
Tissue paper and tissue products —
Part 1:
Vocabulary

Papier tissue et produits tissue —
Partie 1: Vocabulaire

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 172, *Pulp, paper and board*, in collaboration with Technical Committee ISO/TC 6, *Paper, board and pulps*, Subcommittee SC 2, *Test methods and quality specifications for paper and board*, in accordance with the Agreement on Technical Cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 12625-1:2011), which has been technically revised. The main changes compared to the previous edition are as follows:

- change of the number of terms to those which directly concern tissue;
- the alphabetical index has been restructured because of the merging and addition of “term groups”;
- editorial updates.

A list of all parts in the ISO 12625 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document defines terms for the determination of the physical properties of tissue paper manufactured using creping or un-creped techniques, and includes products made using a combination of these tissue-making processes.

Tissue products form an important and growing market for single-use disposable hygiene and industrial products. The current range of these familiar products includes toilet tissue, facial tissue, kitchen/household towels, hand towels, handkerchiefs, table napkins, mats, industrial wipes, other absorbent tissue papers and lotion-treated products.

Tissue-paper-manufacturing technology has evolved and diverged from "ordinary" paper technology so that a new glossary has become necessary.

The purpose of this document is to allow a common understanding of the various tissue-making terms between tissue manufacturers, tissue converters and tissue customers, and to facilitate the harmonization of testing methods. Each listed term is briefly defined and, where this was thought to be useful, an example is given. While elaborating this document, English was chosen as the original language. It was then stated that some expressions cannot be translated into another language. For those cases, the English expression is used.

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Tissue paper and tissue products —

Part 1: Vocabulary

1 Scope

This document establishes general principles for the use of terms in the entire working field of tissue paper and tissue products.

It permits the use of a common terminology in industry and commerce.

It is expressly stated that ISO 15755 applies for the detection of impurities and contraries in tissue paper and tissue products.

For the determination of moisture content in tissue paper and tissue products, ISO 287 applies.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

absorbency

ability of a *tissue paper* (3.58) and/or a *tissue product* (3.59) to take up a liquid

3.2 Absorption

3.2.1

absorption capacity

mass of liquid that is absorbed per unit mass of the test piece

Note 1 to entry: Water-absorption capacity is defined in ISO 12625-8.

3.2.2

absorption rate

mass of liquid that is absorbed by a test piece per unit time, determined by dividing the total mass of liquid that is absorbed over a given time period by the duration of the period

3.2.3

absorption time

time required for complete wetting of a sample

[SOURCE: ISO 12625-8:2010, 3.1]

**3.3
accelerated ageing**

procedure which allows for the fast prediction of changes in the characteristics of *tissue paper* (3.58) or *tissue product* (3.59) that occur in normal conditions over a longer time

Note 1 to entry: This is particularly the case for wet strength tissue paper or tissue product for which the wet resistance occurs over time. An accelerated ageing procedure for determining wet strength is specified in ISO 12625-5.

**3.4
apparent bulk density**

mass per unit volume of *tissue paper* (3.58) or *tissue product* (3.59), calculated from its *grammage* (3.28) and *bulking thickness* (3.10)

Note 1 to entry: It is determined from the grammage of the tissue paper or the tissue product divided by the thickness determined on a stack of that tissue.

[SOURCE: ISO 12625-3:2014, 3.4]

**3.5
away-from-home tissue products
AFH tissue products**

tissue products (3.59) intended for use in the institutional and industrial markets

EXAMPLE Tissue products used in hospitals, restaurants, hotels, offices.

**3.6
base paper**

single-ply tissue paper sheet produced as a semi-finished product intended to be converted to a finished product

**3.7
base sheet forming**

wet forming of a web on one, or between two, endless running wires or between one wire and a felt, producing an endless sheet of tissue with a *grammage* (3.28) typically between 10 g/m² and 50 g/m²

3.8 Brightness

**3.8.1
D65 brightness**

intrinsic radiance (reflectance) factor measured with a reflectometer having the characteristics described in ISO 2469, equipped with a filter or corresponding function having an effective wavelength of 457 nm and a half-peak bandwidth of 44 nm, and adjusted so that the UV content of the irradiation incident upon the test piece corresponds to that of the CIE standard illuminant D65

[SOURCE: ISO 2470-2:2008, 3.4, modified — Symbol $R_{457,D65}$ and Note 1 to entry were removed.]

**3.8.2
C brightness**

ISO brightness
intrinsic diffuse radiance (reflectance) factor measured with a reflectometer having the characteristics described in ISO 2469, equipped with a filter or corresponding function having an effective wavelength of 457 nm and a half bandwidth of 44 nm, and adjusted so that the UV content of the irradiation incident upon the test piece corresponds to that of the CIE illuminant C

[SOURCE: ISO 2470-1:2016, 3.4, modified — Preferred term "C brightness" added, and symbol R_{457} and Note 1 to entry removed.]

**3.9
bulk**

inverse of *apparent bulk density* (3.4)

3.10**bulking thickness**

thickness of a single sheet of *tissue paper* (3.58) or *tissue product* (3.59), calculated from the thickness of several superimposed sheets, measured under the applied static load

[SOURCE: ISO 12625-3:2014, 3.3]

3.11**calendering**

mechanical treatment of base sheet being passed in the nip between two smooth cylinders with the aim of improving the smoothness or *surface softness* (3.52.2) of a *tissue paper* (3.58) or *tissue product* (3.59)

Note 1 to entry: This operation is carried out by means of a calender. In addition, this process permits some control of the thickness of tissue paper or tissue product.

3.12**cellulose wadding**

creped web or sheet of open formation, made of cellulosic fibres (mainly chemical pulp) and comprising one or more plies of lightweight paper

Note 1 to entry: An open formation is obtained when paper is produced at low basis weight and high stretch (usually more than 35 %).

Note 2 to entry: Soft crepe paper of very low grammage, normally used in bundles or pads containing several sheets.

[SOURCE: ISO 4046-4:2016, 4.37, modified — (mainly chemical pulp) added and Note 1 to entry and Note 2 to entry added]

3.13**cloth-like feel**

attribute of a *tissue paper* (3.58) or *tissue product* (3.59) such that it resembles the feel of a woven cloth material

3.14 Colour**3.14.1****CIELAB colour space**

three-dimensional approximately uniform colour space, produced by plotting in rectangular coordinates L^* , a^* , b^*

Note 1 to entry: The quantity L^* is a measure of the lightness of the test piece, where $L^* = 0$ corresponds to black and $L^* = 100$ is defined by the perfect reflecting diffuser. Visually, the quantities a^* and b^* represent respectively the red-green and yellow-blue axes in colour space, such that

- $+a^*$ is a measure of the degree of redness of the test piece,
- $-a^*$ is a measure of the degree of greenness of the test piece,
- $+b^*$ is a measure of the degree of yellowness of the test piece, and
- $-b^*$ is a measure of the degree of blueness of the test piece.

If both a^* and b^* are equal to zero, the test piece is grey.

[SOURCE: ISO 5631-3:2015, 3.6, modified — Note 1 to entry added]

3.14.2**CIELAB colour (D65/10°)**

L^* , a^* and b^* values of the sample according to the CIELAB 1976 system, evaluated according to the CIE 1964 (10°) standard colorimetric observer and the CIE standard illuminant D65

Note 1 to entry: See ISO 12625-7 for further information.

[SOURCE: ISO/TR 10688:2015, 2.5.2, modified — Preferred term " (L^*, a^*, b^*) " removed, preferred term CIELAB colour (D65/10°) and Note 1 to entry added]

3.14.3

CIELAB colour (C/2°)

L^* , a^* and b^* values of the sample according to the CIELAB 1976 system, evaluated according to the CIE 1931 (2°) standard colorimetric observer and the CIE illuminant C

Note 1 to entry: See ISO 12625-15 for further information.

[SOURCE: ISO/TR 10688:2015, 2.5.1, modified — Preferred term " (L^*, a^*, b^*) " removed, preferred term CIELAB colour (C/2°) and Note 1 to entry added]

3.15

conventional wet pressing

CWP

tissue-making process by which the wet-formed web is pressed against the *Yankee cylinder* (3.63) while supported by a felt, and entirely dried by the Yankee cylinder

3.15.1

Yankee coating

coating package

combination of adhesive/release agent and potentially other chemical additives applied to the *Yankee cylinder* (3.63) prior to the creping operation in order to ensure a homogeneous and even contact between the *tissue paper* (3.58) web and the drying cylinder, and induce an easy release of the web from the creping blade

3.15.1.1

adhesive

component of *Yankee coating* (3.15.1) delivering specific adhesion, durability and hardness characteristics

3.15.1.2

modifier

component of *Yankee coating* (3.15.1) that changes its physical properties

Note 1 to entry: For example, plasticizers, corrosion inhibitors and emulsifiers.

3.15.1.3

release

component of *Yankee coating* (3.15.1) responsible for the reduction of creping blade friction, regulating adhesion and ensuring proper removal of the tissue sheet from the *Yankee cylinder* (3.63)

3.15.2

coating in converting

process to apply additives (chemicals, lotion) onto the tissue sheet during converting

Note 1 to entry: The term "coating" has a different meaning in the tissue industry from that in the printing and writing paper manufacturing industry. In the paper industry, the term "coating" refers to

- a layer of a pigment/binder composition applied to the surface of a paper or board having an impact on the surface structure, the optical appearance and the optical and printing behaviour of the coated product, and
- the process of applying a coating composition.

3.16 converting

manufacturing of a *tissue product* (3.59) by a process or operation applied after the papermaking process

Note 1 to entry: For example, unwinding and winding procedures, the assembling of tissue base paper to single or multi-ply webs, their calendering, embossing, laminating, perforating, cutting in the machine direction (MD) or cross direction (CD), winding of small rolls for end-user purposes, folding in the machine direction and/or cross direction, stacking of the separated folded sheets and all kinds of packaging. Converting may include lotion treatment and printing.

3.17 core

tube around which paper is wound to form a reel or a roll of finished product

Note 1 to entry: A core is usually constructed as a one- or multi-ply wall of paper wound and laminated with an adhesive.

Note 2 to entry: Some rolls of finished products may have no core.

3.18 creping

process by which the web is mechanically removed from the *Yankee cylinder* (3.63) by a blade in the machine direction in order to change its properties, which include stretch, thickness, strength and softness

Note 1 to entry: It is a major part of the tissue-making process.

Note 2 to entry: Creping is included in terms 3.18.1 to 3.18.6.

Note 3 to entry: The *Yankee cylinder* (3.63) is usually protected by a coating layer.

3.18.1 creped paper

thin, lightweight paper that has been subjected to creping action on a tissue machine

Note 1 to entry: Creped paper shall not be confused with "crepe" paper which is a type of creped paper that has not been stretched and is often used for decoration and packing material.

3.18.2 creping doctor blade

sharp thin blade that is pressed against the *Yankee cylinder* (3.63) of a tissue machine under high pressure and at a specific angle in order to remove the web from the cylinder

3.18.3 double creped paper

tissue paper (3.58) creped in two consecutive process steps

Note 1 to entry: The second creping cylinder downstream of the main *Yankee cylinder* (3.63) usually works on the opposite paper side.

3.18.4 dry creped paper

tissue paper (3.58) manufactured using a dry creping process

Note 1 to entry: A typical example is creping by means of a *creping doctor blade* (3.18.2) against a *Yankee cylinder* (3.63) of an almost dry sheet with a dry matter content typically between 95 % and 98 %.

3.18.5 uncreped tissue paper

tissue paper (3.58) typically obtained from a *TAD* (3.56) process in which the sheet is dried completely in the TAD section with no creping step on a *Yankee cylinder* (3.63)

3.18.6

wet creped paper

creped paper (3.18.1) typically produced on a wet creped tissue machine, where creping takes place on the surface of a *Yankee cylinder* (3.63) while the sheet is still wet (typically 25 % to 65 % moisture content) and is followed by post-drying to a fully air-dry condition with conventional drying cylinders or other drying devices

3.19

cushioning

pillowing

process of making a cushioned structure resulting in a macro-structure of regularly distributed "cushions" of low-density material separated by high density regions with strong fibre-to-fibre bonding

3.20

disintegration

process that is characterized by a material breaking into small pieces in water under specified conditions

3.21

drapability

ability of a *tissue product* (3.59) to spread over an object in a typically textile-like way

3.22

embossing

converting process by which a raised or depressed design is produced, generally by pressure between engraved rolls or plates, or between an engraved roll or plate and an elastic or a deformable supporting surface

Note 1 to entry: The main objectives of this process are to deliver bulk and ply bonding.

Note 2 to entry: Typical embodiments are full-face embossed or combined spot-embossed tissue products, for example toilet papers or kitchen towels.

Note 3 to entry: Embossing is included in terms 3.22.1 to 3.22.14.

3.22.1

border embossing

embossing along all edges of a *tissue product* (3.59) parallel to the border lines

Note 1 to entry: Mainly done in order to generate ply bonding by mechanical means and for decorative purposes. Typically used with paper handkerchiefs in cases and napkins.

3.22.2

edge embossing

type of *knurling* (3.34) along the edge of a *tissue product* (3.59)

3.22.3

embossed laminate

laminate produced from at least two plies of *tissue paper* (3.58) in a converting process in which primarily at least one ply is embossed, the plies forming the laminate being ply-bonded by glue application to the embossed points

Note 1 to entry: Alternatively, the laminate can be achieved by mechanically bonding the embossed sheet to other sheet(s) using pressure sufficient to enable fibre-to-fibre-bonding to occur at the embossed points.

3.22.4

embossing pattern

design created in the sheet or the product by the process of embossing

3.22.5

female embossing

see *matched steel embossing* (3.22.9)

3.22.6**foot-to-foot embossing**

pin-to-pin embossing

punta-punta embossing

point-to-point embossing

tip-to-tip embossing

steel embossing process where a first steel roll has a pattern or raised protrusions and a second has an identical pattern or raised protrusions such that each protrusion is registered face to face

3.22.7**glued border embossing**

border embossing (3.22.1) combined with a simultaneous ply-bonding with glue at the top face of the embossed protrusions

Note 1 to entry: This process is especially used to produce handkerchiefs.

3.22.8**male embossing**

see *matched steel embossing* (3.22.9)

3.22.9**matched steel embossing**

steel/steel embossing process where a first steel roll has a pattern of raised protrusions (male embossing) and a second one has an identical pattern of depressions (female embossing), formed so that they allow the protrusions of the first roll to dip partly into depressions of the second roll

3.22.10**nested embossing**

process of pressing a pre-embossed ply with a glue applied to the top faces of the raised protrusions to a second pre-embossed ply without glue, to produce a multi-ply laminated web in a nested manner

Note 1 to entry: See *marrying roll* (3.38).

3.22.11**perforation embossing**

embossing by a method that creates very small and discrete ruptures at precisely controlled locations within the web

3.22.12**spot embossing**

embossing by use of predominantly linear embossing points forming a pattern

EXAMPLE A flower or a geometric shape.

3.22.13**steel/rubber embossing**

embossing achieved by pressure between an engraved steel embossing roll bearing a pattern of embossing protrusions and a rubber backing roll

3.22.14**steel/steel embossing**

embossing achieved by pressure between two steel rolls, one bearing male protrusions and the other female depressions

3.23**embryonic web**

wet web immediately after forming

3.24

facial tissue

soft and absorbent *tissue product* (3.59) with wet-strength, intended for use on the face, for blowing the nose or for make-up removal

Note 1 to entry: Facial tissues are also called handkerchiefs in box in some countries.

3.25

finished product

tissue product (3.59) after converting that is ready for its intended use

Note 1 to entry: The finished product may be either packed or unpacked (tissue product).

3.26

folded product

tissue product (3.59) folded during converting for purposes of packaging and dispensing

3.26.1

cross-folded product

tissue product (3.59) folded in both the machine direction and cross direction

Note 1 to entry: Typical examples are handkerchiefs in cases or napkins.

3.26.2

interfolded tissue product

tissue product (3.59) folded in such a way that when one sheet is withdrawn from the dispenser (box or device) the next sheet is presented for easy withdrawal

Note 1 to entry: Typical examples are facial tissues or hand towels.

3.27

folding

converting process applied to certain *tissue products* (3.59) for purposes of packaging and dispensing

Note 1 to entry: There are several ways of folding tissue to obtain different stacks, for example C-fold, J-fold, M-fold, V-fold, W-fold or Z-fold. These configurations are folded in a *tissue paper* (3.58) web in the shape of the designated letters. Some of these result in interfolded tissue products.

Note 2 to entry: Folding can be done in the machine direction, in the cross direction or in a combination of both.

3.28

grammage

mass of a unit area of *tissue paper* (3.58) or *tissue product* (3.59)

[SOURCE: ISO 12625-6:2016, 3.1, modified — removal of "determined by the procedure in this document"]

3.29

handkerchief

typically a multi-ply border-embossed, cross-folded, soft and absorbent *tissue product* (3.59) with wet-strength, intended for blowing and wiping the nose, sold in cases of several items

3.30

haptic feel

see *tactile feel* (3.55)

Note 1 to entry: Haptic feel is synonymous with tactile feel. The term is sometimes used as a synonym of softness, when focusing, for example, on household towels or kitchen towels, to characterize the different type of softness and lower softness level of high-grammage *tissue products* (3.59), in comparison with typical low-grammage, soft tissue products, like facial tissues or handkerchiefs.

3.31**household roll**

towel

kitchen towel

wet-strength *tissue product* (3.59) in the form of a roll, divided by means of perforation, intended for general use in the household

3.32**hygiene paper**

sanitary paper

general term for *tissue paper* (3.58) intended for personal hygiene use

3.33**imprinted web**

pre-dried or finally dried web, obtained after it has been moulded in a structured three-dimensional fabric, also known as forming or marking fabric, for example in a *TAD* (3.56) process

3.34**knurling**

embossing of a *tissue product* (3.59) done with knurling wheels in the machine direction (MD)

Note 1 to entry: See *edge embossing* (3.22.2).

Note 2 to entry: This type of embossing very often occurs in small, endless traces.

3.35**laminated paper**

multi-ply *tissue paper* (3.58) achieved by ply-bonding by *laminating* (3.36)

Note 1 to entry: In the case of laminating associated with embossing, an *embossed laminate* (3.22.3).

3.36**laminating**

process of joining together two or more plies of a tissue material (tissue paper web, tissue paper sheet) to form a multi-ply *tissue product* (3.59)

3.37**layer**

stratum of the ply in the z-direction characterized by a defined fibre composition

Note 1 to entry: Layers per ply is the number of layers with a distinct furnish in one ply. Using a multi-layer headbox, it is possible to produce a single-ply sheet or web with several layers.

3.38**marrying roll**

additional rubber or steel press roll typically used with the nested process to achieve ply bonding

Note 1 to entry: In the case of a two-ply nested product, this press roll works by forming a press nip together with the steel embossing roll that is in contact with the glue application unit. This press roll system then connects and presses the embossed, untreated first ply against the protrusions of the nested embossed second ply of a base tissue web.

3.39**multi-layer ply**

ply consisting of several layers characterized by a different composition in each layer

3.40**napkin**

tissue product (3.59) intended for protection and wiping during meals

**3.41
opacity**

ratio of the single-sheet luminous reflectance factor (C), $R_{y,0}$, to the intrinsic luminous reflectance factor, $R_{y,\infty}$, of the same sample

Note 1 to entry: See ISO 12625-16 for further information.

[SOURCE: ISO/TR 10688:2015, 2.24, modified — Removal of "the single-sheet reflectance factor is defined as the reflectance factor of a single sheet of paper with a black cavity as backing" in Note 1 to entry.]

**3.42
tie bar**

uncut zone in the perforation line

[SOURCE: ISO 12625-12:2010, 3.3]

**3.43
towel**

generally wet-strength *tissue product* (3.59) intended for wiping, taking off, cleaning and absorbing

Note 1 to entry: This term covers hand towels, industrial wipes and kitchen towels.

**3.43.1
hand towel**

tissue product (3.59) intended for wiping and drying hands

**3.43.2
industrial wipe**

tissue product (3.59) intended for industrial use as opposed to household use

Note 1 to entry: Nonwoven products may also exist under this term.

**3.43.3
household towel**

paper towel intended for general domestic use

**3.43.4
kitchen towel**

household towel
paper towel intended for household use

**3.44
perforation efficiency**

E_p
difference between the tensile strengths of non-perforated and perforated material from the same sample divided by the tensile strength of non-perforated material

Note 1 to entry: The higher the perforation efficiency, the easier the sheet separation.

[SOURCE: ISO 12625-12:2010, 3.2, modified — Note 1 to entry added]

**3.45
ply bonding**

converting process by which two or more plies are bonded together

Note 1 to entry: Ply bonding is included in 3.45.1 and 3.45.2.

**3.45.1
chemical ply bonding**

ply bonding achieved with an adhesive (glue or hotmelt) to produce a multi-ply laminated product

3.45.2**mechanical ply bonding**

ply bonding achieved without the application of any kind of adhesive

Note 1 to entry: For example, embossing of two or more tissue paper plies with sufficiently high specific press loads in a press nip formed between two steel rolls, one of them bearing a pattern of male embossing protrusions, the other one with a smooth surface, see [3.22.5](#), [3.22.8](#), [3.22.9](#) and [3.22.14](#).

3.46**ply of a tissue paper**

base paper
independently formed fibrous web

Note 1 to entry: Single plies can be combined with others to form a multi-ply product.

3.47**quilted product**

product with a three-dimensional pillow-like macro-structure

3.48**resilience**

ability of a *tissue paper* ([3.58](#)) to regain its volume following removal of an applied load

3.49**roll**

reel
form in which the paper is produced at the end of the tissue machine

Note 1 to entry: The term roll can also be used for finished products on the converting machine.

Note 2 to entry: This can be subdivided as follows:

3.49.1**jumbo roll**

jumbo reel
parent roll
parent reel
large roll of *tissue paper* ([3.58](#)), wound up on the reel winding station, covering the full width of the tissue machine

Note 1 to entry: The term can also be used for finished products with a large diameter.

3.49.2**mother roll**

mother reel
parent roll
parent reel
large roll of *tissue paper* ([3.58](#)), wound up on the winding station, covering either the full width or part of the width of the tissue machine

Note 1 to entry: When the mother reel/roll covers the full width of the machine it is also called a jumbo reel/roll.

3.49.3**rewound roll**

rewound reel
tissue paper roll/reel obtained after passing through the tissue machine rewinder

3.49.4**roll firmness**

ability of a rolled product to resist compression caused by external force

3.50

sheet

unit of a converted finished product after cutting and/or perforation

Note 1 to entry: The word "sheet" should not be used to describe the continuous web. See also ISO 12625-6 and ISO 186.

3.51

sheet size

dimensions (length and width) of a sheet of a *tissue product* (3.59) that are predetermined by cutting or by perforating during converting

3.52

softness

handfeel

property related to the tactile sensation of a person touching a product or the surface of a material

Note 1 to entry: The softness characteristic can be divided into *bulk softness* (3.52.1) and *surface softness* (3.52.2).

3.52.1

bulk softness

tactile sensation of *softness* (3.52) when the tissue is crumpled in the hand

3.52.2

surface softness

tactile sensation of *softness* (3.52) when a fingertip is drawn lightly over the surface of the material

3.53 Strength

3.53.1

tensile strength

maximum tensile force per unit width that a test piece will withstand before breaking

[SOURCE: ISO 12625-4:2016, 3.1, modified — "in a tensile test" removed from end of definition.]

3.53.1.1

wet tensile strength

maximum tensile force per unit width that a test piece soaked with water will withstand before breaking

[SOURCE: ISO 12625-5:2016, 3.1, modified — "in a tensile test" removed from end of definition.]

3.53.1.2

temporary wet tensile strength

decrease in wet tensile strength of a tissue sample as a function of soaking time

Note 1 to entry: The greater the difference between the wet strength at initial and later different soaking times, the greater the wet strength "temporariness."

3.53.1.3

tensile energy absorption

TEA

amount of energy absorbed per unit surface area of a test piece while being stretched under application of tensile force, until the onset of break (the moment of maximum tensile force)

[SOURCE: ISO 12625-4:2016, 3.4, modified — added "under application of tensile force", and "in a tensile test" removed from end of definition.]

3.53.2**stretch**

elongation of a sample under load as the ratio of increase in length to the initial length

Note 1 to entry: See ISO 12625-4:2016, 3.3.

3.53.3 Bursting strength**3.53.3.1****bursting force**

maximum force that a test piece of *tissue paper* (3.58) or *tissue product* (3.59) can withstand under the test conditions, applied at right angle to its surface

[SOURCE: ISO 12625-9:2015, 3.2, modified — Symbol "F" removed.]

3.53.3.2**wet bursting force**

maximum force, that a wetted test piece of a *tissue paper* (3.58) or *tissue product* (3.59) can withstand under the test conditions, applied at a right angle to its surface

[SOURCE: ISO 12625-11:2012, 3.2, modified — Symbol " F_W " removed.]

3.54**structured paper**

base paper produced on a tissue machine using a structured fabric or belt

Note 1 to entry: Imprinted web when finally dried and wound up on a roll/reel at the end of the tissue machine is called structured paper.

Note 2 to entry: For example, paper produced on TAD, ATMOS, NTT or QRT tissue machines.

3.55**tactile feel**

property of a *tissue product* (3.59) assessed by the sense of touch

Note 1 to entry: See *haptic feel* (3.30).

3.56**through-air drying****TAD**

process in which the wet-formed tissue web is partially or totally dried and structured by blowing hot air through the running web on one or more cylinders while the web is supported by an imprinting fabric or belt

Note 1 to entry: A TAD section is a paper machine section comprising the technical equipment embodying the TAD process.

**3.57
tissue**

product of base paper made from lightweight, dry or wet creped paper and some non-creped paper, predominantly made from natural fibres

Note 1 to entry: The term "tissue" describes products and base papers made from lightweight, dry or wet creped and some "non-creped" papers. For the definition of "paper", see ISO 4046-3.

Tissue products (3.59) can be made of one or several plies, each ply being of one or several layers, prepared as sheets or rolls, folded or unfolded, embossed or unembossed, with or without lamination, printed or not printed and possibly finished by post-treatment, e.g. lotion application.

Products of this type derive from a single-ply, semi-finished, wet-laid tissue-base paper that is predominantly composed of plant fibres. These fibres can be issued from virgin pulp or recycled pulp or a mixture of both. A typical grammage of single-ply tissue-base paper ranges from 10 g/m² to 50 g/m².

Tissue products have typically high bulk, absorption and stretch properties compared with most other types of paper. They may in addition have textile-like properties such as flexibility and softness.

Tissue products are disposable and commonly used for hygienic and industrial purposes.

Nonwovens (see ISO 9092) are not classified as tissue, even if one subgroup of the nonwovens is manufactured in a wet-laid manner according to a process similar to the tissue-making process.

3.58

tissue paper

base paper taken from the tissue machine before conversion (typically between 10 g/m² and 50 g/m²)

Note 1 to entry: The base paper material is taken from the tissue machine as a single-ply web wound up on a roll/reel. The base paper is intended to manufacture single-ply or multi-ply *tissue products* (3.59).

3.59

tissue product

tissue paper (3.58) that has been converted into a finished product for end-user purposes

Note 1 to entry: Typical examples are toilet paper, paper towels and napkins.

3.60

toilet paper

bathroom tissue

bath tissue

tissue paper (3.58) intended for sanitary use after using the toilet

Note 1 to entry: Products labelled as "moist toilet paper" are often made from non-woven material and therefore not in the scope of this document.

3.61

web forming

process of forming a wet web

Note 1 to entry: Tissue-base paper webs are formed from several different well-known wet-laid processes. In these processes, an aqueous suspension, usually of natural fibres from wood or annual plants, is dewatered on one, or between two, endless, rotating plastic wires or felts to give a final dry content of 10 % to 15 %.

Note 2 to entry: Web formation is the structure of the fibre network forming the web.

3.62

wet-laid process

process where the web is formed from an aqueous fibre suspension and simultaneously dewatered

3.63

Yankee cylinder

large, heated drying cylinder, on which the creping process occurs, often above 4 m in diameter, manufactured with a highly polished surface

Note 1 to entry: The Yankee cylinder is the only drying cylinder in conventional dry-crepe tissue machines.