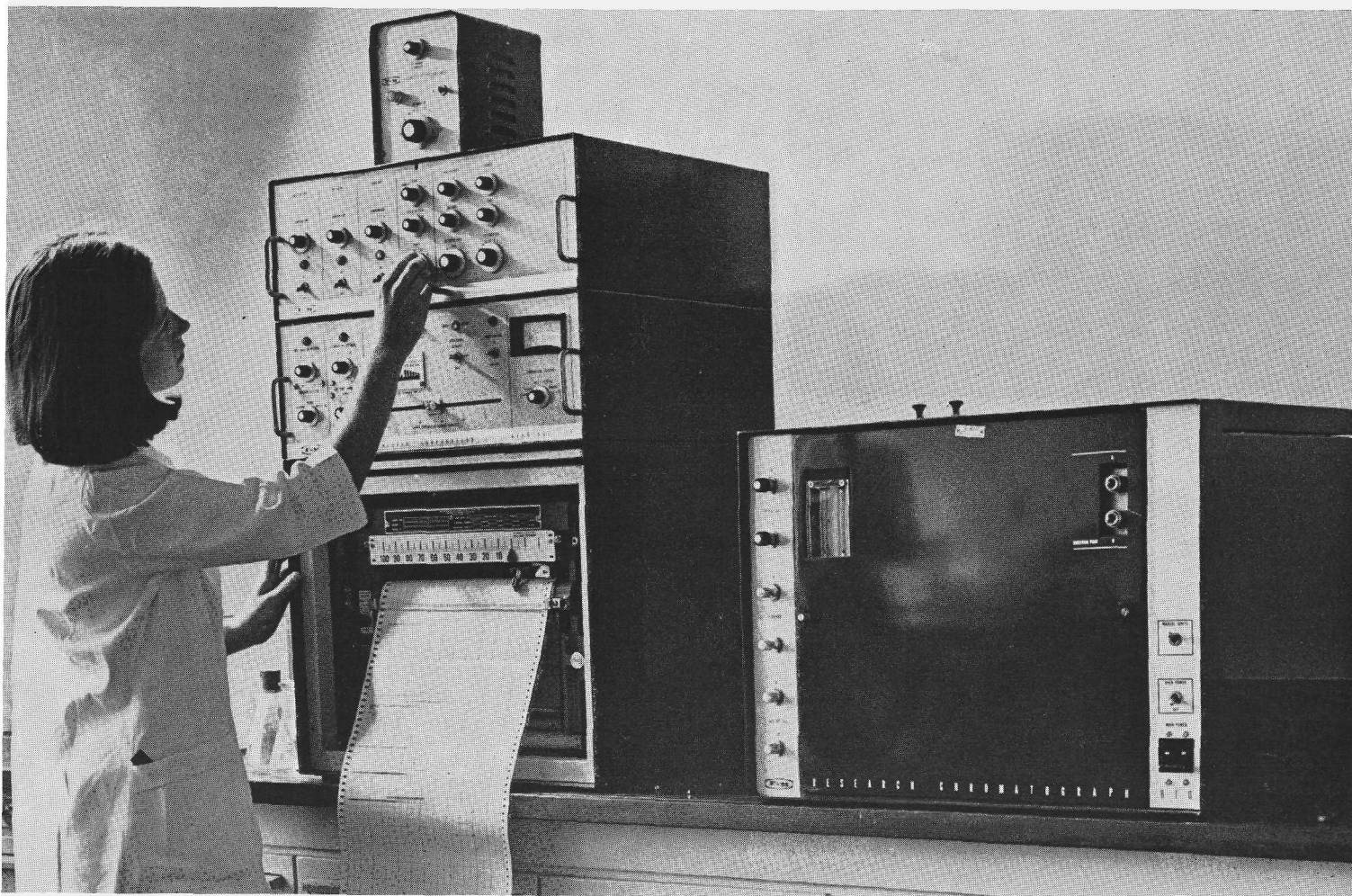


Ultra-microtome

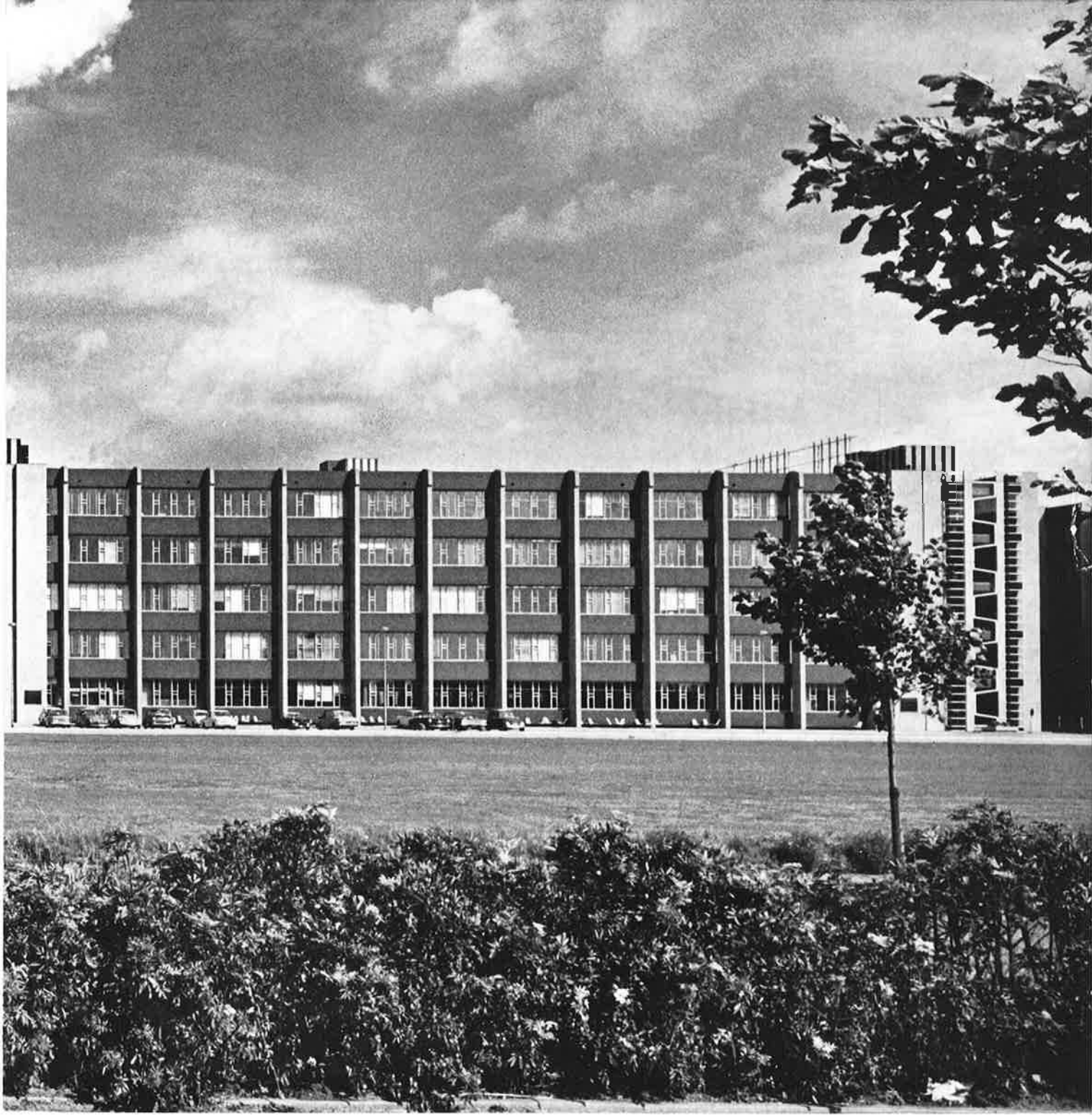
for gaschromatography and equipment for thin layer chromatography.

Thanks to these facilities, along with a close co-operation with trade and industry, the Paint Research Institute TNO has become a well-known research and information centre, whose staff renders valuable services in solving many problems encountered in the manufacture and application of paints and varnishes.

Gas chromatography









PAINT RESEARCH INSTITUTE TNO

97 Schoemakerstraat, Delft - P.O. box 203 - Tel. 01730-37000