

ECO
FRIENDLY
PROCESS



TONELLO & CLARIANT TURNING IDEAS INTO TECHNOLOGY



Exactly your chemistry.

The new garment dyeing system from Tonello and Clariant that uses ecological Sulphur Dyeing under nitrogen atmosphere.

TOP-LEVEL PERFORMANCE, ENERGY SAVINGS AND ENVIRONMENTAL COMPATIBILITY.

Tonello*, at the forefront in the research and development of machinery for treating ready-made garments, and **Clariant**, a leading manufacturer of sulphur dyes with a special emphasis on eco-friendly products and processes.

Together.

They have developed an innovative dyeing system and responded effectively to the increasingly urgent demand for manufacturing processes that are able to combine efficiency with sustainability.

- Extremely high quality standards;
- Excellent performance;
- Reliability and durability;
- Improved repeatability of results;
- Lower electricity, water and chemical consumption, which reduces environmental impact:

These are the advantages of a system that has set new boundaries in manufacturing and is today already the number one reference for dyeing companies the world over.

Tonello & Clariant:
turning ideas into technology.

* Research Laboratory recognised by the Ministry of Universities and Scientific and Technological Research. Gazzetta Ufficiale no. 11 dated 15/01/97

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A new, technologically-advanced, eco-friendly, unique dyeing system.

To optimise water, energy and chemical consumption and reduce processing residues to a minimum.

This new technology enables garments to be dyed under nitrogen atmosphere using an **extremely low liquid ratio** and **ecological sulphur dyeing**.

The entire process is “eco-friendly”.

Here's why:

- Processing in a nitrogen atmosphere with a low liquor ratio to reduce chemical use
- The dyeing temperature can be reduced
- Water and energy consumption are drastically cut
- The process is “cleaner” and safer for workers
- The machine does not stain as easily, making maintenance and cleaning simpler.

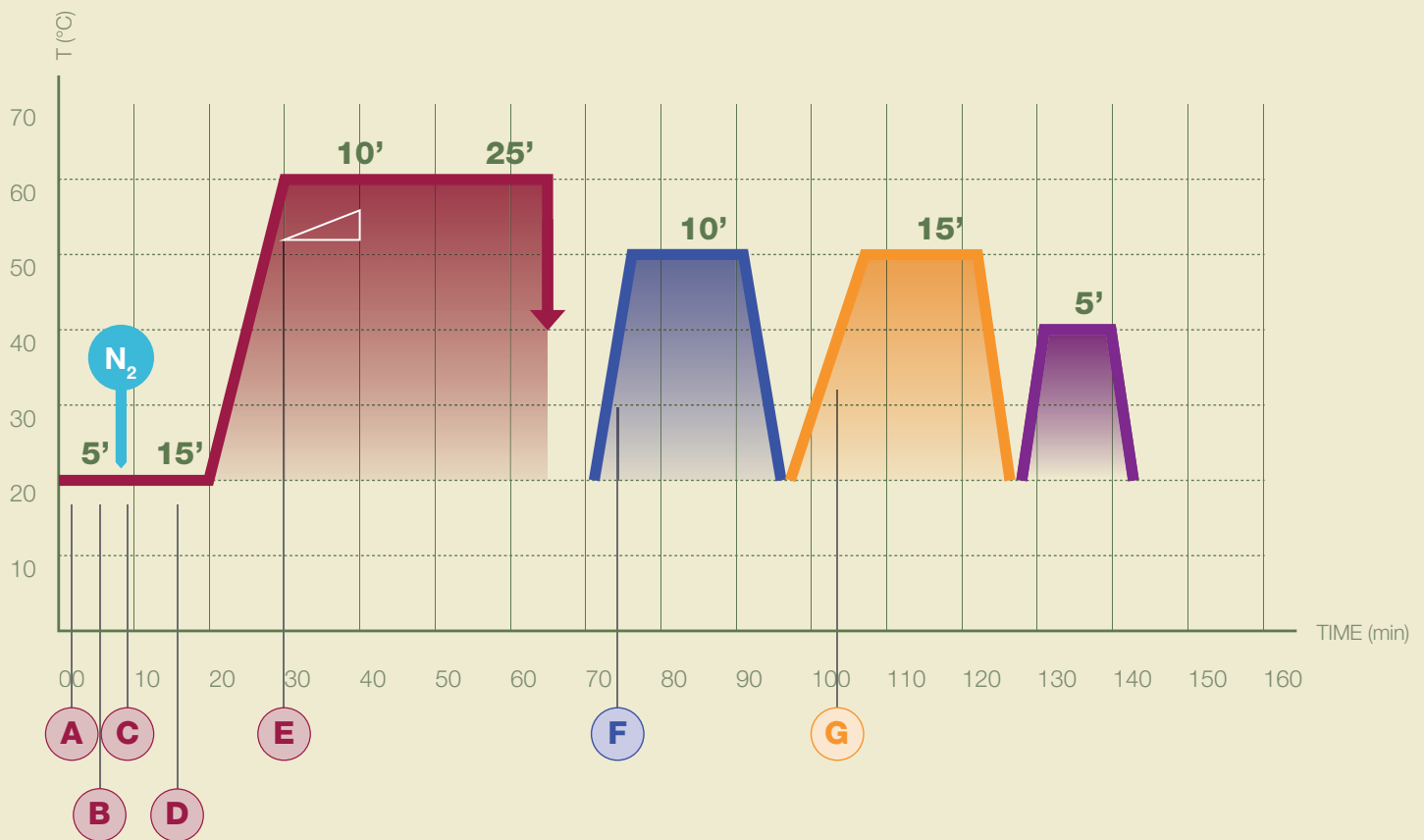
Garment dyeing with Diresul® RDT Liq. (using the Tonello G1 N2 nitrogen dyeing machine)

- Sulphide free reducing system.
- Particularly suited to medium and high intensity shades.
- Peroxide-based, eco-friendly oxidation.
- Greater dyeing stability producing more even results that are easier to reproduce.
- Dyeing is superficial, giving a worn look without damaging the fibre.
- Striking effects and contrasts can be produced by using chemical and physical wash-down after dyeing.

Recommended dyestuffs to apply under this technology:

- Diresul Black RDT-2KS Liq.
- Diresul Brown RDT-R Liq.
- Diresul Blue Black RDT-2B Liq.
- Diresul Blue RDT-2G 150 Liq.
- Diresul Indiblack RDT-2R Liq.
- Diresul Navy RDT-GF 150 Liq.
- Diresul Indinavy RDT-B Liq.
- Diresul Bordeaux RDT-6R 150 Liq.
- Diresul Olive RDT-B150 Liq.
- Diresul Brown RDT-GN Liq.
- Diresul Brown RDT-GS150 Liq.

New Sulphur Dyeing under nitrogen atmosphere_Garment processing – Liquor ratio : 5:1



A 25 G/L Glauber's Salt (solid)

B 0.3% LEONIL EHC conc Liq
0.5% LADIQUEST 2005 conc Liq
0.3% ANTIMUSSOL HRS Liq

C 8 - 10% Caustic Soda 50%
3 - 5% Soda Ash

D 8 - 10% Reductor D p.

E X% DIRESUL RDT Liq *1

F 0.5% DIRESOL EW Liq
0.1% Acetic Acid al 80% (PH 6-7)

G 2% H2O2 *2 adjust pH to 3.5-4

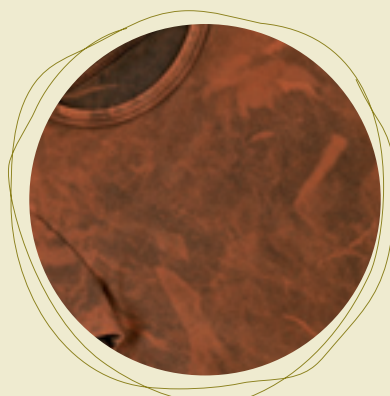
*1 Recommended concentration > 2% dyestuff

*2 For DIRESUL OLIVE RDT-B150, DIRESUL BORDEAUX, RDT-6R150 e, DIRESUL BROWN RDT-R, we recommend using DIRESUL OXIDANT BRI LIQ to achieve full oxidation.

It is recommended to add 1 % Direfix AT p. to the final bath along with softener in case of black shades.



New Sulphur Dyeing System
+ G1 Ofree treatment.



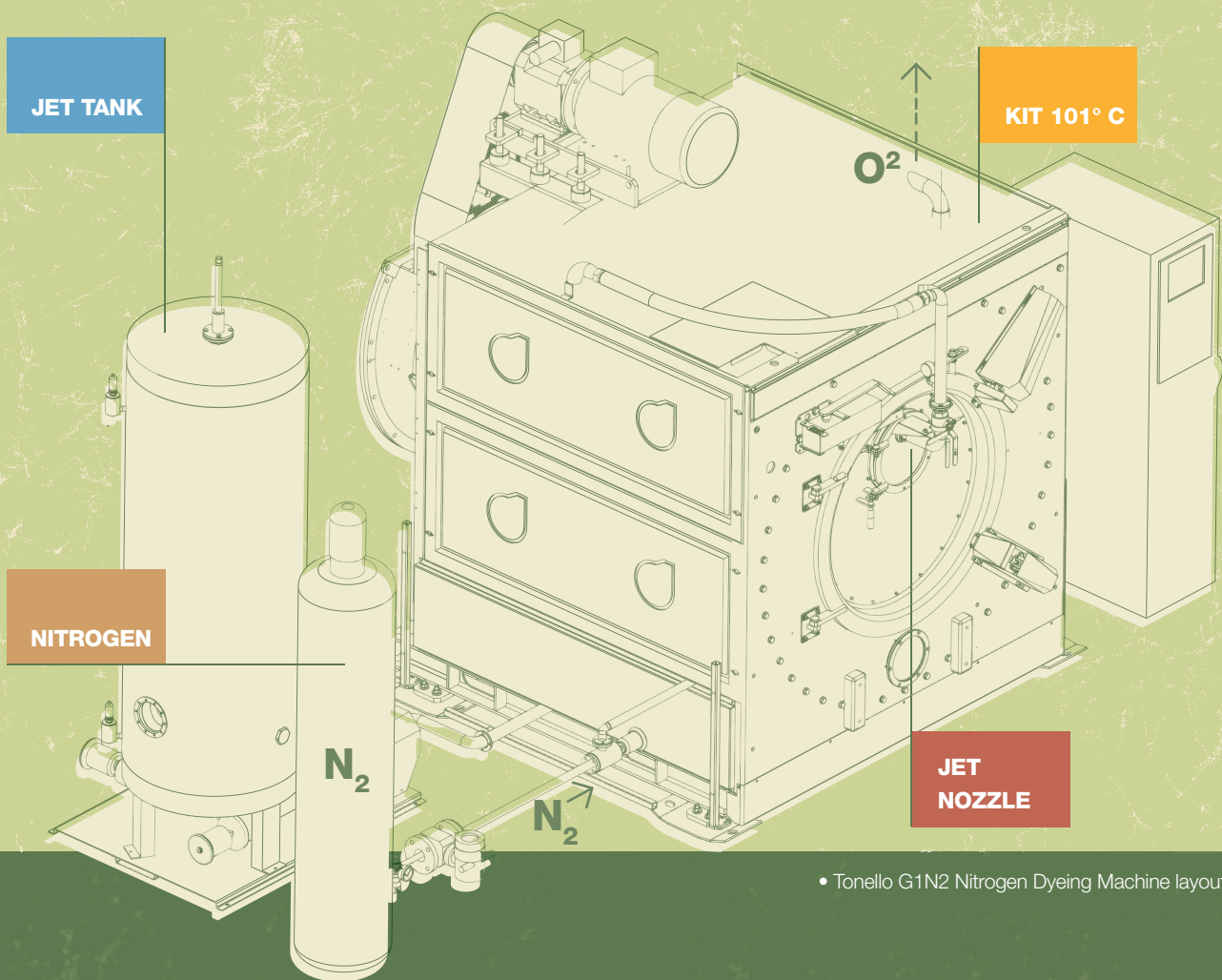
New Sulphur Dyeing System
+ Antarctic Batik



New Sulphur Dyeing System
+ Antarctic Batik

Tonello G1N2 Nitrogen Dyeing Machine:

for controlled dyeing processes without the use of oxygen, under nitrogen atmosphere.



• Tonello G1N2 Nitrogen Dyeing Machine layout

The machine is completely automatic to ensure total control and reproducibility of every process.

It is equipped with:

- **101° C KIT**, which keeps the machine hermetically sealed to ensure total absence of oxygen exchange.
- **AUTOMATIC, CONTROLLED NITROGEN FEEDING;**
- **AUTOMATIC, CONTROLLED DYE AND CHEMICAL FEEDING;**
which enable dyeing to be carried out at a low liquor ratio;
- **JET SYSTEM***: to further reduce the liquor ratio in dyeing processes.

The Tonello G1N2 nitrogen dyeing machine is extremely flexible and can also be used in standard dyeing processes. The range covers all requirements: from sampling (G1 70 model) to large-scale manufacturing.

* **Jet System** (optional), the new evolutionary stage in Tonello technology, guarantees brilliant performance, efficiency, energy savings and respect for the environment. Jet System, technology "Made in Tonello", once again sets today the international standards of tomorrow. Jet System, the revolution in colour. Environmentally compatible.



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Garment Finishing Technologies

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