

# Blueair Performance Book





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Dear Reader,

In 1996, the original Blueair team set up business with a clear goal – to make the best air purifier in the world. But achieving this goal is not just about delivering the cleanest air in the fastest time possible. We also want to ensure a Blueair air purifier is:

- safe and durable, so that you can rely on it at home.
- quiet enough to be used when you sleep.
- designed to fit into your home environment.
- energy efficient.

At Blueair, we are deadly serious about fulfilling all of the above promises to our customers. And it is why we today can proudly say we not only make the highest performing air purifiers in the world, but also the most energy efficient ones. Our units are also globally acclaimed for being whisper-silent and having award-winning contemporary design.

The aim of this book is to share some useful information with you about the professional certifications and designations earned by Blueair's air purifiers. Over the following pages, you can read brief presentations of the testing, reports and rewards as well as other background information.

There is so much we want to tell you about Blueair, our technology and our achievements. We hope this book give you some useful insights into our products, beyond what is normally given to customers by most manufacturers, which will convert you into an ambassador for Blueair.

If you have any questions about the content of this document, please do not hesitate to contact your local Blueair representative.

Yours sincerely,



Johan Wennerström, R&D Manager  
Blueair

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## Table of Contents

Quality and safety	5
Performance and room size	8
Room size and air changes per hour	10
Energy efficiency	12
Ozone	13
Noise	14
Design	15
Particle efficiency	17
Contact	23

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## Quality and safety

Blueair units comply with essential requirements for electronic appliances, encompassing health, safety, function and environment. All units have followed prescribed control procedure of the varying standards found in the countries where they are sold and are safety and quality certified.

### Background

Certain product safety standards, industry requirements and conformity to local requirements are mandatory in many markets before a product can be sold. Standards are not only for safety but also for opening market opportunities and assuring quality of the product.

### Standards and certifications

Blueair is responsible for certifying all units to comply for international markets with CE mark, S mark, CB Scheme and ETL mark protocols. National standards are controlled by the distributors responsible for the market.

#### CE mark

For markets within the European Economic Area (EEA), all products sold need to be CE marked. With the CE mark, the manufacturer ensures that the product complies with essential requirements of EU directives including health, safety, function and environment. The CE mark assures that prescribed control procedure has been applied.

For more information go to:

[http://ec.europa.eu/enterprise/policies/single-market-goods/cemarking/index\\_en.htm](http://ec.europa.eu/enterprise/policies/single-market-goods/cemarking/index_en.htm)

#### S mark

The S mark certifies that a product complies with European safety standards for fire, electric shock, mechanical injuries, radiation injuries, burns and certain types of environmental damage. Certifying a product with S mark is voluntary. Tests and certifications are performed independently and can function as a complement to the CE mark.

For more information go to:

<http://www.intertek.com/marks/s/>

#### CB scheme

Electrical and electronic products require safety certification for each country where it is sold. However, standards and requirements are different for every market. The CB Scheme is an international program that facilitates safety tests for a product to comply with standards in over 50 countries. The CB test report certifies safety of electrical and electronic products in accordance to international (IEC) standards and national regulations.

For more information, go to the IECEE website:

<http://www.iecee.org/cbscheme/default.htm>

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#### ETL mark

A product bearing the ETL mark complies with North American safety standards and has met the U.S. minimum requirements. The mark indicates that the manufacturer's production conforms to set standards and is continuously inspected. Only laboratories recognized by Occupational Safety and Health Administration (OSHA) are allowed to test and certify products for the ETL mark.

For more information, go to:

<http://www.intertek.com/marks/et/>

#### Japanese S mark

The Japanese S mark is a voluntary certification administered in Japan for electrical products. Tests are conducted in accordance with the standards J60335-1, J60335-2-65 and J55014-1. This means that the products comply with material control law and the Japanese product liability law. The certification is issued by a third part certification body that is a member of the Steering Council of Safety Certification for Electrical and Electronic Appliances and Parts of Japan (SCEA).

For more information, go to:

<http://www.ul.com/global/eng/pages/corporate/aboutul/ulmarks/mark/>

#### KC mark

The KC mark is mandatory for certain electrical products sold in South Korea. The purpose for the KC mark is to protect consumers from the hazardous aspects of appliances (electric shock, fires, mechanical, thermal, radiation and chemical hazards etc.) The KC mark also includes a factory inspection once a year.

For more information, go to:

<http://hongkong.intertek-etlsemko.com/services/ek/>

#### C-tick mark

The C-tick is registered to The Australian Communications Authority (ACMA). The mark certifies compliance with EMC standards and indicates a traceable link between the product and the supplier that is responsible for placing the product on the Australian market.

For more information, go to:

[http://www.acma.gov.au/scripts/nc.dll?WEB/STANDARD/1001/pc=PC\\_2796](http://www.acma.gov.au/scripts/nc.dll?WEB/STANDARD/1001/pc=PC_2796)

#### CCC mark

Many products being exported to or sold in the Peoples Republic of China market requires the China Compulsory Certification (CCC) mark. The mark is a safety and quality system administered by the Certification and Accreditation Administration (CNCA). Testings include tests on product samples and inspections of the manufacturing facilities.

For more information, go to:

<http://www.ccc-mark.com/index.html>

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Safety marks



CE mark



S mark



ETL mark



Japanese S-mark



KC mark



C tick



CCC mark

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## Performance

Blueair units are top performing when it comes to reducing indoor air pollution. The Blueair 600 Series has the highest rating in the industry for air purifiers.

### Background

When choosing an air purifier, performance should be considered first. The major factors affecting performance of an air cleaner are its efficiency and airflow. But it is important to note that only in combination of both are they essential components of performance.

### Standards and certifications

Clean Air Delivery Rate (CADR) indicates how much filtered air is delivered by the air purifier (airflow) and how well the system removes tobacco smoke, dust and pollen pollutants from the air (efficiency). The CADR program is sponsored by the Association of Home Appliances Manufacturers (AHAM), an independent organization that ensures testing results are accurate and impartial.

Tests are performed in accordance with the standard ANSI/AHAM AC-1-2006, the only air purifier standard recognized as an American national and global standard. CADR is endorsed by both the U.S. Food and Drug Administration (FDA) and the U.S. Environmental Protection Agency (EPA).

AHAM has also developed a validated way to convert an air purifier's performance into its room size coverage. For more information about room size, read the next chapter: Room size and air changes per hour.

### Testing and results

AHAM certified ratings of Blueair air purifiers\*:

Model	Dust CADR	Tobacco CADR	Pollen CADR	Room Size (for 5 air changes per hour)
200 Series	155	155	155	22 m <sup>2</sup> (240 sq. ft.)
400 Series	240	240	240	34 m <sup>2</sup> (370 sq. ft.)
500 Series	375	375	375	54 m <sup>2</sup> (580 sq. ft.)
600 Series	>400	>450	>450	65 m <sup>2</sup> (698 sq. ft.)
ECO10	195	140	200	20 m <sup>2</sup> (220 sq. ft.)
Sense	100	100	100	14 m <sup>2</sup> (150 sq. ft.)

\*Certified ratings as stated are based on use of Particle filters. The result may be affected by use of Smoke-Stop™ filters.

Learn more and see all certified air purifiers on AHAM's website at:  
[http://www.ahamdir.com/aham\\_cm/site/pages/index.html?code=r.rac>AboutThisProgram](http://www.ahamdir.com/aham_cm/site/pages/index.html?code=r.rac>AboutThisProgram)



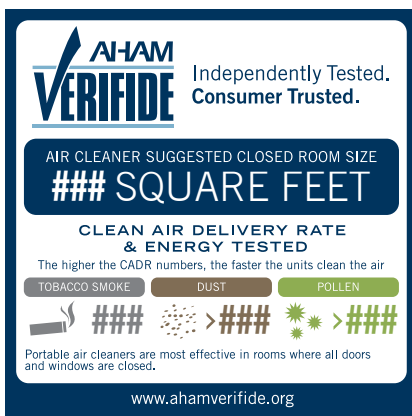
## Seal and mark

The AHAM Portable Electric Room Air Cleaner Certification Seal marks that Blueair units are accurately stated in accordance with the requirements of the set standard.

### Seal and mark 1967- 2012



### Seal and mark 2012 -



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## Room size and air changes per hour

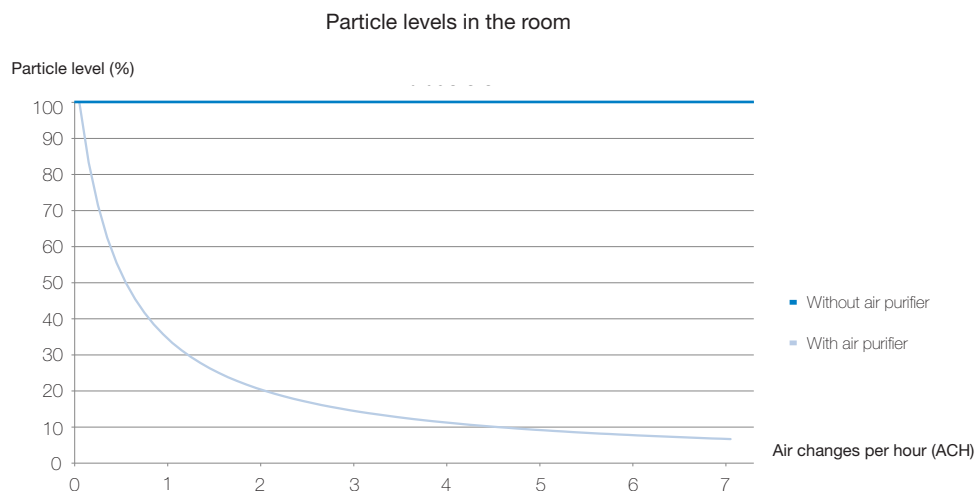
Blueair units are designed to be used in all types of environments, from small bedrooms up to large open areas of 65m<sup>2</sup> (698 sq. ft.).

### Background

Your indoor air is constantly bombarded by pollutants. The basic thought is to remove the pollutants from the indoor air faster than they enter. An easy way to know if an air purifier has the capacity to keep the air in the intended room constantly clean is to look at its recommended room size.

### Standards and certifications

The maximum room size recommendation is based on that the air purifier is able to make 5 air changes per hour (ACH) in the room where it is placed. This guiding principle is set by the Association of Home Appliances Manufacturers (AHAM) and is the only endorsed and accepted measurement for determining room size capacity of an air purifier. The standard is based on that the air purifier can keep the particle levels in the air constantly 90% lower than without an air purifier. Below is a chart that shows how the particle levels in a room are affected by the ACH.



The graph shows that the indoor air quality is shown to reduce the particle levels by approximately 60% with 1 ACH. It is also shown that the more ACH in the room, the lower is the particle level. With 5 ACH the particle level is down 90% compared to without an air purifier in the room.

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## Testing and results

The list below shows the room size conditions for Blueair units making 1 ACH up to 5 ACH. All Blueair units are certified by AHAM.

	200 Series	400 Series	500 Series	600 Series	ECO10	Sense
5 ACH	22 m <sup>2</sup> 240 sq. ft.	34 m <sup>2</sup> 365 sq. ft.	54 m <sup>2</sup> 580 sq. ft.	65 m <sup>2</sup> 698 sq. ft.	28 m <sup>2</sup> 300 sq. ft.	14 m <sup>2</sup> 150 sq. ft.
4 ACH	28 m <sup>2</sup> 300 sq. ft.	43 m <sup>2</sup> 460 sq. ft.	68 m <sup>2</sup> 730 sq. ft.	81 m <sup>2</sup> 870 sq. ft.	35 m <sup>2</sup> 375 sq. ft.	18 m <sup>2</sup> 194 sq. ft.
3 ACH	37 m <sup>2</sup> 400 sq. ft.	57 m <sup>2</sup> 615 sq. ft.	90 m <sup>2</sup> 970 sq. ft.	108 m <sup>2</sup> 1940 sq. ft.	47 m <sup>2</sup> 505 sq. ft.	23 m <sup>2</sup> 248 sq. ft.
2 ACH	55 m <sup>2</sup> 590 sq. ft.	85 m <sup>2</sup> 915 sq. ft.	135 m <sup>2</sup> 1455 sq. ft.	163 m <sup>2</sup> 1755 sq. ft.	70 m <sup>2</sup> 755 sq. ft.	35 m <sup>2</sup> 377 sq. ft.
1 ACH	110 m <sup>2</sup> 1185 sq. ft.	170 m <sup>2</sup> 1830 sq. ft.	270 m <sup>2</sup> 2905 sq. ft.	325 m <sup>2</sup> 3500 sq. ft.	140 m <sup>2</sup> 1505 sq. ft.	70 m <sup>2</sup> 750 sq. ft.

When comparing air purifiers from different manufacturers, make sure that the recommended room sizes are based on the same facts and most importantly that they are certified by AHAM.

Learn more on AHAM's website at:

[http://www.ahamdir.com/aham\\_cm/site/pages/index.html?code=r.rac.AboutThisProgram](http://www.ahamdir.com/aham_cm/site/pages/index.html?code=r.rac.AboutThisProgram)

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## Energy efficiency

The low energy consumption of Blueair units ranges from 7 to 120 Watts depending on unit and speed level. With the ECO10, Blueair offer the most energy efficient air purifier in the world.

### Background

For maximum performance, an air purifier should run 24 hours a day and seven days a week. Traditional room air purifiers use approximately 550kWh a year when running continuously. This is more energy than some new refrigerators. Note that power consumption should not be considered separately but together with performance.

### Standards and certifications

ENERGY STAR® is a program of the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy. The program is developed to help consumers save money and protect the environment through energy efficient products. Criteria for ENERGY STAR qualification include CADR ( $\geq 50$  CADR for dust), CADR/Watt ( $\geq 2.0$  CADR/Watt for dust), standby power usage ( $\leq 2.0$  Watts) and ozone emission that meet UL Standard 867 ( $\leq 0.050$  ppm).

### Testing and results

ENERGY STAR measures the efficiency by using a CADR-to-Watt ratio. Blueair is among the first air purifier manufacturer to earn ENERGY STAR designation for all its air purifiers.

Blueair air purifiers significantly exceed minimum requirements for qualification by its high CADR. Performance are 2.48 CADR/Watt for 200 Series, 4.54 CADR/Watt for 400 Series, 3.968 CADR/Watt for 500 Series, 4.3 CADR/Watt for Sense and as high as 19.66 CADR/Watt for ECO10. All Blueair units also meet U.S. government's criteria for ozone emission. For more detailed information about ozone emission, read the next chapter: Ozone.

Learn more about the ENERGY STAR program, go to:  
[http://www.energystar.gov/index.cfm?c=room\\_airclean.room\\_airclean](http://www.energystar.gov/index.cfm?c=room_airclean.room_airclean)

### Marks and labels

The ENERGY STAR label must be placed on the product packaging of ENERGY STAR qualified air purifiers with the statement:

*"This product earned the ENERGY STAR by meeting strict energy efficiency guidelines set by the US EPA. US EPA does not endorse any manufacturer claims of healthier indoor air from the use of this product."*



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## Ozone

Blueair's patented HEPASilent® filter technology uses active ionization (particle charging) to capture and remove particles from indoor air. However, Blueair systems should not be associated with dangerous indoor ozone that could be formed by ionization. In fact, already in 1999 Blueair units were tested at Karolinska Institutet (Sweden) and shown to actually reduce ozone in a sealed room, the concentration in the output air was lower than in the incoming. Since this report was published, Blueair units have been continuously tested to be made sure that they do not emit ozone.

### Background

Ozone is a molecule composed of three atoms of oxygen (not to be confused with the two-atom-oxygen molecule that we breathe to support life). Ozone from electronic air cleaners is created when air pass through a corona field. Ozone can decrease lung function and cause health effects such as chest pain, shortness of breath, throat irritation and aggravation or higher susceptibility to respiratory health problems.

Learn more about ozone in air purification:  
<http://www.epa.gov/iaq/pubs/ozonegen.html>

### Standards and certifications

One of the most stringent testing for ozone safety is set by the U.S. Food and Drug Administration (FDA) to a threshold of 0.050 ppm (parts per million) for medical devices. Certifications of air purifiers meeting this limit is conducted by the California Air Resource Board (ARB) through tests outlined in the UL Standard 867 Section 37.1.2.

### Testings and results

All Blueair units have been tested and certified by ARB for complying with the UL Standard 867 Section 37.1.2 criteria.

Certified units are listed on the ARB website:  
<http://www.arb.ca.gov/research/indoor/aircleaners/certified.htm>

### Marks



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## Noise

Blueair's whisper-silent operation is a result of the HEPASilent® filtration technology. The patented Blueair technology allows the fan to push air more easily through the filter, making it possible for the unit to deliver high air flow with low noise. With high cleaning capacity even at lower speeds, Blueair units are the perfect air purifiers for rooms where silence is desirable, such as bedrooms.

### Background

Noise from air purifiers are mainly produced from the fan or motor and the air pressure through the filter. High noise can cause severe annoyance and even affect health, causing physical and mental stress. The following references can be used as guidelines when comparing noise levels:

- Normal speech at three feet distance: 65 dB
- Standard vacuum cleaner: 70 dB
- Normal business office: 50 to 60 dB.
- Bedrooms at nighttime (for adequate rest and sleep): 35-40 dB

Learn more about noise:

<http://www.epa.gov/air/noise.html>

### Testings and results

Testing is conducted at Blueair testing facilities where A-weighted sound pressure levels, dB(A), are measured in a normal sized room, 74m<sup>3</sup> (2613 cu. ft.). The testing room has a mix of soft and hard surfaces in order to simulate a normal living room or bedroom. A class 1 graded sound level meter, according to standards IEC.651, IEC.225 and IEC.804, is positioned at 1 meter (3.3 ft) distance from the units' front side and at a height from the floor that equal to half of the units height.

Sound levels of Blueair units:

	203	270E	ECO10	403	450	503	603	650E	Sense
<b>Normal speed</b> (dB)	32	32	32	32	32	32	32	32	29
<b>Maximum speed</b> (dB)	56	56	49	52	52	66	66	66	50

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## Design

Sleek and stylish, Blueair air purifiers are designed to fit in with your lifestyle and décor, which means you can place your Blueair anywhere you like in any room.

### Background

The union of visually pleasing form and effective function is a hallmark of Swedish design, and Blueair is pleased to live up to that tradition.

### Awards and designations

#### Excellent Swedish Design

Excellent Swedish Design is one of the most prestigious Scandinavian design awards. The prize was handed out by Svensk Form between 1983-2002 for product design that represented innovation, good design and superior quality in materials, manufacture process and function.

Blueair traditional series earned the diploma for Excellent Swedish Design in 1998 with the following verdict:

*The product is just as pure and simple as its function. No decoration for the sake of decoration, but well-produced design exercises. The result is just as discreet as an air purifier should be, since it will be located in a wide variety of milieus where it must blend in. The design team also helped with the marketing: the posters and display breathe the same air as the product's design.*

#### Design S

Design S by Svensk Form is the successor to the Excellent Swedish Design. It singles out creative and innovative solutions in every imaginable area of products, services and environments, regardless of the design field.

Blueair Sense was in 2012 nominated with the following evaluation:

*A high-efficiency air purifier in a thoughtful design and with innovative functionality. The air purifier is operated via a motion-detecting control panel and has the same low electricity consumption as a compact fluorescent lamp.*

#### Good Design (Japan)

The Good Design Award (G-mark) is considered one of the world's most prestigious awards for new product design. The products are awarded for its advance lifestyle and industrial activity with outstanding design.

Blueair Sense received the Good Design Award in 2012 with the following evaluation:

*The shape of this air purifier is designed so the perimeter gently bulges out when seen from the top to give it a slightly curvy look. The straightforward construction together with the clever use of materials brings perfection to its beautiful design, proving the creator's strong designing skills. The simple design is further enhanced by making the airflow openings on the sides vary in shape and size in order to avoid significant temperature changes and by incorporating a non-touch control panel on the glass top.*

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## Good Design (USA)

Good Design is the oldest (founded 1950) and the world's most recognized program for design excellence worldwide. The program covers new consumer products designed and manufactured in Europe, Asia, Africa, and North and South America.

Blueair Sense earned the Good Design Award in the Household product category in 2012.

## Red dot design

The red dot design award dates back to 1955 and is now one of the world's largest and most distinguished design competitions. Red dot stands for belonging to the best in design and business. Excellent design is selected by competent expert juries in the areas of product design, communication design, and design concepts.

Blueair Sense was one of only 1.2% to be honored the red dot: best of the best product design in 2013.

## The German Design Award

The German Design Award aims to identify, highlight and honor unique design trends around the world, awarding criterias such as ergonomics, functionality and user friendliness, design quality, innovativeness, brand value, symbolic and emotional content, technical quality and ecological compatibility.

Blueair Sense earned the fifth top design accolade by being nominated for the German Design Award in 2014.

## Marks





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## Particle efficiency

The HEPASilent® filter technology captures 99.97% of particles that are 0.1 micron or larger in size.

### Background

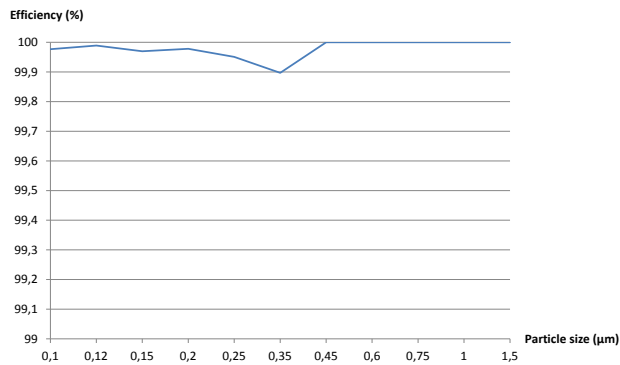
The efficiency of an air purifier indicates how much of pollutants are removed from the air when the air passes through the system once. Note that efficiency does not show the volume of filtered air. Only in combination with high airflow is high efficiency an essential component of good air purification.

### Testings and results

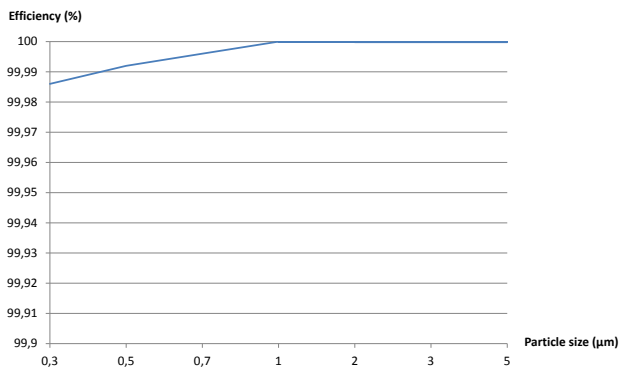
In 2000, a test on the HEPASilent® filtration technology was conducted in Sweden at Camfil Component AB. The test showed the efficiency of 99.97% in capturing particles down to 0.1 microns in size. The test was performed on a Blueair 501 unit fitted with particle filter, placed in a space of 3.6 m<sup>2</sup> (68 sq. ft.). Airflow was 150 m<sup>3</sup>/h (88 cfm). Elapsed testing time was 120 s.

The high efficiency results from Camfil Component AB has been confirmed by other laboratories tested elsewhere such as in the U.S in 2010 at LMS Technologies, Inc. This test was performed on a Blueair 650E unit fitted with particle filter.

**Particle efficiency, Camfil, 2000**



**Particle efficiency, LMS Technologies Inc., 2010**



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