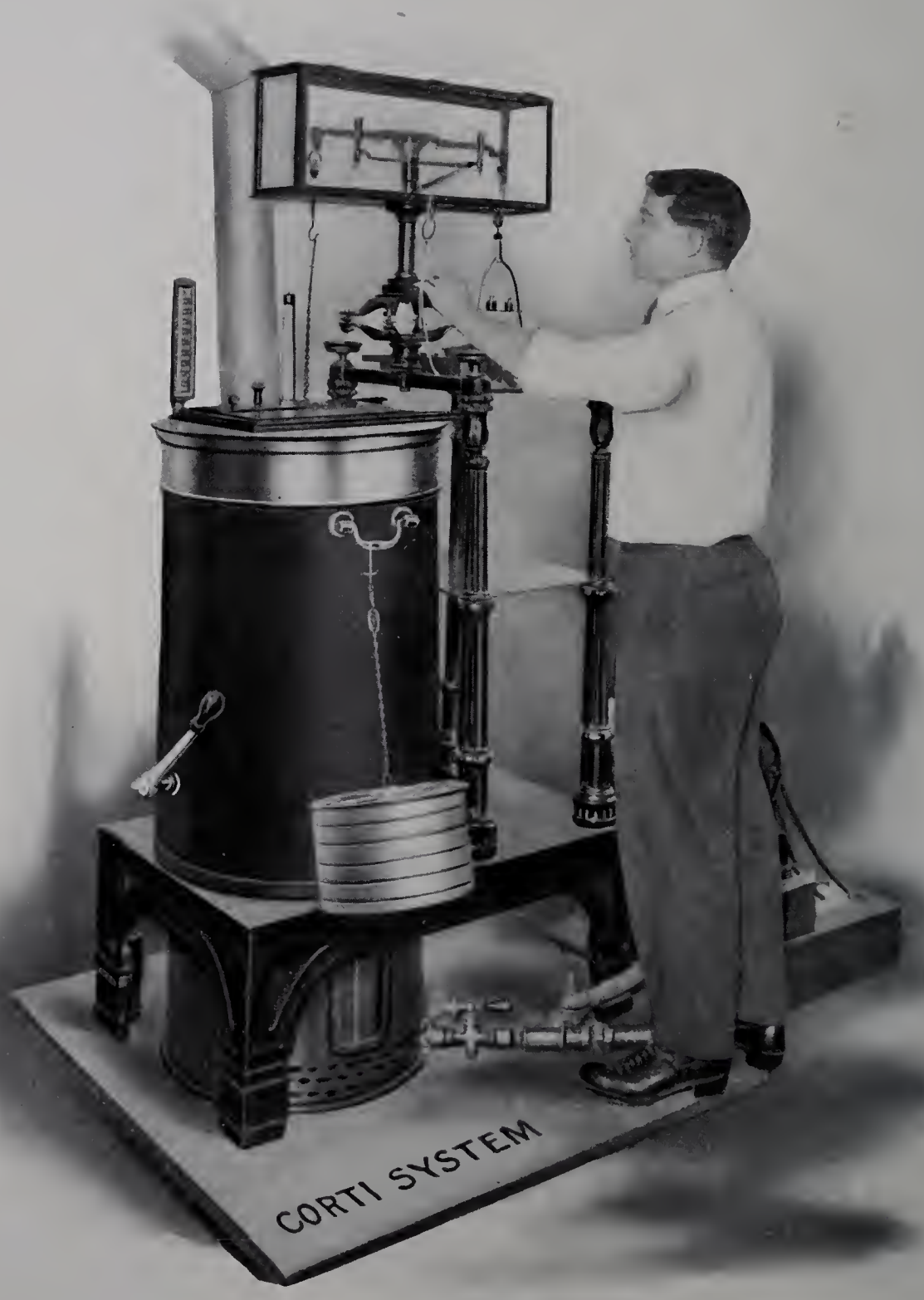
UNITED STATES SILK CONDITIONING COMPANY

472-474 BROOME ST., NEW YORK

THE VALUE of CONDITIONING

1908



THIS PHOTOGRAPH, OF WHICH A REDUCED COPY APPEARS ON THE COVER, SHOWS A CORTI SYSTEM CONDITIONING OVEN, IN OPERATION AT THE LABORATORY OF THE U. S. SILK CONDITIONING CO., NEW YORK.

UNITED STATES SILK CONDITIONING COMPANY

Laboratory: 472-474 Broome Street, New York City

Conditioning Tests

Their Value *in* Purchasing, Throwing, Dyeing *and* Weaving Silk

with Illustrations

Convenient Tables and Units, Metric and other Equivalents

1908

Silk manufacturing is not only a business, but a Science
Silk conditioning is as necessary to the business as to the Science

W. P. VANDEN HOUTEN COMPANY
PRINTERS AND DESIGNERS
409-415 PEARL STREET
NEW YORK

CONTENTS

PART II.

RESOLUTION OF THE BOARD OF MANAGERS OF THE SILK ASSOCIATION OF AMERICA

DESIGNATING THE UNITED STATES SILK CONDITIONING COMPANY AS THE OFFICIAL CONDITIONING HOUSE FOR THE ASSOCIATION

WHEREAS, it is the established custom in the silk centers of the world for the local silk associations and of the National Governments to designate a certain silk conditioning works as the official authority and source of information in making tests of silk in matters of moisture, strength, size, boil-off, etc., and,

WHEREAS, it is believed to be necessary to establish an official recognition of some one silk conditioning establishment in the United States as a governing or authoritative source of information in cases of dispute, as to condition of raw silk or thrown silks coming before Arbitration Committees of this Association, and,

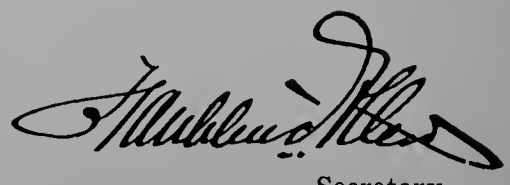
WHEREAS, we deem it to be to the best interests of the members of this Association to recognize the United States Silk Conditioning Company for this purpose;

Therefore, be it

RESOLVED, That the United States Silk Conditioning Company be and hereby is designated as the official conditioning house of this Association, and the Arbitration Committee of the Association, which is elected by this Board, is hereby informed accordingly.

New York, May 22, 1908.

Attest:



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George A. Post — Carl Schoen

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Allentown Silk Co.
Atwood-Morrison Co.
Augusta Silk Works
Baker & Schofield Co.
Belding Bros. Co.
Bliss Silk Throwing Co.
Bloomsburg Silk Mills
Brainerd & Armstrong Co.
Brilliant Silk Mfg. Co.
Bristow, McCollom & Post
Cardinal & Becker
Cedar Cliff Silk Co.
Cheney Bros.
China & Japan Trading Co.
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Paul Gerli & Co.
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Greeff & Co.
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Richardson Silk Co.
Rogers & Thompson
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Stewart Silk Co.
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A. E. Tweedy
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Weidmann Silk Dyeing Co.
Peter D. Westerhoff
Wilkes Barre Silk Co.
Williams Silk Mfg. Co.
Woodhouse, Bopp & Co.
York Silk Co.
Società Anonima Cooperativa Stagionatura e l'Assaggio delle Sete, Milan.

If you are interested in silk your name ought to be enrolled in this enterprise.

In order that every manufacturer may have an interest in its ownership, shares are issued at the low price of $25 each, and the number of shares to any one subscriber is limited to twenty shares, say $500.

Absolute secrecy of all tests is the first rule of this establishment.

A FOREWORD

IT is about a hundred and eighty years (June 1724) since the first silk conditioning establishment was founded in Italy. Conditioning tests are now the rule in all the silk manufacturing countries of Europe.

The experience which has grown out of this universal habit has improved the tests and the processes; and quite recently, (1906) as the result of concerted effort, and enterprise, a marked advance in the construction of drying conditioning ovens was effected and in that year all the leading silk conditioning houses in Europe were standardized to conform mechanically to the results of this newly invented device which takes its name, the Corti System, from the accomplished Director of the silk conditioning works at Milan, Italy.

On the basis of sixteen million pounds of consumption of raw silk annually in the United States the silk manufacturing contries of Europe consume annualy about one-half as much more, say twenty-four million pounds. The reports of their conditioning houses show that double that quantity of raw and thrown silks together are subjected to conditioning tests annually. It is estimated that Europe pays at least half a million dollars annually for the cost of this service.

The practical question for the American silk manufacturer to consider is: Is this money which is paid out for silk conditioning tests wasted, or is the knowledge which these tests disclose and supply a necessity to the intelligent and profitable handling of silk in all its forms?

Evidently, the teaching of Europe proves that "knowledge is power," and that it pays to know.

The proposition which the United States Silk Conditioning Company ventures to lay down is, that silk manufacturing is not only a business, but a science: and that silk conditioning is as necessary to the business as to the science.

It supplies a standard, similarly to the yard stick in textile transactions, or the gold unit which is the foundation of legal tender currencies in all commercial countries. In like manner, conditioning tests are a distinct necessity, because the whole question of Profit or Loss is determined by knowing what you are paying for, and the tests supply that knowledge.

If Europe does not waste the money which it is annually paying out for conditioning tests, and if the silk dealer and manufacturer in Milan, Lyons, St. Etienne, Zurich, St. Gall, Crefeld and Basel *knows* that silk conditioning pays, are not silk dealers and manufacturers in the United States in reality losing large sums annually when theoretically saving

similar testing expenses, and substituting *seemingly inexpensive guesses* for real knowledge of facts?

In addition to the guarantee of knowledge of the truth which the United States Silk Conditioning Company claims is furnished to its clients by its methods and processes, which are absolutely identical with those of the Corti system in Europe, it ventures to think that the personnel of its administration, as disclosed in these pages, guarantees also that other vital essential in an enterprise of this character, viz: absolute integrity of management.

By studying this subject, you may avoid grave errors in calculating the cost price of your merchandise, whether it be raw silk, or thrown silk, or dyed silk, or yard lengths of finished goods.

It is greatly to be desired that every silk manufacturer will read this book understandingly, and will carefully study the illustrations herein set forth.

It is not to be doubted that if he does so, he will find that it will be greatly to his interest to join with us in this enterprise, and make constant use of the testing facilities that we supply.

VARIATION IN TESTS

As the whole principle of conditioning is based on removing small samples from a large amount of silk, and putting these samples through various tests, a slight variation will occur as the samples cannot be assumed to exactly represent the whole lot to be tested.

These variations in any case will be slight. Difference in conditioned weights should not exceed 1/3 of 1%, in boil-off tests ¾ of 1%, and in sizing tests variation will be greater as the quality becomes lower.

Elasticity and tenacity (strength) are greatly affected by variations in moisture, nature, size, etc.

In making twisting tests a variation may be shown in places where spindles have been started up, or have slipped, or when there is greater stretching due to the tension.

In measuring skeins the variation of the tension or stretch, etc., may make a difference of perhaps 1%.

ACCURATE WEIGHING AT
UNITED STATES SILK CONDITIONING CO.

Conditioning Certificate of Weight.

United States Silk Conditioning Company

OFFICIAL TESTING HOUSE FOR

The Silk Association of America

Certificate of Conditioned Weight

No. A 10,000

Duplicate

New York, Jan. 1st, 1909.

Certificate for Mr. John Doe, New York.

Mr. Richard Roe, Paterson.

S A #550

Shirtweight

One Bale Jap Raw

Gross weight	Lbs.	137.65
Gross weight	Kilos	62.44
Tare 0.36 Kilos Paper and Strings 0.93 Kilos		1.28
134.83 lbs Net Weight	Kilos	61.16

Of 18 Skeins taken for Condition Test 12 were used.

Which weighed originally Grams.	880.00
When reduced to absolute weight of Grams.	778.30
From which results, for the above net weight, an absolute weight of Kilos	54.04
Add 11% Kilos	5.94
Conditioned Weight Kilos	59.98
Gain / Loss 1.93% on Net Weight Kilos	1.18
Conditioned Weight Lbs.	132.2[illegible]

Charges to the Consignor $ 0.50

Charges to the Consignee $ 0.50

Signed for the Company ....

Laboratories: 472 and 474 Broome St., New York

Telephone No. 778 Spring

United States Silk Conditioning Company

OFFICIAL TESTING HOUSE FOR

The Silk Association of America

Certificate of Conditioned Weight

No. A 10,000 Duplicate

New York, Jan. 1st, 1909.

Certificate for Mr. John Doe, New York.

Mr. Richard Roe, Paterson.

S A

#550

Shirtweight

One Bale Jap Raw

Gross weight		Lbs.	137.	65
Gross weight		Kilos	62.	44
Tare	0.35	Kilos		
Paper and Strings	0.93	Kilos	1.	28
134.83 lbs Net Weight		Kilos	61.	16

Of 18 Skeins taken for Condition Test 12 were used. Which weighed originally Grams. 880. 00

When reduced to absolute weight of Grams. 778. 30

from which results, for the above net weight, an absolute weight of Kilos 54. 04

Add 11% Kilos 5. 94

Conditioned Weight Kilos 59. 98

Gain / Loss 1.93% on Net Weight Kilos 1. 18

Conditioned Weight Lbs. 132. 23

Charges to the Consignor $ 0.50

Charges to the Consignee $ 0.50

Signed for the Company .....

Laboratories: 472 and 474 Broome St., New York

Telephone No. 738 Spring.

No Conditioning House in the world attempts at present to grade, classify or value silk.

CONDITIONING SILK FOR CORRECT WEIGHT

By its very nature, raw silk is an article which is capable of lending itself successfully to misconception or deception. Its weight varies according to climatic conditions. In rainy weather, for instance, the same silk will automatically increase in weight as much as THREE per cent. over its weight in ordinary dry weather. Because of its power to absorb moisture its weight CAN be still further increased through artificial means, as much as thirty (30) per cent. Silk "conditioning," so called, determines the ABSOLUTE DRY WEIGHT of silk, and to this weight so ascertained eleven (11) per cent. is added as the universal standard to represent the usual absorption of moisture from the normal atmosphere.

When buying a specified lot of raw silk it, therefore, becomes important to know the true AMOUNT OF FIBRE AND OF ATMOSPHERIC MOISTURE, RESPECTIVELY, contained in the lot. Not to *know* the conditioned weight of the silk you are buying means to risk from five to ten or more cents per pound on your purchase.

1. All the operations of weighing are made by two persons, one checking the other.

2. Subsequent to taking the gross weight of the bale, which is the weight in the shirt with bagging and ropes removed, the opening and unpacking is speedily done and samples are taken from all parts of the bale. These sample skeins are divided into three equal lots, each of these three lots to represent in itself the bale under operation. One lot for conditioning test should not be under 300 grams nor over 500 grams, (say 10 to 20 ounces).

All tare attached to the silk, (Shirts, paper, strings, etc.) is reported separately.

The lacings (capiures) of Grant-reeled silk are not considered as tare, if kept in normal size (40 inches to one skein).

3. The three sample lots are at once weighed net on two different scales and by two different persons, within one decigram (about 1½ grains). If the second weighing does not differ from the first by more than 1½ decigrams, (2.3148 grains), the first weight is definite, and forms the basis for the calculation.

4. Two of the three sample lots are submitted to Dessication or Drying out in the conditioning ovens at a temperature not exceeding 140 degrees Centigrade, (284 degrees Fahrenheit), and weighed within one decigram, (1.5432 grains). The weight obtained is the dry weight or absolute weight.

5. If the difference in the percentage of loss of the two lots does not exceed ½% (half per cent.) the average of the two losses constitutes the basis for calculating the absolute weight of the whole bale, from which the conditioned or commercial weight is obtained by adding 11% for allowed normal moisture.

Conditioning Houses supply only the information which can be expressed in figures.

6. If the difference in the percentage of loss of the two lots exceeds ½% (half per cent.) the third lot, kept in reserve, is also submitted to the dessication. If the difference in the percentage of loss of the three lots does not exceed 1% (one per cent.), the average of the three losses forms the basis for calculating the conditioned weight of the whole bale.

7. In case the maximum difference in the percentage of loss of all three lots should exceed 1% (one per cent.) the conditioning operation is inconclusive. The silk has then to be spread openly during 48 hours in order to obtain uniformity in the state of moisture. A new operation of conditioning follows. A charge for both operations is made.

8. All calculating operations are made in duplicate by different persons, one checking the other.

ILLUSTRATION:

INVOICE.

Sales to be governed by Raw Silk Rules, adopted by Board of Managers of the Silk Association of America, May 22, 1908.

NEW YORK, *Jan. 1, 1909.*

MR. JOHN DOE,
N. Y.

Bought of RICHARD ROE & CO.
New York

Terms Cash less 3%.

As per Contract No. 999, dated Dec. 1, 1908.
Payable in Gold at New York. Silk bought Conditioned weight, plus two per cent.

JAPAN FILATURE No. 1.

548-557—10 Bales Silk.

S. A. A.

548	136.50
9	137.00
50	137.50
1	137.50
2	137.50
3	137.00
4	135.50
5	137.50
6	138.00
7	138.00
	1372.00 gross weight.
Tare 2.26 per B.	22.60
	1349.40 lbs. at $4.00—$5,397.60.

The man who insists upon having his raw silk purchase tested for absolute weight intends to pay his bill; he is watching his cost.

Two illustrations, A and B, follow, showing importance of this test. Bales as follows are selected for test:

(A)

548	136.50
550	137.50
553	137.00
557	138.00
Total	549.00 gross weight.

Conditioning tickets show Total 526 lbs. Conditioned weight for the four bales.

Then, by simple proportion,

549 : 526 :: 1372 : x

Gross Wt. Cond. Wt. Gross Wt. Con. Wt. whole lot.

This reduced equals 526×1372=721672÷549=1314.52 Cond. Wt. whole [ten bales.

+2% 26.29

1340.81 Limit of amount [to be paid for.

Bill calls for	1349.40 lbs.	at $4.00	$5,397.60
Limit	1340.81 lbs.		
Adjustment claim against seller	8.50 lbs.	at $4.00	34.36
(A) final bill			$5,363.24

(B) Suppose the same four bales selected had dried out one pound each.

Then gross bill weight becomes	1368.00 lbs.
Gross test bale weight becomes	545.00 lbs.
Bill will call for	1345.40 lbs.

Then by simple proportion,

545 : 526 :: 1368 : x =conditioned weight whole lot.

The conditioned weight of the bales is obviously the same.

Reduced, 526×1368=719568÷545=1320.30 Cond. Wt. whole ten bales.

+2%= 26.40

1346.70 limit to be paid for.

Bill now calls for	1345.40 lbs.	at $4.00	$5,381.60
But Conditioned Weight plus 2%	1346.70 lbs.		
Bill as above	1345.40 lbs.		
Adjustment claim in favor of seller	1.30 lbs.	at $4.00	5.20
Final bill			$5,386.80
(B) Final bill			$5,386.80
(A) Final bill			5,363.24
Loss to buyer from selecting only four bales out of ten			$ 23.56

To have conditioned the whole ten bales would cost buyer and seller each $5.00, and all uncertainty removed.

NOTE.—Always get an invoice for *each* bale, either gross or net. *After* receipt of these weights select for conditioning at random to avoid wet or dry bale. *This is most important.*

To get conditioned weights of every bale prevents error and is the only sure way to know exactly what you receive. (See Combination Test, page 22.)

One hundred pounds absolute weight plus 11% equals one hundred and eleven pounds—conditioned weight. Conditioned weight of the same silk plus 2% equals 113.22 pounds. Therefore while conditioned weight is obtained by adding 11% to absolute dry weight, conditioned weight plus 2% contains 13.22% of moisture, added to absolute dry weight, inasmuch as the 2% is added to the conditioned weight which has been already included.

Weighing Certificate.

United States Silk Conditioning Company

The Silk Association of America

Certificate of Net Weight

No. ... Duplicate

New York, ...

Received from Messrs. ...

Bales ...

Charges ...

United States Silk Conditioning Company

OFFICIAL TESTING HOUSE FOR

The Silk Association of America.

Certificate for Net Weight

No. E 100 Duplicate

New York, Jan 1st. 1909.

Received from Messrs. Mr. John Doe,

Bales 4 Japan Raw

Mark and Number	Gross Weight	Tare	Paper and Strings	Net Weight
S A 549	68.19	2.63		65.56
551	66.68	2.64		64.04
554	69.21	2.69		66.52
556	68.85	2.64		66.21
Kilos	272.93	10.60		

Net Kilos	262.33
Net Equals Lbs.	578.33

In shirt

Charges, $1.00

Signed for the Co. .....

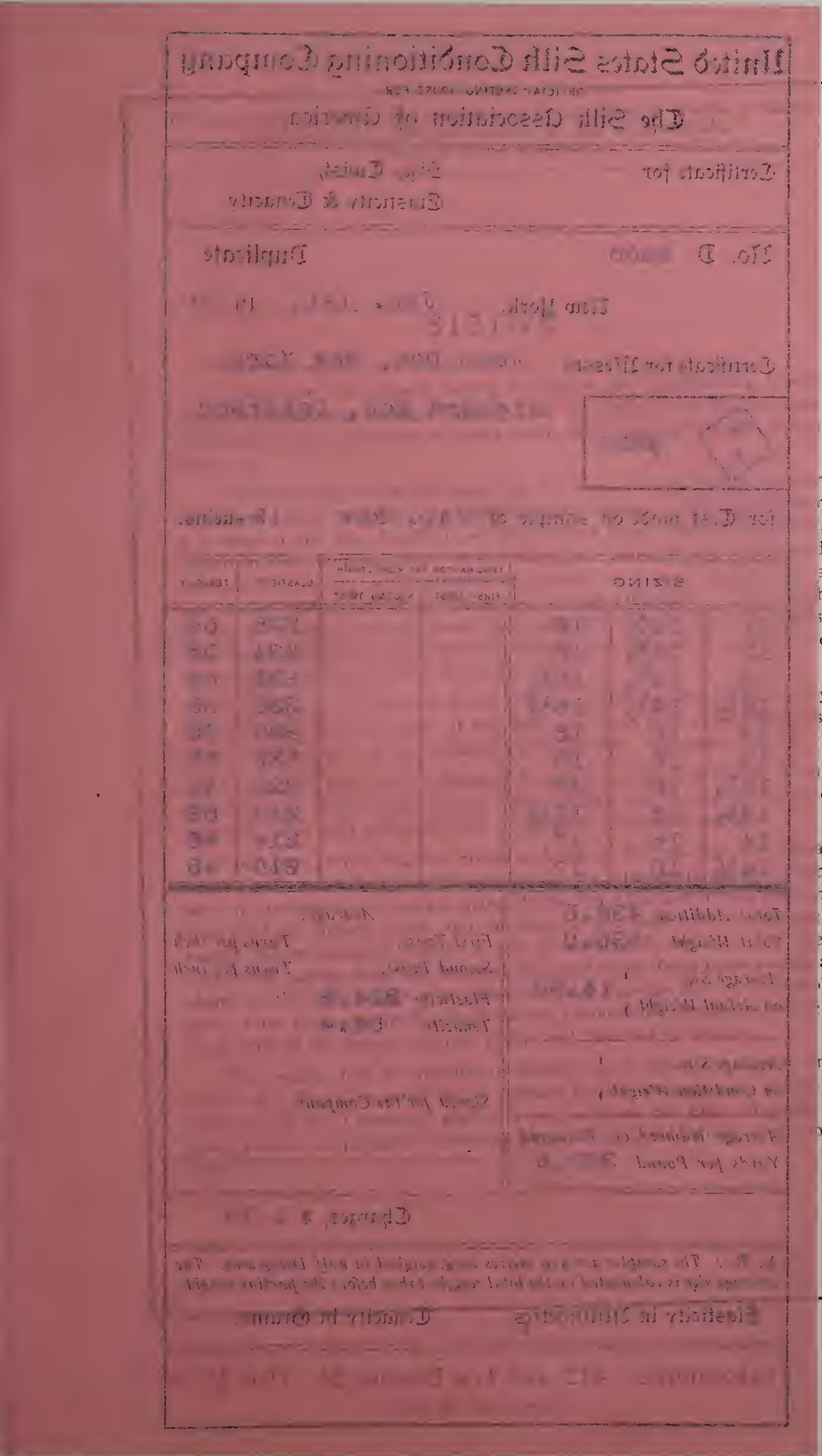
Laboratories: 472 and 474 Broome St, New York

Telephone No. 738 Spring.

WEIGHING BALES in SHIRTS or WEIGHING BALES WITH TARE, I. E., FREE FROM SHIRT, PAPER AND STRINGS

When five bales of silk have been carefully weighed in this manner and two bales have then been conditioned, the estimated total conditioned weight of the entire five bales will be much more exact than if the original invoice, or other weight, is used as a basis.

Certificate of Size, Twist, Etc.


United States Silk Conditioning Company

The Silk Association of America

Certificate for Size, Twist, Elasticity & Tenacity

No. D Duplicate

New York,

Certificate for Messrs.

for Test made on sample of

SIZING

ELASTICITY

TENACITY

Total Addition

Total Weight

Average Size on Actual Weight

Average Size on Condition Weight

First Twist

Second Twist

Turns per Inch

Turns per Inch

Elasticity

Tenacity

Signed for the Company

Average Deniers or Dressed Yards per Pound

Charges

Elasticity in Millimeters

Tenacity in Grams

United States Silk Conditioning Company

OFFICIAL TESTING HOUSE FOR

The Silk Association of America.

Certificate for Size, Twist, Elasticity & Tenacity

No. D 2500 Duplicate

New York, Jan. 1st, 1909.

Certificate for Messrs. John Doe, New York.

Richard Roe, Paterson.

S A #550

for Test made on sample of Jap. Raw 15 skeins.

SIZING			TESTS MADE ON ONE METRE LENGTH		ELASTICITY	TENACITY
			FIRST TWIST	SECOND TWIST		
11	14½	15			238	54
12	14½	15			234	55
12	14½	15½			232	62
12½	14½	15½			230	65
13	15	16			230	65
13	15	16			230	60
13½	15	16			222	49
13½	15	16½			218	52
14	15	17			214	46
14½	15	17			210	45

Total Addition 436.5

Total Weight 435.0

Average Size on Actual Weight 14.50

Average Size on Condition Weight

Average Number of Thousand Yards per Pound 307.5

Average:

First Twist, *Turns per inch*

Second Twist, *Turns per inch*

Elasticity 224.8

Tenacity 54.4

Signed for the Company,

Charges, $ 1.75

N. B.: The samples are 450 metres long, weighed in half Decigrams. The average size is calculated on the total weight taken before the partial weights.

Elasticity in Millimetres. Tenacity in Grams.

Laboratories: 472 and 474 Broome St., New York

Telephone No. 738 Spring

The wise man as well as the foolish man knows there is always a chance for mistakes. The wise man is he who uses available tests to avoid mistakes.

SIZING

To buy raw silk without having it sized at the Conditioning House means a variation of perhaps five per cent. or more in the cost of your merchandise, due to heavier or lighter goods, the requiring of more or less picks, etc.

The fineness of silk is determined by the size. The size is the number of deniers which a skein of a certain length weighs. The legal denier is a skein of silk four hundred and fifty meters long, (about 500 yards), wound in four hundred turns on a reel of one hundred and twelve and one-half centimeters in circumference, (about 44") and weighed by a unit of five centigrams, about 7¾ grains, (called DENIER). The length of silk in a pound of one denier size will therefore be 4,464,528 yards. This figure divided by the number of deniers that any silk may be in size will give the yards per pound that it measures.

To establish the size of a lot of silk, ten skeins are taken from every bale and from different parts of the bale, and from each skein three test skeins, of 450 meters each, (called FLOTTILONS) are reeled off.

The conditioned size is obtained by reducing the test skeins to the absolute dry weight and adding 11% (eleven per cent.) of allowed moisture. For such additional test, a charge of 50 cents is made.

The above is the Regular Sizing and shows the "Spring" or "Variation," (in French called "Ecart") of the silk, i. e., the maximum of unevenness of the highest and lowest sizing skeins, but as a bale of silk contains from 30 to 65 million yards, and the Regular test only tries out approximately fifteen thousand yards; a new *Compound Sizing Test* has been authorized, taking about one hundred thousand yards, from twenty original skeins of the bale, to get more closely at the *Average size* of the whole bale. Four thousand five hundred meters, (about 5,000 yards), are reeled, from each of the twenty original skeins and reported in deniers.

The regular test is valuable for Quality as it shows the Coarse and Fine ends. The Compound test is valuable for the *Average size,* and as a basis to pay for Throwing; also as a test to know the yards of goods a given number of pounds conditioned weight Raw should make. (see table page 34).

Conditioning certificate expresses physical characteristics of silk to guide the owner in appraising quality, grade, and value.

TWIST TESTS

Twist tests, and Elasticity and Tenacity, are reported on the same certificate as sizing.

Twist tests are made on one-half meter length, (about 19¾ inches), and reported both in meters and inches for convenience.

Ten per cent. average variation either way from twist as ordered is allowed. (See Throwsters Rules, Article III).

In Europe a maximum variation of 20 to 25% is allowed on first time twist and about 20% on second time twist. As the machinery in the United States is of entirely different type larger variation is allowable here. In tying up the ends, a large increase of twist necessarily occurs which afterwards spreads each way along the thread. For this reason tests should never be made near knots in the thrown silk, and numerous and careful tests are necessary to show exact conditions as to twist, although a single set of tests will generally serve to give a fair idea of the work done in the Throwing.

ELASTICITY AND TENACITY TESTS

Elasticity, and Tenacity, (breaking strength), tests are reported on one meter length, (39.37 inches), Elasticity in millimeters and Tenacity in grams.

NOTE.—There are no strictly determined relations between the gradings of silk and the tenacity and elasticity that they exhibit. There are so many factors influencing the silk thread from the time the worm spins its cocoon until the finished raw silk thread is produced, that a closely defined scale for the elasticity and strength of thread that the different grades should possess is impracticable.

The following table gives approximately, for general guidance, the Elasticity and Tenacity to be reasonably expected for the different grades of silk.

Elasticity:

25%	average stretch	is a	very good result.
20%	"	"	is a good result.
18-20%	"	"	is a fair result.
under 18%	"	"	is a poor result.

Tenacity: (Breaking strength).

The *average size* in deniers multiplied by four is a very good result.

by 3½, a good result.
by 3, a fair result.
under 3, a poor result.

The elasticity and breaking strength of thrown silk may be greater or less than that of the raw silk from which it has been produced. A variation of 10%, on the average, may cover the difference to be looked for, figured in terms of single thread.

Every unnecessary cent of cost retards business progress.

INSPECTION TEST

This new test was recently authorized by the Executive Committee of the Conditioning Company on account of the new raw silk rules regarding CLAIMS FOR DIFFERENCES IN QUALITY AND/OR SIZE, which require that the buyer must accept or reject a lot within two weeks after delivery. (See page 48.)

A charge of $5.00 is made on from one to five bales. The authorized agent of the Conditioning Company removes twenty sample skeins from the bales, drawn as evenly as possible from different parts of each bale, at the Storage House.

These twenty skeins are then submitted to the compound sizing test so that the average size will be disclosed. About one thousand yards is then wound off of each of the twenty original skeins and made into standard two-thread Tram or Organzine, without soaking. The ten small skeins of about one thousand yards each of the two-thread thrown silk are then boiled-off by the exact method for that test, namely:—boiling twice for one-half hour each in a separate solution of soap, the quantity of soap in each solution to be 25% of the weight of the silk. These small samples are then returned to the party in interest with the compound sizing ticket for his inspection, and give a very fair average impression as to the quality of the silk.

It is believed that this test will be of particular advantage to both buyer and seller as it should avoid a great deal of trouble where silks are needed for special uses. When made in conjunction with the combination test, the sizing need not be duplicated, and the price of this test is, therefore, reduced to $2.50.

The value of this test will be better appreciated by those who have read the pamphlet entitled "Ravelings (or lousiness) of Dyed Silks," published by the Silk Association of America, which is a translation from the report of the Laboratory for Silk Testing of the Silk Conditioning House of Milan, 1905. From this pamphlet we quote as follows:

"Practice has demonstrated that the presence of 100 to 150 "nibs" (fiocchetti) per each thousand metres in thread used for material ordinarily manufactured, does not damage the appearance of the fabric and it is only when the nibs amount to several hundred that the effect becomes disastrous. As the success of many facbrics is dependent on the judicious selection of the raw silk used, and the exterior appearance of the raw silk does not give a reliable indication about its susceptibility to take on dyes uniformly and to produce the required results, the manufacturer can only resort to the direct examination of a small sample, and submitting it to tests calculated to ascertain the quality of the silk which he proposes to use.

"Especially when the purchase is of silk of unknown origin or when new articles are to be manufactured, it would be always advisable to have a trial of ungumming in two successive 3% soap baths and for the duration of half an hour, as is practiced in conditioning establishments for official trials of boiling off.

"It is clear that the silk which can stand the usual operation of boiling off will resist even better when the dyer shall have applied the improvements which we shall mention further on. In the dye-shop the boiling off is usually performed at a temperature below 100 degrees C. and with two soap baths, the first of which is prepared with 30 to 33% of soap to the weight of the silk, and the second with one-half. For silks that are to be dyed in dark colors the second bath is not infrequently used for the ungumming of a subsequent parcel."

Mistakes are among the things that are not governed by the law of supply and demand.

United States Silk Conditioning Company

OFFICIAL TESTING HOUSE FOR

The Silk Association of America.

Certificate for Boiling Off

No. B — Duplicate

New York, Jan. 1st. 1909.

Messrs. John Doe, New York.

Have consigned for Boiling Off Test.

One Sample 7th Bale — Weight Grams
from 10 skeins Net 113.2

Which results in an absolute weight			
Before boil-off, Grams	102.	3	
After boil-off, Grams	83.	0	That is to say
Loss in boil-off, Grams	19.	3	18.87 %

Charges $1.00

Signed for the Company

Laboratories 472 and 474 Broome St., New York

Telephone No. 788 Spring

United States Silk Conditioning Company

OFFICIAL TESTING HOUSE FOR

The Silk Association of America.

Certificate for Boiling Off

No. B 2000 Duplicate

New York, Jan. 1st, 1909.

Messrs. John Doe, New York.

Have consigned for Boiling Off Test.

One Sample Jap Raw Weight Grams
from 10 skeins Net 113.2

S A

#550

Which results in an absolute weight			
Before boil-off, Grams	102.	3	
After boil-off, Grams	83.	0	That is to say
Loss in boil-off, Grams	19.	3	18.87 %

Charges $1.00

Signed for the Company .....

Laboratories: 472 and 474 Broome St., New York

Telephone No. 738 Spring.

When you find that your conditioning tests continue to prove satisfactory, you should remember that you are thereby safe-guarding yourself against mistakes.

BOIL-OFF

The boil-off test on raw and thrown silk shows the loss of gum, soap, oil, or other soluble substance, which the silk sustains by boiling twice, for one-half hour each time in separate solutions of soap. The quantity of soap in each solution to be 25% (twenty-five per cent.) of the absolute weight of the silk and the quantity of water to be standard proportion. The sample to be tested is reduced to the absolute weight before and after the boiling-off. From the difference between these two weights the percentage of loss is computed.

To buy, and have thrown, raw silk without having the boil-off test of the Raw and Thrown applied by the Conditioning House may mean a loss of ten cents per pound without your being aware of it, either in the Raw, the Throwing, or the Dyeing of the silk.

The boil-off of the raw and thrown silk should be tested simultaneously in the same process, according to Throwsters' Rules, Article IX, on determination of loss. See page 52.

The boil-off test is unlike the one made by the dyer, who may strip more or less gum than the Conditioning House, as he finds wise and necessary, but it represents the standard test and is always made with the same proportion of soap and water and boiled for exactly the same length of time, so that all tests will be *comparative* and *standard.*

The real value of all silk is and must be based on the Conditioned Weight Boiled-Off Thrown Silk. This is what you get, though few will compare costs to ascertain this only Real Value.

The value of the raw silk, the waste made in throwing, the proper weighting to be used in the dyeing, and the very "goodness of the goods" are controlled by knowing the conditioned weight of the boiled-off thrown silk. Variable starting points on the other hand, (like Thrown Actual Ticket Weight for Dyeing) cause loss and trouble continually.

The value of the Raw and Thrown Silk boil-offs is illustrated on page 23, showing the clearance of the lot when returned from the Throwster, and on page 24, showing the discrepancies in Dyeing.

Measuring Certificate.

United States Silk Conditioning Company

OFFICIAL TESTING HOUSE FOR

The Silk Association of America.

Certificate of Length of Skeins

No. C 2000 — Duplicate

Jan. 1st, 1909.

Certificate for Messrs. John Doe, New York.

Richard Roe, Paterson.

for test made on Japan Tram. 20 skeins

					Marks, Etc.
1	9679	Yds.	11	9754	Yds.	
2	9989	"	12	9922	"	
3	9952	"	13	9781	"	
4	9899	"	14	9678	"	
5	9662	"	15	9931	"	Lot E
6	9933	"	16	9862	"	390
7	9941	"	17	9806	"	
8	9986	"	18	9895	"	
9	10,023	"	19	9780	"	
10	9858	"	20	9744	"	

1st Total { 9892 — 2d Total { 9815

1st Total 9892

Grand Total 19,707

Average 9854 Yds.

Signed for the Co.

Charges $1.00

Laboratories: 472 and 474 Broome St., New York

Telephone No. 738 Sprina.

Universal use of conditioning tests will eliminate unfair and unintelligent competition from all branches of the business and is in the line of true costing of silk merchandise.

MEASURING LENGTHS OF SKEINS

We present on page 40 a table which will be found very useful in this connection. This table deals with silks running from 9/11 deniers to 16/18 deniers and presents the number of yards per pound for the two allowable extremes of each size in raw silk thrown without soaking (in which a take up of 3% for twist should be figured on) and in raw silk thrown with soaking, the additions to the weight from soap and oil of 1, 2, 3, 4, 5, 6 and 7%, in addition to the 3% of take up in twist in each case.

If the compound sizing test shows for instance that a lot of raw silk runs 300,000 yards to the pound and if this is thrown into two-thread organzine with approximately 3% allowance, as in Europe, for the shortening due to twist, and if the difference between the boil-off raw and the boil-off thrown is shown to be 4% the number of yards given in the Table marked No. 7 will show, (always in terms of single thread of course) what the thrown silk should measure per pound.

These measuring tests are also of special value to the makers of spool or twist silks, and their customers.

Those manufacturers who use much cotton yarn, particularly in fine counts, whether domestic or imported, will find it of much importance to have the Conditioning House test the weights and yards per pound of the yarns delivered to them.

In fine numbers a difference in the count means a considerable difference in the price, and any one wishing to know that he is getting what he is paying for can only be sure of it by having the size of his yarns, on a conditioned basis, tested by the Conditioning House.

To see that the skeins delivered are of standard length measuring tests should also be made.

Your most unsatisfactory competitor is he who only believes his "cost is low," but who doesn't know.

COMBINATION TEST

This is by far the most valuable and eventually the cheapest method of testing all silk, as it gives the Conditioned Weight Raw, the Conditioned Weight Thrown, the Boil-off Raw and the Boil-off Thrown, also the sizing from each bale; and on five or more bales the option is given on each five to have three Regular sizings and one Compound sizing made under this test. With this information the purchased weight, returns from the Throwster, Boil-off for your instructions to dyers, size for paying Throwster and controlling the manufacture of the goods, are all obtained in the most definite possible manner at the low cost of $17.50 for five bales, probably worth $2,500.00. We believe this should be particularly attractive to all American manufacturers. Part of the tests for conditioned weight are already by agreement in the new rules payable by the seller, so that in the end the cost to the manufacturer is further reduced.

When ordered to include the Inspection Test a total charge of $20.00 for five bales will be made, as the sizing test will not need to be duplicated.

In making the Combination Test all the Raw bales are sent to the Conditioning House, where the bales are tested for Conditioned Weight, and samples are removed for sizing, (and Inspection test when desired). Samples of Raw are reserved for Boiling-off, marked with the lot number and held in reserve until the throwing is completed. The raw is at once shipped away for Throwing. As soon as one bale, (6 to 8 bundles), is thrown, it is returned to the Conditioning Works and tested for Conditioned Weight Thrown; small samples are removed for boiling off, and the bale forwarded to the Dyer or Owner to avoid delay. Each bale, as thrown, is treated in like manner, and when all are finished, the samples of Raw and Thrown are Boiled off *together* in the same baths, as this test is uncertain if done at different times. (See Art. IX, Trowsters' Rules, page 52.)

When the Conditioned Weight and Boil-off of all the raw silk, and the Conditioned Weight and Boil-off Thrown of all the thrown silk is thus determined, the clearance like that following is made and the loss determined.

To test part of the Raw or Thrown is inconclusive as silk varies rapidly in weight, and the parcels tested may be too dry or too wet to properly represent the whole lot.

The ten bale purchase on page 10 is supposed to be sent to two throwsters, A and B.

The dealer or manufacturer who is credited with having loyally accepted conditioning tests as his standards in his transactions will not be idle; he will be busy, when others, who have not adopted them, are idle.

Conditioned Weight is..... 1314.52 Pounds.
Both throwsters report Opening Weight..... 1350.00 "

Throwster A. Returns..... 1363.00 Pounds.
Opening weight..... 1350.00 "

Boil-off Raw 20% } Gain 13.00 "
Boil-off Thrown 26% }

Throwster B. Reports Opening Weight.... 1350.00 Pounds.
Returns..... 1345.00 "

Boil-off Raw 20% } Loss 5.00 "
Boil-off Thrown 24% }

Throwster A.'s Clearance. Conditioned Weight Raw..... 1314.52 Pounds.
Conditioned Weight Thrown. 1360.00 "

Conditioned Weight Raw.....	1314.52	
Boil-off Raw 20%.....	262.91	
Boil-off Raw Silk.....	1051.61	1051.61
Conditioned Weight Thrown.....	1360.00	
Boil-off Thrown, 26%.....	353.60	
Boil-off Thrown.....	1006.40	1006.40
Loss		45.21

45.21÷1051.61=4 3/10 per cent. of loss made.

Throwster B.'s Clearance. Conditioned Weight Raw.. 1314.52
Boil-off Raw 20%..... 262.91

Boil-off Raw Silk.....	1051.61	1051.61
Conditioned Weight Thrown.....	1353.00	
Boil-off Thrown 24%.....	324.72	
	1028.28	1028.28
Loss		23.33

23.33÷1051.61=2 2/10 per cent. of loss made.

N. B.—Note carefully that in these instances it will be seen how the man who has given back 18 pounds more than the other has really made nearly twice as much loss.

VALUE OF TESTS IN DYEING

Few manufacturers realize what an important difference may result in the cost of their dyeing, and in the percentage of their weighting, from a lack of knowledge of the Boil-off of their Thrown Silk.

We invite careful attention to the following:

BOIL-OFF IN DYEING. Showing that variations may result in practice if Conditioned Weight, and Boil off Thrown certificates are not used as the basis of computation.

The following ilustrations are all based on 100 lbs. of Conditioned Weight Thrown Silk. The Boil-off in each of these cases being 20%, leaves 80 pounds of Conditioned Weight Boiled-off Thrown Silk.

The 100 pounds Conditioned Weight is supposed to weigh 103 and 105 pounds, scale or ticket weight, for the purpose of this illustration. The cost of Dyeing and the returns are shown for

I. Pure dye at 30c. per pound.
II. 16 oz. dye at 50c. per pound.
III. 24 oz. dye at 80c. per pound.
IV. 32 oz. dye at $1.00 per pound.
V. 48 oz. dye at $1.50 per pound.

I. Pure Dye at 30c. per pound.

105 lbs. at 30c.....	$31.50
103 " " "	30.90
100 " " " (Conditioned Weight).....	30.00

Conditioned Weight saves $1.50.
80 lbs. of Boiled-off Silk Dyed. Saving 5%.

II. 16 oz. Dye at 50 c. per lb.

	Silk		Weighting		Return	Bill
A. 105 lbs. at 50c.....	80	+	25	=	105	$52.50
B. 103 " " "	80	+	23	=	103	51.50
C. 100 " " "	80	+	20	=	100	50.00

5 lbs. weight gained on A. for $2.50—50c. per lb. no saving.
3 lbs. weight gained on B. for $1.50—50c. per lb. no saving.

III. 24 oz. Dye at 80c. per pound.

	Silk		Weighting		Return	Bill
A. 105 lbs. at 80c.....	80	+	77½	=	157½	$84.00
B. 103 " " "	80	+	74½	=	154½	82.40
C. 100 " " "	80	+	70	=	150	80.00

7½ lbs. gain on A. for $4.00 saves $2.00—2½% on dyeing.
4½ lbs. gain on B. for $2.40 saves $1.20—1½% on dyeing.

% Weighting on original 80 lbs. silk, A—96.8%
% Weighting on original 80 lbs. silk, B—93.1%
% Weighting on original 80 lbs. silk, C—87.5%

The most dangerous competitors are those who take things for granted.

IV. 32 oz. Dye at $1.00 per pound.

		Silk		Weighting		Return	Bill
A.	105 lbs. at $1.00.....	80	+	130	=	210	$105.00
B.	103 " " "	80	+	126	=	206	103.00
C.	100 " " "	80	+	120	=	200	100.00

10 lbs. gain on A. for $5.00 saves $5.00—5% on dyeing.
6 lbs. gain on B. for $3.00 saves $3.00—3% on dyeing.

% Weighting on original 80 lbs. silk, A—162½%.
% Weighting on original 80 lbs. silk, B—157½%
% Weighting on original 80 lbs. silk, C—150%

V. 48 oz. Dye at $1.50 per pound.

		Silk		Weighting		Return	Bill
A.	105 lbs. at $1.50.....	80	+	235	=	315	$157.50
B.	103 " " "	80	+	229	=	309	154.50
C.	100 " " "	80	+	220	=	300	150.00

15 lbs. gain on A. for $7.50 saves $15.00—10% on dyeing.
9 lbs. gain on B. for $4.50 saves $ 9.00— 6% on dyeing.

% Weighting on original 80 lbs. silk, A—293¾%.
% Weighting on original 80 lbs. silk, B—286¼%.
% Weighting on original 80 lbs. silk, C.—275%.

Therefore:

So long as the price of dyeing is based on ticket bundle or actual weight, the manufacturer will, as illustrated, find it profitable to arrange that

I. All silk of 16 oz. dye and under should be soaked lightly in throwing and kept very dry.

II. All silk for 16 oz. dye and over should be soaked heavily in throwing and kept moist.

To know the real return, however, the Conditioned Weight Boiled-off Thrown Silk must be used as the basis of figuring or your silk may be over-weighted 10% or more without your being aware of it.

All this information for $3.50 per bale, worth $500 to $1,000.

All tests made by numbers—owner of silk unknown to employees.

RULES AND REGULATIONS FOR HANDLING SILK

(Subject to addition or alteration as required, due notice of which will be given.)

CONDITIONING

1. Absolute secrecy of all tests is the first rule of this establishment.

2. All the operations of weighing are made by two persons, one checking the other.

3. Subsequent to taking the gross weight of the bale, the opening and unpacking is speedily done and samples are taken from all parts of the bale. These sample skeins are divided into three equal lots, each of these three lots to represent in itself the bale under operation. One lot for conditioning test should not be under 300 grams nor over 500 grams.

Tare attached to the silk (paper and strings) is reported separately.

The lacing (capiures) of Grant-reeled silk are not considered as tare, if kept in normal size (40 inches to one skein).

4. The three sample lots are at once weighed net on two different scales and by two different persons, within one decigram. If the second weighing does not differ from the first by more than 1½ decigram, the first weight is definite, and form the basis for the calculation.

5. Two of the three sample lots are submitted to Desiccation or Drying out in the conditioning ovens at a temperature not exceeding 140 degrees Centigrade and weighed within one decigram. The weight obtained is the dry-weight or absolute weight.

6. If the difference in the percentage of loss of the two lots does not exceed ½% (half per cent.), the average of the two losses constitutes the basis for calculating the absolute weight of the whole bale, from which the conditioned or commercial weight is obtained by adding 11% for allowed normal moisture.

7. If the difference in the percentage of loss of the two lots exceeds ½% (half per cent.), the third lot, kept in reserve, is also submitted to the Desiccation. If the difference in the percentage of loss of the three lots does not exceed 1% (one per cent.), the average of the three losses forms the basis for calculating the conditioned weight of the whole bale.

8. In case the maximum difference in the percentage of loss of all three lots should exceed 1% (one per cent.), the conditioning operation is inconclusive. The silk has then to be spread openly during 48 hours in order to obtain uniformity in the state of moisture. A new operation of conditioning follows. A charge for both operations is made.

9. All calculating operations are made in duplicate by different persons, one checking the other.

10. Other articles than silk may also be submitted to the conditioning operation. The allowance for natural moisture is as follows:

Carded wool and wool waste	18¼%
Wool yarn	17 %
Cotton, raw and yarned	8½%
Linen, raw and yarned	12 %
Jute, raw and yarned	13¾%
Tow, raw and yarned	12½%
Mixed yarn of wool and cotton	10 %
Mixed yarn of wool and silk	16 %
Spun or schappe, raw and carded silk	11 %

SIZING TESTS

The fineness of silk is determined by the size. The size is the number of deniers which a skein of a certain length weighs. The legal denier is a skein of silk four hundred and fifty meters long, wound in four hundred turns on a reel of one hundred and twelve and one-half centimeters in circumference and weighed by a unit of five centigrams (called DENIER).

To establish the size of a lot of silk, ten skeins are taken from every bale and from different parts of the bale, and from each skein three test skeins (called FLOTTILONS) are reeled off.

The conditioned size is obtained by reducing the test skeins to the absolute weight and adding 11% of allowed moisture. For such additional test, a charge of 50c. is made.

TWIST TESTS

Samples of about 3 to 4 yards are taken from each skein and reeled on a metallic holder. A short boiling operation serves to free the silk from the gum. The tests are made on a fixed length (half meter or about 20 inches) and the number of turns reported on one meter, and also per inch by dividing turns per meter by 40—(the exact equivalent being 39, 37/100 inches).

ELASTICITY AND TENACITY

The elasticity is expressed in Millimeters on one meter and tenacity in Grams on one meter.

BOIL-OFF

The boil-off test shows the loss of gum which silk, (raw or thrown) sustains by boiling twice for one-half hour in a separate solution of soap. The quantity of soap in each solution to be 25% of the absolute weight of the silk. The sample to be tested is reduced to the absolute weight before and after the boiling-off. The difference between the two weights gives the percentage of loss.

Eternal vigilance is the source of gain.

PRICE LIST

Subject to alteration, as required, due notice of which will be given.

Transportation Charges Payable by Owner.

	Per bale.		Per test.
Conditioning all raws, or thrown silk	$1.00	Elasticity and tenacity	$0.75
	Per test.	Twist	.75
Boiling off	1.00	Inspection test, 5 bales or less.	5.00
Measuring:		Net weighing (with detailed tare)	.75
10 skeins, 20,000 yds. long...	1.00	Weighing raw in shirts	.25
15 skeins, 15,000 yds. long...	1.00	Sizing	1.00
20 skeins, 10,000 yds. long, or less	1.00	Compound sizing	2.00
Additional copies of certificates (in double) each	.25	Conditioning test skeins	.50
		Conditioning spun silk (limited to 300 lbs. per bale)	1.00

COMBINATION TESTS.

On not less than five bales and not more than twenty bales in any one lot. Thrown bales not to exceed the number of raw bales.

For five bales	$17.50
For each additional bale	3.50
For five bales, with inspection test	20.00

Conditioning, five bales raw...	$5.00	Sampling thrown silk as returned, for boil-off	$0.50
Sizing, five bales raw	5.00	Boiling off raw	1.00
Conditioning, five bales thrown, as returned from throwster and forwarded to dyer	5.00	Boiling off thrown	1.00

If treated separately the individual charge for each of the above tests would be $5.00, making $25.00 in all, showing a saving of $7.50 when the combination test is ordered.

Combination test must have lot number for identification of thrown silk when returned.

MEMO. THE COMBINATION TEST GIVES

a. The conditioned weight raw as a check in paying for the silk.

b. Sizing test on each bale showing the variation in the thread—30 small skeins from each bale.

c. The conditioned weight of the thrown silk returned by the throwster.

d. A boil off of the raw silk (sizing skeins) giving the average gum in the entire lot—30 small skeins from each bale.

e. A boil off of the thrown giving the average gum and soap in all the thrown silk as returned.

RULES REGARDING DELIVERY OF CERTIFICATES

All certificates are produced in triplicate. The original is permanently filed at the laboratory.

The test tickets of our Company are only delivered to the firm or person who has ordered the test, and in whose name the ticket is issued.

To avoid confusion, the tests ordered have to be paid for by the firm ordering the same.

If the charges are to be divided between two firms, both firms are entitled to one ticket. For Duplicate Copies (in double) 25 cents is charged.

METRIC EQUIVALENTS

LINEAR MEASURE.

1 centimeter=0.3937 in.	1 inch=2.54 centimeters.
1 decimeter=3.937 in.=0.328 ft.	1 foot=3.048 decimeters.
1 meter=39.37 in.=1.0936 yds.	1 yard=0.9144 meters.
1 decameter=1.9884 rods.	1 rod=0.5029 decameters.
1 kilometer=0.62137 miles.	1 mile=1.6093 kilometers.

(The meter, as used in Europe, is 39.370432 inches.)

SQUARE MEASURE.

1 sq. centimeter=0.1550 sq. inches.	1 sq. inch=6.452 sq. centimeters.
1 sq. decimeter=0.1076 sq. feet.	1 sq. foot=9.2903 sq. decimeters.
1 sq. meter=1.196 sq. yards.	1 sq. yard=0.8361 sq. meters.
1 are=3.954 sq. rods.	1 sq. rod=0.2529 ares.
1 hectare=2.47 acres.	1 acre=0.4047 hectares.
1 sq. kilometer=0.386 sq. miles.	1 sq. mile=2.59 sq. kilometers.

WEIGHTS.

1 decigram = 0.003527 oz. = 1.5432 grains.	1 metric ton=1.1023 English short tons.
1 gram=0.03527 oz. Avoir., or about 15½ Troy grains.	1 ounce Avoir.=28.35 grams.
1 kilogram=2.2046 lbs. Avoir.	1 pound Avoir.=0.4536 kilograms.
	1 English short ton=0.9072 metric tons.

APPROXIMATE METRIC EQUIVALENTS.

1 decimeter=4 inches.	1 liter=1.06 qt. liquid, 0.9 qt. dry.
1 meter=1.1 yards.	1 hectoliter=2 5/6 bushels.
1 kilometer=⅝ of a mile.	1 kilogram=2 1/5 lbs.
1 hectare=2½ acres.	1 metric ton=2,200 lbs.
1 stere, or cu. meter=¼ of a cord.	

TROY WEIGHT.

24 grains=1 pennyweight.	12 ounces=1 pound=5,760 grains.
20 pennyweights=1 ounce.	

Used for weighing gold, silver, etc.

APOTHECARIES' WEIGHT.

20 grains=1 scruple.	8 drams=1 ounce.
3 scruples=1 dram.	12 ounces=1 pound=5,760 grains.

The ounce and pound in this are the same as in troy weight.

AVOIRDUPOIS WEIGHT.

27 11/32 grains=1 dram.	4 quarters=1 hundred weight.
16 drams=1 ounce.	2,000 lbs.=1 short ton.
16 ounces=1 pound=7,000 grains.	2,240 lbs.=1 long ton.
25 pounds=1 quarter.	

To avoid error, use abbreviations grs. for grains, gms. for grams.

Pounds and decimals of pounds are preferable to pounds and ounces for all calculations.

The values given above have been checked by the U. S. Bureau of Standards.

EQUIVALENTS OF METRIC WEIGHTS IN POUNDS AND DECIMALS

Kgs.	Lbs.	Kgs.	Lbs.	Kgs.	Lbs.
1	2.2046	36	79.3656	71	156.5266
2	4.4092	37	81.5702	72	158.7312
3	6.6138	38	83.7748	73	160.9358
4	8.8184	39	85.9794	74	163.1404
5	11.0230	40	88.1840	75	165.3450
6	13.2276	41	90.3886	76	167.5496
7	15.4322	42	92.5932	77	169.7542
8	17.6368	43	94.7978	78	171.9588
9	19.8414	44	97.0024	79	174.1634
10	22.0460	45	99.2070	80	176,3680
11	24.2506	46	101.4116	81	178.5725
12	26.4552	47	103.6162	82	180.7773
13	28.6598	48	105.8208	83	182.9818
14	30.8644	49	108.0254	84	185.1864
15	33.0690	50	110.2300	85	187.3910
16	35.2736	51	112.4346	86	189.5956
17	37.4782	52	114.6392	87	191.8002
18	39.6828	53	116.8438	88	194.0048
19	41.8874	54	119.0484	89	196.2094
20	44.0920	55	121.2530	90	198.4140
21	46.2966	56	123.4576	91	200.6186
22	48.5012	57	125.6622	92	202.8232
23	50.7058	58	127.8688	93	205.0278
24	52.9104	59	130.0714	94	207.2324
25	55.1150	60	132.2760	95	209.4370
26	57.3196	61	134.4806	96	211.6416
27	59.5242	62	136.6852	97	213.8462
28	61.7288	63	138.8898	98	216.0508
29	63.9334	64	141.0944	99	218.2554
30	66.1380	65	143.2990	100	220.4600
31	68.3426	66	145.5036	150	330.6900
32	70.5472	67	147.7082	200	440.9200
33	72.7518	68	149.9128	300	661.3800
34	74.9564	69	152.1174	400	881.8400
35	77.1610	70	154.3220	500	1102.3000

EQUIVALENTS OF POUND WEIGHTS IN KILOS AND DECIMALS

Lbs.	Kgs.	Lbs.	Kgs.	Lbs.	Kgs.
1	0.4536	36	16.3296	71	32.2056
2	0.9072	37	16.7832	72	32.6592
3	1.3608	38	17.2368	73	33.1128
4	1.8144	39	17.6904	74	33.5664
5	2.2680	40	18.1440	75	34.0200
6	2.7216	41	18.5976	76	34.4736
7	3.1752	42	19.0512	77	34.9272
8	3.6288	43	19.5048	78	35.3808
9	4.0824	44	19.9584	79	35.8344
10	4.5360	45	20.4120	80	36.2880
11	4.9896	46	20.8656	81	36.7416
12	5.4432	47	21.3192	82	37.1952
13	5.8968	48	21.7728	83	37.6488
14	6.3504	49	22.2264	84	38.1024
15	6.8040	50	22.6800	85	38.5560
16	7.2576	51	23.1336	86	39.0096
17	7.7112	52	23.5872	87	39.4632
18	8.1648	53	24.0408	88	39.9168
19	8.6184	54	24.4944	89	40.3704
20	9.0720	55	24.9480	90	40.8240
21	9.5256	56	25.4016	91	41.2776
22	9.9792	57	25.8552	92	41.7312
23	10.4328	58	26.3088	93	42.1848
24	10.8864	59	26.7624	94	42.6384
25	11.3400	60	27.2160	95	43.0920
26	11.7936	61	27.6696	96	43.5456
27	12.2472	62	28.1232	97	43.9992
28	12.7008	63	28.5768	98	44.4528
29	13.1544	64	29.0304	99	44.9064
30	13.6080	65	29.4840	100	45.3600
31	14.0616	66	29.9376	150	68.0400
32	14.5152	67	30.3912	200	90.7200
33	14.9688	68	30.8448	300	136.0800
34	15.4224	69	31.2984	400	181.4400
35	15.8760	70	31.7520	500	226.8000

EQUIVALENTS OF OUNCES

IN DECIMALS OF THE POUND

Ozs.	Decimals.	Ozs.	Decimals.
¼	Lbs. 0.0156	8¼	Lbs. 0.5156
½	0.0312	8½	0.5312
¾	0.0468	8¾	0.5468
1	0.0625	9	0.5625
1¼	0.0781	9¼	0.5781
1½	0.0937	9½	0.5937
1¾	0.1093	9¾	0.6093
2	0.1250	10	0.6250
2¼	0.1406	10¼	0.6406
2½	0.1562	10½	0.6562
2¾	0.1728	10¾	0.6718
3	0.1875	11	0.6875
3¼	0.2031	11¼	0.7031
3½	0.2187	11½	0.7187
3¾	0.2343	11¾	0.7343
4	0.2500	12	0.7500
4¼	0.2656	12¼	0.7656
4½	0.2812	12½	0.7812
4¾	0.2968	12¾	0.7968
5	0.3125	13	0.8125
5¼	0.3281	13¼	0.8281
5½	0.3437	13½	0.8437
5¾	0.3593	13¾	0.8593
6	0.3750	14	0.8750
6¼	0.3906	14¼	0.8906
6½	0.4062	14½	0.9062
6¾	0.4218	14¾	0.9218
7	0.4375	15	0.9375
7¼	0.4531	15¼	0.9531
7½	0.4687	15½	0.9687
7¾	0.4843	15¾	0.9843
8	0.5000	16	1.0000

INTERNATIONAL YARN TABLES

(Quoted from the published tables of Mr. Matthew Blair, of Glasgow, Scotland.)

Several conferences have been held on this subject, and at that of Paris in 1900 it was agreed that the best system was that of a fixed weight, and a variable count length. The unit was fixed at 1 meter, equal to 1 gramme. Number 1 would mean that a length of 1 metre would weigh 1 gramme; number 100 would be 100 meters per gramme, etc.

Exception was allowed for Raw and Thrown silks, to enable the count to show the degree of variation and irregularity incident to this class of material. The system agreed upon in that case was, on the contrary, that of a fixed length and a variable count weight. The length of skein adopted was 450 meters, and the unit of weight the ½ decigram; thus the count of a silk is expressed by the number of ½ decigrams which a length of 450 meters weighs. The count in International Metric System is also indicated on the bulletin.

EQUIVALENTS OF DRAMS AND DENIERS

TABLES OF LENGTH OF YARDS TO THE POUND — RAW AND THROWN

International Count Meters per Gramme	Deniers Legal Count for Raw and Thrown Silk ½ Décigrammes per 450 Metres	Manchester Thrown Silk Count Drams per 1,000 Yards	Decimal Count Yards per Pound Raw	Decimal Count Yards per pound Thrown, Deducting 3% for Shortening from Twist, and 3% for Soaking, 6% in all
1	9,000	515.93	496	466
2	4,500	257.96	992	933
3	3,000	171.97	1,488	1,399
4	2,250	128.98	1,984	1,865
5	1,800	103.20	2,481	2,332
6	1,500	85.98	2,977	2,798
7	1,285^{71}	73.70	3,473	3,264
8	1,125	64.49	3,969	3,751
9	1,000	57.33	4,465	4,197
10	900	51.59	4,962	4,664
11	818^{18}	46.90	5,458	5,131
12	750	42.99	5,954	5,597
13	692^{31}	39.68	6,450	6,063
14	642^{85}	36.85	6,946	6,529
15	600	34.39	7,443	6,996
16	562^{50}	32.25	7,939	7,463
17	529^{41}	30.35	8,435	7,929
18	500	28.66	8,931	8,395
19	473^{68}	27.15	9,426	8,860
20	450	25.79	9,924	8,831
21	428^{57}	24.56	10,420	9,795
22	409^{09}	23.45	10,916	10,261
23	391^{30}	22.43	11,412	10,727
24	375	21.49	11,908	11,193
25	360	20.63	12,405	11,661
26	346^{50}	19.84	12,901	12,127
27	333^{33}	19.11	13,397	12,593
28	321^{42}	18.42	13,893	13,060
29	310^{34}	17.79	14,389	13,526
30	300	17.19	14,886	13,995
31	290^{32}	16.64	15,382	14,459
32	281^{25}	16.12	15,878	14,925
33	272^{72}	15.63	16,374	15,392
34	264^{70}	15.17	16,870	15,858
35	257^{14}	14.74	17,364	16,322
36	250	14.33	17,863	16,791
37	243^{24}	13.94	18,350	17,249
38	236^{84}	13.57	18,859	17,728
39	230^{76}	13.23	19,351	18,190
40	225	12.89	19,848	18,657
41	219^{51}	12.58	20,344	19,123
42	214^{28}	12.28	20,840	19,590
43	209^{30}	11.99	21,336	20,056
44	204^{04}	11.72	21,832	20,552
45	200	11.46	22,329	20,989
46	195^{65}	11.21	22,825	21,456
47	191^{49}	10.97	23,321	21,922
48	187^{50}	10.74	23,817	22,388
49	183^{60}	10.53	24,313	22,854
50	180	10.32	24,809	23,320

EQUIVALENTS OF DRAMS AND DENIERS

TABLES OF LENGTH OF YARDS TO THE POUND — RAW AND THROWN — *Continued*

International Count Meters per Gramme	Deniers Legal Count for Raw and Thrown Silk ½ Décigrammes per 450 Meters	Manchester Thrown Silk Count Drams per 1,000 Yards	Decimal Count Yards per Pound Raw	Decimal Count Yards per Pound Thrown, Deducting 3% for Shortening from Twist, and 3% for Soaking, 6% in all
51	176^{47}	10.11	25,305	23,787
52	173^{07}	9.92	25,801	24,253
53	169^{81}	9.73	26,298	24,720
54	166^{66}	9.55	26,794	25,185
55	163^{63}	9.38	27,290	25,653
56	160^{71}	9.21	27,786	26,120
57	157^{89}	9.05	28,282	26,585
58	155^{17}	8.89	28,778	27,051
59	152^{54}	8.74	29,274	27,518
60	150	8.59	29,771	27,985
61	147^{54}	8.45	30,269	28,453
62	145^{16}	8.32	30,763	28,917
63	142^{84}	8.18	31,259	29,384
64	140^{62}	8.06	31,755	29,850
65	138^{46}	7.93	32,252	30,317
66	136^{36}	7.81	32,748	30,785
67	134^{32}	7.70	33,244	31,249
68	132^{35}	7.58	33,740	31,716
69	130^{43}	7.47	34,236	32,182
70	128^{52}	7.37	34,733	32,649
71	126^{76}	7.26	35,229	33,105
72	125	7.16	35,725	33,582
73	123^{28}	7.06	36,221	34,048
74	121^{62}	6.97	36,717	34,514
75	120	6.88	37,214	34,981
76	118^{42}	6.78	37,710	35,447
77	116^{88}	6.70	38,206	35,914
78	115^{38}	6.61	38,702	36,464
79	113^{92}	6.53	39,198	36,836
80	112^{50}	6.44	39,695	37,303
81	111^{11}	6.37	40,191	37,780
82	109^{75}	6.29	40,681	38,246
83	108^{43}	6.21	41,183	38,712
84	107^{14}	6.14	41,679	39,178
85	105^{88}	6.07	42,176	39,645
86	104^{65}	5.99	42,672	40,112
87	103^{44}	5.93	43,168	40,578
88	102^{02}	5.86	43,664	41,044
89	101^{12}	5.79	44,160	41,510
90	100	5.73	44,657	41,978
91	98^{90}	5.67	45,153	42,444
92	97^{82}	5.61	45,649	42,910
93	96^{77}	5.55	46,145	43,376
94	95^{74}	5.49	46,643	43,844
95	94^{70}	5.43	47,138	44,310
96	93^{75}	5.37	47,634	44,784
97	92^{78}	5.31	48,130	45,242
98	91^{83}	5.26	48,626	45,708
99	90^{90}	5.21	49,122	46,175
100	90	5.15	49,619	46,642

EQUIVALENTS OF DRAMS AND DENIERS

TABLES OF LENGTH OF YARDS TO THE POUND – RAW AND THROWN — *Continued*

International Count Meters per Gramme	Deniers Legal Count for Raw and Thrown Silk ½ Décigrammes per 450 Meters	Manchester Thrown Silk Count Drams per 1,000 Yards	Decimal Count Yards per Pound Raw	Decimal Count Yards per Pound Thrown, Deducting 3% for Shortening from Twist, and 3% for Soaking, 6% in all
105	85^{71}	4.91	52,100	48,974
110	81^{81}	4.69	54,581	51,306
115	78^{26}	4.48	57,062	53,638
120	75	4.29	59,543	55,970
125	72	4.12	62,024	58,303
130	69^{23}	3.96	64,505	60,635
135	66^{66}	3.82	66,986	62,967
140	64^{26}	3.68	69,467	65,299
145	62^{07}	3.56	71,948	67,631
150	60	3.44	74,429	69,963
155	58^{06}	3.32	76,910	72,295
160	56^{25}	3.22	79,391	74,627
165	54^{54}	3.13	81,872	76,960
170	52^{94}	3.03	84,353	79,292
175	51^{42}	2.94	86,834	81,624
180	50	2.86	89,315	83,956
185	48^{05}	2.79	91,796	86,288
190	47^{35}	2.71	94,277	88,620
195	46^{15}	2.64	96,758	90,953
200	45	2.57	99,239	93,285
205	43^{90}	2.52	101,720	95,467
210	42^{85}	2.46	104,201	97,949
215	41^{86}	2.40	106,682	100,281
220	40^{90}	2.34	109,163	102,613
225	40	2.29	111,644	104,945
230	39^{13}	2,24	114,125	107,277
235	38^{30}	2.19	116,606	109,610
240	37^{50}	2.14	119,087	111,942
245	36^{73}	2.10	121,568	114,274
250	36	2.06	124,049	116,606
255	35^{29}	2.02	126,530	118,938
260	34^{01}	1.98	129,011	121,270
265	33^{90}	1.94	131,492	123,602
270	33^{33}	1.91	133,973	125,935
275	32^{72}	1.87	136,454	128,267
280	32^{13}	1.84	138,935	130,599
285	31^{57}	1.81	141,416	132,931
290	31^{03}	1.78	143,897	135,263
295	30^{50}	1.75	146,378	137,595
300	30	1.72	148,859	139,927
305	29^{50}	1.69	151,340	142,260
310	29^{03}	1.66	153,821	144,592
315	28^{57}	1.63	156,302	146,924
320	28^{12}	1.61	158,783	149,256
325	27^{69}	1.58	161,264	151,588
330	27^{27}	1.56	163,745	153,920
335	26^{83}	1.53	166,226	156,290
340	26^{47}	1.51	168,707	158,585
345	26^{08}	1.49	171,188	160,917
350	25^{71}	1.47	173,668	163,248

EQUIVALENTS OF DRAMS AND DENIERS

TABLES OF LENGTH OF YARDS TO THE POUND — RAW AND THROWN — *Continued*

International Count Meters per Gramme	Deniers Legal Count for Raw and Thrown Silk ½ Décigrammes per 450 Meters	Manchester Thrown Silk Count Drams per 1,000 Yards	Decimal Count Yards per Pound Raw	Decimal Count Yards per Pound Thrown, Deducting 3% for Shortening from Twist, and 3% for Soaking, 6% in all
355	25^{35}	1.45	176,149	165,570
360	25	1.43	178,630	167,912
365	24^{64}	1.41	181,111	170,244
370	24^{32}	1.39	183,592	172,577
375	24	1.37	186,073	174,909
380	23^{65}	1.35	188,554	177,241
385	23^{37}	1.34	191,035	179,573
390	23^{07}	1.32	193,516	181,905
395	22^{78}	1.30	195,991	184,232
400	22^{50}	1.28	198,479	186,570
405	22^{22}	1.27	200,960	188,902
410	21^{95}	1.26	203,441	191,235
415	21^{68}	1.24	205,922	193,567
420	21^{42}	1.22	208,403	195,899
425	21^{17}	1.21	210,884	198,231
430	20^{93}	1.20	213,365	200,563
435	20^{69}	1.18	215,846	202,895
440	20^{45}	1.17	218,327	205,227
445	20^{22}	1.16	220,408	207,183
450	20	1.14	223,288	209,881
455	19^{78}	1.13	225,769	212,013
460	19^{56}	1.12	228,250	214,555
465	19^{35}	1.11	230,731	216,887
470	19^{15}	1.09	233,212	219,219
475	18^{94}	1.08	235,639	221,501
480	18^{75}	1.07	238,174	223,884
485	18^{56}	1.06	240,655	226,216
490	18^{36}	1.05	243,136	228,548
495	18^{18}	1.04	245,617	230,880
500	18	1.03	248,097	233,211
505	17^{82}	1.02	250,578	235,543
510	17^{64}	1.01	253,059	237,876
515	17^{47}	1.00	255,540	240,208
520	17^{30}	0.99	258,021	242,540
525	17^{14}	0.98	260,502	244,872
530	16^{98}	0.97	262,983	247,204
535	16^{82}	0.96	265,464	249,536
540	16^{66}	0.95	267,945	251,868
545	16^{51}	0.94	270,426	254,200
550	16^{36}	0.93	272,906	256,532
555	16^{21}	0 93	275,387	258,864
560	16^{07}	0.92	277,868	261,096
565	15^{93}	0.91	280,349	263,528
570	15^{78}	0.90	282,830	265,860
575	15^{65}	0.90	285,311	268,192
580	15^{51}	0.89	287,791	270,524
585	15^{38}	0.88	290,272	272,856
590	15^{25}	0.87	292,753	275,188
595	15^{13}	0.86	295,234	277,520
600	15	0.85	297,716	279,853

EQUIVALENTS OF DRAMS AND DENIERS

TABLES OF LENGTH OF YARDS TO THE POUND — RAW AND THROWN — *Continued*

International Count Meters per Gramme	Deniers Legal Count for Raw and Thrown Silk ½ Décigrammes per 450 Meters	Manchester Thrown Silk Count Drams per 1,000 Yards	Decimal Count Yards per Pound Raw	Decimal Count Yards per Pound Thrown, Deducting 3% for Shortening from Twist, and 3% for Soaking, 6% in all
610	14^{75}	0.84	302,679	284,518
620	14^{51}	0.83	307,641	289,182
630	14^{28}	0.81	312,603	293,847
640	14^{06}	0.80	317,565	298,511
650	13^{84}	0.79	322,526	303,174
660	13^{63}	0.78	327,488	307,839
670	13^{41}	0.77	332,450	312,503
680	13^{23}	0.75	337,412	317,167
690	13^{04}	0.74	342,374	321,831
700	12^{85}	0.73	347,336	326,496
710	12^{67}	0.72	352,298	331,160
720	12^{50}	0.71	357,260	335,824
730	12^{32}	0.70	362,222	340,489
740	12^{16}	0.69	367,184	345,153
750	12	0.68	372,145	349,816
760	11^{83}	0.67	377,107	354,481
770	11^{68}	0.67	382,069	359,145
780	11^{53}	0.66	387,031	363,809
790	11^{39}	0.65	391,993	368,473
800	11^{25}	0.64	396,956	373,139
810	11^{11}	0.63	401,918	377,803
820	10^{97}	0.63	406,880	382,477
830	10^{84}	0.62	411,842	387,131
840	10^{71}	0.61	416,804	391,796
850	10^{58}	0.60	421,765	396,459
860	10^{46}	0.60	426,727	401,123
870	10^{34}	6.59	431,689	405,788
880	10^{22}	0.58	436,651	410,452
890	10^{11}	0.58	441,613	415,116
900	10	0.57	446,575	419,780
910	9^{89}	0.56	451,537	424,454
920	9^{78}	0.56	456,499	429,109
930	9^{67}	0.55	461,461	433,773
940	9^{57}	0.54	466,423	438,438
950	9^{47}	0.54	471,384	443,101
960	9^{37}	0.53	476,346	447,765
970	9^{28}	0.53	481,308	452,429
980	9^{18}	0.52	486,270	457,094
990	9^{09}	0.52	491,232	461,758
1000	9	0.51	496,194	466,422

TABLE OF LENGTH OF YARDS OF SILK TO THE POUND IN SIZES 9/11 TO 16/18 DENIERS,

TAKING THE AVERAGE OF THE SIZE

The table is based on the following figures of length of silk of *One* denier.

1 denier=0.05 grams.
1 kilogram=1000 grams.
1 kilogram=20,000 deniers of 450 meters each.
1 kilogram=9,000,000 meters=354,330,000 inches.
1 kilogram=2.2046 pounds.
1 pound=160,723,033 inches.
1 pound=4,464,528 yards to one pound of one denier.
4,444,444=Rule of seven four's yards to one pound of 1 denier.
20,084=Error less than ½ of 1%.

4,464,528

The exact decimal equivalent in inches for one meter as used in Europe and elsewhere, is 39.370432. As established by United States Standard it is 39.37 inches. This standard has been followed in preparing this book as the difference of .000432 may be considered negligible for silk calculations.

The term denier is generally used in this country as applying exclusively to raw silk. To indicate the size of thrown silk, the term dram is used. A 1 dram silk measures 1000 yards for a weight of one dram, which equals 256,000 yards per pound. A 2 dram silk is one-half this or 128,000 yards per pound. A 3 dram, 85,333 yards, and so on.

To find the dramage of any given length per pound divide 256,000 by the yards.

To find the yardage of any given dramage divide 256,000 by the drams.

To reduce any given dramage to deniers multiply the dramage by 17.44.

To reduce any given deniers to drams divide the deniers by 17.44.

In figuring sizes of thrown silk always make due allowance for soap and oil, take up in twist, etc.

TABLE OF LENGTHS OF YARDS OF SILK TO THE POUND IN SIZES 9/11 TO 16/18 DENIERS, TAKING THE AVERAGE OF THE SIZE

Explanation:

1. The table gives the raw silk yards to the pound.
2. If thrown unsoaked, the silk is shortened about three per cent., depending on the varying twists and threads.
3. The difference between the raw and thrown silk boil-off, when added to this three per cent., indicates the number of the table to be used up to ten.

Illustration on page 21.

	RAW	(3) Thrown 3% Shortening	(4) 3% Shortening + 1% Soap	
16/18-16½ to 17½	255,100 to 270,600	247,400 to 262,500	244,900 to 259,800	16/18-16½ to 17½
15/17-15½ to 16½	270,600 to 288,000	262,500 to 279,400	259,800 to 276,500	15/17-15½ to 16½
14/16-14½ to 15½	288,000 to 307,900	279,400 to 298,700	276,500 to 295,600	14/16-14½ to 15½
13/15-13½ to 14½	307,900 to 330,700	298,700 to 320,800	295,600 to 317,500	13/15 13½ to 14½
12/14-12½ to 13½	330,700 to 357,100	320,800 to 346,400	317,500 to 342,800	12/14-12½ to 13½
11/13-11½ to 12½	357,100 to 388,200	346,400 to 376,600	342,800 to 372,700	11/13-11½ to 12½
10/12-10½ to 11½	388,200 to 425,200	376,600 to 412,400	372,700 to 408,200	10/12-10½ to 11½
9/11- 9½ to 10½	425,200 to 469,900	412,400 to 455,800	408,200 to 451,100	9/11- 9½ to 10½
	(5) 3% Shortening + 2% Soap	(6) 3% Shortening + 3% Soap	(7) 3% Shortening + 4% Soap	
16/18-16½ to 17½	242,300 to 257,100	239,800 to 254,400	237,200 to 251,700	16/18-16½ to 17½
15/17-15½ to 16½	257,100 to 273,600	254,400 to 270,700	251,700 to 267,800	15/17-15½ to 16½
14/16-14½ to 15½	273,600 to 292,500	270,700 to 289,400	267,800 to 286,300	14/16-14½ to 15½
13/15 13½ to 14½	292,500 to 314,200	289,400 to 310,900	286,300 to 307,600	13/15-13½ to 14½
12/14-12½ to 13½	314,200 to 339,200	310,900 to 335,700	307,600 to 332,100	12/14-12½ to 13½
11/13-11½ to 12½	339,200 to 368,800	335,700 to 364,900	332,100 to 361,000	11/13-11½ to 12½
10/12-10½ to 11½	368,800 to 403,900	364,900 to 399,700	361,000 to 395,400	10/12-10½ to 11½
9/11- 9½ to 10½	403,900 to 446,400	399,700 to 441,700	395,400 to 437,000	9/11- 9½ to 10½
	(8) 3% Shortening + 5% Soap	(9) 3% Shortening + 6% Soap	(10) 3% Shortening + 7% Soap	
16/18 16½ to 17½	234,700 to 249,000	232,100 to 246,200	229,600 to 243,500	16/18-16½ to 17½
15/17-15½ to 16½	249,000 to 265,000	246,200 to 262,000	243,500 to 259,200	15/17-15½ to 16½
14/16-14½ to 15½	265,000 to 283,300	262,000 to 280,200	259,200 to 277,100	14/16-14½ to 15½
13/15 13½ to 14½	283,300 to 304,200	280,200 to 300,900	277,100 to 297,600	13/15-13½ to 14½
12/14-12½ to 13½	304,200 to 328,500	300,900 to 325,000	297,600 to 321,400	12/14-12½ to 13½
11/13-11½ to 12½	328,500 to 357,100	325,000 to 353,300	321,400 to 349,400	11/13-11½ to 12½
10/12-10½ to 11½	357,100 to 391,200	353,300 to 386,900	349,400 to 382,700	10/12-10½ to 11½
9/11- 9½ to 10½	391,200 to 432,300	386,900 to 427,600	382,700 to 423,000	9/11- 9½ to 10½

POINTS OF INTEREST IN THE HISTORY OF SILK CONDITIONING

The first attempt to condition raw silk was made in 1684 in Italy, when a royal decree, issued the 15th of October of that year in Turin, informed both sellers and buyers of raw silk that there was a possibility of establishing the true weight of raw silk in an impartial manner.

At that period the conditioning of silk was a private operation of good faith between the two parties interested. Gradually the neeessity developed for a public and disinterested testing house, and in 1724 the first conditioning house was founded in Turin and opened for public service on the 8th of April.

The method of conditioning adopted was the following: Raw silk skeins were suspended on sticks and exposed to the open air for 24 hours in large, open rooms in order to obtain uniformity in the condition of moisture of the silk. In summer time, the natural state of the atmosphere was considered propitious for the silk, whereas during the cooler part of the year the rooms were heated and the temperature of the air kept at 20 to 25 degrees Centigrade. At the end of this drying opration of 24 hours the raw silk was considered to be in the proper condition of moisture to change the ownership.

On the 25th of March 1735 the King of Italy issued a decree entrusting to the Consul of Trade the task of establishing detailed rules for the method of conditioning; also of appointing the manager and stipulating the charges to be collected for the operation. The receipts went to the treasury of the Consulate of Trade, a fact which means that this first conditioning house was an official institution.

In 1779 a merchant of Lyons, Mr. Rast-Maupas, made a trip through the whole of Italy and on his way back visited also the conditioning house in Turin. On his return to Lyons, Mr. Rast addressed to the Consul of Trade a request to be allowed to open a conditioning house in Lyons and asking for the exclusive right to condition raw silk for a period of 30 years. This request was rejected with the argument that the monopoly for conditioning silk could only be granted to the Board of Trade of Lyons, and not to a private individual. Consequently Mr. Rast being convinced of the neeessity of such an institution, opened a conditioning house out of his own funds without any official protection. He adopted a somewhat different method of conditioning than the one used in Turin. Instead of hanging the silk in open rooms on sticks, he had boxes or partitions of wire-grate, where the raw silk was placed in a loose manner and exposed to the freely passing air. Seller and buyer were present at the filling of these boxes which were then sealed. After 24 hours of drying, the seals were removed and the silk weighed net in the presence of both

seller and buyer, and this weight was recognized as the official commercial weight of the silk. As in Turin the boxes were heated, or not, according to the season of the year. The Lyons system had the advantage of leaving the bale undivided and under seal, thus avoiding any mixing or theft.

Mr. Rast was successful, and the success of his venture induced three other merchants of Lyons to establish similar conditioning houses. Consequently a strong competition amongst the four institutions sprang up with the result that the three younger concerns were ruined. The competition had affected the integrity of the operation. as improper means to influence the weight of the silk had been introduced in order to attract clients to these contestants, and these manipulations destroyed the good reputation of the Lyons Trade.

In order to overcome this drawback the Board of Trade of Lyons applied to the Central Government in Paris suggesting the amalgamation of the four private conditioning houses, and by seizing the business to run it as a monopoly under a very close supervision.

Consequently, by decree of the 23rd Germinal XIII (5th April, 1805) Napoleon I. conferred on the Board of Trade of Lyons the monopoly for the conditioning of silk. The owners of the four private conditioning houses were forced to close and received a small compensation. In 1809 the Board of Trade voted the building of a new plant, and in 1814 the concern was opened for the public service. Until 1842 the method of conditioning remained unchanged.

In 1831 a French engineer, Mr. Léon Talabot, tried to have a new system of conditioning adopted. But it was only after ten years of hard work and by innumerable tests of comparison that he succeeded in 1842 in convincing the Board of Trade and the Central Government of the superiority of his method over the old system. The collaborators of Mr. Léon Talabot were the two constructors Persoz and Rochat.

At first Mr. Talabot had dried out the whole bale of silk by hot air, and then gave to the silk a certain amount of moisture. But the high temperature affected the fibre of the silk and the operation occupied too much time and was too expensive. He had then the idea of building the drying oven on a much smaller scale and instead of drying out the whole bale to use only samples from all parts of the bale. These samples were dried out until a complete state of dryness was obtained, that is to say until the heat had no more influence on the weight of the silk. By means of careful studies, and hundred of tests followed systematically for years, he had arrived at the conclusion that 10% regain of moisture is the natural specific state or condition of raw silk. Later on the percentage of allowance for regain was raised to 11% which is now the recognized standard throughout the silk trade of the world.

Since 1842 nothing has been changed in this standard of establishing the commercial weight of the raw silk. Only the method of attaining the

absolute weight (dry weight) has changed occasionally by using different kinds of heating material, such as charcoal, gas, steam, electricity and others.

Up to 1903 all the systems were in connection with the fact that the high chimney exerted a certain suction power from the ovens into the chimney. But this suction of air was variable and depended on the state of atmosphere, such as hot or cold weather, wind, rain, sunshine, each of these facts influencing the amount of draught in the chimney. All possible means were tried to counterbalance these effects by adopting regulating machinery of different systems, but without absolute success.

Mr. Guiseppe Corti, the Manager of the Milan Conditioning House Cooperativa, conceived the idea, that instead of the suction power of the chimney, a ventilator or blower might be used to force the necessary amount of heated air through the ovens and silk and thus obtain the absolute weight of the silk samples. He constructed the machinery fit for the purpose and had it patented.

At the present time all the important Conditioning Houses in Europe have adopted the Corti System, which means a good step forward, as the conditioning operation has been shortened by nearly one-half, and uniformity of method obtained, which was unknown before.

There are Conditioning Houses at the following points, as well as in some other places where the testing is principally on other fibres.

Italy	Milan (2)
	Turin
	Bergamo
	Lecco
	Como
	Florence
	Udine
	Messina
France	Lyons
	St. Etienne
	St. Chamond
	Aubenas
	Avignon
	Calais
	Paris
	Marseilles
Switzerland	Zurich
	Basel
Germany	Crefeld
	Elberfeld
Austria	Vienna
England	Bradford

RAW SILK RULES AND REGULATIONS

TO GOVERN TRANSACTIONS BETWEEN BUYERS AND SELLERS

IN

THE UNITED STATES OF AMERICA

Approved by the Raw Silk Division of the Silk Association May 18, 1908, and approved by the Board of Managers of the Silk Association of America, May 22, 1908, by the following resolution:

RESOLVED, That the Raw Silk Rules and Regulations to govern transactions between Buyers and Sellers on the Raw Silk Market, which have been approved by the Raw Silk Division of the Silk Association of America, have been carefully considered by the Board of Managers and approved by them.

The Board feels justified in adopting them as rules to govern (in the absence of other special agreements), the adjudication of all disputes or claims which may be referred to the Arbitration Committee of the Silk Association of America for settlement.

RULES

NOTE.—It is understood that nothing in the following rules shall be construed as waiving the right in individual transactions to make any special or distinct contrary agreement, but that the rules shall govern only in cases where no special or specific contract exists.

SALES OF SPECIFIED OR IDENTIFIABLE LOTS OF SILK from stock, or to arrive, for prompt, or future delivery (as for instance, of a lot giving marks and numbers, or of Seller's purchase of such and such a date, or of a lot shipped on a specified steamer or date, or in any other manner identifiable and distinct from other silks), are cancelled by destruction of such silks by fire, flood, marine disaster, or other unavoidable casualty prior to delivery dates as called for by contract; or by the failure of Reeler, or by damage to, or destruction of, the producing factory prior to delivery by the Reeler.

NOTE.—The buyer can protect himself at any time, by taking out additional marine insurance to any extent.

SALES OF AN UNSPECIFIED LOT OF A GIVEN QUALITY, GRADE, CLASS AND SIZE OF SILK (as for instance, a sale of 100 Bales Japan Filatures No. 1 at a given price and delivery), cannot be voided except by mutual consent of Buyer and Seller. Delay in actual transit, damage, or destruction of an unspecified lot of silk, where a similar lot is not obtainable on the New York market, gives the Seller a reasonable period (to be determined by Arbitration in case of dispute) in which to replace.

DELIVERIES. Sales for delivery on a given date, demand delivery or readiness for delivery on the date specified.

Sales for delivery on arrival on or about a given date, give Seller the right of delivery 15 days earlier or later than the date specified.

Sales for delivery within a given period, give Seller the right of delivery at any time within the period specified, unless the contract calls for specific deliveries during said period.

Seller should notify Buyer of readiness to deliver, in accordance with contract terms of delivery, and Buyer is under equal obligation to call for silk when due him, but inadvertent failure of either party to tender or call for delivery, shall not void contract where readiness to deliver can be proved.

Delivery by Seller to common carrier, or Agent of Buyer, in compliance with oral or written instructions of Buyer, or party ordering shipment, is at the risk of said Buyer, or party ordering shipment.

SHIPMENTS FROM ABROAD. Sales for shipment on or before a given date, demand shipment on or before the date specified.

Sales for shipment on or about a given date, give Seller the right of shipment 15 days earlier or later than the date specified.

Sales for shipment within a given period, give Seller the right of shipment at any time within the period specified, unless the contract calls for specific shipments during said period.

Date of bill of lading shall be construed as giving date of shipment.

DEFERRED DELIVERIES caused by request of Buyer, are at the risk of Buyer, who shall pay interest if incurred, storage and fire insurance.

FIRE INSURANCE. In case of total or partial loss by fire where silks remain in the custody of Seller for account of Buyer, whether actually billed up or held for deferred delivery (paid for or not), the amount due Seller becomes payable in accordance with terms of contract, and Seller shall credit Buyer with whatever amount may be recovered from the Underwriters on the lots in question.

WEIGHTS—Actual Weight and Tare is weight as taken at the time of delivery, or billing date (if delivery is deferred), less actual tare of bags, papers and strings.

Invoice Weight is net weight as invoiced by Seller or Seller's Agent at point from which originally shipped.

Conditioned Weight. To ascertain conditioned weight of a lot of Asiatic silks sold on basis of conditioned weight, plus the percentages provided for the different classes of silk, at least two bales out of every five bales shall be tested at Conditioning House in New York. The average of all tests must be accepted as the

basis for entire lot, and expense of conditioning divided equally between Buyer and Seller.

Questions Over Actual and/or Invoice Weight must be adjusted by Buyer notifying Seller that he wishes the lot rebilled to him conditioned weight plus the usual percentages, and Buyer must then send at least two original bales out of every five bales or less of the lot, to be conditioned at Conditioning House in New York, in accordance with the rule for "Conditioned Weight." Result shall be accepted by Buyer and Seller, whether to their benefit or loss, and conditioning costs borne by losing party. Conditioning tests by Buyer, or his Agent, before notifying Seller that conditioned weight will be accepted, cancels Buyer's claim to weight adjustment, and proof that such prior conditioning tests have not been made must be furnished, if desired.

Japan Silks, China Steam Filatures, Canton Filatures are sold New York conditioned weight plus 2 per cent., or actual weight, or invoice weight.

China Rereels, Canton Rereels are sold conditioned weight plus 2½ per cent., or actual weight, or invoice weight.

European Silks are sold conditioned weight, and European Conditioning House tests must be accepted, unless Buyer chooses, at his own expense, to have the silk reconditioned in New York. Should the result be 1/3 of one per cent. less than European conditioned weights, Seller must accept the New York conditioned weights and pay costs of the re-conditioning; each bale to be treated individually.

Tussahs are sold invoice weights, or actual weights carrying no guarantee of loss in weight by conditioning.

Bale Weights. A contract calls for the delivery of a number of bales or pounds varying on the average not more than 5 per cent. from the following usual bale weights:

Europeans	220	pounds	net
Japans	135	"	"
Shanghais	135	"	"
Tussahs	135	"	"
Cantons	106 2/3	"	"

Variation in weight beyond the allowed 5 per cent., shall not be cause for cancellation of contract, but may be adjusted with Seller at market rates at the time of delivery.

ADULTERATION. Shanghai Rereels and Native Filatures are guaranteed by Seller not to lose more than 22 per cent. by boil off at Conditioning House in New York. Buyer and Seller may have as many tests made as they see fit, at their own expense, and the average of all such tests shall govern.

VARIATION OF SIZE. The average size under contract shall not vary more than given below for different classes and grades of silk. In case of dispute, Buyer and Seller may have as many tests made at Conditioning House in New York as they desire. The average of all tests on a bale shall determine the size of silks in the bale. For Asiatics, the average of all bales of a lot shall determine the average of the lot, and if more than one-third of the bales in each individual lot are of wrong size, such entire lot may be rejected; otherwise, only the incorrect bales may be rejected. European bales are treated individually. Test skeins must be drawn from bales by the Conditioning House, and the total expense of such tests must be borne by the losing party.

European Silks. European Conditioning House sizing tickets shall be final, unless demonstrated to be wrong by Conditioning House at New York. EXTRA CLASSICAL TO NO. 1 INCLUSIVE 11/12 AND FINER shall not vary more than 3/8 denier either way from the average given on each and every bale.

From 11/13 to 15/17.....1/2 denier either way is allowed
From 16/18 to 19/21.....3/4 " " " " "
From 20/22 to 24/26.....7/8 " " " " "
From 25/27 to 28/30..... 1 " " " " "

FULLER, the variation is by agreement.

Japans. Seller's sizing tests, or Yokohama Conditioning House sizing tickets shall be final, unless demonstrated to be wrong by Conditioning House at New York. FANCY AND DOUBLE EXTRA are governed by the same rule as Europeans. FILATURES AND REREELS, EXTRA TO NO. 1/1½ INCLUSIVE, and BEST EXTRA KAKEDAS 14/16 AND FINER, shall not vary more than 1/2 denier either way for the lot, and 1 denier for each bale, from the average given. FILATURES AND REREELS NO. 1 1/2 TO NO. 2 INCLUSIVE AND KAKEDAS EXTRA TO NO. 1 INCLUSIVE 14/18 AND FINER, shall not vary more than 1 denier either way for the lot, and 1 1/2 denier for each bale, from the average given. LOWER GRADES carry no guarantee of size.

SIZE 16/18 AND COARSER IN FILATURES NO. 1 AND HIGHER GRADES shall not vary more than the European allowances for the lot, and 1/2 denier additional for each bale, from the average given. COARSE SIZES below No. 1 carry no guarantee of size.

China Steam Filatures. Seller's sizing tests shall be final, unless demonstrated to be wrong by Conditioning House at New York. FILATURES FIRST CATEGORY are governed by the rule for Europeans. FILATURES SECOND CATEGORY 14/16 AND FINER shall not vary more than 1/2 denier either way for the lot, and 1 denier for each bale, from the average given. FILATURES THIRD CATEGORY 14/16 AND FINER shall not vary more than 3/4 denier either way for the lot, and 1 denier for each bale, from the average given.

Shanghai Rereels, Native Filatures and Tussahs carry no guarantee of size.

Canton Filatures. Seller's sizing tests shall be final, unless demonstrated to be wrong by Conditioning House at New York. DOUBLE EXTRA AND EXTRA 14/16 AND FINER shall not vary more than 3/4 denier either way for the lot, and 1 1/4 denier for each bale, from the average given. 16/20 TO 28/32 shall not vary more than 1 1/2 denier either way for the lot, and 2 deniers for each bale, from the average given. FILATURES No. 1—14/16 AND FINER shall not vary more than 1 denier either way for the lot, and 1 1/2 denier for each bale, from the average given.

Canton Filatures No. 2 and lower
Canton Rereels } carry no guarantee of size.

REJECTIONS AND REPLACEMENTS. Any bales or lots rejected for proper cause must be replaced by Seller and accepted by Buyer within 15 days of rejection agreed to by Seller or established by arbitration. Where a lot of similar quality and size is not obtainable on the New York market, Seller must pay Buyer an allowance to cover market difference, if any. In case of a specified, uninspected lot on a primary market—of which all or a portion shall prove upon inspection not of the stipulated quality and/or size—Seller must immediately notify Buyer, who shall have the option of cancelling such incorrect portion of the contract, or of instructing Seller to accept it with any allowance that he may be able to collect, or of giving the necessary time for replacement.

CLAIMS FOR DIFFERENCES IN QUALITY AND/OR SIZE. Seller's obligation to deliver raw silk of contract quality and size is clearly defined. Buyer is under equal obligation to examine and test silk received, and promptly pass upon its quality and size as *raw silk in the bale.* This can be determined by testing sample skeins of the lot or one entire bale; Buyer must then accept, or immediately notify Seller of intention to reject the balance of the lot. All claims must be made within two weeks after delivery; and where silks remain in the custody of Seller for account of Buyer, the Buyer shall have three weeks from expiration of time for delivery in which to pass upon quality and size; after which periods no claims shall be admissible unless false or fraudulent packing can be shown. In no case can the Seller be held as guaranteeing the working of the silk, or its suitability to produce certain results, unless by special agreement.

ARBITRATION. All differences arising between Buyer and Seller must be submitted to the Arbitration Committee of the Silk Association of America.

SELLING TERMS

The recognized rate of discount in the Silk Trade is 6 per cent. per annum when not otherwise stated or agreed.

Offers of silk when not otherwise stated imply:

6 months basis for Asiatics.
60 days basis for Europeans.

Six months, 4 Months, 3 Months, or 60 Day Notes. Such sales convey no right to discount. Within 30 days from date of bill, Buyer must give his note for the period specified, bearing same date as bill, drawn to his own order, blank endorsed and payable at discretionary points as defined by New York Clearing House.

Six Months' Notes, or Cash Less 3 Per Cent. implies the right of Buyer to pay his bill within 10 days (which are not discountable) by deducting 3 per cent. from the face thereof; otherwise he must give 6 months' notes from date of bill as above provided.

Four Months' Notes, or Cash Less 2 Per Cent. are governed in principle by the above terms.

Ninety Days' Notes, or Cash Less 1 1/2 Per Cent. are governed in principle by the above terms.

Ninety Days, Sixty Days, or Thirty Days—requires that the bill must be paid within the time specified.

Six Months' Basis, Payment Within 30 Days, or 60 Days or 90 Days (as written) requires payment at any time within period stated, with discount for unexpired portion of the six months.

Six Months' Basis, Settlement by Note or Cash Within 30 Days, or 60 Days, or 90 Days (as written) gives Buyer the option of paying (at any time within the stipulated period for settlement) in cash less discount for unexpired portion of the six months, or giving (at any time within the stipulated period for settlement) his six months' note from date of bill.

Cash Sales less a stipulated discount require immediate payment of the bill less the specified discount.

Bankers' Credit Sales require the Buyer to immediately furnish approved Credits at the usance agreed upon in the transaction. For such sales the Seller takes no responsibility for arrival, damage, loss or pilferage en route. Seller's failure to demand the Letter of Credit shall not be cause for voiding the contract.

F. O. B.—Free on Board, is the Shipper's invoice cost of the silk placed on board ship at port of original export; Buyer must provide and pay for marine insurance and freight.

C. & F.—Cost and Freight, is the Shipper's invoice cost including freight.

C. F. & I.—Cost, Freight and Insurance, is the Shipper's invoice cost including freight and marine insurance.

CLASSIFICATIONS OF RAW SILKS

Adopted by Division A., June 15, 1908

At the request of the Board of Managers of the Silk Association of America, Division A. has carefully considered the classification names to apply to the various qualities of European Silk, and Japan Filatures, Rereels and Kakedas dealt in on the New York Market and have adopted the following:

EUROPEAN SILKS.

Grand Extra.
Extra Classical.
Best Classical.
Classical.
Best No. 1.
No. 1.
Realina.

JAPAN SILKS.

Filatures.

Double Extra.
Extra.
Sinshiu Extra.
Best No. 1 to Extra.
Best No. 1.
Hard Nature No. 1.
No. 1 (of the grade of Sinshiu Okaya (Chicken) Summer reeling Season 1907-8.
No. 1-1½.
No. 1½.
No. 1½-2.
No. 2.

Rereels.

Extra.
No. 1.
No. 1-1½.
No. 1½.
No. 1½-2.
No. 2.
No. 2-2½.
No. 2½.
No. 3.

Kakeda.

Best Extra.
Extra.
No. 1.
No. 2.
No. 3.

The Board of Managers of the Silk Association of America at a meeting on June 10, 1908, approved the foregoing classification with the recommendation that the Raw Silk Division of the Association consider the feasibility of tabulating a set of descriptions with samples of raw silk to represent the agreed upon classification at the opening of each silk season.

On June 15, 1908, the Raw Silk Division voted to endeavor to adopt a standard for No. 1 Filatures and rereels as soon after the opening of each silk season as sufficient silk shall have arrived in New York to give a fair representation of the average quality of the season's summer reelings, and this matter is now under consideration by them.

It is believed that the deposit with the Silk Association of America at the opening of each silk season of a set of samples representing say five grades of silk would bring within the reach of both buyer and seller a standard to which offerings of parcels could be compared; thereby avoiding existing uncertainty and misapprehension as to qualities.

LABORATORY: 472-474 BROOME STREET, NEW YORK CITY

SILK THROWSTERS' ASSOCIATION OF AMERICA

RULES AND REGULATIONS

TO GOVERN TRANSACTIONS IN THROWING SILK

(As Amended June 21, 1907.)

Approved, respectively, by the Board of Managers of the Silk Association of America, February 13, 1907, and August 14, 1907.

RESOLVED, That the Rules and Regulations of the Silk Throwsters' Association of America submitted to the Silk Association of America on January 5th, 1907, have been carefully considered by the Board of Managers of the Silk Association of America and are approved by them.

The Board feels justified in adopting them as rules to govern the adjudication of disputes or settlement of claims between throwsters and weavers or whomsoever they may concern, where no other special agreements have been made, provided the owner of the raw silk has been furnished with a copy of the regulations of the Silk Throwsters' Association prior to the consignment of silk to be thrown.

Article I. Winding—Raw silk is single thread as reeled from the cocoons and known as (raw silk with knotted ends). It is understood to be a continuous thread from beginning to end of the skein and as a rule this class of silk must be such that one winder can attend to one hundred swifts with a thread speed of sixty yards per minute.

Article II. Soaking—Only such ingredients shall be added in soaking the silk as will boil out easily in the ordinary process of dyeing, and only such amounts as shall be necessary for the proper throwing of the silk, but not to exceed 5 per cent. gain in weight.

Article III. Twist—An average variation of 10 per cent. on organzine (20 test skeins) either way from the twist as ordered is permissible. On tram two and one-half to three turns per inch, a variation of one-half turn either way may be allowed.

Article IV. Size—The fineness of silk is determined by the size. The size is the number of deniers which a skein of a certain length weighs. The legal denier is a skein of silk four hundred and fifty metres long, wound in four hundred turns on a reel of one hundred and twelve and one-half centimeters in circumference and weighed by a unit of five centigrams (called denier).

To establish the size of a lot of silk, ten skeins are taken from every bale and from different parts of the bale, and from each skein two test skeins are reeled off, on Japan silks, one inside and one outside skein. The weight of these test skeins is to be reduced to conditioned weight in case either of the parties to the transaction desires. On raw silk up to twenty deniers a margin of one-half denier average, above or below, is permissible; coarser sizes are treated as special articles.

The regularity (evenness) of the thread of different grades shall be such that the difference between the finest and coarsest test skeins shall not be more than is decided by the Rules of the Silk Association of America.

Article V. Reeling into Skeins—An average variation of 5 per cent. shall be allowed from the number of yards per skein, as ordered for thrown silk. The minimum number of test skeins is twenty. The pro-

cedure is similar to that for sizing silk. Condition House rules to apply.

Article VI. Price, Terms, Etc.—The price for throwing is net cash, final settlement to be made on the average date of the return delivery of the product. The throwster is entitled to payment on account in proportion to his deliveries, and on completion of work when held for orders.

Amendment adopted June 21, 1907:

"Weights for throwing silk shall be estimated upon invoice weights, in no case less than condition weight plus (2) *per cent., or upon condition weight, when given, plus two* (2) *per cent.*

Condition weight, as here used, is found by adding eleven (11) *per cent. to absolute dry weight, determined from samples by customary methods."*

Article VII. Payment of Transportation, Etc.—The consignee pays the transportation charges on receipt of the raw silk; the consignor pays the transportation charges on the return of the thrown silk.

Article VIII. Liability for Silk—A commission throwster who accepts a lot of raw silk for the manufacture of tram or organzine or any other operation, is responsible to the owner for the full value of the silk as long as it remains in his possession. The throwster must cover by insurance the loss of silk against fire while in his immediate possession.

Article IX. Determination of Loss—In order to establish a claim against a throwster for excess of loss in working, the whole parcel of raw silk to be thrown should be sent to the Condition Works to be tested for the conditioned weight, where skeins of the raw silk should be retained. The entire quantity of the thrown silk should be returned to the Condition Works to be reweighed for conditioned weight. The boil-off tests of the raw skeins so retained and the skeins of thrown silk should be tested simultaneously in the same process, and the boil-off established in this manner by the identical process; as the matter of boiling-off is so involved in uncertainty if done at different times.

Five skeins of the raw silk should be retained from each bale, and three skeins of the thrown silk from each one hundred pounds for the boiling-off test.

This is the generally accepted practice in Europe, and the matter of the amount of loss to be allowed in the actual working of a given silk (to be arrived at as above stated) is universally a matter of agreement between the manufacturer and the throwster. The throwster is responsible at the price agreed upon on receipt of the silk for an excess of loss above the amount agreed, and the owner is to pay the throwster at this price when any less loss is made than the amount as agreed.

The manufacturer is to furnish a description of the raw silk, giving the origin, classification and grading, and is responsible to the throwster for a proper delivery of the raw silk as agreed upon. Duplicate tickets of all tests to be supplied to the throwster.

(Signed) Silk Throwsters' Association of America.

Attest: By JEROME C. READ, President.

JAMES H. BRITTON, Secretary.

CUSTOMS PREVAILING IN THE SKEIN SILK DYEING TRADE OF THE UNITED STATES, SEPTEMBER, 1908

STORAGE AND INSURANCE

The dyer provides safe and suitable storage for silk sent to him to dye, without charge to the customer, assumes liability for the loss, theft, or destruction of silk while in his possession, and keeps it fully insured.

TRANSPORTATION CHARGES

The dyer pays the transportation charges on the silk sent him to dye, unless otherwise agreed, and he delivers the dyed silk free within a short radius of his dye house. Transportation charges on dyed silk, shipped to a considerable distance, to be paid by the customer.

PACKING

The dyer when shipping the dyed silk is to have it safely and suitably packed, using such quality of paper, cords, and bagging as will insure the proper protection of the silk.

WITHDRAWALS OF UNDYED SILK

Should the customer order silk to be sent by the dyer to some other dye house, or to be returned to him undyed, he must reimburse the dyer for any money that has been expended by him for transportation charge, insurance, or storage of such silk.

TIME OF DELIVERY OF ORDER

Dyer must execute order with reasonable promptness. If silk is on hand at the dyer's, shipment back of the dyed silk may be expected in from one to three weeks, (according to circumstances and the nature of the work), from receipt of the order.

PRICES, DISCOUNTS, AND TERMS

Prices, discounts, and terms, are matters of mutual arrangement. A standard printed price list is generally used as a basis for prices. Bills are rendered at the end of each month, a common basis of settlement being cash within 30 days.

ORDERS FOR WEIGHTING

The dyer is obligated to deliver silk within the limits of the weighting ordered. Thus, 20-22 oz. is supposed not to run below 20 oz. and, unless by

special agreement, a greater weight than 22 oz. cannot be claimed. If the weight comes less than 20 oz. the customer can claim the price corresponding with what it weighs. If, however, it runs over 22 oz., even when not specially agreed on, the dyer cannot charge more for the extra weight.

WEIGHTING OF SILKS WITH VARYING BOIL-OFFS

Whether the dyer treats silk having either a light or a heavy boil-off, his price is the same, though he is at greater expense in bringing up the weight of the silk that boils off most. (N. B. This is an anomaly that seems to need correction).

MATCHING COLORS

The dyer does not undertake to guarantee an exact match to sample, but does undertake to furnish a commercial match, that is, a shade so close that fabrics made of it can be properly delivered as that color. If the customer finds on examination of dyed silk that same is off shade, or too dark, or too light, the dyer will make the necessary modification of the color, if it can be done without injury to the working qualities of the silk, without extra charge.

If, through his error, the dyer puts on the silk the wrong color, or weighting, the customer may use the lot if he chooses to do so to the best advantage charging the dyer the loss, if any. If this is impossible the dyer may be required to pay for the silk at current market prices.

SHADY SILK

Should silk be found to be shady to an uncommercial degree and the defect be found not due to the nature of the silk the dyer must try and rectify the trouble at his own expense, and should this be impossible he may be required to keep and pay for the lot.

Should the customer, before knowing of the trouble, have put such silk in work the dyer may not only be required to make right, or to take back and pay for, the silk, as already stated, but he should reimburse the customer for money actually spent in the winding, warping, quilling, etc., of such defective lot.

He is not, however, to be held liable for damaged cloth, woven from such material, past the point where the defect should have become apparent, as the weaving of visibly imperfect goods should not be proceeded with.

The consequential damages in such cases due to standing looms, goods late for delivery, etc., fall upon the customer.

ROTTEN SILK

Should silk, originally sound, be returned from the dyer rotten, or seriously defective in strength, or should it while remaining in stock for a reasonable time after dyeing, and under proper conditions of storage,

develop such trouble, the dyer can be called on to take back and pay for the silk.

If, however, the weighting ordered is beyond the bounds of prudence and the limitations of good practice, the dyer should promptly notify the customer to that effect, before proceeding with the order, and, should the customer then direct that the work be proceeded with, any loss that may arise if the silk turns out unsound must be borne by the owner.

FAST COLORS

Dyers are supposed to make their colors commercially fast for such ordinary purposes as the goods are used for. Customers wanting colors fast, i. e., not liable to change by light, washing, perspiration, or what not, must so specify in ordering, and charge for the work is made accordingly.

If the silk is ordered *"fast"* for certain uses, and is paid for on that basis, and claims should come upon the manufacturer for a deficiency in this respect when the fabric has been used under reasonable conditions, the dyer may properly be called on to make good such claims as the manufacturer has had to allow.

MIXED SILK

Should the dyer mix one customer's silk with another's, or different lots of the same customer's silk, he is chargeable with the loss that may result.

BAD WINDING

When properly thrown silk is so handled in the dyeing that it is difficult to wind, and when in consequence the customer has to pay extra wages for the winding of it, and when excessive waste may be caused thereby, such loss in wages and waste is properly chargeable to the dyer.

As souple dyed silks generally wind poorly, specific arrangement with dyer should be made regarding same.

REMARKS

All claims and complaints should be promptly made, clearly stated, and proper opportunity given the dyer to verify and check them off.

The difficulty of dyeing and the chance of silk going wrong being very great, it is the duty of the manufacturer when a loss occurs that is chargeable to the dyer to try by all reasonable means in his power to minimize it, and each should do the best he can to help the other.

When controversies occur between dyer and manufacturer, where each party thinks the other is unreasonable, recourse can always be had to an arbitration by the Silk Association of America.

September, 1908.

Unreliable cost units flood the market with too cheap merchandise until the sheriff or the schoolmaster calls a halt.

MANUFACTURER'S COST SHEETS

On the following pages we present two forms for use in the making of cost calculations, one for Broad Silk and one for Ribbons, which are comprehensive in character, correct in principle, and which have worked well in practise.

We believe that a careful study of these forms, and of the explanations regarding them, will be of interest and profit to manufacturers.

The heavy faced type represents the written-in calculation, the other is the printed form.

The various cost figures given therein are assumed simply for the purpose of illustration.

It is needless to say that preliminary calculations should always be checked back and verified by actual results.

BROAD SILK COST CALCULATION

Date, **January 1,** 1909.

Pattern **Black Taffeta. Quality C. H.** 100 Yds. **35⅞** Wide.

Reeding **60/3.** Width in Reed **36.**

				Raw	
Warp	**6416** Ends Organzine	**1.65** Drams	**4.96** lbs. @	**$5.95**	$**29.51**
110 Yds.....	" **2 Thd. 13/15 Den.**	"	**16/14 Turns** " "	**Jap. Ex. Fil.**	$.....
.....	"	"	..... " "	.....	$.....
Selvages **108=36—1 & 2**	.....	"	..... " "	.....	$.....
Total **6524** Ends Organzine	.....	"	..... " "	.....	$.....
				Raw	
FILLING	**88** Picks Tram	**2.57** Drams	**3.40** lbs. @	**$5.81**	$**19.75**
	1 End 3 Thd. 3 Turns 13/15 Den. Jap. Fil. No. 1				$.....
	Warping .....110 Yds.	**6524** Ends @ **3**		per C	$ **1.96**
	Twisting	**6448** Ends @	**25** per M.= **1.62**	÷3	$ **.54**
	Weaving .....99 Yards, @ **7**				$ **6.93**
	Picking .....99 Yards, @ ¾				$ **.75**
	Cleaning .....99 Yards, @.....				$.....
	Finishing .....100 Yards, @ **1**				$ **1.00**
	Cards and Designs 100 Yards (on basis of.....Yards made)				$.....
	General Expenses, **4.80÷90**.....100 Yards, @ **5 1/3**				$ **5.33**
(For Piece Dye)	Dyeing and Finishing.....100 Yards, @.....				$.....
(For Ptd. Wps.)	Weaving before Printing.....110 Yards, @.....				$.....
" "	Printing .....110 Yards, @.....				$.....
" "	Rebeaming .....110 Yards, @.....				$.....
" "	Retwisting .....Ends @.....per M÷3				$.....

Average Dyed Weight of 100 Yds. **8.17** lbs. Net cost of 100 Yds., $**65.77**

Organzine weighted to **24/26** oz. Tram weighted to **30/32** oz.

4 per cent. is included in above figures for waste of warp.
7 " " " " " " filling.
3 " " " " " twist take-up of warp and filling.

PARTICULARS OF COST OF SILK.

	ORGANZINE	TRAM
Raw Silk	$**4.00**	$**3.80**
Throwing	$ **.70**	$ **.35**
Dyeing	$**1.00**	$**1.25**
Winding	$ **.15**	$ **.15**
Doubling	$....	$....
Quilling	$....	$ **.15**
Thr. Waste	$ **.10=2½%**	$ **.11=3%**
Total	$**5.95**	$**5.81**

CONCLUSIONS.

Net Mill Cost		$**0.6577**
Lowest Selling Cost **65.77÷85**		$**0.7738**
Estimated Selling Price, $**0.85** Less 15%	$**0.1275**	$**0.7225**
Weekly Product, per Loom	**90** Yds.	

	$	%
Raw Silk	32.76	.498
Throwing	4.66	.071
Waste	.87	.013
Dyeing	9.21	.140
Winding	1.25	.019
Quilling	.51	.008
Warping	1.96	.029
Twisting	.54	.008
Weaving	6.93	.106
Picking	.75	.011
Finishing	1.00	.015
General Expense	5.33	.082
	65.77	1.000

REMARKS CONCERNING USE OF THE COST CALCULATION FORM, FOR BROAD SILK, SHOWN HEREWITH

This form is for 100 yards finished cloth. A length of 110 yards warp is assumed as enough to cover take-up in weaving and unwoven ends of warp. This can be modified for goods with more or less take-up.

The size, or dramage, of organzine and tram should be figured from Conditioning House Sizing tests, and should include an average take-up in twist of about 3%.

The weight of silk for warp and filling should include waste in weaving and preparatory processes, and is here assumed as 4% for warp and 7% for filling, a very full figure if for plain goods. This can be modified according to experience but is an item that is generally under-estimated. Weights should be figured on Raw Conditioned basis.

Waste in throwing is filled in under "Particulars of Cost of Silk" and the proper percentages will be shown by the Conditioning and Boil-off tests.

In calculating filling the full width of warp in reed should be taken as the width.

Warping cost is figured on a price for 100 ends of 100 meters (about 110 yards) length. Mills paying on another basis can use a different form.

Total length of warp is assumed as sufficient to yield 300 yards of cloth. Twisting cost for the 100 yards is therefore marked as 1/3 of the total. For other length warps use a different divisor. Extra drawing-in expense can be here included.

Weaving, picking and cleaning are based on 99 yards, as cloth when relieved from loom tension will creep in about 1%. This is recovered in finishing and is only a regain, not a gain as many suppose.

When cleaning expenses have to be made for a line of goods experience shows what percentage of pieces need cleaning and thus an average cost per yard can be arrived at.

When mills do their finishing, throwing, or printing, the market prices should appear in cost sheet, the profit or loss thereby to mill appearing in the department accounts.

"Cards and Designs" can be filled in according to the mill practise and character of the fabric. Special harness expenses, or loom mounting, can be here included.

"General Expense" should include every charge upon the mill, exclusive of specific items here provided for. It should cover interest on capital, loans, and Commission House advances, depreciation, and everything except selling expense. The view here taken is that each loom should pay its share of the expense. Thus if a 500 loom mill has an annual

expense of $120,000, each loom has to be charged with $240.00 a year, or $4.80 a week.

If a cloth weaves at rate of 80 yards weekly, 4.80÷80=6c. will be set down. Sixty yards a week would figure 8 cents. A greater or less charge can be apportioned to different classes of looms, wide, narrow, box, jacquard, etc., but total earnings must equal total expense.

There are other satisfactory methods of handling this important question but there is one most common and most incorrect way of dealing with it—that is, adding for expenses a percentage of cost. Figures so obtained are seldom right and often grossly wrong and misleading.

The cost of Beaming has been here included in the General Expenses, but, if desired, it can be figured separately.

If piece dyed goods lose in length see that proper allowance is made on the cost sheet.

"Weaving before Printing" item is weaving in of the necessary binding picks, every yard or so, to preserve pattern.

In deciding what weightings to order, boil-off Conditioning House tests should be carefully studied so that proportion of weighting to actual silk fibre will be neither more or less than desired.

Prices on Raw silks bought on different terms should be reduced to a uniform basis. If desired all cost sheets can be made on a settled base price for the raw silks, and additions to, or substractions from the costs so obtained can be made as required, according to market fluctuations.

Lowest selling cost is arrived at by dividing net mill cost by 85, experience showing the selling expenses and discounts of the average mill to approximate 15%.

RIBBONS.

The foregoing remarks will also apply to the cost calculation form for Ribbons which follows. An arbitrary figure of $12 a week has been assumed for the general expense per loom.

Note that the principal items of cost are silk weaving and general expenses. Therefore, selection of proper raw silk, with the best throwing and dyeing, reduces these items by increased production and excellence of output.

Within reasonable limits, a difference in price of the raw silk, throwing and dyeing is so small in percentage that it is easily regained in the manufacturing.

RIBBON COST CALCULATION

Date, **January 1, 1909.**

Pattern **Black Taffeta.** **Quality C. H.** 100 Yds. Width **45** Lignes.
Spaces **18.** Reeding **60/3.** Width **4** Inches.

						Raw			
Warp	**726** Ends Organzine		**1.65** Drams		**.58** lbs. @	**$5.65**		$	**3.28**
110 Yds.....	"	**2 Thd. 13/15 Den.**	"	**16/14 Turns**	"	"	**Jap. Ex. Fil.**	$	.....
.....	"	.....	"	.....	"	"	.....	$	.....
Selvages	**48=24/2** "	.....	"	.....	"	"	.....	$	.....
Total	**774** "	.....	"	.....	"	"	.....	$	.....
						Raw			
FILLING	**88** Picks Tram		**2.57** Drams		**.38** lbs. @	**$5.81**		$	**2.21**
	1 End 3 Thd. 3 Turns 13/15 Den. Jap. Fil. No. 1							$	.....
	Warping ..... 110 Yds.		**774** Ends @ **3**				per C	$	**.23**
	Twisting	**750** Ends @	**25** per M.= **18**				÷3	$	**.06**
	Weaving, **1.80** per cut ÷**18**÷**10**.....		.99 Yards, @ **1**					$	**.99**
	Picking, ¾c. per piece.....		.99 Yards, @ **.075**					$	**.08**
	Cleaning		.99 Yards, @					$	.....
	Finishing, Blocking and Boxing.....		100 Yards, @ **.45**					$	**.45**
	Cards and Designs 100 Yards (on basis of .....Yards made)							$	.....
	General Expenses, **$12**÷**18**÷**75**.....		100 Yards, @ **.89**					$	**.89**
(For Piece Dye)	Dyeing and Finishing.....		100 Yards, @					$	.....
(For Ptd. Wps.)	Weaving before Printing.....		110 Yards, @					$	.....
" "	Printing		110 Yards, @					$	.....
" "	Rebeaming and Spacing.....		110 Yards, @					$	.....
" "	Retwisting		Ends @.....				per M÷3	$	.....
	Average Dyed Weight of 100 Yds. **1.42** lbs. Net cost of 100 Yds.,							$	**8.19**
	Organzine weighted to **20/22** oz. Tram weighted to **30/32** oz.								
								$8.19÷10=.82	
								$.82÷45=1.82	

4 per cent. is included in above figure for waste of warp.
7 " " " " " " " filling.
3 " " " " " twist take-up of warp and filling.

PARTICULARS OF COST OF SILK.

	ORGANZINE	TRAM
Raw Silk ...	$4.00	$3.80
Throwing ...	$ .70	$ .35
Dyeing	$ .70	$1.25
Winding	$ .15	$ .15
Doubling	$....	$....
Quilling	$....	$ .15
Thr. Waste..	$ .10=2½%	$ .11=3%
Total	$5.65	$5.81

	$	%
Raw	3.76	.459
Throwing	.54	.066
Dyeing	.88	.108
Winding	.15	.018
Quilling	.06	.007
Waste	.10	.012
Warping	.23	.028
Twisting	.06	.007
Weaving	.99	.121
Picking	.08	.010
Finishing, Blocking and Boxing	.45	.055
General Expense	.89	.109
	8.19	1.000

CONCLUSIONS.

Net Mill Cost, per Ligne		$0.0182
Net Mill Cost, per Piece		$0.82
Lowest Selling Cost **82**÷**85**...		$0.965
Estimated Selling Price, $1.10 Less 15%	$0.165	$0.935
Weekly Product, per Loom, per Space		75 Yds.

Conditioning Houses supply only the information which can be expressed in figures.

DON'TS

Don't fail to see that intelligent and regular use is made of your Conditioning House reports. This is often neglected. If carefully used the small cost of these tests will be, either directly or indirectly, returned to you many fold.

Don't believe in any testing, unless made by persons properly trained, and with accurate instruments. Europe discovered the need of exact methods years ago.

Don't look on Conditioning House charges as an expense to be avoided if possible. The salary of a weighmaster, or an employee to measure goods, is considered a necessary expense of a business, and while it could be avoided by accepting weights and measures as delivered by seller no sensible person would do so. With such an expensive and moisture absorbing material as silk the check-off of the Conditioning House is just as vital.

Don't forget that the foremost, smartest, and most economical houses use the Conditioning House freely and regularly and find a saving in so doing. Can you afford not to?

Don't forget that all people, including raw silk importers and throwsters, are human. Therefore who is most apt to get a lot of raw silk that is in some way questionable? With whose silk is the average throwster likely to exercise the least care in the matter of waste, etc.? Why of course with those houses that do not regularly pass their raw and thrown silk through the Conditioning House.

Don't think that the United States Silk Conditioning House simply exists as an institution for preventing trickery. Its function is to enable the trade to know with aboslute certainty what weights, yardage, etc., etc., of silk, they are getting for the dollars they are paying out.

At the same time the general use by the trade of Conditioning House Tests in all transactions would practically eliminate questionable practices.

Don't forget that, if for no other reason, it pays to set an example for care and accuracy by the free use of the Conditioning House facilities as it will help to make such use the general custom, and when practically everybody tests his silk we will see fewer absurd prices for goods made by those who will not take the pains to find out just what their goods do cost them.

Don't make claims on raw silk houses, throwsters, dyers or finishers, until you are entirely sure of your ground, and the facilities offered by the Conditioning House will be found of the greatest service in the proving of all just claims, and by their use much misunderstanding may be avoided.

Don't hesitate to ask freely for information on any points that may not appear to be clear. We welcome enquiries and suggestions.

Universal use of conditioning tests will eliminate unfair and unintelligent competition from all branches of the business and is in the line of true costing of silk merchandise.

Don't expect something for nothing. Exact information costs money to arrive at and is worth paying for. What costs nothing is generally worth nothing.

Don't expect the Conditioning House to tell you how to manufacture goods, or to say what sort of silks you should use for particular purposes.

Don't ask the Conditioning House to pass on the classification of any particular lot of silk. As no exact standards exist, at present, there is no basis for exact decisions.

Don't be too sure that, even in your own throwing plant, you know exactly the waste you are making. Much waste is made that never finds its way to the waste bag. An occasional Combination Test by the Conditioning House is a very useful check.

Don't overlook the fact that the greater the boil-off the less silk fibre you get for your money, and boil-offs differ widely. Makers of grege goods for piece dye, etc., should know the boil-off of the different lots they receive and the Conditioning House can tell them.

Don't be penny wise and pound foolish. If every bale of raw or thrown silk was regularly subjected to all the Conditioning Tests the total cost would be a very small addition to the cost of the silk. The unseen losses that may and do occur from a lack of the proper knowledge will run into astonishingly large figures.

Don't think that even when you do your own throwing that you know all about the dramage of a lot by figuring out the length and number of the skeins, and that there is no use in having sizing tests made. This is a most erroneous supposition. When a garment maker buys cloth he does not cut up his goods and trust to the length holding out for as many garments as it should. He would be a poor manufacturer if he did not measure his goods first.

Don't forget that silk is not the only material in need of testing. Fine cottons, worsteds, etc., are expensive and need checking off just as much.

Don't forget that the United States Conditioning Company is not operated as a money making enterprise. It is designed to promote the general welfare of the trade, and many experienced and capable men are giving much time, thought, and money in its service without thought of any direct commercial return. Manufacturers should show an appreciation of this by making free and constant use of its facilities, and those who do, will find that they will be well rewarded in the close control of their business that it will give them.

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THE VALUE OF CONDITIONING

FOR WEIGHT. You know exactly how many pounds you should pay for. Pages 9-11, 45-46

FOR VARIATION IN SIZE, AND FOR AVERAGE SIZE. You are shown the regularity of the silk, and the average yardage per pound. Pages 15, 47

FOR ELASTICITY AND TENACITY. Enables you to select the right lots for different fabrics, thus helping production. Even the best silks, and of the same mark, vary widely. Page 16

INSPECTION TEST. Is a guide in examining quality before acceptance. Pages 17, 48

BOIL-OFF TEST. Shows returns and clearances from the throwing. Shows the proper amount of weighting to order from dyer. Pages 19, 23-25, 52

FOR TWIST. Showing if your silk has been twisted as ordered. Page 16

MEASURING TEST. Tells you if your skeins are of proper length. Page 21

COMBINATION TEST. Automatically keeps you posted in several important directions. Pages 22-23

The cost of complete tests for every bale of raw and thrown silk used would be only *about half of one per cent. of the cost of the output.* In Europe this expense is considered as much a part of the manufacturing cost as any of the mechanical operations.

The American manufacturer should recognize this truth. Regular and thorough testing saves its cost many fold in preventing mistakes as well as in tangible gains.

WE DESIRE INQUIRY AND WILL GLADLY GIVE INFORMATION OR EXPLANATION REGARDING THE CONTENTS OF THIS BOOK.