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Chamber of Commerce (RN) N° 156766
Rimini Company Register N° 00549540409
Company capital E 516,000.00 entirely paid up

OFFICIAL ACKNOWLEDGEMENTS:

MINISTRY OF PUBLIC WORKS: Law 1086/71 with Ministerial Decree D.M. 27/11/82 N° 22913 "Tests on building materials".
MINISTRY OF INDUSTRY COMMERCE HANDICRAFTS: Ministerial Decree D.M. 09/11/99 "EC certification for amusement units".
MINISTRY OF INDUSTRY COMMERCE HANDICRAFTS: Ministerial Decree D.M. 31/10/91 "EEC certification of the sound emissions of building site machines".
MINISTRY OF INDUSTRY COMMERCE HANDICRAFTS: Law Decree D.L. 27/01/92 N° 136 "EEC certification of the sound emissions of earth moving machines".
MINISTRY OF INDUSTRY COMMERCE HANDICRAFTS: Ministerial Decree D.M. 08/07/93 "EEC certification concerning the safety of toys".
MINISTRY OF INDUSTRY COMMERCE HANDICRAFTS: Ministerial Decree D.M. 30/07/97 "EEC certifications and conformity statements for the efficiency of hot water boilers fired with liquid or gaseous fuels".
MINISTRY OF INDUSTRY COMMERCE HANDICRAFTS: Notification N° 757890 "EEC certification for gas appliances".
MINISTRY OF INDUSTRY COMMERCE HANDICRAFTS and MINISTRY OF LABOUR AND SOCIAL SECURITY: Ministerial Decree D.M. 09/07/93 "EEC certification concerning simple pressurised vessels".
MINISTRY OF INDUSTRY COMMERCE HANDICRAFTS and MINISTRY OF LABOUR AND SOCIAL SECURITY: Ministerial Decree D.M. 04/08/94 "EEC certification of machines".
MINISTRY OF INDUSTRY COMMERCE HANDICRAFTS: "Verification assignments concerning the safety and conformity of products in relation to market surveillance and consumer safeguards".
MINISTRY OF INDUSTRY COMMERCE HANDICRAFTS: Ministerial Decree D.M. 02/04/98 "Issue of certificates of conformity for the energy specifications and performances of the components in buildings and systems".
MINISTRY OF THE INTERIOR: Law 818/84 and Ministerial Decree D.M. 26/03/85 with authorisation of 21/03/86 "Fire reaction tests according to Ministerial Decree D.M. 28/08/84".
MINISTRY OF THE INTERIOR: Law 818/84 and Ministerial Decree D.M. 26/03/85 with authorisation of 10/07/86 "Fire resistance tests according to Circular N° 91 of 14/09/81".
MINISTRY OF THE INTERIOR: Law 818/84 and Ministerial Decree D.M. 26/03/85 with authorisation of 03/07/82 "Fire resistance tests according to Circular N° 7 of 02/04/91 and standard CNVVF/CCI UNI 9723".
MINISTRY OF THE INTERIOR: Law 818/84 and Ministerial Decree D.M. 26/03/85 with authorisation of 12/04/88 "Tests on portable fire extinguishers according to Ministerial Decree D.M. 20/12/82".
MURST (MINISTRY OF UNIVERSITIES AND SCIENTIFIC AND TECHNOLOGICAL RESEARCH): Law 46/82 with Ministerial Decree D.M. 09/10/85 "Admission to the rolls of laboratories authorised to conduct applied research in favour of small and medium sized industries".
MINISTRY OF PUBLIC EDUCATION: Protocol N° 116 of 27/03/87 "Registration with the National research Registry File with code N° E049Y9Y".
SINCERT (Accrediting of Certification Bodies): Accreditation N° 057A of 19/12/00 "Quality system certification body".
SINAL (National Laboratory Accrediting System): Accreditation N° 0021 of 14/11/91.
SIT (Calibration Service in Italy): Accreditation N° 20 "SIT calibration centre for thermometric and electrical magnitudes".
ICIM (Industrial Certification Institute for Mechanics): "Laboratory tests concerning Product Certification Plans".
IMQ (Quality Mark Institute): "Laboratory tests concerning Product certification plans for flues".
UNCSAAL (National Union of Aluminium Steel Alloy frame makers): Acknowledgement of 28/03/85 "Laboratory for UNCSAAL certification tests on door and window frames and curtain walls".
UNI (Italian National Standardising Body - Certification Sector): Laboratory tests concerning Product certification plans for wood fireplaces with fluid in forced circulation and external door and window frames".

ASSOCIATION MEMBERSHIPS:

AIA: Italian Acoustics Association.
AICARR: Italian Association of Air Conditioning, Heating and Refrigerating.
AICQ: Italian Association for Quality.
AIPnD: Italian Association for non-Destructive Tests.
ALIP: Italian Association of Fire Laboratories.
ALPI: Independent Test Laboratory Association.
ASHRAE: American Society of Heating, Refrigerating and Air Conditioning Engineers inc.
ASSINDUSTRIA: Industrialists' Association of Rimini.
ASTM: American Body for Testing and Materials.
ATIG: Italian Technical Association for Gas.
CTE: Board of Building Industrialisation Technicians.
CTI: Italian Committee of Heating and Cooling technology.
EARMA: European Association of Research Managers and Administrators.
EARTO: European Association of Research and Technology Organisation.
EGOLF: European Group of Official Laboratories for Fire Testing.
UNI: Italian National Standardising Body.

CLAUSES:

This document refers to the tested sample or material only. This document cannot be partially duplicated without written authorisation from the laboratory

TEST REPORT N° 174823)

Place and date of issue: Bellaria, 27/08/2003

Principal: BEMO SYSTEMS Gmbh & Co KG - Karl-Henschel-Strasse, 7 - 72770 REUTLINGEN-BETSINGEN (GERMANY)

Date on which test was requested: 04/07/2003

Number and date of job order: 22814, 07/07/2003

Date on which sample was received: 24/07/2003

Date on which test was conducted: from 25/07/2003 to 25/08/2003

Subject of the test: Test for watertightness of the metal roofing element

Testing place: Istituto Giordano S.p.A. - Test field of Via San Mauro - 47814 Bellaria (RN)

Origin of sample: supplied by Principal

Denomination of the sample*.

The sample tested consists of a tunnel containing a portion of "BEMO" metal roofing and mainly consists of:

- portion of "BEMO" roofing;
- bearing structure.



(* according to the Principal's declaration and inspections made by the Institute's technical personnel

Stamp of

This test report consists of 14 pages

Page
N° 1 of 13

**The portion of roofing consists of:**

- 3 (three) "BEMO - Normal Profil 65/500 - 1" panels 9840 mm in length;
- modified "BEMO panel 9840 mm in length and with female turn-up at the ends;
- modified "BEMO" panel 9840 mm in length with male turn-up at the ends;
- 36 "BEMO - Halter 80/6" supports made of aluminium alloy.

The panels are made of 1 mm thick aluminium alloy and are connected together at the top of the end turn-up by means of male/female profiles formed by bending the metal plate. The male profile has an elastomer seal which holds the panels together.

The portion of roofing made with the panels described above is borne by 36 "BEMO - Halter 80/6" supports made of aluminium alloy.

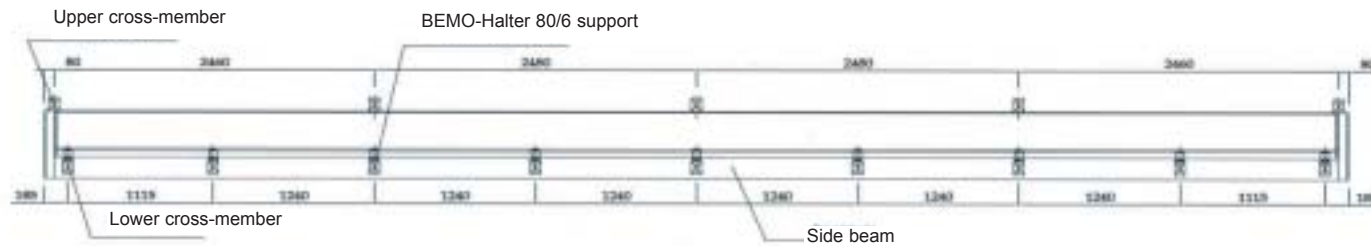
The end sections of the portion of roofing, consisting of three standard profiles and the two modified profiles, are closed with a sealing sheath so as to form a retaining trough borne by the wooden structure. These end sections are approx. 520 mm in length and are not considered in relation to the test results as the watertightness could be impaired by the sheath-panels connection.

The bearing structure consists of two longitudinal beams made of laminated wood measuring 100 x 520 x 10040 mm and a series of wooden cross-members measuring 80 x 100 mm in section. The cross-members and beams are connected together with galvanised steel sheet brackets and self-threading screws.

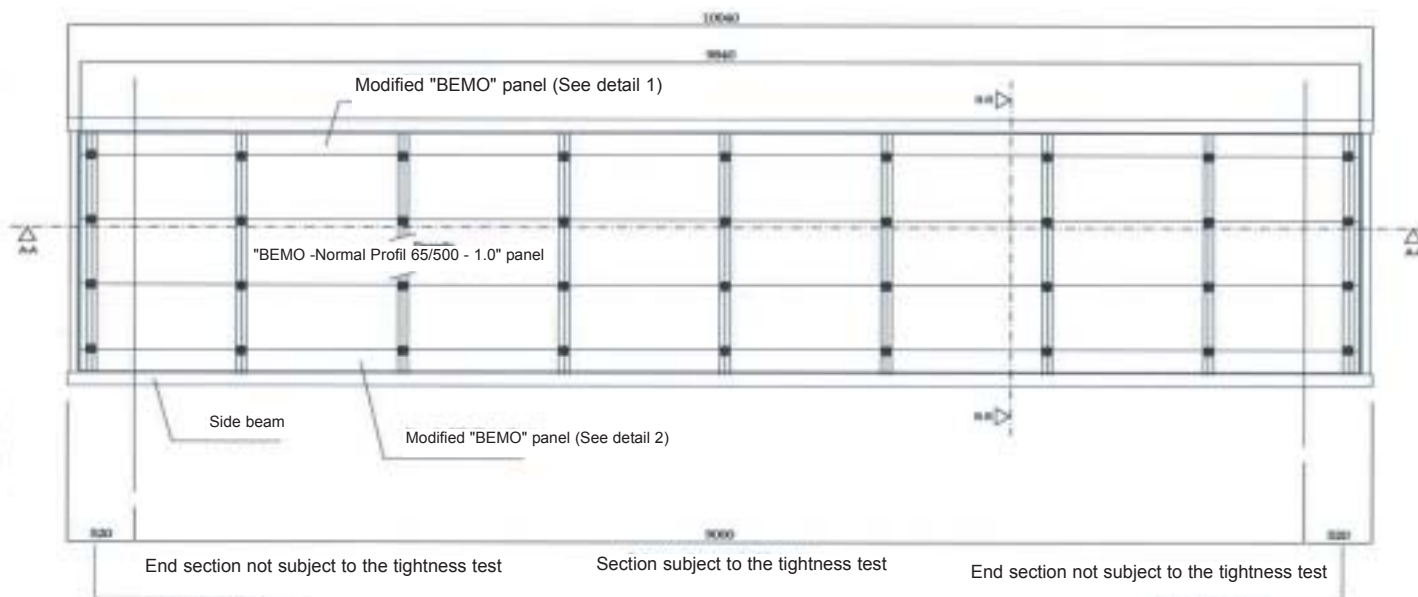
The sample is illustrated in the following drawings and photographs.



SECTION A-A

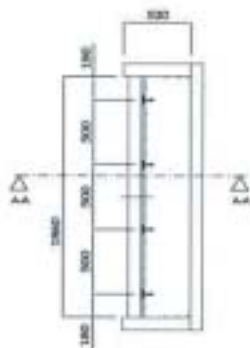


PLAN



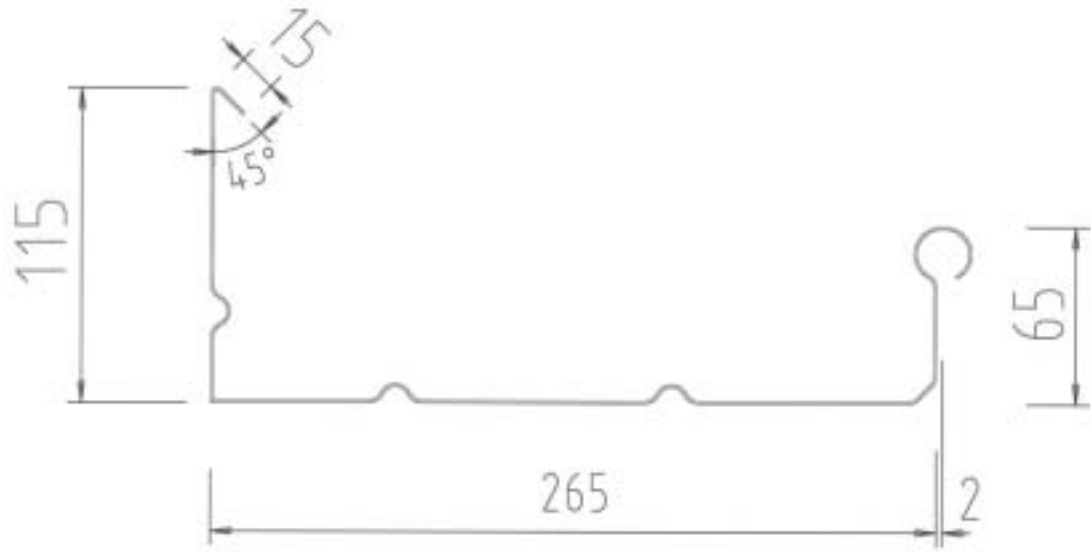
Upper cross-member

SECTION B-B

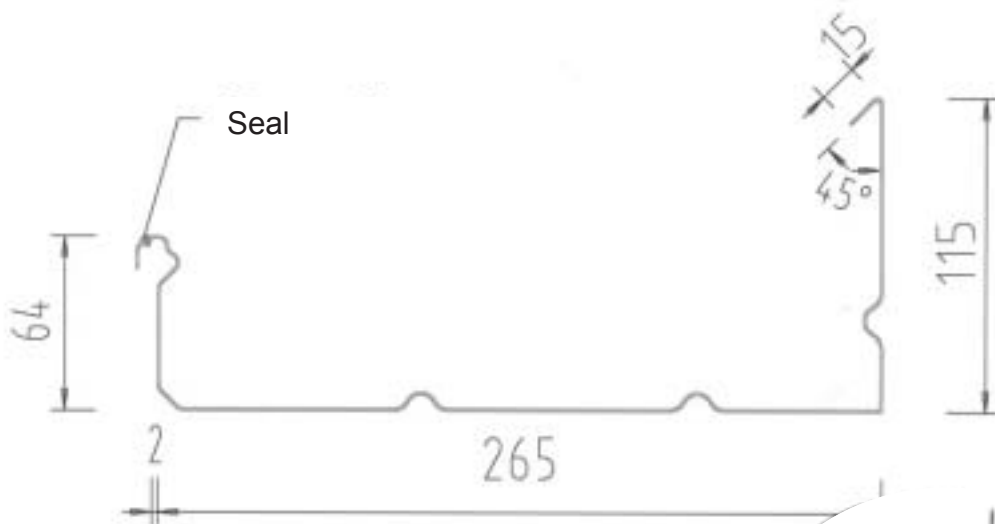




DETAIL 1: MODIFIED PANEL WITH FEMALE END TURN-UP

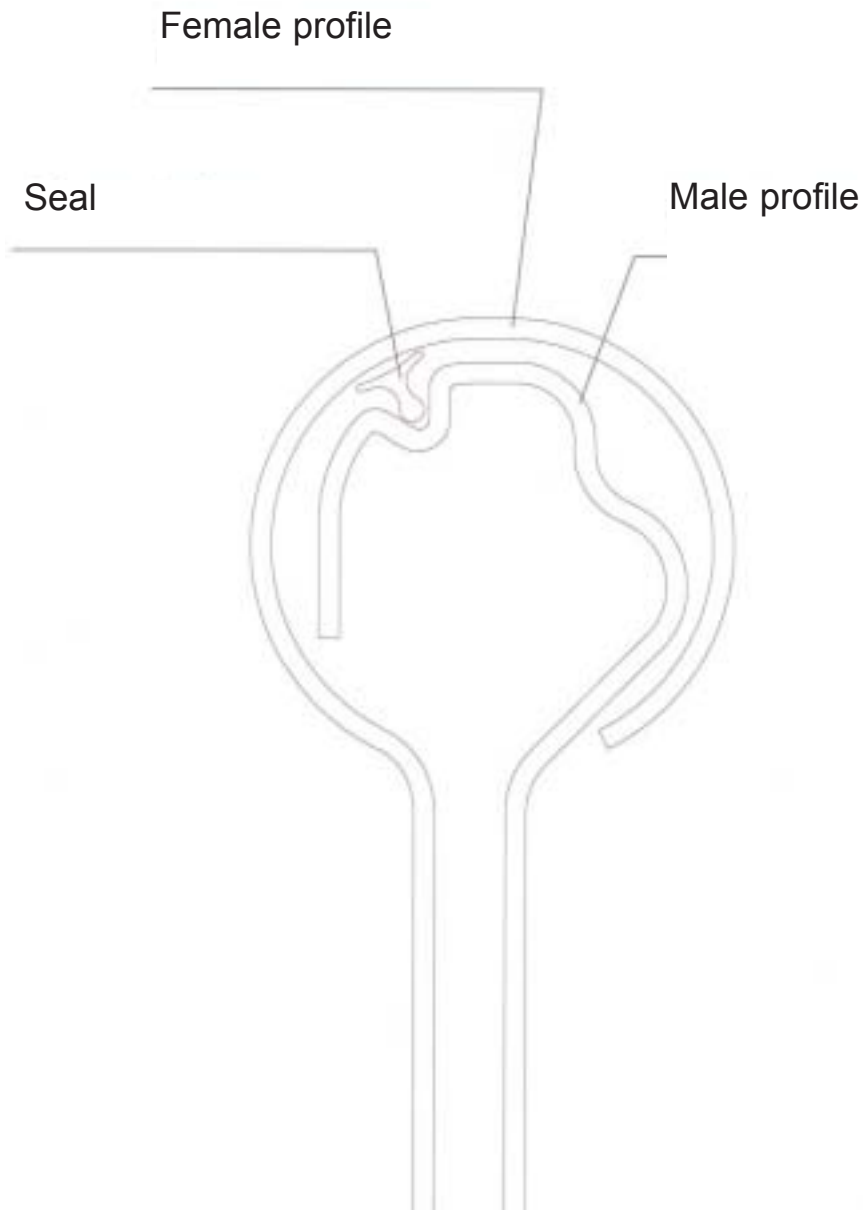


DETAIL 2: MODIFIED PANEL WITH MALE END TURN-UP

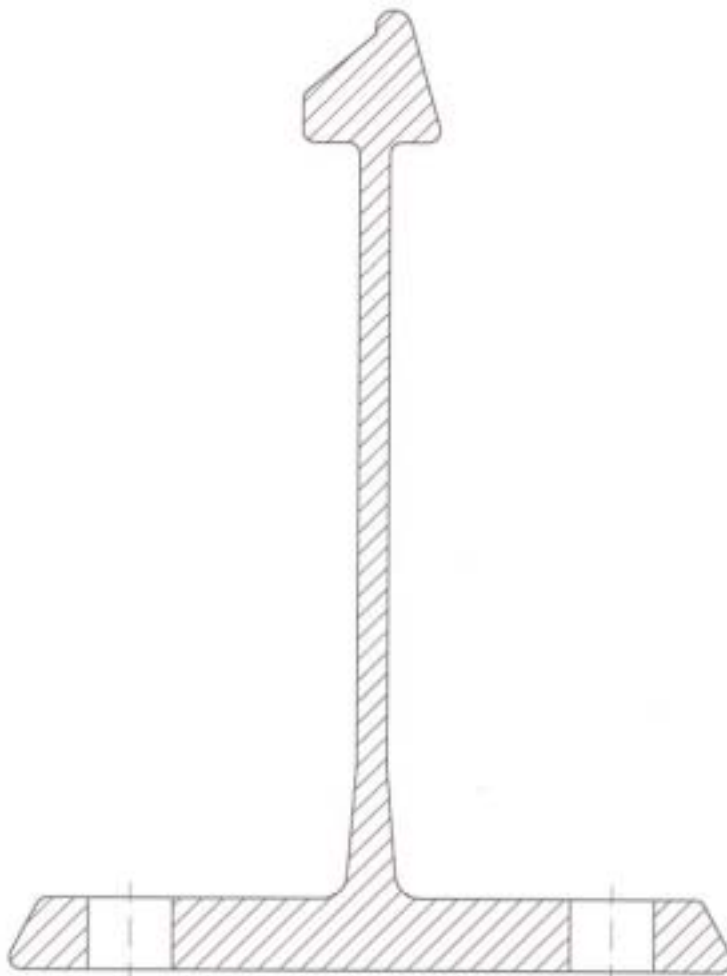




DETAIL 3: PANEL COUPLING ON A LEVEL WITH THE END TURN-UPS

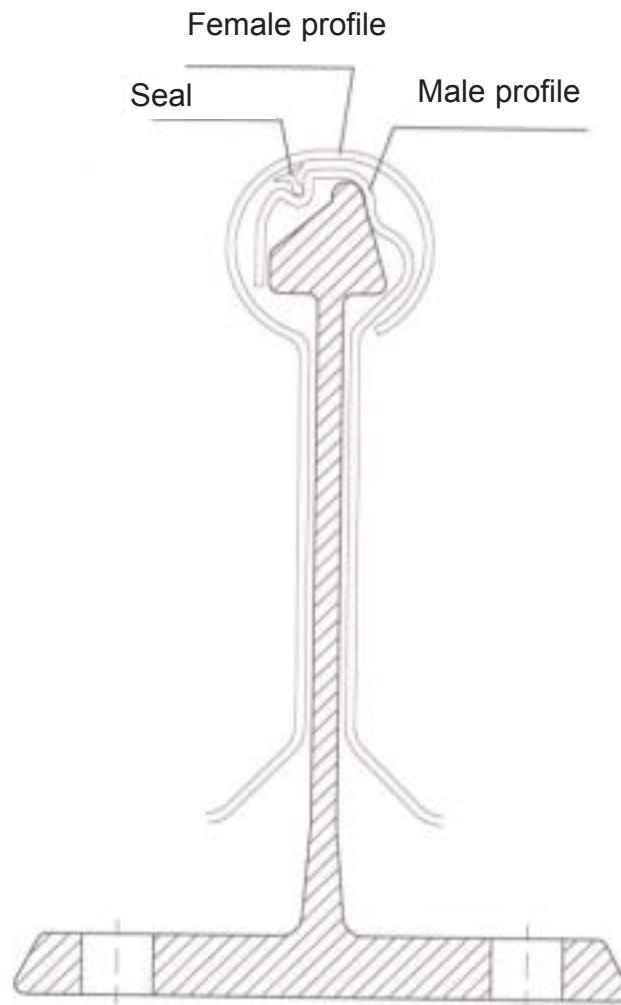


DETAIL 4: SUPPORT

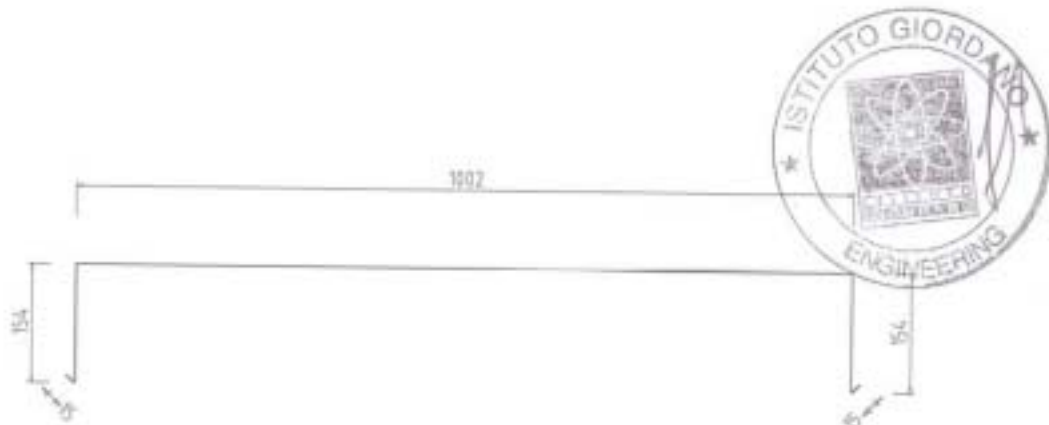




DETAIL 5: SUPPORT-PANEL CONNECTION



DETAIL 6: CHANNEL CASING





Photograph of the sample subjected to the test



Photograph of the sample subjected to the test:
Detail of the connection between the panels and panels-
support.





Photograph of the sample subjected to the test:
Detail of the connection between the lower cross-members and longitudinal beams.

Test equipment:

The following equipment was used for the test:

- bearing structure of the sample;
- metric rod to check the level of the water on the sample;
- water source;
- absorbent felt pads for the tightness test.





Test method and development.

The sample was installed flat on the bearing structure and was then given a covering able to prevent variations in the level of water in the trough caused by evaporation or rainfall. The test then started and developed during the following operating phases:

- water was poured into the trough so as to form a 150 mm head in relation to the flat surface of the panels. This head was maintained for 7 days, during which the intrados area of the panels was visually inspected each day on a level with the joints to check whether water was present either in the form of drops or whether it had simply wetted the surface itself. Accurate tightness tests were conducted at the end of the first and seventh day of the test with the 150 mm head, by passing pads of absorbent paper along the slits on a level with the joints between the panels;
 - water was added to the trough so as to form a 200 mm head in relation to the flat surface of the panels. This head was maintained for 7 days, during which the intrados area of the panels was visually inspected each day on a level with the joints to check whether water was present either in the form of drops or whether it had simply wetted the surface itself. Accurate tightness tests were conducted at the end of the first and seventh day of the test with the 200 mm head, by passing pads of absorbent paper along the slits on a level with the joints between the panels;
 - water was added to the trough so as to form a 300 mm head in relation to the flat surface of the panels. This head was maintained for 17 days. During the first seven days with the 300 mm head, the intrados area of the panels was visually inspected each day on a level with the joints to check whether water was present either in the form of drops or whether it had simply wetted the surface itself. Accurate tightness tests were conducted at the end of the first, the seventh and the seventeenth day of the test with the 300 mm head, by passing pads of absorbent paper along the slits on a level with the joints between the panels;
- A portion of the roofing was taken at the end of the test, on a level with a support, so as to check the coupling between the panels and connection to the supports.

The test is illustrated in the following photographs.





The sample during the test.



Intrados of the sample during the test with a 300 mm head.





The sample during the test with a 300 mm head.





A sample is taken of the roofing.

Test results.

No water was found on the intrados surface of the sample either near or on a level with the joints between the panels, neither during the visual inspection nor during the test with absorbent pads.



The Test Technician
in Charge
(Dr.Eng. Giovanni Capitani)

Engineering Laboratory
Manager
Dr.Eng. Giovanni Capitani

The Chairman or
Managing Director
Dr.Eng. Vincenzo Iommi