siplast®

Certificates of Analysis

An innovative statement of quality from Siplast.

Many Things are Required to Ensure a Great Roof.

High quality products, thoughtful specifications, careful application by a professional roofing contractor, and responsible maintenance all play a critical role in the performance and life of a finished roof membrane. Owners and their representatives have a reasonable level of control over most elements of the roofing process. Roof design and specifications, developed by professionals, can be reviewed by professionals. Quality of application can be controlled by the owner through the choice of experienced professional roofing contractors and, if desired, the consistent monitoring of the application process by independent industry experts. An ongoing program of planned maintenance can be implemented and monitored by the owner or his representative. All in all, these critical components of the process can be controlled to ensure that the owner gets what he paid for.

But what about the fourth component – the roofing materials themselves? How much control does the owner have over them? What assurances does he have that the actual product being delivered to his roof even meets the manufacturer's own specifications? Let's face it. Very little.

That's Why Siplast Offers the Certificate of Analysis (COA).

The COA is a document issued by our North American roofing manufacturing facility in Arkadelphia, Arkansas that reports the actual results obtained on a series of quality control tests that measure criteria important to the performance of the roofing product.

It is important to note that the Siplast Certificate of Analysis Program is not a quality testing program. Siplast always has had the most stringent of quality control/quality assurance programs that meet or exceed the sampling requirements established in ASTM D 5147.

The values reported on each Certificate of Analysis are not an average of some special laboratory study performed once a year. Rather, the values shown are the actual data taken as a matter of routine quality control practiced each and every day.

How is a Certificate of Analysis Created?

Actual production and laboratory data are recorded and entered into our integrated computer system for each production run. If a production run is longer than 24 hours, a new lot number is assigned and a new Certificate of Analysis is generated.

Siplast is willing to provide this data for two reasons, First, and most importantly, we have great confidence in the absolute and consistent quality of the products that we manufacture and supply to our customers. Second, as a result of our routine testing of competitors' products, we are convinced that product quality varies widely among competitors. Further, it has been our experience that the quality of some manufacturers' products is inconsistent from one production run to another.

How is a Certificate of Analysis Obtained?

Standard hard copy Siplast Certificates of Analysis are available to building owners upon request for roofing material shipped from the Siplast manufacturing facility to the jobsite. Additionally, Certificate of Analysis information can be accessed via computer with **Siplast RoofTag: RF Technology for Roof Asset Identification**. By choosing Siplast roof membranes with RoofTag RF chips factory-embedded in the sheets, owners and the design professionals they may work with have a simple way to verify that the product quality specified matches that of the product installed. With RoofTag, access to Certificate of Analysis data, product information, and job information is possible by scanning either the palletized rolls or the installed roof membrane. Once installed, building owners have a tool for roof asset management, with a unique opportunity to link the roof system in place with its history.

Understanding the Certificate of Analysis.

Each Certificate of Analysis contains three sections of information:

1. Product Identification.
2. Dimensions and Mass.
3. Physical and Mechanical Properties.

Let's look at each section individually.

Section 1: Product Identification

The Product Identification section contains the date, lot number, and material type. The date is the date of manufacture. The lot number identifies the material included on that specific Certificate. The material type is the commercial name of the product for that specific Certificate, such as Paradiene 20 HT or Paradiene 30 FR.

Section 2: Dimensions and Mass

The Dimensions and Mass section contains physical characteristics data for the finished product. **It is important to observe that there are three columns of data in the Dimensions and Mass section:**

Column 1 This column displays Siplast's minimum acceptable production specification for the identified finished product.

Column 2 Contains the actual average ± standard deviation quality assurance data for the specific production lot. The frequency of our testing is aggressive, so this data gives an accurate picture of the actual quality of our finished products.

Column 3 Puts teeth in our Certificate by reporting the lowest value recorded for material shipped from the production run. This prevents any "shading" or "smoothing" of the data.

The frequency with which these characteristics are measured is critical to ensure that our high quality standards are consistently met. Throughout each shift of manufacturing, the Production Department:

- Monitors the physical appearance of every roll of finished product.
- Automatically records the weight of every roll of finished product via computer.
- Records the thickness of the finished product at least every 30 minutes.
- Continually monitors the length of the finished product.

Following are explanations regarding the relevance and importance of these parameters in a roofing membrane.

Length and Width

These two-dimensional measurements are important to ensure that the customer is, indeed, receiving the square footage they specified and paid for.

Thickness at the Selvage and Total Thickness

In general, if blend quality is good, performance properties of SBS-modified bitumen membranes are related to the thickness of the blend in the product. Overall product thickness is not necessarily related to blend thickness, as it may include granule, slate, or other weathering surfaces. Thus, while total thickness is important, it is the thickness of the blend that counts. Further, no amount of thickness will make up for a poor quality blend.

Siplast measures thickness on the selvage and on the granules. Since granules play no role in the waterproofing capability of the modified bitumen, we place little importance on the total thickness of the product, but measure and record it per the ASTM standard. Again, it is the actual thickness of the modified bitumen that is important.

Weight

Weight is not an accurate measure of the quality or quantity of SBS blend in the sheet. Instead, it measures several factors such as:

- Density and coverage rate of parting agents (sand, talc, etc.).
- Density and coverage rate of surfacing (granules, slate, etc.).
- Density and usage of SBS blend (related to the percentage of filler in the blend).
- Weight and thickness of the reinforcement and any non-SBS saturant.

Selvage Width

Selvage width is important to ensure that an adequate overlap can be achieved during application.

These values are entered in the QC/QA Laboratory records. The data is transferred to the computer where the average value for each characteristic is reported. A Certificate is then produced with this average being reported in the middle column under the **Average Tested Value** heading. The lowest recorded value for each test is recorded in the column on the right under **Actual Minimum**.

Other attributes (i.e., surface appearance, granule coverage, carrier placement, laying lines, and packaging condition) are observed and recorded as well.

Section 3: Physical and Mechanical Properties

The Physical and Mechanical Properties section contains performance specification data. Siplast believes this data to be

Parameter	Frequency
• Low Temperature Flexibility	Every 300 rolls
• Granule Embedment	Every 300 rolls
• Breaking Load (Tensile Strength)	Beginning and end of a production run
• Ultimate Elongation[1]	Beginning and end of a production run
• Compound Stability	Beginning and end of a production run
• Dimensional Stability	Every 300 rolls (polyester carriers)
• Resistance to Thermal Shock[2]	Once per production run (Veral only)

most important in the selection of quality modified bitumen roll roofing material. Once again, sampling frequency is very important with the following test parameters:

Low Temperature Flexibility

The low temperature flexibility test includes bringing a sample to the target temperature and bending the sample around a 1-inch diameter steel mandrel in three seconds. The value reported is the last temperature at which the sheet passed the flex test. The test is a good indication of flexibility, but results must be compared carefully. **They depend not only on blend quality, but also on type of polymer, mat thickness and position, and specimen thickness.** Some asphalt/polymer blends perform very well when new, but degrade very quickly. Others will suffer from polymer fragmentation and, thus, lose elasticity, but still exhibit acceptable cold bend values. The thickness of the sheet also has a great deal to do with the result. Two sheets of different thicknesses, manufactured with the same blend, will not pass at the same temperature. The thicker one will fail first, because the stress applied when bending around the mandrel is greater.

Granule Embedment

Granule surfacings provide a variety of benefits to a roof system, including reflectivity, aesthetics, increased fire resistance and UV protection. When granules are specified as a part of the roof system, it is important that they remain adhered to the sheet in sufficient quantities to provide these benefits over time.

The granule embedment test gives a good indication of the quality of the adhesion of this important membrane component.

Breaking Load (Tensile Strength)

Breaking load is primarily a function of mat (reinforcement) strength. No roof membrane can hold a building together. Thickness and quality of the SBS blend are the keys **as tensile strength is secondary to blend quality in the ultimate performance of these roofing membranes.** This characteristic is reported to show that the same basic mats are used in the product from lot to lot.

Ultimate Elongation

This value is defined as the elongation percentage on the load-elongation curve where the load value has decreased to 5% of the maximum value obtained. This point was chosen because it is a definitive value without being dependent on subjective operator assessment. This property is directly related to the integrity of the SBS-modified bitumen and can be directly correlated with GPC (Gel Permeation Chromatography) results regarding the degradation of the modified bitumen blend. As such, **it is the clearest mechanical measure of aging and ultimate performance of the asphalt/polymer blend**.

Compound Stability

This test is important to know the resistance to vertical flow of the SBS blend. This is a gauge of the finished product's ability to avoid slumping at high slope, and of overall blend integrity.

Dimensional Stability

One of the most critical characteristics of a roofing membrane is that it be inherently stable. If not, there is the potential for membrane shrinkage placing undue stress on the overlaps.

Unstable products can also exhibit unsightly wrinkling during application as manufacturing stresses are released from the heat of application. All Siplast polyester-reinforced roofing sheets maintain a dimensional stability value of less than 0.5% movement. (Glass-reinforced products are not tested because they do not experience the dimensional changes inherent with polyester products.)

Resistance to Thermal Shock

This test is specifically intended for metal foil-clad materials such as Veral. These materials include three different components: continuous metal foil, glass scrim, and SBS-modified bitumen. Each has a different coefficient of expansion, and it is imperative that these individual components function harmoniously to avoid severe dimensional problems that can result in foil delamination, creep, wrinkling, or even disbonding of the sheet from the substrate. Siplast Veral products maintain movement values of <0.2% for the duration of this test.

All of these values are recorded in the QC/QA Laboratory records. The data is transferred to the computer where the average value for each characteristic is reported. The Certificate is then produced with this average being reported in the column under the **Average Tested Value** heading.

With the exception of the footnoted items, these tests are performed in accordance with ASTM D 5147.

If you have questions about the Siplast Certificate of Analysis program, please contact your local Siplast Representative, or call 1-800-922-8800.

[1] Defined as the point on the load-elongation curve when the load has dropped to 5% of the maximum achieved load.
[2] Tested according the UEAtc standard (Union of European Agreement for technical construction).

SIPLAST

CERTIFICATE OF ANALYSIS

DATE: 06/05/2000 LOT NUMBER : Q-2 157 1001-5012

MATERIAL TYPE: Paradiene 30 FR White

DIMENSIONS & MASS

	MINIMUM SPECIFICATION	AVERAGE TESTED VALUE ±STANDARD DEVIATION			ACTUAL MINIMUM
LENGTH (ft.):	33.5	33.6	±	.0	33.5
WIDTH *(in.)*:	39.0	39.4	±	.0	39.4
THICKNESS AT SELVAGE *(mils)*:	94	100	±	2.8	96
TOTAL THICKNESS (mils):	N/A	133	±	4.0	126
WEIGHT *(lbs/roll)*:	90	95.9	±	2.2	91.3
SELVAGE WIDTH (in.):	2.2	2.5	±	.1	2.4

PHYSICAL & MECHANICAL PROPERTIES[1]

	SPECIFICATION	AVERAGE TESTED VALUE ±STANDARD DEVIATION		
LOW TEMP. FLEXIBILITY *(°F)*:	-13	-13	±	0.0
GRANULE EMBEDMENT *(avg. grams loss/sample)*:	1.50max	.6	±	.2
BREAKING LOAD *(lbf/in.)*:	30avg	36	±	2.9
ULTIMATE ELONGATION[2] *(%)*:	55avg	61	±	2.5
COMPOUND STABILITY *(°F)*:	248	248	±	0.0
DIMENSIONAL STABILITY *(%)*:	n/a			
RESISTANCE TO THERMAL SHOCK[3] (%):	n/a			

[1]Tested in Accordance with ASTM D-5147

[2]Defined as the point on the load-elongation curve where the load value has decreased to 5% of the maximum value obtained.

[3]Tested according to UEAtc (Union of European Agreement for technical construction)

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