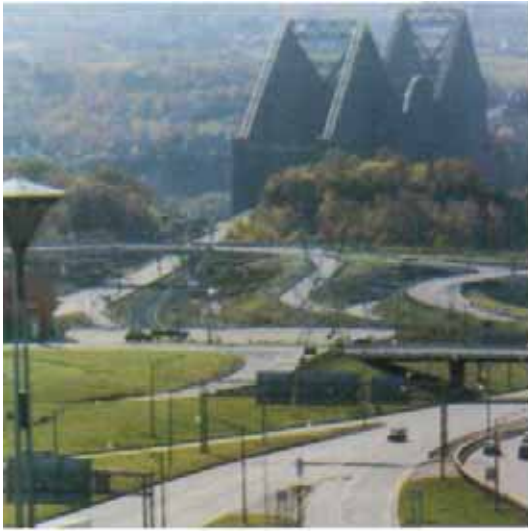


# SOPRALENE ANTIROCK

---



## WATERPROOFING FOR PARKING DECKS AND BRIDGES

Supplied by  
**nuplex**  
Construction Products

Free Phone: 0508 88 22 88

Free Fax: 0508 55 33 44

[www.nuplexconstruction.co.nz](http://www.nuplexconstruction.co.nz)





# SOPRALENE ANTIROCK

## INTRODUCTION

The waterproofing of civil engineering structures is fast becoming a standard requirement by engineers and contractors, especially in regions where the winter climate is wet and cold. Effective waterproofing lengthens the life of a structure and greatly reduces the cost of maintenance.

The following reasons explain why:

- it prevents penetration of water into the superstructure,
- it protects concrete and reinforcement from the corrosive action of water, de-icing salts and other agents, especially in an industrial atmosphere,
- it prevents entrapment of soluble substances from the structure and eliminates the formation of stalactites or of carbonate deposits,
- it constitutes one of the principal components of the drainage system of the superstructure.

In order to perform its function, a waterproof covering for bridges in particular, must possess a certain number of essential properties:

- ensure uninterrupted waterproofing,
- be integral with the base and the wearing surface so as to transmit the traffic stresses to the structure,
- be resistant to chemicals and to fatigue in relation to the expected traffic loads,
- must not deform thereby causing instability of the wearing surface, such as the formation of ruts,
- be sufficiently elastic to follow the possible movements and cracking of the base,
- be reliable throughout the extremes of long term thermal cycling.

The required characteristics for good waterproofing of bridges are fully satisfied with **Sopralene Antirock**.

## PRESENTATION

**Sopralene Antirock** is a prefabricated membrane consisting of a reinforcement of synthetic non-woven material, thoroughly impregnated and coated with SBS modified bitumen. The reinforcement gives **Sopralene Antirock** remarkable physical and mechanical properties.

**Sopralene Antirock** is protected by a thermofusible plastic film on the underside and has mineral surface protection in the upperface. The latter consists of sized ceramic mineral granules which provide an excellent physical and chemical bond with the surface pavement. This protection also enables the membrane to withstand site traffic while it's temporarily exposed before surfacing.

**Sopralene Antirock** is supplied in rolls and has the following characteristics

Roll	SOPRALENE ANTIROCK
------	--------------------

Length	8 m
Width	1 m
Weight of roll	45 kg
Thickness	4.5 mm approx.

Each roll incorporates a 75 mm wide selvedge.

**Sopralene Antirock physical properties and characteristics are regularly measured, evaluated and controlled when factory made. These strict manufacturing and product specifications give the specifier complete design confidence when including antirock on a parking deck or bridge project.**

**Sopralene Antirock** ensures:

high tensile strength resistance, tear resistance, resistance to perforation and to static and dynamic punctures, resistance to cracking. It has elasticity, flexibility, dimensional stability and is rot-proof.

## CONDITION OF THE DECK

The decking must have adequate slope which should preferably be provided during casting of the decking. Any defects must be made good with a material that adheres to the base, is stable, does not deform under the traffic loads and is compatible with bituminous materials.

The deck and all parts of the structure that are to be covered with **Sopralene Antirock** must possess excellent surface stability with an even surface finish, be free of excessive ridges, hollows and water traps and without sharp angles. The deck must be clean and dry prior to the application of **Sopralene Antirock**. The surface must be free of contamination by concrete treatment products, lubricating oils, diesel oil, or grease, which could affect the adhesion of the waterproofing or the physical integrity of the membrane itself.

## METHODS OF ORDINARY SURFACE APPLICATION

**Sopralene Antirock** is applied using the following techniques:

- the substrate is treated with bitumen primer to improve adhesion. This primer is applied by brush, roller or sprayer at a rate of .25 L/square meter (1 gal./200 sq. ft.) depending on surface porosity. The drying time of the primer is related to the ambient temperature and may vary from a few hours to a whole day. Primer shall be Elastocol 500.
- The membrane is welded by torch directly onto the substrate as soon as the primer is dry.



## ADVANTAGES

- **Sopralene Antirock can withstand temporary traffic, at slow speed, of site vehicles equipped with tires or rubber tracks (surfacing machine). Any other traffic requires the project manager's approval.**
- **Sopralene Antirock does not require any protection board.**
- **Sopralene Antirock ensures a waterproofing with uniform thickness over the entire surface.**

## ARRANGEMENT OF THE STRIPS AND JOINTS ACCORDING TO THE GEOMETRY OF THE STRUCTURE

On straight structures, the membrane is unrolled parallel to the traffic axis of the structure with end joints staggered, to prevent 4 overlaps.

On curved parts of the structure, the strips should be arranged so that they do not form an angle larger than 60° with the axis of traffic. This is important: the strips should never be placed totally opposed to the axis of traffic in order to avoid the development of a "corrugated" effect.

## THE ASPHALT

The asphalt topping should be applied as soon as possible after laying **Sopralene Antirock**.

The high thermal stability of **Sopralene Antirock** and its mineral protection mean that asphalt topping can be spread onto the membrane directly. The latter is not damaged by the thermal stress transmitted by the base or wearing course spread at the prescribed temperature.





## REFERENCES

<b>PROJECTS</b>	<b>AREA</b>	<b>YEAR</b>
Southgate Shopping Center, Edmonton	20 440 m <sup>2</sup>	1982
Edmonton Convention Mall, Edmonton	37 660 m <sup>2</sup>	1982
Northwood Mail Parkade, Edmonton	16 010m <sup>2</sup>	1986
Royal Alec Hospital Parkade, Edmonton	11 400 m <sup>2</sup>	1990
Londonderry Mall Parkade (Phase 1), Edmonton	12 900m <sup>2</sup>	1990
Alberta Trans Overpass, Leduc	59 200 m <sup>2</sup>	1988
Minto Botannia, Ottawa	17 200m <sup>2</sup>	1984
Peel Condominium #143, Mississauga	4 610m <sup>2</sup>	1986
Rideau Hall, Ottawa	5 700 m <sup>2</sup>	1987
Sheridan Mall, Mississauga	4 730 m <sup>2</sup>	1988
City Centre Plaza, Sudbury	11 830m <sup>2</sup>	1988
Post Office Building, Montreal	10 760m <sup>2</sup>	1986
Les Promenades de la Cathedrale, Montreal	15 010m <sup>2</sup>	1987
Galeries de la Capitale, Quebec	10 000m <sup>2</sup>	1987
Place de la Cite, Quebec	3 230 m <sup>2</sup>	1987
Overpass, highway 20, Levis	7 530m <sup>2</sup>	1987
Charles de Gaulle Bridge, Repentigny	29 050m <sup>2</sup>	1988
Tunnel, Pointe Claire	2 150m <sup>2</sup>	1988
Terrace Pignon du St-Laurent, Montreal	2 580m <sup>2</sup>	1988
Condo Le Sieur de la Fontaine, Montreal	1 075m <sup>2</sup>	1988
Pierre Laporte Bridge, Quebec	34 430 m <sup>2</sup>	1989
Overpasses, Highway 220, Montreal	64 560 m <sup>2</sup>	1989
Convention Center, Sherbrooke	7 500 m <sup>2</sup>	1990
Bridge, St-Felicien, Quebec	3 400 m <sup>2</sup>	1990



SOPREMA INC.

800, ST-VALLIER QUEST QUEBEC (QUEBEC) CANADA G1N 1C9

TEL.: (418) 681-8127 FAX: (418) 681-1224

# TECHNICAL ADVICE

## BRIDGES

### WATERPROOFING OF ROAD BRIDGES

No. F AT ET 97.09

NAME OF PRODUCT : **SOPRALENE FLAM ANTIROCK P**

COMPANY : **SOPREMA**

Sopralene Flam Antirock P is a waterproofing layer made up of a prefabricated sheet made of SBS modified bitumen and a non-woven polyester reinforcement. It has a protective surface of light grey coloured slate chippings.

It is torch welded (using a torch or heated rollers) onto the cement concrete substrate prepared and treated beforehand with a cold-applied primer : Elastocol 500.

It then directly receives the hot rolled asphalt wearing course, which is laid at approximately 160°C.

<i>Contents :</i>			
<i>I - Identification sheet .....</i>	<i>page</i>		<i>2</i>
<i>II - Characterisation tests .....</i>	<i>page</i>		<i>4</i>
<i>III - The Commission's Opinion.....</i>	<i>page</i>		<i>6</i>
<i>Publication Information.....</i>	<i>page</i>		<i>8</i>

This document may not be reproduced, even partially, without the permission of the SETRA



**Date: 07.1997**  
**Valid until: 07.2002**

SOPREMA - SOPRALENE FLAM ANTIROCK P

# CHAPTER I - IDENTIFICATION SHEET

## 1.1 - Commercial information

Sopralene Flam Antirock P waterproofing sheet is marketed by :

SOPREMA  
 14 rue de Saint Nazaire 67025 - STRASBOURG  
 Tel. : + 33.(0)3.88.79.84.00 Fax : +33.(0)3.88.79.84.01

Soprema produces Sopralene Flam Antirock P sheet at its Strasbourg (67) and Avignon (84) sites.

Industrial and commercial property :

Sopralene Flam Antirock P is a registered trademark of Soprema, which has full ownership of the product.

## 1.2 - Definition, constitution and composition

This waterproofing process is part of the family of waterproofing systems involving single layer prefabricated sheet as defined in 'Fascicule 67', part I, of the CCTG specifications (Fas. 67-1), article 7.3.1. It includes :

a) a cold-applied primer, **Elastocol 500**, made of a solvent phase elastomer bitumen. The quantity to be used is 150 to 250 g/m<sup>2</sup> (50 to 85 g/m<sup>2</sup> of residual bitumen).

### b) a prefabricated sheet

This is made of a bitumen binder modified by a polymer (SBS elastomer) with a non-woven polyester reinforcement. The surface self-protection is light grey coloured slate chippings. On the underside, it has a thermofusible plastic film. Standard packaging is by rolls of 1 x 8 m (it is possible to have other roll sizes for 1 m width). The sheet is welded onto the substrate to obtain total adhesion. The average thickness (standard surfaces) is approximately 4.5 mm and the nominal thickness is 4 (± 0.2) mm on the overlap.

The composition of the product is summarised in Table 1.

**TABLE 1**

	NVAP*	Variation range				
		Production specifications			Values measured by extraction in acc. with NF P 84350***	
			RVR95**			RVR95**
Mass per unit area (in g/m <sup>2</sup> )	5380	4896	± 9%	5864	5253	± 7
reinforcement	250	235	± 6%	265	245	± 9
binder	3200	2880	± 10%	3520	3049	± 9
mineral matter < 0.1 mm	800	720	± 10%	880	565	± 19
mineral matter > 0.1 mm	1000	870	± 13%	1130	1387	± 15
Underside protection (fusible film)	6				6	

\* NVAP : Nominal Value Announced by Producer

\*\* RVR 95 : Relative Variation Range, in %

\*\*\* Values given by the producer, for information only.

### **1.3 - Scope of application. Limits and precautions for use.**

This waterproofing system is suitable for structures where the base for the waterproofing is concrete (reinforced or prestressed), in particular when minimum superstructure weight is required.

Application may be manual or mechanical depending on the rate of work sought. Whatever the application technique used, smoothing the surface is obligatory and must be carefully done. At the time of application, the concrete must be at least 2 weeks old and any curing compound used will have been eliminated. The base must be clean and dry, with no traces of hydrocarbons or dirt.

Application means employed do not necessarily require road access .

In accordance with Fas 67 (part 1, § 6.5), application during the rain is forbidden. Application in temperatures below 0°C is forbidden ; if the temperature is between +1°C and +5°C, application is admissible as long as the substrate temperature is over +2°C.

The waterproofing must be covered as soon as possible by a protective layer (gravel-sand mixture or similar), or by the wearing course.

The pavement should preferably be at least 7cm thick.

### **4 - Particular transport and storage requirements**

For the storage and application of the Elastocol 500 primer, the (currently valid) Safety Instruction sheet must be strictly adhered to : work in a ventilated area (in the case of indoor work) and remove of all fire sources from the vicinity of the products stored and during application. This document is available on request from Soprema.

Sopralene Flam Antirock P must be stored according to the instructions on the roll wrapping (store upright).

### **1.5 - Consideration of essential requirements**

The Sopralene Flam Antirock P system fulfils throughout its lifetime the requirements of Decree No. 92 467 of 8.7.92 concerning "the suitability for use of building products".

Requirements relating to mechanical stability and durability are also taken into account in the present advice document.

The constituent parts of the waterproofing system are not harmful to public health, safety or the environment.

### **1.6 - References**

Since 1976, approximately 150,000 sqm. of bridge surfaces have been waterproofed using this system (in France).

### **1.7 - Measures taken by the company to ensure quality**

Soprema is ISO 9002 certified by the AFAQ for its production activities.

The packaging of the rolls carries the name of the product, factory identification number (1 for Strasbourg, 3 for Avignon), and production unit, shift, date and time (hour and minutes) of manufacture.

**A set of instructions for the laying of the product is available from Soprema .**

## CHAPTER II - CHARACTERISATION TESTS

### II.1 - Characterisation elements

NB : For the exploitation of the information contained in this chapter, see § III.5.

#### II.1.1- Coating binder

Polymer(s) family: **SBS (Styrene-Butadiene-Styrene) Elastomer**

**TABLE II**

Characteristic	Unit	Standard	Nominal value announced by producer (NVAP)	Relative variation range (RVR) 95 **
Density		NF T 66.007	1.203	±4 %
Ring & ball test	°C	NF T 66.008	129	± 6.5 %
Penetrability at 25°C	1/10ths of mm	NF T 66.004	23	± 30 %
Tensile strength	MPa	XP T 66.038	0.9	-
Elongation at break	%	XP T 66.038	1150	-
24 hr elastic limit	%	XP P 84.360		-
Modulus at 100 %	MPa	-	0.38*	-
Cold bending on 0 20 min mandrel	°C	-	- 20*	-

\* Values given for information only

\*\* %

An infra-red spectrum (XP P 18.809) was carried out on the binder, which is Soprema property. A sealed copy has been deposited with the Commission secretariat.

#### II.1.2 - Finished product

Tests are carried out in accordance with either the NF G 07.001 standard (for the VNAP) or the NF P 98.283 standard (for the PV).

The results are recorded in Table III.

**TABLE III**

Test conditions		Conditioning : thermal shock	% elongation			Force in daN/cm		
			NVAP	RVR 95 *	PV**	NVAP	RVR 95 *	PV**
20°C 100mm/min	Longitudinal Direction	Without	61.8	±15 %	48.6 (2.3)	25.2	±13 %	28.6 (1.0)
20°C 100mm/min	Transversal Direction	Without	69.0	± 16%	47.9 (3.3)	20.7	± 14 %	29.4 (1.6)
20°C 100mm/min	Longitudinal Direction	With			48.9 (3.3)			27.9 (1.6)
10°C 100mm/min	Longitudinal Direction	With			35.0 (3.2)			36.2 (1.1)

\* %

\*\* Control prior to tests in § 11.2



## II.2 - Tests to assess suitability for use

In order to assess suitability for use, Soprema has carried out a number of tests, in accordance with the details in the standards, with Fas. 67, part 1 of the CCTG specifications and with the technical advice request instruction guide. At the request of the Commission, the tests carried out according to the conditions defined in the guide are as follows :

Test method	References
Watertightness (NF P 98.281.1 or Test method No. 1)	LCPC report No. 328 200 A of 18.1.89
Crack bridging test with and without fatigue (Test method No. 6 *)	LCPC report No. 328 200 A of 18.1.89
Cracking performance tests for surfacing (Test method No. 4 *)	Test not operational
Substrate adhesion test (NF P 98.282, Speed 1.65 mm/min)	LCPC report No. 328 200 A of 18.1.89 and Aix LRPC report No. C0050/97 of 24.2.97
Water absorption test	LCPC report No. 328 200 A of 18.1.89
Shearing test (Test method No. 5 *)	Aix LRPC report No. C0050/97 of 24.2.97
Wet substrate adhesion test (NF P 98.282, Speed 1.65 mm/min)	Aix LRPC report No. C0050/97 of 24.2.97
Tracking test (NF P 98.253.1 T°: 45°C, total thickness of test piece : 10 cm, 30,000 cycles)	Aix LRPC report No. C0050/97 of 24.2.97
Non-penetration chloride test	
Static puncture test (Test method No. 7 *)	LCPC report No. 328 200 A of 18.1.89
Dynamic puncture test (NF P 84.506, special conditions).	Test not operational
Compaction test (Test method No. 3 *)	Aix LRPC report No. C0050/97 of 24.2.97

\* References to Appendix 3 of the Guide. These methods will soon be published as standards.

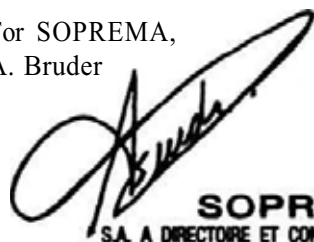
## II.3 - Classes, levels

Not applicable

The undersigned Director of the applicant Company or his authorised representative hereby certifies that the information given in Chapters I and II of the present document is accurate.

31 July 1997

For SOPREMA,  
A. Bruder



**SOPREMA**  
S.A. A DIRECTOIRE ET CONSEIL DE SURVEILLANCE  
AU CAPITAL DE 17.850.000 F  
558 500 187 B RC STG  
**ÉTANCHÉITÉ**  
14, rue de St-Nazaire - B.P. 121  
67025 STRASBOURG CEDEX  
Tél. 03.88.79.84.00

Translation approved by Secretary Commission of  
'Waterproofing road bridges'  
M. Fagnet



**MINISTÈRE DE L'ÉQUIPEMENT, DU LOGEMENT  
DES TRANSPORTS ET DU TOURISME**

**SERVICE D'ÉTUDES TECHNIQUES  
DES ROUTES ET AUTOROUTES**

**S.E.T.R.A. - 46, avenue Aristide Briand - B.P. 100  
92225 BAGNEUX Cedex - FRANCE  
Tél. 01 46 11 31 31 - Fax 01 46 11 31 69**

## CHAPTER III - THE COMMISSION'S OPINION

The system presented in the preceding chapters was examined by the "Waterproofing of road bridges" Commission including representatives of the Contracting Authorities and Main Contractors (Road agencies, Scetauroute, SNCF ...), the government civil engineering laboratory, SETRA and the profession ; the latter being represented by the following bodies : Office des Asphaltes, CSNE, USIRF and SN FORES.

### **III. 1 - SUITABILITY FOR USE**

Reference documents : Fas. 67 (part 1), technical advice request instruction guide, technical documents in support of the approval request.

NB : this appreciation is given for use in Metropolitan France. For use in other situations (eg. overseas territories), please consult the Secretary's office.

#### **III. 1.1 - Waterproofing**

Waterproofing is satisfactory within the conditions of the test carried out in accordance with standard NF P 98.281.1 under a pressure of 0.5 MPa.

#### **III.1.2 - Crack bridging ability** (Simple cracking test and cracking test after fatigue at -10°C)

For simple cracking, a 10 mm crack opening must be reached before any peeling is noted on either side of the lips of the crack.

This is an excellent result.

Following the cracking test after fatigue, the beginnings of a 10 mm peeling can be seen on each side of the lips only from 10 mm.

The result is satisfactory and well over the value required by Fas. 67 which requires that "a crack with an opening of 2 mm be born without breaking".

#### **III.1.3 - Cracking performance of surfacing**

Test not operational at the time the request was examined.

#### **III.1.4 - Adhesion to concrete substrate**

In the laboratory, the average tensile stress required to break the material bonded to its concrete substrate is 0.7 MPa with a typical deviation of 0.06 (test carried out at + 20°C)

This result is in conformity with the specification in Fas. 67 (part 1) : 0.4 MPa at 20°C.

The curve of the variation in adhesion according to temperature was established in the laboratory. The values measured at substrate temperatures over 30°C render the precautions outlined in § III. 2 obligatory.

This curve is available from Soprema (Soprema curve, dated 19 May 1995, confirmed by the Aix LRPC report No. C0050/97 of 24.2.97), and will allow the interpretation of the adhesion tests on site.

#### **III. 1.5 - Shearing test**

As far as current knowledge stands, the maximum values measured prove that there is good bonding between the surfacing and the waterproofing sheet ; on the other hand, after the maximum shear stress, the curve does not show any sudden fall in shearing, which is very satisfactory.

### **III.1.6 - Appreciation of adaptation to the state of the substrate**

Application to a substrate kept at 5°C with 95 % hygrometry leads to a fall of approximately 15 % compared to the adhesion value at 20°C (Cf. § III.1.4). This explains the limitations in the area of application specified in § 1.3.

### **III.1.7- Wheel tracking test performance**

The performance of the waterproofing layer in the tracking machine, under the test conditions (Cf. § 11.2) is satisfactory.

### **III.1.8 - Non penetration of chlorides**

Not claimed.

### **III.1.9 - Static and dynamic puncture tests**

The force necessary for static perforation is on average 12.8 daN at 20°C.

The product is suitable for light site traffic and the traffic connected with the laying of the wearing course.

### **III.1.10- Performance on laying of the overlying layers**

The waterproofing sheet shows no perforations after the sheet compaction test.

### **III.1.11 - Water absorption test**

During the test, the percentage of water absorbed after 30 days immersion is 0.75 % on average over 3 samples. This is in conformity with the specification in Fas. 67.

### **III.1.12 - Conclusions**

a) The tests to assess suitability for use indicate that the process meets the specifications laid down in Fas. 67 and the guide. The process has excellent resistance to cracking, excellent bonding with the surfacing and a good performance in the compaction test.

b) Particular conditions necessary to the obtaining of the results announced.

Respect the temperature and humidity conditions during application.

## **III.2 - APPRECIATION ON AREA OF APPLICATION**

The maximum adhesion ratings at high ambient temperatures mean that there is a risk of blistering, notably during periods with sudden temperature changes (de-gassing of concrete). This is why it is advised that the wearing course be laid as soon as possible (15 days during normal period, 8 days during high risk period). It is also possible to use a temporary protective layer (Cf. STER 81, S/Dos 3, Ch IV. § 10).

## **III.3 - DURABILITY**

Performance in use, as far as the Commission was able to ascertain, did not reveal any particular problems of effectiveness on the structures waterproofed using this process.

If any evidence of unsatisfactory durability is observed, the Contractor is requested to inform the Commission Secretary's office.

## **III.4 - ADAPTATION TO THE STATE AND GEOMETRY OF THE SUBSTRATE**

a) Texture of concrete, slope etc.

Use on vertical surfaces presents no particular difficulties, subject to the upstand being maintained and protected (by a mesh coating or a metal fillet or similar).

The concrete surface must be treated with a surface preparation in conformity with the specifications in Fas. 67 and the STER 81 guide (sub-dossier ST).

b) Reprofiling (the formulation of this layer must be designed for this specific area of application).

"Black" reprofiling on top of the sheet poses no particular problem if the longitudinal section lends itself to it (no depressions forming water traps).

"White" reprofiling underneath the sheet is possible, but with the disadvantages connected to this type of (reprofiling) technique.

"Black" reprofiling underneath the sheet has been carried out a few times (in the case of waterproofing being re-done) with positive results, thus showing the advantages of this technique and the high level of adaptability of the product in this context.

### III.5 - CONFORMITY INSPECTION

We would remind you that the Technical Advice document is made available to Main Contractors to help them in their choice or acceptance of a technique, notably as regards the adaptation of the product to the area of application concerned. The Technical Advice document therefore concerns a clearly identified product, on which type tests are carried out.

The Advice limits itself to this appreciation and the procedure does not involve following up the manufacturing of the product during the period when the Advice is valid.

It is therefore up to the Main Contractor to check the conformity of the product procured in relation to how it is identified in Chapters I and II. Thus, in accordance with fas. 67, part 1, Article 8.3.3.1, § II.1.2 (in conjunction with Table 1) allows conformity checks to be carried out when the product is received on site.

§ II.1.1 gives, for the coating mass binder, the characteristics which were registered with the Commission when the request was made for Technical Advice.

If the results fail to conform with the elements given in II.1, it is requested that the file be transmitted to the Commission for further analysis (eg. infrared spectrum).

### III.6 - INSTALLATION

Soprema manufactures the products. It is recommended that the person responsible for their application have **on site a copy of the specifications for installation** prepared by Soprema and that he provides his client with a site quality assurance plan.

To avoid any risk of blistering, **the thickness of the hot rolled asphalt must be at least 7 cm**, and it is recommended that the sheet should not be left unprotected for more than two weeks, and even less in periods of strong sunlight. (Cf. § III.2)

Moreover, Soprema has a Technical Department specialising in the civil engineering field which provides advice and assistance.

### III.7 - OTHER ELEMENTS OF APPRECIATION

The elements concerning the Quality System made available to the Commission do not require any remarks on this point. (Cf. § 1.7 on the existence of ISO 9000 certification).

For all information, please contact :

The manufacturer mentioned in § I.1 of the Advice document

S.E.T.R.A. : Publication manager : 46 Avenue Aristide Briand, 92225 BAGNEUX CEDEX  
Tel. 01.46.11.31.31 - Fax: 01.46.11.31.69

Document reference: F AT ET 97 09