

NATI

Neps And Trash Indicator

code 3280A



TO DETERMINE:

- *Neps in raw cotton*
- *Neps and Trash in cotton sliver*
- *Neps in synthetic and blended sliver*
- *Quality and efficiency of carding and combing operations*

NATI has been specifically designed to be fast, reliable, user-friendly as well as easily transportable to the production floor for continuous testing and assessment of Neps and Trash at different process stages.

Neps and Trash negatively affect the quality of the yarn originating from sliver and roving and ultimately they affect the quality of the fabric. The impossibility of clearing all these faults in the yarn leads to the necessity of controlling them in the preparation process and especially in the carding and combing operation. A continuous control of Neps and Trash content in the sliver is essential for the spinner who can at any time ameliorate the carding cleaning efficiency by changing card settings, by replacing card clothing or varying blends.

T&O

Nati Technology and Operation



After setting the test parameters, the sliver sample* is introduced into the sliver feeder.

By pressing the starting key the sliver is fed into an O.E. opening roller where it is opened into fibres.

The cotton or synthetic fibres are sucked into the Neps channel where they are checked by an Opto-electrical system.

The Trash particles go into the Trash channel by gravity where they are counted and collected in the Trash box.

The process automatically stops and in case of multiple test selection the next test is performed .

In addition to counting, NATI classifies Neps and Trash according to the size in the following classes:

Neps $\geq 0,5$ mm
 Neps $\geq 0,7$ mm
 Neps ≥ 1 mm

Trash $\geq 0,25$ mm
 Trash $\geq 0,5$ mm

```
Card      Test
Length(cm) 10
No. of Test 5
Test with pause:Yes
```

Example of test parameters

```
Trash      Neps
>0.5:      1 >1.0:      0
>.25:      12 >0.7:      7
T:          1 >0.5:      23
```

Example of display of test results

At the end of the test, the Neps and Trash content is divided in class of different size and the relative statistics (mean, standard deviation and CV%) are displayed and printed if the optional printer is connected.

NATI - REPORT

Test No.	TRASH >...mm		NEPS >...mm		
	0.25	0.5	0.5	0.7	1.0
1	12	1	23	7	0
2	15	6	24	8	1
3	8	4	15	2	0
4	14	4	17	5	2
5	16	6	20	7	0
MEAN	13.0	4.2	19.8	5.8	0.6
STD	3.2	2.0	3.8	2.4	0.9
CV%	24.30	48.78	19.35	41.17	150.00

NATI report referring to a group of 5 tests of 10cm each and relative statistics

* the transformation of raw cotton in sliver form can be performed by means of the "Raw Cotton Selector".

Nati Advantages

FAST IN TESTING LARGE SIZE SAMPLES

NATI can perform a large number of tests on a big sample in order to increase the statistical confidence of the results (NATI testing speed is 1cm/sec). A statistically significant sample of at least 2g should be tested to reduce the variability of results especially in case of good combed slivers or synthetic slivers with just few Neps/gram. It is obvious that a small sample of 0,5g cannot be adequate.

HIGH REPEATABILITY OF RESULTS

The testing principle of NATI (and sample preparation with the "Raw Cotton Selector") prevents from data variability and results fluctuation which are a common consequence of material handling and manual sample preparation.

It is known that the preparation of the sample can lead to a big variability of results in the range of $\pm 25\%$ for sliver and $\pm 50\%$ for raw cotton.

AUTOMATIC EXECUTION OF GROUP OF TESTS

Only NATI can execute consecutive tests on the same sample without the operator attendance.

COMPACT AND TRANSPORTABLE

NATI has been conceived for testing in the carding department. It does not require compressed air or any particular installation: just plug the NATI in and you are ready to test!

VERY EASY TO OPERATE

NATI does not require any particular skill or ability to be used. Hence it can be operated by any worker assigned to the carding process.

IMPORTANT SAVINGS CAN BE OBTAINED BY THE CONSTANT USE OF NATI

enabling a better quality of carding operation, a better planning of card clothing renewal and the reduction of defects in the final yarn.



This graph indicates the significant improvements on sliver quality achieved by a customer using NATI as a tool to monitor the quality of carding operations on cotton material on daily basis.

MEASURE OF NEPS IN RAW COTTON

High repeatability of results can be obtained by the standardization of sample preparation by means of NATI accessories, such as the "Raw Cotton Selector" and the "Electronic balance", thus eliminating the influence of the personal ability on this preliminary operation. More detailed information are available in the relative section.



3.5 times faster in testing large samples, NATI just takes 7 minutes to test for example 2g of raw cotton. Even though 0,5g of raw material cannot provide any reliable and statistically relevant information about the Neps content, this is the sample size which can be tested by other Neps testers available on the market.

MEASURE OF NEPS AND TRASH CONTENT IN COTTON SLIVERS

A large number of tests on large size samples can be performed by NATI without the operator attendance thanks to its automatism.

In the automatic modality NATI can perform multiple tests of pre-set length without the operator attendance. The operator presence is required only to restart the instrument at the end of the test program and to remove the tested fibres from the waste box after testing 6-7mt of sliver (corresponding to about 30-35 grams depending on the sliver count).



High repeatability of results is achieved by feeding NATI with the sliver directly coming from cards and combers, as no sample preparation is required.

Neps/gram & Trash/gram will be automatically obtained if the length of each test corresponds to one gram of sliver (the suitable length can be easily calculated based on the sliver count). Otherwise the counting of Neps and Trash will refer to the particular weight or length of the sample.

12 times faster in testing large size samples, NATI allows the constant monitoring of carding operations. The automatic testing of 2g sliver takes less than 2 minutes with NATI; on the contrary, the other Neps testers require 25 minutes to prepare and execute 4 tests of 0,5g thus making the constant control of carding machinery not feasible.



Statistical relevance of results directly available on the production site allows the spinner to timely take corrective actions in order to optimise the process by changing the card settings by making the necessary mechanical adjustments such as replacing damaged wires or re-clothing the card.

MEASURE OF NEPS CONTENT IN SYNTHETIC AND MAN-MADE SLIVER

The formation of Neps in synthetic and man-made fibres is due to the spinning process (primarily to carding operation). Therefore the constant monitoring of carding quality and efficiency is essential also for this type of fibres.

NATI is the only Neps tester that can determine the Neps content in synthetic and man-made short staple slivers as well as in blended slivers. Specific opening rollers are available. More detailed information are available in the section relative to NATI accessories.

MONITORING OF CARDING QUALITY AND EFFICIENCY

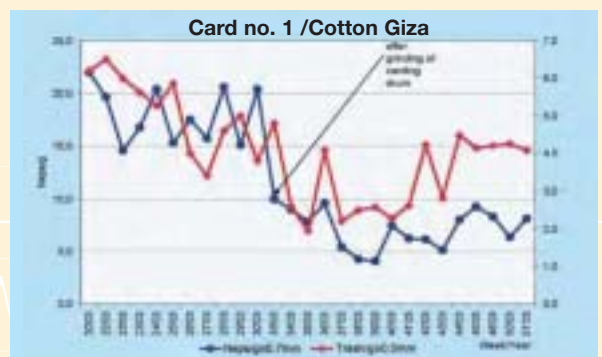
It is common knowledge that if the Neps and Trash content is high after the carding process the final spun yarn will also have a high content of Neps and Trash. Processing after carding can reduce these levels, but not to the extent of a good quality carding. Therefore constant monitoring of carding quality and efficiency is extremely important.

To this extent, **NATI fastness and accuracy is crucial to take timely corrective actions.**

It is also true that, although it is possible to plan approximate grinding and renewal dates of card clothing, these plans can never give exact dates because the lifetime and grinding period depend on the manufacturer, wire type, fibre type, machine speed and settings.

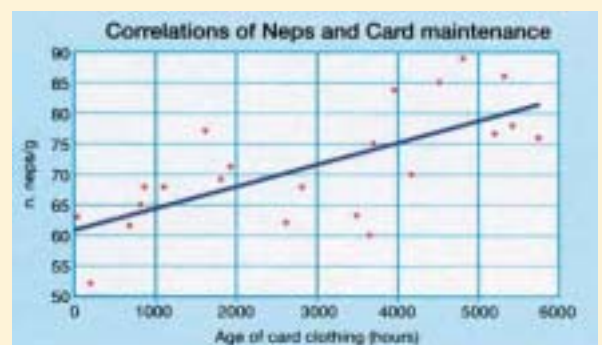
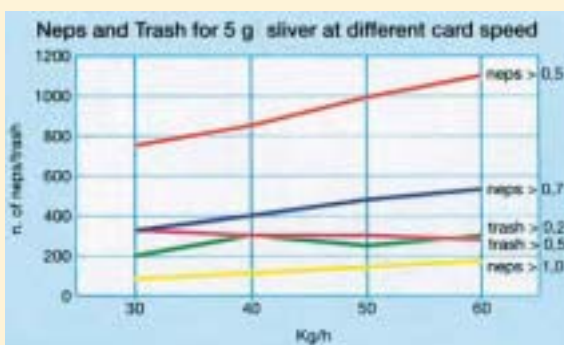
NATI optimizes cards maintenance reducing loss of production and cost of card clothing renewal.

By entering the weekly reading of NATI in a database, it is possible to perform the necessary card grinding, re-clothing and setting as soon as the increasing tendency of Neps begins. If the test results increase not in one but in all cards, raw material or blow-room equipment should be checked.



The graph shows the test results relative to a card running Giza 70 type of cotton before and after card grinding.

The isolated or periodical increase of Neps level in some points of the sliver could indicate the presence of a specific problem in the card, such as a group of damaged wire teeth in the main carding drum, in one of the strippers or in any other working rollers (to this extent, it is convenient to inspect a certain length of sliver equal to the circumference of the carding drum by means of a multiple short test sequence e.i. 25 tests of 20 cm each).



The graphs show the influence of card speed and of the wear of card clothing on the number of Neps in the sliver.

TRASH ANALYSIS

The analysis of the sliver trash content is an essential parameter to measure the quality of the carding process. Particularly for compact, O.E. and knitting yarns.

Automatic counting and classification of Trash directly available in the carding department enables the operator to timely adjust the setting of combers and drawers. This is possible by means of NATI only.



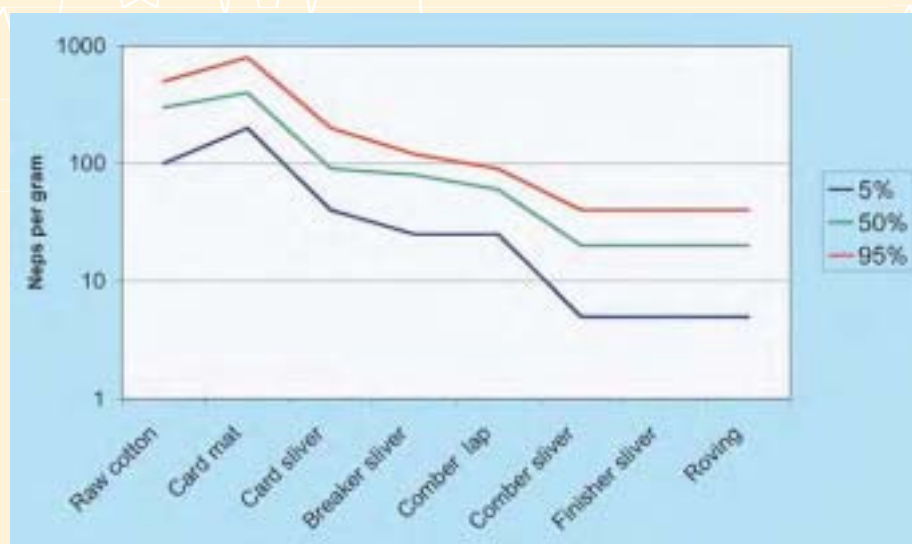
After the sliver is opened into fibres, gravity drives the Trash particles into the Trash channel where they are counted and classified by an opto-electrical sensor.

Following to the optical analysis the Trash particles are collected in the Trash box where they can be easily gathered by the operator for further inspection and analysis.

Referring to raw cotton, NATI can give an indication on Trash content but the most appropriate instrument for Trash analysis in raw cotton is MESDAN-LAB Trash Analyser code 281A, which separates Lint from Trash and Dust content inside a sample of 100g.

READING OF INTERNATIONAL STATISTICS ON NEPS/GRAM

In case of reference to International Statistics, the number of NEPS/gram measured by NATI can be directly compared with the number of Neps/gram indicated for raw cotton and sliver at different stages of the spinning process.



This graph is an example of the typical percentile block available in the International Statistics. It is evident that carding operation is primarily responsible of Neps removal.

NATI WITH BLOWER Code 3280A

The top model code 3280A consists in the testing unit connected to a blower unit.

The Opto-electrical system, the waste box for fibres and for Trash are placed in the testing unit that is equipped with a user-friendly keyboard and a digital display for reading the test results.

The inbuilt microprocessor acquires and elaborates the testing results. It controls the correct functioning of NATI components and the testing progress. In case of functioning anomaly, the test is interrupted and codified error messages are displayed.

The blower unit contains a powerful brushless motor and an electronic system for setting and controlling negative pressure which is necessary for testing.

The brushless motor and the enlarged waste box chamber allows frequent testing of large size samples which is highly recommended especially in case of synthetic man-made and combed cotton sliver.

For technical features please refer to the relative table.



NATI WITHOUT BLOWER Code 3280

It is the compact version of the top model code 3280A. Due to the absence of the blower unit, the brushless motor has been replaced by a smaller motor with brushes and the waste box can only allocate 2,5-3mt of sliver.

NATI without blower is recommended only in case of small cotton spinning mills for which only few hundred hours/year of test can be foreseen, or in case frequent transportation from one plant to a far away site is required. The testing system is the same as Code 3280A's. It is not possible to upgrade NATI code 3280 with the blower unit.



- size: 40cm x 35cm x 40.5cm
- weight: 26Kg
- power absorption: 500VA
- for other technical details refer to the table relative to the NATI technical features.

PRINTER CUSTOM TYPE Code 3280 760

It is equipped with a serial port for NATI connection and it automatically prints the test report at the end of the test.

Power supply: 220V-50Hz/110V-60Hz

Size: 17cm x 13cm x 10cm

Weight: 1Kg

Paper rolls: standard 5.7 cm width



OPENING ROLLERS

They open the fed sliver into fibres without changing the content of Neps and Trash.

Code 3280 168

It is suitable for 100% cotton sliver and blends with cotton prevalence (up to nominal 65%)

Code 3280 169

It is suitable for 100% synthetic man-made short staple sliver and blends.

Easily interchangeable, they do not require any maintenance as they are self-cleaning and not subject to wear.

One opening roller is already supplied with NATI (model to be specified when ordering).



ELECTRONIC HIGH PRECISION BALANCES

for weighing raw cotton and trash waste.

Sartorius Code 165 628, 150g capacity and 0.001g accuracy, is equipped with round plate of Ø 100mm and protection cover.

It is recommended to determine the Trash percentage content.

Sartorius Code 165 618, 200g capacity and 0.01g accuracy, is equipped with round plate of Ø 116mm. Protection cover not available.

It is adequate to weigh raw cotton samples to be tested.



*They are equipped with serial exit for PC connection even though not necessary for NATI.
Power supply: 220V-50Hz/110V-60Hz*

RAW COTTON SELECTOR Code 3282

The R.C.S. opens and parallelize the fibres transforming the raw cotton in an homogenous web sample ready for NATI analysis.

If manually operated, this preliminary operation can badly affect the repeatability of the results as they will depend upon the operator ability.

Therefore the Raw Cotton Selector eliminates the influence of the operator and the possibility of human error. It also allows preparation of large size samples in a short time.

The R.C.S. can also be used to prepare samples for testing purposes other than Neeps counting whenever the preparation of a uniform web sample is required.



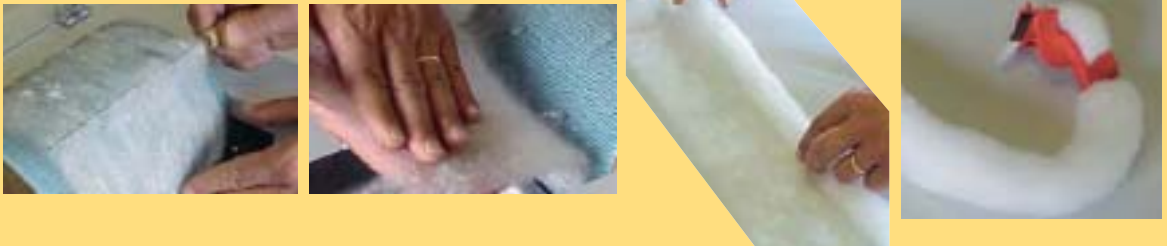
TECHNICAL FEATURES

- Size: 60cm x 45cm x 25 cm
- Weight: 25Kg
- Power supply: 220V, 50 Hz.
Alternatively: 110V, 60 Hz by means of an external transformer.
- Sample size: 2g-2,5g
- Drum diameter: 20cm, equipped with special elastic gaskets.
- Rotation speed: 200 rot./min
- Accident-prevention device covering the rotating drum.

HOW TO USE IT WITH NATI

After weighing 2,5g of raw cotton with a high precision electronic balance and inserting the same into the Raw Cotton Selector, the operator can remove the obtained web with the special extractor and pass it again a couple of times through the R.C.S..

The cotton web is now ready to be rolled up by the operator in sliver form. After cutting the part of the sliver in excess of 2g the operator can insert the obtained sliver in the NATI and start the test. The illustrated preparation takes less than 7 minutes for a 2g sample.



TROLLEY Code 3280 900

Compact and self-standing, it is equipped with four 360° rotating wheels and large handle. Useful tool compartment available. It is suitable to hold both NATI models .

Size: 50cm x 47cm x 130cm

Weight: 30Kg



Nati Technical Features

Tested material	cotton, synthetic and man-made short staple sliver blended sliver raw cotton material
testing speed	1cm/sec
classes of Neps	≥0,5mm ≥0,7mm ≥1mm
classes of Trash	≥0,25mm ≥0,5mm
testing means	Opto-electrical system
opening rollers	interchangeable and suitable for cotton and for synthetic short staple fibres
testing mode	3 to be selected by the operator cm/test the operator just inputs the number of tests and the unit length. It is recommended for testing slivers. gram/test the operator inputs the count in grain of 6 yard of sliver, the number of tests and the unitary weight. The length of the sample is automatically calculated by the NATI. gram/sample The operator inputs the weight of the sample. It is recommended for testing raw cotton.
Printer connection	parallel port available - serial port RS232 optional for Printer CUSTOM Type
PC connection	presently under construction-not yet available
size	40cm x 35cm x 64cm *
weight	35Kg *
power supply	220V-50Hz / 110V-60Hz **
power absorption	1000VA *
noise	< 70 Db
Air supply	not required

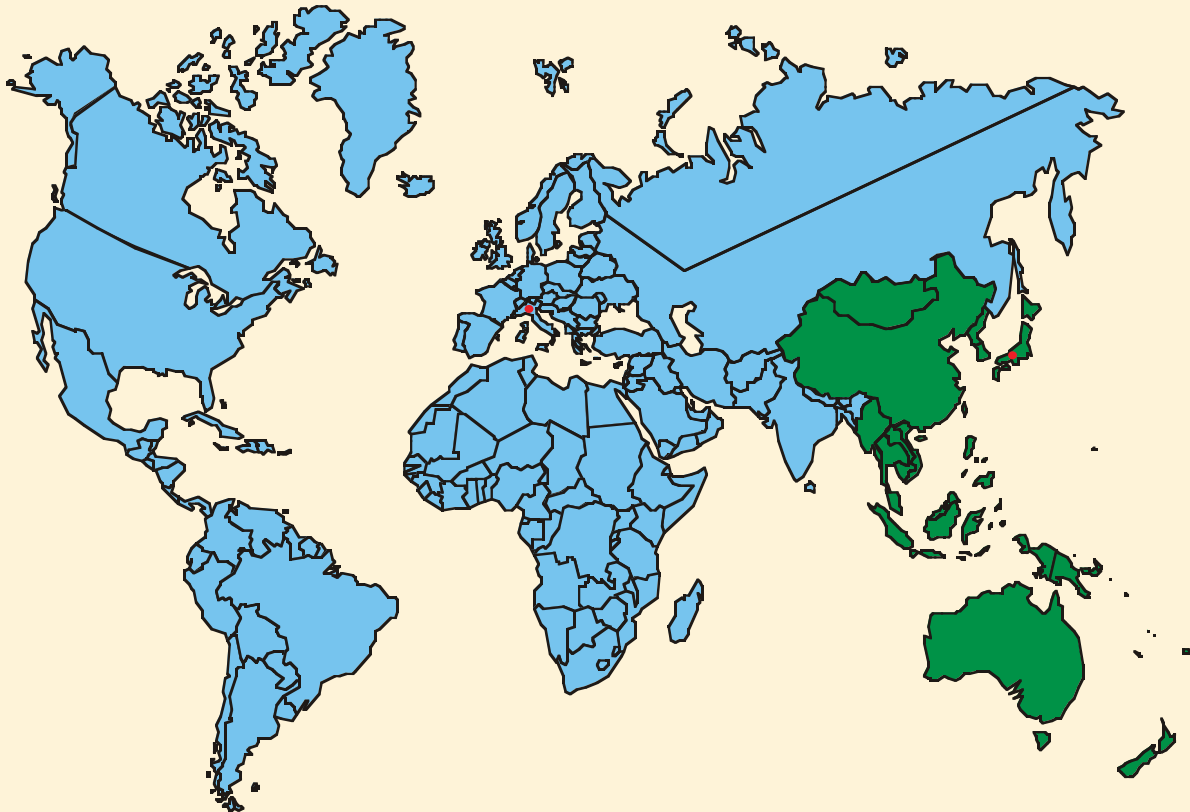
* these features refer only to NATI complete with blower.

For information on NATI without blower please refer to the relative section.

** to be specified when ordering: 220V- 60 Hz is also available.

About NATI Manufacturers

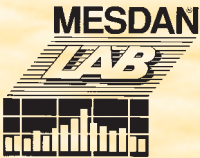
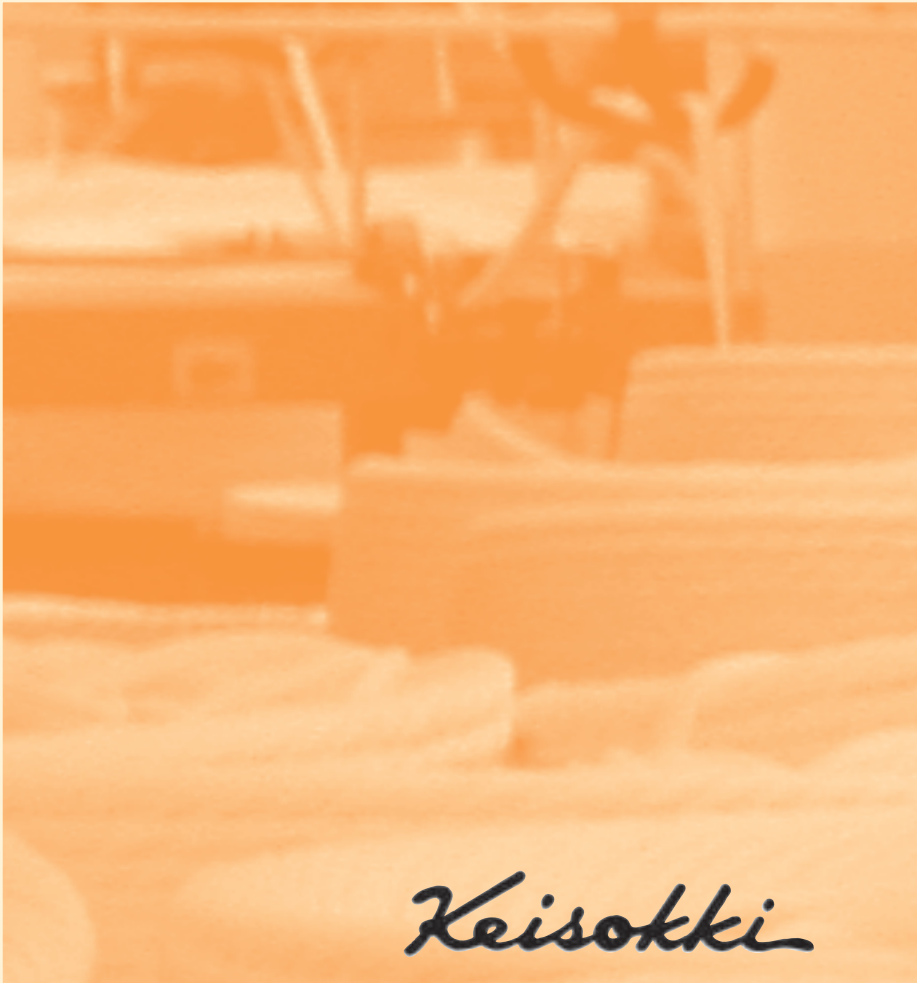
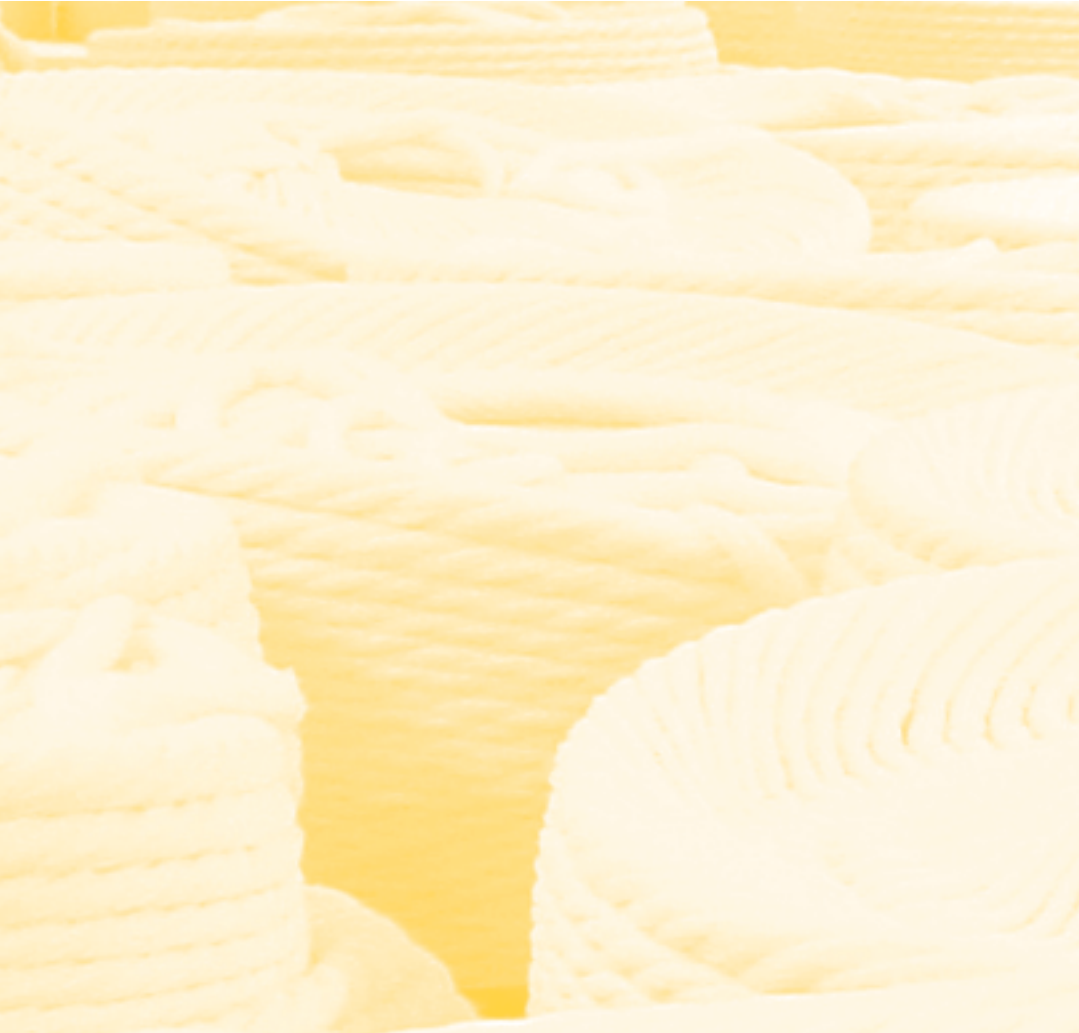
- *NATI is produced by MESDAN-LAB (a division of Mesdan Spa) and KEISOKKI KOGYO CO.,LTD.*
- *NATI is the result of the intensive collaboration and vast experience of the two companies in their respective fields.*
- *NATI is distributed by MESDAN and by KEISOKKI sales network in different areas of the world as indicated in the map below.*



MESDAN, located in Salò (Italy), has accumulated a remarkable and unrivalled knowledge in yarn joining, quality testing and fine mechanics in over 50 years of activity at the service of the textile industry. It is particularly renowned for the manufacture of yarn joining devices (splicers and knotters) and the manufacture of laboratory instruments for testing of fibre yarn and fabrics which are marketed under the MESDAN-LAB trademark.

KEISOKKI KOGYO, based in Osaka (Japan), is active in the electronic field related to textile and manufactures a large number of instruments for textile laboratory such as testers for measuring yarn and sliver evenness, fibre length distribution and a system for classifying yarn fault, as well as yarn clearers for winding machines.

Light blue: MESDAN-LAB distribution area
Green: KEISOKKI distribution area



Keisokki

MESDAN-LAB a division of MESDAN S.p.A.
Via IV Novembre, 27 25087 Salò (BS) Italy
Export Department Ph. +39 0365 440242 Fax 520998
e-mail: sales@mesdan.it web site: www.mesdan.it

KEISOKKI KOGYO CO., LTD.
2-12-7, Meishin-cho, Amagasaki-shi, Hyogo-ken, 661-0021 Japan
Ph. 81-6-6428-7821 Fax 81-6-6428-7825