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COMMISSION REGULATION (EU) .../...

of XXX

implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for fans driven by motors with an electric input power between 125 W and 500 kW and repealing Commission Regulation (EU)

No 327/2011

(Text with EEA relevance)

This draft has not been adopted or endorsed by the European Commission. Any views expressed are the preliminary views of the Commission services and may not in any circumstances be regarded as stating an official position of the Commission.

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THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products¹ and in particular Article 15(1) thereof,

Whereas:

- (1) Pursuant to Directive 2009/125/EC, the Commission is to set ecodesign requirements for energy-related products that account for significant volumes of sales and trade in the European Union, which have a significant environmental impact, and which present significant potential for improvement through design in terms of their environmental impact without entailing excessive costs.
- (2) The Commission first established ecodesign requirements for certain fans in Regulation (EU) No 327/2011². It has carried out a review of that Regulation, pursuant to Article 7 thereof and analysed the technical, environmental and economic aspects of fans. The review was carried out in close cooperation with stakeholders and interested parties from the Union and third countries. Its results were made public and presented to the Consultation Forum established pursuant to Article 18 of Directive 2009/125/EC.
- (3) The results of the review of Regulation (EU) No 327/2011 show that fans are a significant electricity consumer in the Union. It is estimated that without Regulation (EU) No 327/2011, fans would have consumed 336 TWh of electricity in 2020, corresponding to 132 Mt of CO₂-equivalent emissions and are expected to rise to 384 TWh in 2030 due to anticipated increased market penetration of fans.
- (4) Fans driven by motors are an important element of gas handling products and systems. Minimum energy efficiency requirements have been established for electric motors in

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Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products (OJ L 285, 31.10.2009, p. 10).

Commission Regulation (EU) No 327/2011 of 30 March 2011 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for fans driven by motors with an electric input power between 125 W and 500 kW (OJ L90, 6.4.2011, p.8).

Commission Regulation (EU) No 2019/1781³. Those requirements also apply to motors that are part of a motor-fan system. However, many fans are used in combination with motors not covered by Regulation (EU) No 2019/1781, and the aerodynamic performance of the fans in creating the appropriate airflow is a major part of the product's efficiency, also not regulated through Regulation (EU) No 2019/1781. Rules should therefore be laid down or maintained regarding the energy efficiency of those fans.

- Taking into account the possible overlap on savings accounting with other measures, such as Regulation (EU) No 2019/1781, the measures set out in Regulation (EU) No 327/2011 resulted in net savings of about 14 TWh in 2020. That is expected to rise to 27 TWh in 2030, corresponding to 5 Mt of CO₂-equivalent in 2020 and 8 Mt of CO₂-equivalent in 2030 annually.
- (6) The review study shows that there is significant additional saving potential for costeffective improvements of fans. The means to realise this potential include technological progress in energy efficiency performance, expansion of the scope of the Regulation, inter alia with jet fans, and improving the effectiveness of the measure by more accurate definitions.
- (7) The environmental aspect of fans that has been identified as the most significant for the purposes of this Regulation is electricity consumption.
- (8) Improvements in the electricity consumption of fans should be achieved by applying existing non-proprietary cost-effective technologies that can reduce the total combined costs of purchasing and operating them.
- (9) Ecodesign requirements should harmonise power consumption requirements for fans throughout the Union, thus contributing to the functioning of the internal market and to the improvement of the environmental performance of these products.
- (10) Manufacturers should have enough time to redesign or adapt their products where needed. The timing should be such as to minimise negative impacts on the functionalities of fans. It should also take account of cost impacts for manufacturers, including small and medium-sized enterprises, while ensuring that the objectives pursued by this Regulation are achieved in good time.
- (11) An additional transition period should be provided to economic operators who integrate fans into their products, to enable them to adapt their products once the compliant fans are made available on the Union market.
- (12) Measures envisaged by the Commission in its Communication on the Ecodesign and Energy Labelling Working Plan 2022-2024⁴ have an estimated potential to deliver a total in excess of 440 TWh of annual final energy savings in 2030 (170 for reviews

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Commission Regulation (EU) 2019/1781 of 1 October 2019 laying down ecodesign requirements for electric motors and variable speed drives pursuant to Directive 2009/125/EC of the European Parliament and of the Council, amending Regulation (EC) No 641/2009 with regard to ecodesign requirements for glandless standalone circulators and glandless circulators integrated in products and repealing Commission Regulation (EC) No 640/2009 (OJ L 272, 25.10.2019, p. 74).

Communication from the Commission - Ecodesign and Energy Labelling Working Plan 2022-2024, (OJ C 182, 4.5.2022, p. 1).

- and 270 for new products). Fans are one of the product groups listed in the Working Plan, with an estimated 10 TWh of annual energy savings in 2030⁵.
- (13) This Regulation should increase the market penetration of technologies that improve the life-cycle environmental impact of fans, leading to an estimated annual electricity savings of 4 TWh by 2030 and 12 TWh in 2040, compared with the situation where no additional measures are taken.
- (14) Regulation (EU) No 327/2011 was estimated to save 14 TWh per year by 2020. As the changes introduced by this Regulation constitute an upgrade of Regulation (EU) No 327/2011, the savings of the latter will be maintained, and the savings expected to be delivered by this Regulation are additional to them.
- (15) Measurements of the relevant product parameters should be performed through reliable, accurate and reproducible measurement methods, which take into account the recognised state-of-the-art measurement methods including, where available, harmonised standards adopted by the European standardisation organisations, as listed in Annex I to Regulation (EU) No 1025/2012 of the European Parliament and of the Council⁶.
- (16) In accordance with Article 8(2) of Directive 2009/125/EC, this Regulation should specify which conformity assessment procedures apply.
- (17) To facilitate compliance checks, manufacturers, importers or authorised representatives should provide the information in the technical documentation referred to in Annexes IV and V to Directive 2009/125/EC, insofar as that information relates to the requirements laid down in this Regulation.
- (18) To improve the effectiveness of this Regulation and to protect consumers, products that automatically alter their performance in test conditions to improve the declared parameters should be prohibited from being placed on the market or put into service.
- (19) To facilitate verification testing, market surveillance authorities should be allowed to test, or witness the testing of, larger fans at premises such as those of the manufacturer.
- (20) Many fans are integrated into other products. To maximise cost-efficient saving, this Regulation should apply to such fans, provided that their efficiency can be tested separately.
- (21) Ecodesign requirements should also include product information requirements that will help potential buyers make the most appropriate decision and make it easier for Member States to perform market surveillance.
- (22) In particular, it is relevant to require quantified information on fan efficiency at part load, in order to enable fan system designers to optimise the energy efficiency of such systems.

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Commission staff working document accompanying the document Communication from the Commission -Ecodesign and Energy Labelling Working Plan 2022-2024. SWD/2022/0101 final.

Regulation (EU) No 1025/2012 of the European Parliament and of the Council of 25 October 2012 on European standardisation, amending Council Directives 89/686/EEC and 93/15/EEC and Directives 94/9/EC, 94/25/EC, 95/16/EC, 97/23/EC, 98/34/EC, 2004/22/EC, 2007/23/EC, 2009/23/EC and 2009/105/EC of the European Parliament and of the Council and repealing Council Decision 87/95/EEC and Decision No 1673/2006/EC of the European Parliament and of the Council (OJ L 316, 14.11.2012, p. 12).

- (23) To facilitate reparability of products containing fans, spare part fans should be subject to certain exemptions for a certain period of time in certain conditions.
- (24) The Union action plan for the circular economy⁷ and the Ecodesign and Energy Labelling Working Plan 2022-2024 underline the importance of using the ecodesign framework to support the move towards a more resource-efficient and circular economy. Therefore, this Regulation should lay down appropriate requirements contributing to circular economy objectives, in particular making the availability of spare parts mandatory and ensuring the availability of relevant information, such as on disassembly, recycling or disposal at end of life.
- (25) In addition to the legally binding requirements laid down in this Regulation, benchmarks for currently available technologies should be identified to make information on the life-cycle environmental performance of products subject to this Regulation widely available and easily accessible, in accordance with part 3, point (2), of Annex I to Directive 2009/125/EC.
- (26) A review of this Regulation should assess the appropriateness and effectiveness of its provisions in achieving its goals. The timing of the review should be set so that all provisions are implemented and the effect on the market can be observed.
- (27) To ensure clarity and transparency regarding the applicable requirements for different fans, Regulation (EU) No 327/2011 should be repealed from the date of entry application of this Regulation.
- (28) The measures provided for in this Regulation are in accordance with the opinion of the Committee established by Article 19(1) of Directive 2009/125/EC,

HAS ADOPTED THIS REGULATION:

Article 1

Subject matter and scope

- This Regulation lays down ecodesign requirements for the placing on the market or putting into service of fans with an electric input power between 125 W and 500 kW (≥ 125 W and ≤ 500 kW) at their best efficiency point, including where they are integrated into other products.
- 2. This Regulation shall not apply to:
 - (a) fan impellers mounted on the shaft of electric motors with the sole purpose of cooling the motor itself;
 - (b) fans integrated into laundry and washer-dryers with maximum electric input power lower than or equal to 3 kW;
 - (c) fans integrated into kitchen hoods with total maximum electric input power attributable to the fan(s) lower than 280 W;
 - (d) fans with a best energy efficiency point at 8 000 revolutions per minute or more;

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Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *Closing the loop – An EU action plan for the circular economy* (COM(2015)/614 final of 2.12.2015).

- (e) jet fans with maximum electric input power lower than 750 W.
- 3. This Regulation shall not apply to fans that are specified to operate exclusively, as follows and are clearly marketed as such:
 - (a) in potentially explosive atmospheres, as defined in Article 2, point (5), of Directive 2014/34/EU of the European Parliament and of the Council⁸;
 - (b) for emergency use only, with regard to fire safety requirements as set out in Regulation (EU) No 305/2011 of the European Parliament and of the Council⁹, capable of short-time duty operation of 1 hour or more at temperatures of 300° C and above;
 - (c) in nuclear installations, as defined in Article 3, point (1), of Council Directive 2009/71/Euratom¹⁰;
 - (d) in military establishments (bunkers) and civil defence establishments (bomb shelters);
 - (f) where operating temperatures of the gas being moved are higher than 100° C or lower than -40° C;
 - (g) where operating ambient air temperatures for the motor driving the fan, if located outside the gas stream, are higher than 60° C or lower than -30° C;
 - (h) with a supply voltage higher than 1 000 V AC or higher than 1 500 V DC;
 - (i) for handling toxic, highly corrosive or flammable gases or vapours as referred to in Regulation (EC) No 1272/2008 of the European Parliament and of the Council¹¹;
 - (j) for material transport, characterised by handling substances with a solid particle concentration of more than 10 mg/m³ and particles with an average size of at least 0.1 mm and a hardness of at least 2 on the Mohs scale, while having an average blade angle of 50° to 90°;
 - (k) for handling gases containing biohazardous substances of risk groups 2, 3 and 4 as set out in Directive 2000/54/EC of the European Parliament and of the Council¹²:
 - (l) for handling gases containing carcinogens or mutagens as defined in Directive 2004/37/EC of the European Parliament and of the Council¹³;

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Directive 2014/34/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres (OJ L 96, 29.3.2014, p. 309).

Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC (OJ L 88, 4.4.2011, p. 5).

Council Directive 2009/71/Euratom of 25 June 2009 establishing a Community framework for the nuclear safety of nuclear installations (OJ L 172, 2.7.2009, p. 18).

Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (OJ L 353, 31.12.2008, p. 1)

Directive 2000/54/EC of the European Parliament and of the Council of 18 September 2000 on the protection of workers from risks related to exposure to biological agents at work (seventh individual directive within the meaning of Article 16(1) of Directive 89/391/EEC) (OJ L 262, 17.10.2000, p. 21).

- (n) for handling gases with a compressibility factor, rounded to the nearest second decimal, in the designated pressure and temperature range of the scope that is not equal to 1.00;
- (o) in cordless or battery-powered equipment;
- (p) in handheld equipment whose weight is supported by hand during operation;
- (q) ceiling fans.

Article 2

Definitions

For the purposes of this Regulation, the following definitions shall apply:

- (1) 'fan' means a rotary-bladed machine that receives energy and utilises it by means of one or more impellers to maintain a continuous flow of air or other gas passing through it and, with a pressure-increase ratio lower than 1.1 and an output air velocity lower than 65 m/s, which can be of the following categories: axial, centrifugal, cross-flow, mixed-flow or jet, and made of at least an impeller, a motor and a stator, and includes any other significant elements that are supplied with the fan;
- (2) 'significant elements' means the elements of a fan that contribute to the continuous conversion of electric power into air volume flow rate and pressure, or that influence the efficiency of that conversion, namely:
 - (a) impeller(s), including all rotating elements that have an aerodynamic influence;
 - (b) electric motor;
 - (c) stator;
 - (d) other stationary aerodynamic elements that have an aerodynamic influence, including:
 - (i) inlet cone;
 - (ii) inlet or outlet guide vanes;
 - (iii) diffuser;
 - (e) other stationary elements that have an aerodynamic influence, including:
 - (i) mechanical transmission (aerodynamic influence and influence on efficiency);
 - (ii) electrical transmission (aerodynamic influence and influence on efficiency), such as cable conduits, frequency inverter, variable speed drive, terminal box, AC/DC converter;

Directive 2004/37/EC of the European Parliament and of the Council of 29 April 2004 on the protection of workers from the risks related to exposure to carcinogens or mutagens at work (Sixth individual Directive within the meaning of Article 16(1) of Council Directive 89/391/EEC) (OJ L 158, 30.4.2004, p. 50).

- (iii) structural components that hold the assembly in place and may interfere with the airflow (such as brackets supporting the motor or the bearings);
- (3) 'best efficiency point' (BEP) means the best energy efficiency point for fan operation, as declared by the manufacturer and specified by the fan speed, expressed in revolutions per minute (rpm);
- (4) 'impeller' means the rotating part of the fan that is imparting energy into the gas flow and is also known as the fan wheel;
- (5) 'electric motor' or 'motor' means a device that converts electrical input power into mechanical output power in the form of a rotation with a rotational speed and torque that depends on factors including the frequency of the supply voltage and the number of poles of the motor as applicable;
- (6) 'inlet cone', also known as venturi inlet, inlet bell, inlet radius, means a device that steers the air into the impeller and reduces the vena contracta and turbulence that would occur at the entrance of the impeller;
- (7) 'inlet guide vanes' means vanes positioned before the impeller to guide the gas stream towards the impeller and which may or may not be adjustable;
- (8) 'outlet guide vanes' means vanes positioned after the impeller to guide the gas stream from the impeller and which may or may not be adjustable;
- (9) 'diffuser' means a device that influences the fan performance through static recovery;
- (10) 'protective guard' means a grid placed at fan inlet or outlet designed to prevent the ingestion of relatively large foreign bodies or to prevent human body elements reaching the moving parts;
- (11) 'stator' means the stationary part of the fan that interacts with the air stream passing through the impeller and, within the geometrical air-stream envelope between defined fan inlet and outlet sections, includes any part that may increase, and excludes any non-fan component that may decrease, the fan efficiency;
- (12) 'drive system' means electric motor, transmission or direct drive and a variable speed drive if supplied;
- (13) 'direct drive' means a driving arrangement for a fan where the impeller is fixed to the motor shaft, either directly or with a coaxial coupling, and where the impeller speed is identical to the motor's rotational speed;
- (14) 'transmission' means a driving arrangement for a fan that is not direct drive, including using a belt drive, gearbox or slipping coupling;
- (15) 'variable speed drive' (VSD) means an electronic power converter that continuously adapts the electric power supplied to a single motor, or multiple motors, to control the motor's mechanical power output according to the torque-speed characteristic of the load driven by the motor, by adjusting the power supply to a variable frequency and voltage supplied to the motor, including all integrated protection devices and auxiliaries;
- (16) 'specific ratio' means the stagnation pressure measured at the fan outlet divided by the stagnation pressure at the fan inlet at BEP;

- (17) 'fan flow angle' means the angle between incoming and outgoing gas flow direction of the fan impeller, as set out in Annex III;
- (18) 'axial fan' means a fan with a fan flow angle <20°, as set out in point 3 of Annex III;
- (19) 'centrifugal fan' means a fan with a flow angle $\geq 70^{\circ}$, as set out in point 3 of Annex III;
- 'mixed flow fan' means a fan with a flow angle $\ge 20^\circ$ and $< 70^\circ$, as set out in point 3 of Annex III;
- (21) 'centrifugal blade angle' means the blade angle β2 of a centrifugal fan, expressed in degrees, as set out in point 4 of Annex III;
- (22) 'forward curved fan' means a centrifugal fan with a fan blade angle β2 > 90°, as set out in point 4 of Annex III;
- 'backward curved fan' means a centrifugal fan with a fan blade angle β2 where 0° > β2 ≤50°, as set out in point 4 of Annex III;
- 'backward inclined fan' means a centrifugal fan with a fan blade angle β2 where 50° > β2 ≤90°, as set out in point 4 of Annex III;
- (25) 'cross-flow fan' means a fan in which the gas path through the impeller is in a direction essentially at right angles to its axis both entering and leaving the impeller at its periphery;
- (26) 'jet fan' means an axial, centrifugal or radial fan that produces a high velocity jet of air in a space (thrust), unconnected to any ducting, where the jet of air induces movement of the surrounding air, creating an overall air flow through the space, and that is designed for operation with open inlets, including radial and centrifugal jet fans with an angle entrance of ≤90° to the outlet, and outlets rather than operating against pressure;
- 'declared values' means the values provided by the manufacturer, importer or authorised representative for the stated, calculated or measured technical parameters in accordance with Article 4, for the verification of compliance by the Member State authorities;
- (28) 'spare part' means a significant element (or other element) of a fan that can replace the corresponding equivalent element of an existing fan, and that leads to comparable or superior efficiency of the fan;
- (29) 'spare part fan' means a fan intended to replace a corresponding existing fan that is integrated into a product;
- (30) 'equivalent model' means a model that has the same technical characteristics relevant for the technical information to be provided, but which is placed on the market or put into service by the same manufacturer, importer or authorised representative as another model with a different model identifier;
- (31) 'model identifier' means the code, usually alphanumeric, which distinguishes a specific product model from other models with the same trademark or the same manufacturer's, importer's or authorised representative's name;
- (32) 'multiple speed motor' means a motor of which the rotating speed can be varied by energising different motor windings;

(33) 'ceiling fan' means a non-portable fan, or an impeller with an electric motor, that is designed to be suspended from the ceiling or overhead structure of a building, usually with a vertically oriented fan shaft.

Article 3

Ecodesign requirements

The ecodesign requirements for fans are set out in Annex II and shall apply from the dates indicated therein.

Article 4

Conformity assessment

- 1. The conformity assessment procedure referred to in Article 8 of Directive 2009/125/EC shall be the internal design control system set out in Annex IV to that Directive or the management system for assessing conformity set out in Annex V to that Directive.
- 2. For the purposes of the conformity assessment pursuant to Article 8 of Directive 2009/125/EC, the technical documentation shall contain a copy of the product information provided in accordance with points 2, 3 and 4 of Annex II to this Regulation, and the details and results of calculations set out in Annex III.
- 3. Where the information included in the technical documentation for a particular model has been obtained by either of the following means, the technical documentation shall include the details of the calculation, the assessment undertaken by the manufacturer to verify the accuracy of the calculation and, where appropriate, the declaration of identity between the models of different manufacturers:
 - (a) from a model that has the same technical characteristics relevant for the technical information to be provided but is produced by a different manufacturer;
 - (b) by calculation on the basis of design or extrapolation from another model of the same or a different manufacturer, or both.
- 4. The technical documentation shall include a list of all equivalent models, including the model identifiers.
- 5. Where the manufacturer has used the compliance testing options set out in point 2 of Annex III, modifications, test conditions and calculations shall be duly reported in the technical documentation.
- 6. Where this Regulation requires the provision of performance curves at different speeds pursuant to point 3 of Annex II, the technical documentation shall indicate the characteristics of the speed regulation device used, and the speed used (as a percentage of the inherent speed) for the lowest curve.
- 7. A fan to which a VSD is added shall not be considered a different fan requiring a new conformity assessment if:
 - (a) the VSD is physically located so as not to interfere with the air stream;
 - (b) the VSD can be removed from the product for verification without damaging the product and the VSD.

Article 5

Verification procedure for market surveillance purposes

Member State authorities shall apply the verification procedure laid down in Annex IV to this Regulation when performing the market surveillance checks referred to in Article 3(2) of Directive 2009/125/EC.

Article 6

Circumvention

- 1. Manufacturers, importers or authorised representatives shall not place on the market or put into service products designed to alter their behaviour or properties when being tested so as to achieve a more favourable result for any declared value of the parameters regulated in this Regulation. That includes, but is not limited to, products designed to detect they are being tested by recognising the test conditions or test cycle and to automatically alter their behaviour or properties in response, and products preset to alter their behaviour or properties at the time of testing.
- 2. Manufacturers, importers or authorised representatives shall not prescribe specific test instructions that alter the behaviour or the properties of products to achieve a more favourable result for any of the declared values of the parameters regulated in this Regulation. That includes, but is not limited to, prescribing a manual alteration of a product in preparation for the test that alters the product's behaviour or properties compared with when it is in normal use and operated by the end-user.
- 3. Manufacturers, importers or authorised representatives shall not place on the market or put into service products designed to alter their behaviour or properties within a short period of being put into service in a way that worsens any declared value for the parameters regulated in this Regulation.

Article 7

Indicative benchmarks

The indicative benchmarks for the best-performing fans available on the market at the time of adopting this Regulation are set out in Annex V.

Article 8

Review

The Commission shall review this Regulation in the light of technological progress and shall present the results of that assessment, including, if appropriate, a draft revision proposal, to the Consultation Forum by [six years after entry into force of this Regulation] at the latest. The review shall, in particular, address:

- whether it is appropriate to revise the metrics with an extended and technologyneutral product approach, including part load performance;
- whether it is appropriate to revise the efficiency limits in line with the new metrics and technological progress;

- the relevance of regulating fans below 125 W electric power, ceiling fans and large comfort fans;
- the relevance of regulating jet fans below 750 W;
- resource efficiency, reuse and recycling, recycled content and durability;
- the relevance of the exemptions laid down in Article 1;
- the relevance of the circumvention provisions laid down in Article 6;
- the relevance of requiring an energy label.

Article 9

Repeal and transitional provisions

Regulation (EU) No 327/2011 is repealed with effect from [two years after entry into force of this Regulation]. However, Annexes I, II and III to that Regulation, shall continue to apply until [three years after entry into force of this Regulation], in relation to fans integrated into other products.

Article 10

Entry into force and application

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

It shall apply from [two years after entry into force of this Regulation]. However, Article 6 shall apply from [the date of entry into force of this Regulation].

This Regulation shall be binding in its entirety and directly applicable in all Member States. Done at Brussels.

For the Commission The President Ursula VON DER LEYEN