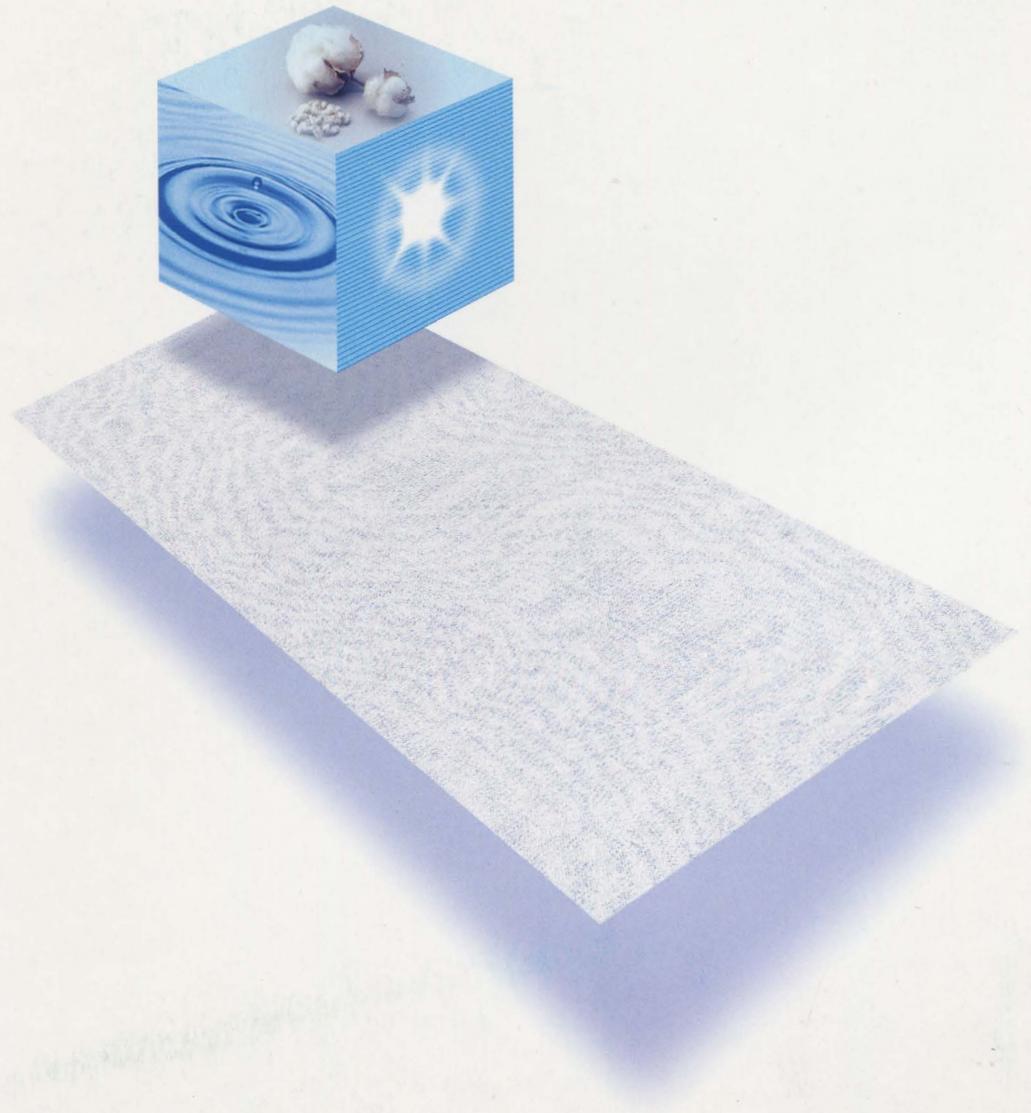


the Clean & Green wiper

BEMCOT™

For cleanrooms



AsahiKASEI

BEMCOT™ cleanroom wipers

World leading true performance

Natural origins, gentle return

Bemcot™ is an established leader in true cleanroom wiper performance that meets emerging requirements in electronics and other rapidly advancing industrial applications, developed and proven in over two decades of predominance as the cleanroom wiper of choice in Japan.

Bemcot™ wipers and related products serve cleanroom applications throughout the world with true performance through a unique synergy of characteristics intrinsic to their composition, structure, and purity. With their natural origin in the cotton plant and their clean-burning, biodegradable disposability, they also serve the ecological environment.

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the *Clean & Green* wiper

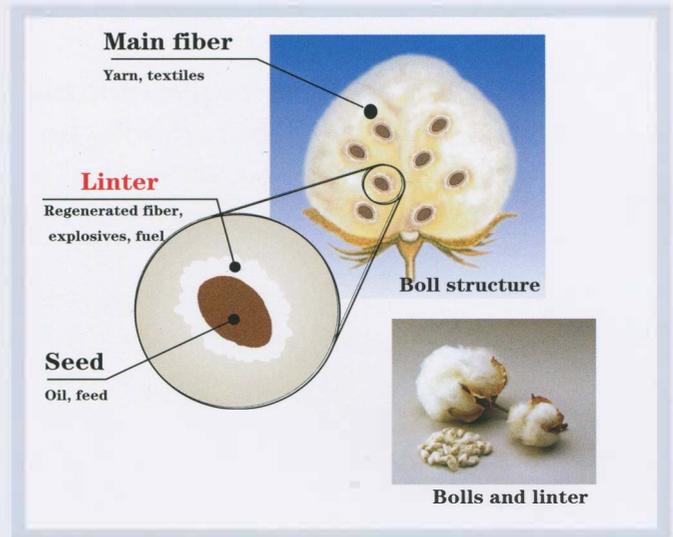
BEMCOT™

◆ Origins

BEMCOT™ cleanroom wipers are produced from Bemliese™, the 100% pure “cupro” cellulosic nonwoven derived from cotton linter—the fine, downlike fiber that naturally protects and cushions the seed of the cotton plant.

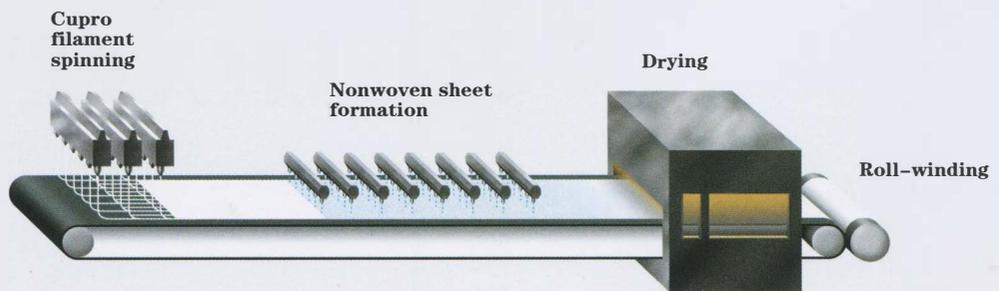
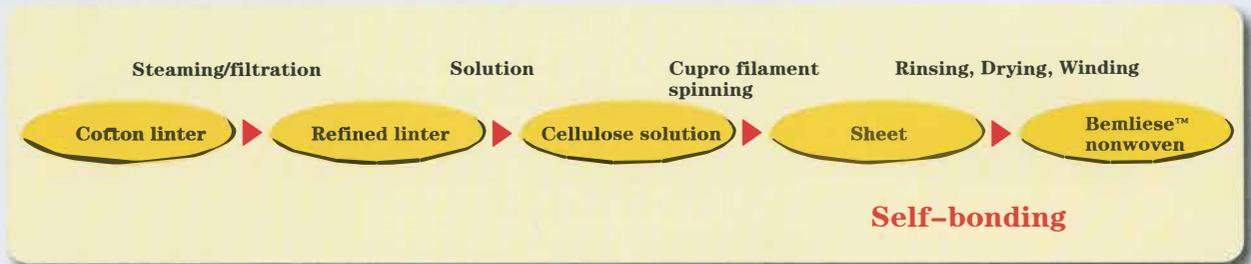
Cotton linter from around the world is transformed to pure cellulosic nonwoven sheets in an integrated process unique to the Bemliese™ plant of Asahi Kasei .

Corporation located at Nobeoka City in Japan, an ISO 9001 certified production facility.



◆ Bemliese™ production process

The Bemliese™ production process is unique in its formation of a pure nonwoven sheet by self-bonding between its cupro continuous filaments, with no binder or other additive in any step from spinning to roll winding.

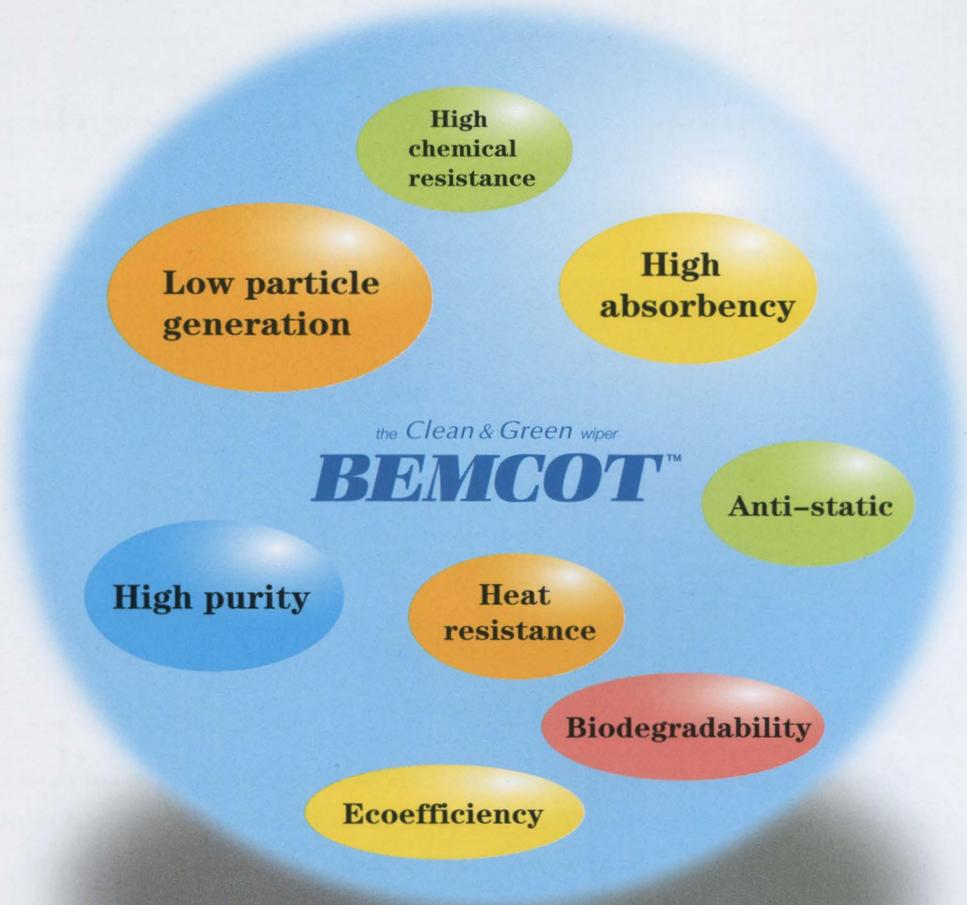


Continuous-filament cupro nonwoven

The result is a pure, integral nonwoven composed of cellulosic cupro continuous filaments and containing no binder, oil, or surfactant.

◆ The **BEMCOT™** Advantage

The Bemcot™ advantage in cleanroom wiper performance is the synergy of its inherent performance characteristics.



The result is a combination of properties and performance characteristics found in no other wiper.

The Bemcot™ Advantage – 1

Low particle generation — fallen fibers

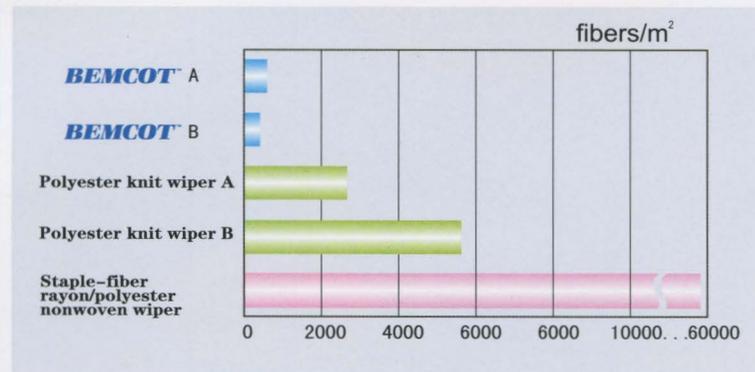
Fallen fibers are one of two basic categories of particles which may be generated in wiper use. They are 100 μm or more in length, and thus visible to the human eye. The other category comprises microparticles, which may be classified as either “airborne” or “liquid” as described on pages 7 and 8.



Asahi Kasei has developed three test methods for fallen fibers, reflecting the mechanisms of their generation in actual use. In all three, Bemcot™ shows very low fallen-fibers generation.

◆ Fallen fibers comparison — wet-agitation test quantification

The wet-agitation test, as described below, was applied here to two Bemcot™ grades and three typical competitive wipers, with the fallen fibers counted and expressed in terms of fibers/m² wiper.



As shown by all of these tests, the continuous-filament structure of Bemcot™ inherently resists fallen-fiber generation under immersion and wiping stresses, in marked contrast to staple-fiber knitted wipers.

◆ Typical fallen-fiber test results

• Wet-agitation test

Wiper immersed in 300 mL pure water, subjected to 15 min ultrasound agitation, water filtered, and fibers remaining on filter counted (as above) or photographed (as below).



BEMCOT™



Polyester knit wiper



Staple-fiber rayon/polyester nonwoven wiper



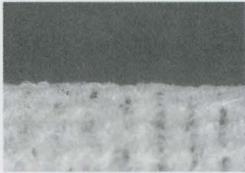
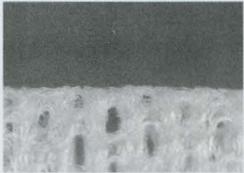
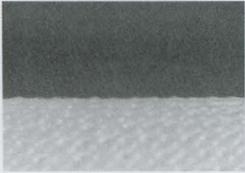
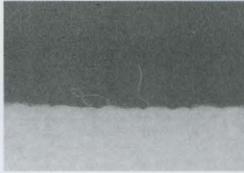
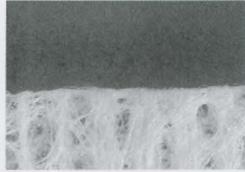
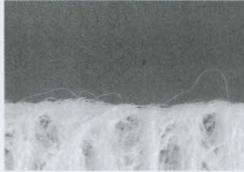
Paper wiper (wood-pulp)

the Clean & Green wiper

BEMCOT™

• **Wiping fluff test**

Silicon board wiped by wiper under 22.2 g/m load in single stroke of 40 cm length at 1.0 m/min, wiper surface then observed for fluff formation.

	Before wiping	→	After wiping	Enlarged view
BEMCOT™			 Little or no fluff or filament damage	 Enlarged view
Polyester knit wiper			 Some fluff; filament and structure damage	 Enlarged view
Staple-fiber rayon/polyester nonwoven wiper			 Much fluff, filament rupture and damage	 Enlarged view

• **Cellophane tape test**

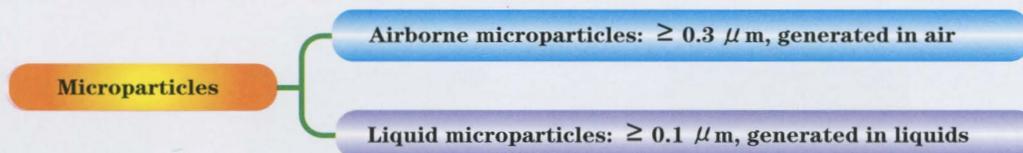
Cellophane tape pressed on wiper then peeled away and observed for adhering fibers.

			
BEMCOT™	Polyester knit wiper	Staple-fiber rayon/polyester nonwoven wiper	Paper wiper (wood-pulp)

The Bemcot™ Advantage – 1

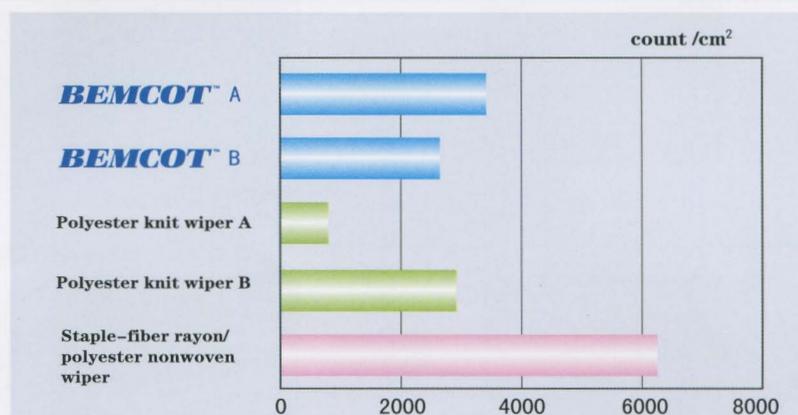
Low particle generation — microparticles

Microparticles may be classified as either “airborne”, when generated in air, or “liquid”, when generated in liquids. The former are also generated in liquids, and are thus included in both categories. Most wiping applications actually involve liquid use or absorption, and liquid microparticle test results generally provide a far more accurate indication of actual wiper performance and are therefore shown below.



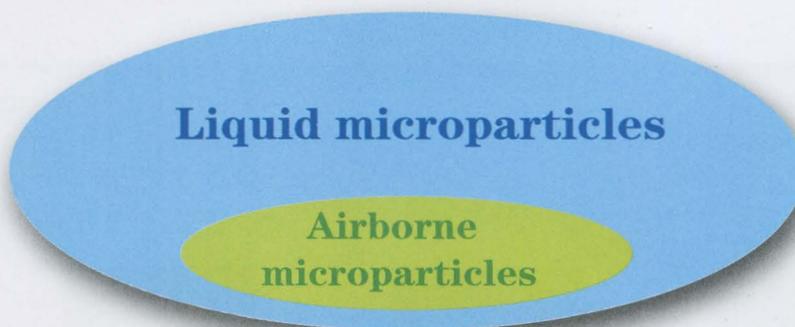
◆ Liquid microparticles comparison

Liquid-microparticle generation by two Bemcot™ grades and three typical competitive wipers, as measured by biaxial shake test (IES-RP-CC004.2, Section 5.2).



◆ Airborne microparticles — a subset of liquid microparticles

Airborne microparticles are actually generated in liquids as well as in air, and thus constitute a small subset of liquid microparticles.



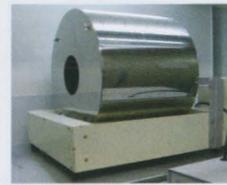
Airborne microparticles
Cellulose, polyester,
other organics



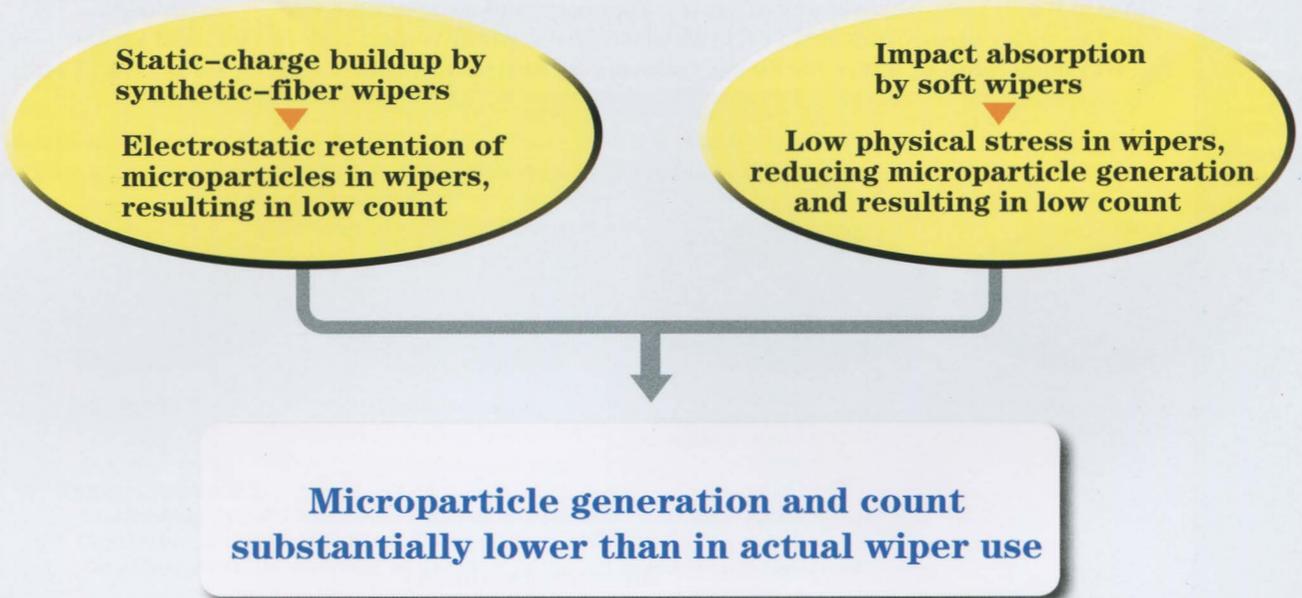
Liquid microparticles
Half or more Al, Si, other
inorganics; remainder organic

◆ **Airborne microparticle test inadequacy**

The airborne microparticle test, with wiper tumbling in a stainless steel tumbler, is widely employed due to its relative simplicity and convenience, but the test conditions and results tend to differ substantially from those of actual wiper use.



Steel tumbler
Wipers tumbled by cylinder rotation, airborne microparticle concentration then measured.



◆ **Direct relevance of liquid microparticle test**

Liquid microparticle test conditions correspond closely to most actual wiping conditions, which require either impregnation with solvents or absorption and removal of liquids.

Liquid microparticle test results provide a direct indication of actual wiping performance.



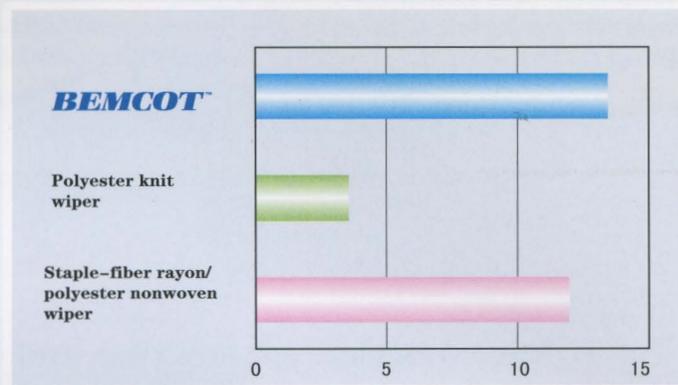
The Bemcot™ Advantage – 2

High absorbency

Bemcot™ absorbs some 13 times its own weight in water, as its uniquely structured cellulosic filaments are themselves absorbent – in marked contrast to the effectively non-absorbent synthetic filaments of other wipers.

◆ Absorbency comparison

Asahi Kasei test: Absorbency of typical Bemcot™ and competitive wipers, expressed as the water absorption ratio (A) calculated from wiper weight before (W_i) and after (W_f) immersion in water for 30 sec followed by draining of free water. $A = (W_f - W_i) / W_i$.



Absorption ratio (A)

◆ Liquid absorption and retention test

Higher water absorption and retention, for superior performance in liquids wiping

Asahi Kasei test: Wiper mounted on plate at 45° slant, 10 mL of colored water dripped onto center over 15 sec, water diffusion and flow patterns observed as indicators of water absorption and retention characteristics.



BEMCOT™

No flow



Polyester knit wiper

Flow



Staple-fiber rayon/polyester nonwoven wiper

Flow



Paper wiper (wood-pulp)

Flow

the Clean & Green wiper

BEMCOT™

The Bemcot™ Advantage – 3

High purity

No additive, oil, or binder is used in the Bemcot™ nonwoven sheet production process. It is therefore extremely low in impurities transfer to the wiped surface, even under exposure to solvents.

◆ Wafer residue test

Readily observable reduction in impurities transfer

Asahi Kasei test: Water (0.1 mL) wiped from blank wafer by typical Bemcot™ or competitive wiper under given load, wafer surface then observed for residual impurities.



BEMCOT™



Polyester knit wiper



Staple-fiber rayon/polyester nonwoven wiper



Paper wiper (wood-pulp)

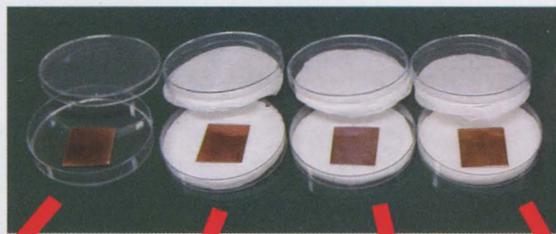
Typical impurities

- Surfactants used in production of staple-fiber nonwoven sheets.
- Oligimers from polyester knit wipers, particularly if acetone or other organic solvent is used in filament production process.

◆ Sulfur content test — comparison with staple-fiber nonwovens

Far lower metal-corroding sulfur content than rayon, a main constituent of staple-fiber nonwoven wipers

Asahi Kasei test: Typical Bemcot™ or staple-fiber nonwoven wiper left on copper plate in petri dish at 70 °C, 90% RH for approx. 100 hours, plate surface then observed for discoloration and corrosion.



Control blank (no wiper)



BEMCOT™



Staple-fiber rayon nonwoven wiper



Staple-fiber rayon/polyester nonwoven wiper

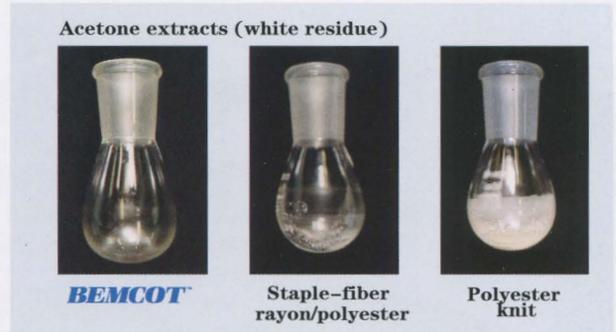
the Clean & Green wiper
BEMCOT™

The Bemcot™ Advantage – 4 High chemical resistance

◆ Solvent resistance test

Asahi Kasei test: Typical Bemcot™ or other competitive wiper immersed in solvent for 1 day, solvent then evaporated and residual extracts measured and expressed in parts per million parts solvent.

Wiper	Extracts (ppm)	
	IPA	Acetone
BEMCOT™	50	40
Polyester knit	200	250
Staple-fiber rayon/ polyester nonwoven	350	1,020
Paper (wood-pulp)	1,440	1,740



The Bemcot™ Advantage – 5

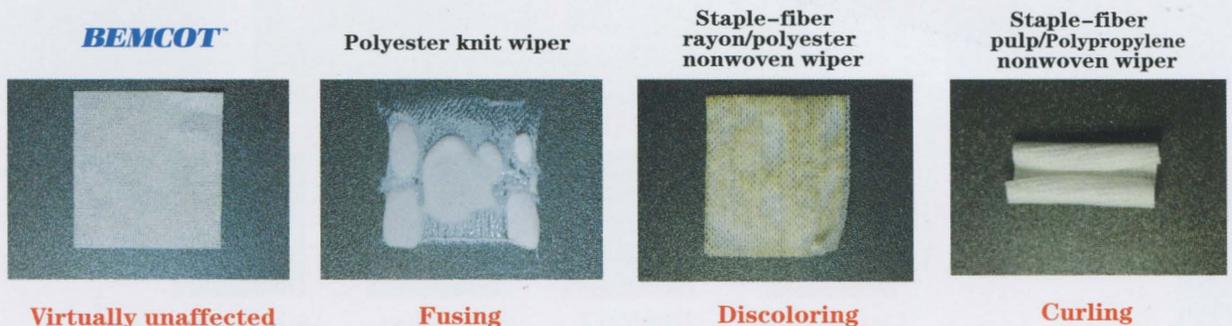
High heat resistance

The constituent cellulosic filaments of Bemcot™ – unlike polyester, nylon, and other synthetic filaments – are inherently heat resistant and thus enable effective use of Bemcot™ wipers at higher temperatures.

Filament	BEMCOT™	Polyester	Nylon	Polypropylene
Softening temp. (°C)	No softening or fusing; discoloration and decomposition at 260-300 °C	238 °C ~ 240 °C	180 °C	140 °C ~ 160 °C
Fusing temp. (°C)		255 °C ~ 260 °C	215 °C ~ 220 °C	165 °C ~ 173 °C

◆ Heat resistance test

Asahi Kasei test: Typical Bemcot™ or competitive wiper left on hotplate at 250 °C for 20 sec and then observed for change in conformation or appearance.



the Clean & Green wiper

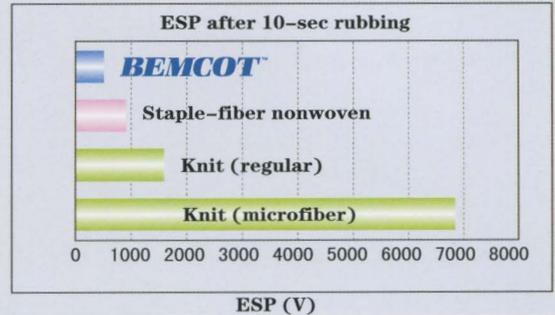
BEMCOT™

The Bemcot™ Advantage – 6 Anti-static

◆ Electrostatic test

Typical Bemcot™ or competitive wiper rubbed across plastic plate for 10 sec at 20 C and 40% RH, and its electrostatic potential (ESP) then measured in accordance with JISL 1094B test standard.

Wiper	Material	Wgt (g / m ²)	ESP (V)
BEMCOT™	Cupro	27.5	400
Staple-fiber nonwoven	Rayon/polyester	29.5	900
Knit (regular)	Polyester	119.0	1600
Knit (microfiber)	Polyester/nylon	166.0	7000



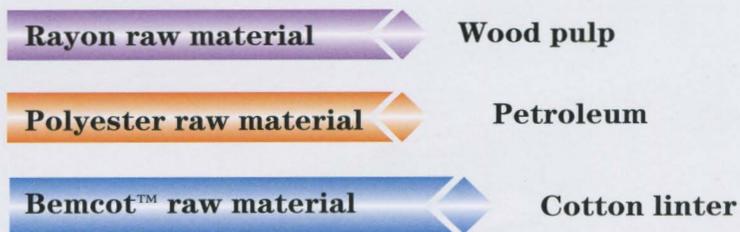
The Bemcot™ advantage – 7 Ecoefficiency

With its recognized ecoefficiency in origins, production, use, and disposal, Bemcot™ can help support green-procurement programs.



BEMCOT™...

- Non-use of wood or petroleum as raw material.



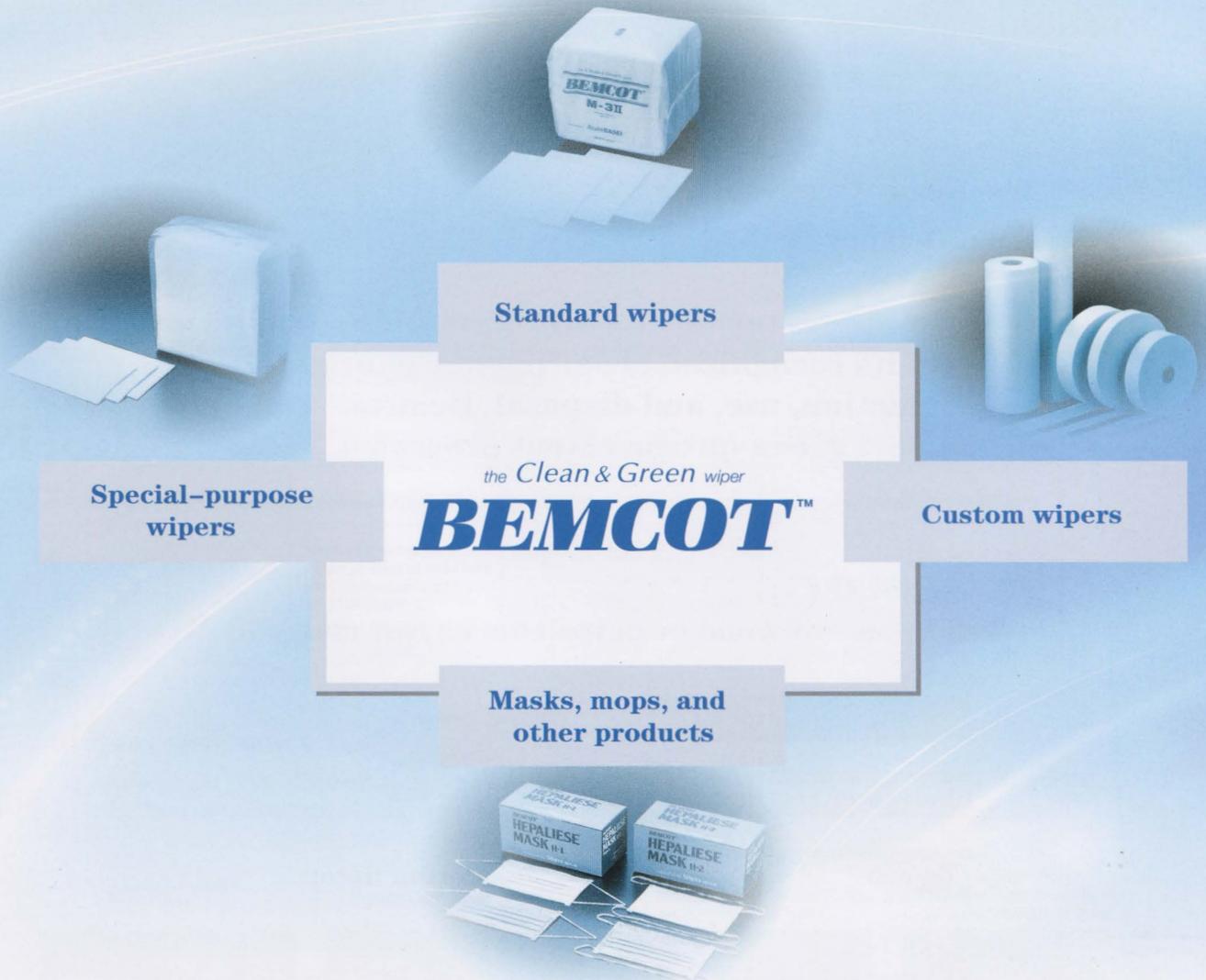
- ◆ Minimal gas release other than CO and CO₂ in incineration.
- ◆ Natural biodegradability in landfill disposal.

Product Family

True performance for multifaceted cleanroom requirements

The Bemcot™ product family meets multifaceted cleanroom needs and requirements with true performance—in a broad, rich spectrum of wipers and other products that is unmatched by any competitor.

It includes: standard wiper products in a wealth of configurations and sizes; special-purpose wipers with added functions; custom roll and sheet products for freedom in wiper size and design; and masks, mops, and other essential cleanroom products.



the Clean & Green wiper

BEMCOT™

Special-Purpose Wipers

Class 1*
ISO
(Fed. Std. 209D)

ISO Class 4~
(Class 10~)



PW-RE20CN

**Bemcot™-polyester composite
SUPER CN impregnated with
alcoholic solvent**

240 mm x 300 mm
All edges in-folded
20 sheets x 50 packs
70% cupro, 30% polyester

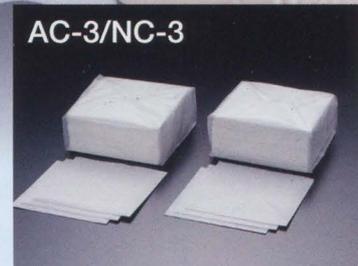
ISO Class 5~
(Class 100~)



TZ-7

**Microfilament; superior
wiping performance**

240 mm x 300 mm
All edges in-folded
80 sheets x 30 packs



AC-3/NC-3

**Smooth-surface;
pull resistant**

AC-3	NC-3
245 mm x 250 mm	245 mm x 250 mm
C-folded	C-folded
100 sheets x 20 packs	150 sheets x 20 packs

ISO Class 6~
(Class 1,000~)



AZ-8

**Specially folded;
ease of use, high absorbency**

300 mm x 250 mm
8-folded
100 sheets x 30 packs

ISO Class 7~
(Class 10,000~)



CLEAN WIPE-P

**Paper-like; optimal for wiping
small spills or fine soiling**

100 mm x 210 mm
Pop-up
300 sheets x 60 packs

ISO Class 8~
(Class 100,000~)

the Clean & Green wiper
BEMCOT™

* Class shown for basic reference only; always confirm suitability for any intended application in advance.
Wiper composition: All wipers except "PW-REZOCN" composed of 100% cellulosic cupro.
All wiper sizes: Fully unfolded.

BEMCOT™ Production and sale
OZU CORPORATION

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www.ozu.co.jp 1131@ozu.co.jp

Fabric production
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the Clean & Green wiper

BEMCOT™

Standard Wipers

Class 1*
ISO
(Fed. Std. 209D)

ISO Class 4~
(Class 10~)

ISO Class 5~
(Class 100~)

ISO Class 6~
(Class 1,000~)

ISO Class 7~
(Class 10,000~)

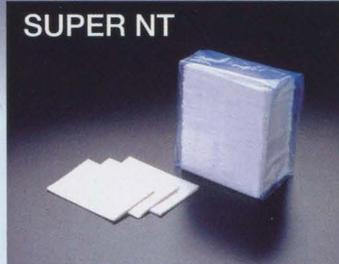
ISO Class 8~
(Class 100,000~)



SUPER CN

**Bemcot®-polyester composite;
high strength, low particle**

240 mm x 300 mm
All edges in-folded
50 sheets x 20 packs
70% cupro, 30% polyester



SUPER NT

low particle

240 mm x 300 mm
All edges in-folded
80 sheets x 30 packs



TR-7F

**Specially cut;
low microparticle**

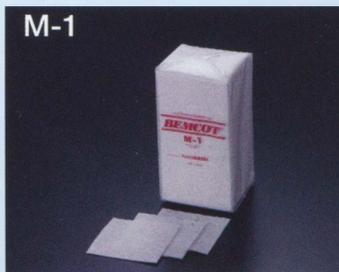
250 mm x 250 mm
4-folded
150 sheets x 20 packs



M-3 II

**Successor to multipurpose M-3;
higher performance, markedly
reduced fallen-fiber**

250 mm x 250 mm
4-folded
100 sheets x 30 packs



M-1

Small-size

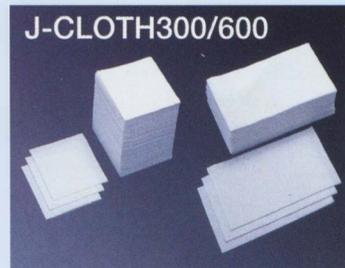
150 mm x 150 mm
4-folded
150 sheets x 40 packs



S-2

Soft, thin

250 mm x 250 mm
4-folded
150 sheets x 30 packs



J-CLOTH300/600

**Large size & volume;
high absorbency**

J-CLOTH 300	J-CLOTH 600
340 mm x 300 mm	340 mm x 600 mm
4-folded	4-folded
100 sheets x 16 packs	50 sheets x 16 packs

the Clean & Green wiper
BEMCOT™

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Wiper composition: All wipers except "SUPER CN" composed of 100% cellulosic cupro.
All wiper sizes: Fully unfolded.

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the Clean & Green wiper

BEMCOT™



Masks, mops, other products

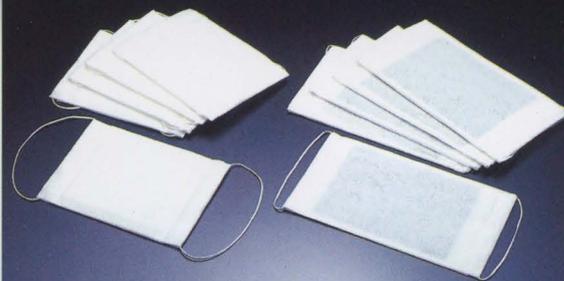
HEPALIESE™ MASK



Trilayer: Bemliese™ outside, high-efficiency filtration melt-blown nonwoven inside

H-1: 50/box, 10 boxes OZ-3 (AC*) : 50/pack, 4 packs
H-2: 50/box, 10 boxes OZ-3H (AC*) : 50/pack, 4 packs
*AC: Internal activated charcoal

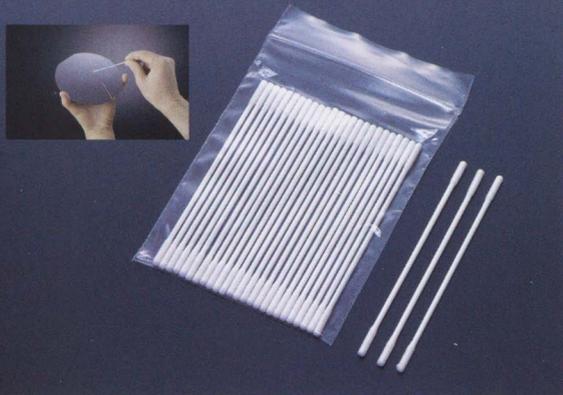
BEMCOT™ masks



Bemliese™ outside for soft-touch on skin, AC* inside for effective odor removal

BEMCOT™ mask : 50/box, 8 boxes
BEMCOT™ mask (AC*) : 50/pack, 10 packs/box, 4 boxes

Swabs

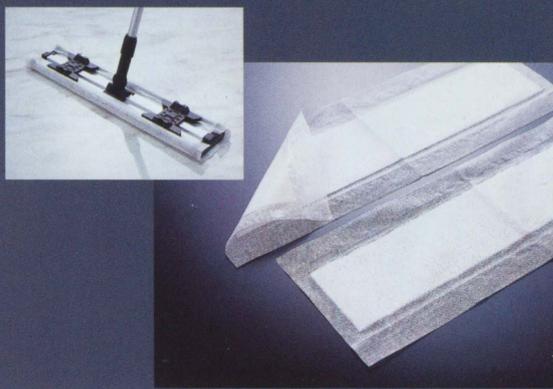


Optimal for cleanroom; Bemliese™ tips, low fallen fibers

25/pack, 400 packs/ctn

Bemliese™ – World's only cellulosic continuous-filament nonwoven, used in all Bemcot™ products.

Mops



Optimal for cleanroom and lab floor and wall cleaning; Bemliese™ outside and in absorption layer

Mop set: 2 mop tools, 20 pag/bag, 2 bags
Spare pads: 20/pack, 5 packs
Components
Heads: Type 45 (10 x 45 cm), Type 60 (10 x 60 cm)
Handle: 131 cm, 0.8 kg
Pads: Type 45 (21 x 49 cm), Type 60 (21 x 64 cm)

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www.bemliese.com bemliese@om.asahi-kasei.co.jp F65D118

the Clean & Green wiper

BEMCOT™

Custom Products

Please inquire for specific compositions, sizes, and configurations to meet your requirements.

Roll wipers



Roll wipers for autocleaning systems, in various compositions and sizes

Mold liners



Sheet-form liners that expedite plastic mold cleaning in semiconductor and other industries

Folded sheets



Custom-made compositions, sizes, and configurations, for broad range of applications

Tray and container sheets



For tray mats, parts and components cushioning and packaging, paper composites, and many other applications

BEMCOT™ Production and sale **OZU CORPORATION**

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F65D118

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www.bemliese.com bemliese@om.asahi-kasei.co.jp

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All test values shown in this brochure represent typical test results obtained by the indicated test methods. They are provided for basic reference only and not as any obligatory specification or warranty, and are subject to change without notice.