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EN

(^{1})   Text with EEA relevance.

IV

(Notices)

NOTICES FROM EUROPEAN UNION INSTITUTIONS, BODIES, OFFICES AND AGENCIES

EUROPEAN COMMISSION

Commission communication in the framework of the implementation of Commission Regulation (EU) 2016/2281 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for air heating products, cooling products, high temperature process chillers and fan coil units

(Publication of titles and references of transitional methods of measurement and calculation (^{1}) for the implementation of Regulation (EU) 2016/2281, and in particular Annexes III and IV thereto)

(Text with EEA relevance)

(2017/C 229/01)

1. *References*

Parameter	ESO	Reference/Title	Notes
Warm air heaters using gaseous fuel			
P_{nom}, rated heating capacity P_{min}, minimum heating capacity	CEN	[See note]	EN 1020:2009, EN 1319:2009, EN 1196:2011, EN 621:2009 and EN 778:2009 do not describe methods to establish the heat output. The efficiency is calculated on the basis of the flue gas loss and the heat input. The heat output P_{nom} can be calculated with the equation $P_{nom} = Q_{nom} * \eta_{th,nom}$, where Q_{nom} is the nominal heat input and $\eta_{th,nom}$ is the nominal efficiency. P_{nom} shall be based on the gross calorific value of the fuel. Similarly P_{min} can be calculated with the equation $P_{min} = Q_{min} * \eta_{th,min}$

(^{1}) It is intended that these transitional methods will ultimately be replaced by harmonised standard(s). When available, reference(s) to the harmonised standard(s) will be published in the *Official Journal of the European Union* in accordance with Articles 9 and 10 of Directive 2009/125/EC.

Parameter	ESO	Reference/Title	Notes
$\eta_{th,nom}$ useful efficiency at rated heating capacity		EN1020:2009 - see clause 7.4.5 EN1319:2009 clause 7.4.4 EN 1196:2011, clause 6.8.2 EN621:2009 clause 7.4.5 EN 778:2009 clause 7.4.5	Efficiency can be determined as described in applicable standards, but shall be expressed on basis of gross calorific value of fuel
$\eta_{th,min}$ useful efficiency at minimal load		EN 1020:2009 - see clause 7.4.6 EN1319:2009 clause 7.4.5 EN 1196:2011, clause 6.8.3 EN621:2009 clause 7.4.6 EN 778:2009 clause 7.4.6	Efficiency can be determined as described in applicable standards, but shall be expressed on basis of gross calorific value of fuel
AF_{nom} air flow at rated heating capacity AF_{min} air flow at minimal load		[See note]	None of the standards describes methods to establish the warm air flow rate (or air delivery rate).
el_{nom} electric power consumption at rated heating capacity el_{min} electric power consumption at minimum load		[See note]	According EN1020:2009 the electric power input shall be expressed on the data plate (clause 8.1.2. f) in volts, amperes, etc. The manufacturer may convert the applicable values to Watts using known conventions. Care should be taken not to include the fan for transport/ distribution of warm air in the electric power consumption.
el_{sb} electric power consumption at standby mode		IEC 62301:2011-01	IEC 62301:2011 applies to household appliances/issues to be discussed with relevant TCs
P_{pilot} permanent pilot flame power consumption		[See note]	According EN1020:2009 clause 8.4.2 the technical instructions for installation and adjustment shall contain " a technical table (that includes) heat input, heat output, rating of any ignition burner, (etc.), air delivery volumes, etc. The heat input by the permanent pilot flame can be determined in a way similar to the main energy input.

Parameter	ESO	Reference/Title	Notes
Emissions of nitrogen oxide (NO_x)	CEN	CEN Report CR 1404:1994	NO_x emission values are to be expressed in mg/kWh, based on gross calorific value GCV of the fuel.
F_{env} envelope losses	CEN	EN 1886:2007	Insulation class according to five classes, designated as T1-T5
IP rating (ingress protection rating)		EN 60529:1991/ AC:2016-12	

Warm air heaters using liquid fuel

Parameter	ESO	Reference/Title	Notes
P_{nom}, rated heating capacity P_{min}, minimal load	CEN	EN 13842:2004 Oil-fired convection air heaters — Stationary and transportable	EN 13842:2004 does not describe methods to establish the heat output. The heat output P_{nom} can be calculated with the equation $P_{nom} = QN * \eta_{th,nom}$, where QN is the nominal heat input (clause 6.3.2.2) and η_{nom} is the efficiency at rated heating capacity. Q_N and η shall be based on the gross calorific value of the fuel. Similarly P_{min} can be calculated with the equation $P_{min} = Q_{min} * \eta_{th,min}$ where Q_{min} and $\eta_{th,min}$ are the heat input and efficiency at minimum load conditions
$\eta_{th,nom}$ useful efficiency at rated heating capacity $\eta_{th,min}$ useful efficiency at minimal load		EN 13842:2004 Clause 6.5.6, applicable to either nominal or minimum load	$\eta_{th,nom}$ equals η in clause 6.5.6
AF_{nom} air flow at rated heating capacity AF_{min} air flow at minimal load		[See note]	None of the standards describes methods to establish the warm air flow rate (or air delivery rate).
el_{nom} electric power consumption at rated heating capacity el_{min} electric power consumption at minimum load el_{sb} electric power consumption at standby mode		[See note]	According EN1020:2009 the electric power input shall be expressed on the data plate (clause 8.1.2.k) in volts, amperes, etc. The manufacturer may convert the applicable values to Watts using known conventions. Care should be taken not to include the fan for transport/distribution of warm air in the electric power consumption.

Parameter	ESO	Reference/Title	Notes
Emissions of nitrogen oxide (NO_x)	CEN	EN 267:2009 + A1:2011 Automatic forced draught burners for liquid fuels; § 4.8.5. Emission limit values for NO_x and CO; § 5. Testing. ANNEX B. Emission measurements and corrections.	NO_x emission values are expressed on the basis of the gross calorific value of the fuel.
F_{env} envelope losses	CEN	EN 1886:2007	Insulation class according five classes, designated as T1-T5
IP rating (ingress protection rating)		EN 60529:1991/ AC:2016-12	

Warm air heaters using electric Joule effect

Parameter	ESO	Reference/Title	Notes
P_{nom}, rated heating capacity and P_{min}, heat output at minimal load	CEN	IEC/EN 60675 ed 2.1; 1998 § 16	A standard for actual measurement of heat output of electric warm air heaters has not been identified. The electric power input at nominal or minimum load is considered representative for the nominal or minimum heat output. P_{nom} and P_{min} correspond to the usable power in IEC 60675 ed. 2.1:1998 at nominal and minimum load, minus the power requirement for fans that distribute the warm air and the power requirement of electronic controls where relevant.
$\eta_{th,nom}$ useful efficiency at rated heating capacity	n.a.	[See note]	The value is default 100 %.
$\eta_{th,min}$ useful efficiency at minimal load	n.a.		
AF_{nom} air flow at rated heating capacity AF_{min} air flow at minimal load		[See note]	None of the standards describes methods to establish the warm air flow rate (or air delivery rate).
el_{sb} electric power consumption at standby mode		IEC 62301:2011-01	
F_{env} envelope losses	CEN	EN 1886:2007	Insulation class according five classes, designated as T1-T5

Parameter	ESO	Reference/Title	Notes
IP rating (ingress protection rating)		EN 60529:1991/ AC:2016-12	

Electric driven comfort chillers, air conditioners and heat pumps

Parameter	ESO	Reference/Title	Notes
SEER	CEN	EN 14825:2016, section 6.1	
Q_C		EN 14825:2016, section 6.2	
Q_{CE}		EN 14825:2016, section 6.3	
$SEER_{on,part\ load\ ratio}$		EN 14825:2016, section 6.4	
$EER_{bin}(T_j)$, CR_u, C_c, C_d		EN 14825:2016, section 6.5	
$\eta_{s,h}$		EN 14825:2016, section 7.1	η_s is equal to $\eta_{s,h}$
SCOP		EN 14825:2016, section 7.2	
Q_H		EN 14825:2016, section 7.3	
Q_{HE}		EN 14825:2016, section 7.4	
$SCOP_{on,part\ load\ ratio}$		EN 14825:2016, section 7.5	
$COP_{bin}(T_j)$, CR_u, C_c, C_d		EN 14825:2016, section 7.6	
C_c and C_d		EN 14825:2016, section 8.4.2 & 8.4.3	C_c is equal to $C_{d,c}$ or $C_{d,h}$ C_d is equal to $C_{d,c}$ or $C_{d,h}$
P_{off}, P_{sb}, P_{ck} & P_{to}		EN 14825:2016, section 9	

Comfort chillers, air conditioners and heat pumps using internal combustion

Parameter	ESO	Reference/Title	Notes
$SPER_c$	CEN	EN 16905-5:2017, section 6	
$SGUE_c$		EN 16905-5:2017, section 6.4	
$SAEF_c$		EN 16905-5:2017, section 6.5	
$GUE_{c,pl}$		EN 16905-5:2017, section 6.10	

Parameter	ESO	Reference/Title	Notes
$GUE_{d,c}$		EN 16905-5:2017, section 6.2	
Q_{Ec} & Q_{Eh}		EN 16905-4:2017, section 4.2.1.2	
Q_{Ehr}		EN 16905-4:2017, section 4.2.2.1	
Q_{gmc} & Q_{gmh}		EN 16905-4:2017, section 4.2.5.2 and section 4.2.5.1	
$Q_{ref,c}$ & $Q_{ref,h}$		EN 16905-5:2017, section 6.6	
$SPER_h$		EN 16905-5:2017, section 7	
$SGUE_h$		EN 16905-5:2017, section 7.4	
$SAEF_h$		EN 16905-5:2017, section 7.5	
$SAEF_{h,on}$		EN 16905-5:2017, section 7.7	
$AEF_{h,pl}$		EN 16905-5:2017, section 7.10	
$AEF_{d,h}$		EN 16905-5:2017, section 7.2	
P_{Ec} & P_{Eh}		EN 16905-4:2017, section 4.2.6.2	

Comfort chillers, air conditioners and heat pumps using sorption cycle

Parameter	ESO	Reference/Title	Notes
$SGUE_c$	CEN	EN 12309-6:2014, section 4.3	
$SAEF_c$		EN 12309-6:2014, section 4.4	
$Q_{ref,c}$		EN 12309-6:2014, section 4.5	
$SAEF_{c,on}$		EN 12309-6:2014, section 4.6	
GUE_c & AEF_c		EN 12309-6:2014, section 4.7	
$SPER_h$		EN 12309-6:2014, section 5.3	
$SGUE_h$		EN 12309-6:2014, section 5.4	
$SAEF_h$		EN 12309-6:2014, section 5.5	

Parameter	ESO	Reference/Title	Notes
$Q_{ref,h}$		EN 12309-6:2014, section 5.6	
$SAEF_{h,on}$		EN 12309-6:2014, section 5.7	
GUE_h & AEF_h		EN 12309-6:2014, section 5.8	

High temperature process chillers

Parameter	ESO	Reference/Title	Notes
refrigeration load $P_{designR}$		Analogue to EN14825:2016 — Section 3.1.44	
part load ratio		Analogue to EN14825:2016 — Section 3.1.56	
declared capacity DC		Analogue to EN14825:2016 — Section 3.1.31	
capacity ratio C_R		Analogue to EN14825:2016 — Section 3.1.17	
bin hours		As defined in Regulation (EC) 2016/2281, Annex III, Table 28.	
energy efficiency ratio at declared capacity EER_{DC}		EN 14511-1/-2/-3:2013 for the determination of EER values at given conditions	The EER includes degradation losses when the declared capacity of the chiller is higher than the refrigeration demand
energy efficiency ratio at part load or full load conditions EER_{PL}			
seasonal energy performance ratio (SEPR)		Point 5 of this Communication (European Commission)	
capacity control		As in EN14825:2016 — Section 3.1.32	See comments related to capacity control of air conditioners, chillers and heat pumps
degradation coefficient C_C		As in EN14825:2016 — Section 8.4.2	

Parameter	ESO	Reference/Title	Notes
Multisplit air conditioners and multisplit heat pumps			
$EER_{outdoor}$	CEN	EN 14511-3:2013, Annex I	Rating of indoor and outdoor units of multisplit and modular heat recovery multisplit system
$COP_{outdoor}$	CEN	EN 14511-3:2013, Annex I	Rating of indoor and outdoor units of multisplit and modular heat recovery multisplit system

NOTES:
— There is no European standard dealing with vapour compression liquid or gaseous fuel engine driven heat pumps. A working group: CEN/TC 299 — WG3 is working on a standard.
— The European standards EN 12309 part 1 and part 2, dealing with liquid or gaseous fuel sorption heat pumps are under revision in CEN/TC299 — WG2, particularly to calculate a seasonal energy efficiency.

2. *Additional elements for measurements and calculations related to the seasonal space heating energy efficiency of warm air heaters*

2.1. **Test points**

The useful efficiency, the useful heat output, the electric power consumption and the air flow shall be measured at nominal and minimum heat output.

2.2. **Calculation of the seasonal space heating energy efficiency of warm air heaters**

(a) The seasonal space heating energy efficiency η_S for warm air heaters using fuels is defined as:

$$\eta_S = \eta_{S,on} - \sum F(i)$$

(b) The seasonal space heating energy efficiency η_S for warm air heaters using electricity is defined as:

$$\eta_S = \left(\frac{1}{CC}\right) \cdot \eta_{S,on} - \sum F(i)$$

where:

— $\eta_{S,on}$ is the seasonal space heating energy efficiency in active mode, expressed in %;

— CC is the conversion coefficient as defined in Annex I of Regulation (EU) 2016/2281;

— F(i) are corrections calculated according to point 2.7 below and expressed in %.

2.3. **Calculation of the seasonal space heating energy efficiency in active mode**

The seasonal space heating energy efficiency in active mode $\eta_{S,on}$ is calculated as follows:

$$\eta_{S,on} = \eta_{S,th} \cdot \eta_{S,flow}$$

where:

— $\eta_{S,th}$ is the seasonal thermal energy efficiency, expressed in %;

— $\eta_{S,flow}$ is the emission efficiency for a specific air flow, expressed in %.

2.4. **Calculation of the seasonal thermal energy efficiency $\eta_{S,th}$**

The seasonal thermal energy efficiency $\eta_{S,th}$ is calculated as follows:

$$\eta_{S,th} = \left(0{,}15 \cdot \eta_{th,nom} + 0{,}85 \cdot \eta_{th,min}\right) - F_{env}$$

where:

— $\eta_{th,nom}$ is the useful efficiency at nominal (maximal) load, expressed in % and based on GCV;

— $\eta_{th,min}$ is the useful efficiency at minimum load, expressed in % and based on GCV;

— F_{env} is the envelope loss factor of the heat generator, expressed in %.

2.5. **Calculation of the envelope loss**

The envelope loss factor F_{env} depends on the intended placement of the unit and is calculated as follows:

(a) if the warm air heater is specified to be installed in the heated area:

$$F_{env} = 0$$

(b) if the protection against ingress of water of the part of the product that incorporates the heat generator has a IP rating of x4 or higher (IP rating according IEC 60529 (ed 2.1), clause 4.1), the envelope loss factor depends on the thermal transmittance of the envelope of the heat generator according to Table 1.

Table 1

Envelope loss factor of the heat generator

Thermal transmittance (U) [W/m²·K]	Factor F_{env}
U ≤ 0,5	0,4 %
0,5 < U ≤ 1,0	0,6 %
1,0 < U ≤ 1,4	1,0 %
1,4 < U ≤ 2,0	1,5 %
No requirements	5,0 %

2.6. **Calculation of the emission efficiency $\eta_{S,flow}$**

The emission efficiency $\eta_{S,flow}$ is calculated as follows:

$$\eta_{S,flow} = 1 - 9{,}78 \cdot \left(\frac{0{,}15 \cdot P_{nom}}{AF_{nom}} + \frac{0{,}85 \cdot P_{min}}{AF_{min}}\right)$$

where:

— P_{nom} is the output power at nominal (maximal) load, expressed in kW;

— P_{min} is the output power at minimum load, expressed in kW;

— AF_{nom} is the air flow at nominal (maximal) load, expressed in m^3/h, corrected to 15 °C equivalent ($V_{15\,°C}$);

— AF_{min} is the air flow at minimal load, expressed in m^3/h, corrected to 15 °C equivalent.

The emission efficiency of the air flow is based on a 15 °C temperature increase. In case the unit is intended to produce a different temperature increase ('t') the actual air flow 'V' shall be recalculated into an equivalent air flow '$V_{15\,°C}$' as follows:

$$V_{15°C} = V \cdot \frac{288}{273 + t}$$

where:

— $V_{15\,°C}$ is the equivalent air flow at 15 °C;

— V is the actual delivered air flow;

— t is the actual delivered temperature increase.

2.7. **Calculation of ∑F(i) for warm air heaters**

∑F(i) is the summation of various correction factors, all expressed in percentage points.

$$\sum F(i) = F(1) + F(2) + F(3) + F(4)$$

These correction factors are as follows:

(a) The correction factor F(1) for the adaptation of heat output takes into account the way the product adapts to a heat load (which can be either through single stage, two stage, modulating control) and the load range ($1-(P_{min}/P_{nom})$) the heater can work in related to the state-of-the-art load range of this technology, as described in Table 2.

For heaters with state-of-the-art or higher load ranges the full value of parameter B can be taken into account, leading to a lower value for correction factor F(1). For heaters with a smaller load range a smaller than maximum value of B is taken into account.

Table 2

Calculation of F(1) depending on heat output control and load range

Heat output control	Calculation of F(1)	Where B is calculated as:
Single stage (no load range)		B = 0 %
Two stage (highest load range: 50 %)	F(1) = 5% − B	$B = \dfrac{1 - \left(\frac{P_{min}}{P_{nom}}\right)}{(100\% - 50\%)} \cdot 2{,}5\%$ *with B is maximum 2,5 %*
Modulating (highest load range: 70 %)		$B = \dfrac{1 - \left(\frac{P_{min}}{P_{nom}}\right)}{(100\% - 30\%)} \cdot 5\%$ *with B is maximum 5 %*

(b) The correction F(2) accounts for a negative contribution to the seasonal space heating energy efficiency by auxiliary electricity consumption for warm air heaters, expressed in %, and is given as follows:

(i) For warm air heaters using fuels:

$$F(2) = 2,5 \cdot \frac{0,15 \cdot el_{max} + 0,85 \cdot el_{min} + 1,3 \cdot el_{sb}}{P_{nom}}$$

(ii) For warm air heaters using electricity:

$$F(2) = 1,3 \cdot \frac{el_{sb}}{P_{nom} * CC}$$

where:

— el_{max} is the electric power consumption when the product is providing the nominal heat output, excluding the energy needed for the transport fan, expressed in kW;

— el_{min} is the: electric power consumption when the product is providing the minimum heat output, excluding the energy needed for the transport fan, expressed in kW;

— el_{sb} is the electric power consumption when the product is in standby mode, expressed in kW;

OR a default value as set out in EN 15316-1 may be applied.

(c) The correction F(3) accounts for a negative contribution to the seasonal space heating energy efficiency for gravity vented combustion systems (combustion air transported by natural draft) as additional thermal losses during the time the burner is off have to be considered.

(i) For warm air heaters in which transport of combustion air is by natural draught:

F(3) = 3 %

(ii) For warm air heaters in which transport of combustion air is by forced draught:

F(3) = 0 %

(d) The correction F(4) accounts for a negative contribution to the seasonal space heating energy efficiency by permanent pilot flame power consumption and is given as follows:

$$F(4) = 4 \cdot \frac{P_{ign}}{P_{nom}}$$

In which the value '4' is the ratio of the average heating period (4 000 hrs/yr) by the average on-mode duration (1 000 hrs/yr).

3. *Additional elements for calculations related to the seasonal space heating and cooling efficiency of comfort chillers, air conditioners and heat pumps*

3.1. **Calculation of the seasonal space heating energy efficiency for heat pump:**

(a) *For heat pumps using electricity*

(i) The seasonal space heating energy efficiency $\eta_{S,h}$ is defined as:

$$\eta_{S,h} = \frac{1}{CC} \cdot SCOP - \sum F(i)$$

where:

— SCOP is the seasonal coefficient of performance, expressed in %;

— F(i) are the corrections calculated according to point 3.3, expressed in %.

(ii) Calculation of SCOP of heat pumps using electricity is as follows:

$$SCOP = \frac{Q_H}{Q_{HE}}$$

where:

$$Q_H = P_{designh} * H_{HE}$$

and,

$$Q_{HE} = \frac{Q_H}{SCOP_{on}} + (H_{TO} * P_{TO}) + (H_{SB} * P_{SB}) + (H_{CK} * P_{CK}) + (H_{OFF} * P_{OFF})$$

in which,

$$SCOP_{on} = \frac{\sum_{j=i}^{n} hj * P_h(T_j)}{\sum_{j=i}^{n} hj * \left(\frac{P_h(T_j) - elbu(T_j)}{COP_{bin}(T_j)} + elbu(T_j) \right)}$$

(iii) $COP_{bin}(T_j)$ is determined as follows:

(1) For fixed capacity units:

In case the lowest declared heating capacity exceeds the part load for heating (or capacity ratio $CR_u \leq 1,0$):

$$COP_{bin}(T_j) = COP_d * \{1 - C_d * (1 - CR_u)\}$$

where:

— $COP_{bin}(T_j)$ = bin-specific coefficient of performance;

— $COP_d(T_j)$ = declared coefficient of performance;

— C_d = 0,25 (default value) or established by a cycling test;

and,

$$CR_u = \frac{P_H}{P_d}$$

(2) For staged or variable capacity units:

Determine the declared heating capacity and $COP_d(T_j)$ at the closest step or increment of the capacity control of the unit to reach the required heat load.

If this step does allow to reach the required heating load within ± 10 % (e.g. between 9,9 kW and 8,1 kW for a required heating load of 9 kW), then $COP_{bin}(T_j)$ is assumed to be equal to $COP_d(T_j)$.

If this step does not allow to reach the required heating load within ± 10 % (e.g. between 9,9 kW and 8,1 kW for a required heating load of 9 kW), determine the capacity and $COP_{bin}(T_j)$ at the defined part load temperatures for the steps on either side of the required heating load. The part load capacity and the $COP_{bin}(T_j)$ at the required heating load are then determined by linear interpolation between the results obtained from these two steps.

If the smallest control step of the unit only allows a declared heating capacity higher than the required heating load, the $COP_{bin}(T_j)$ at the required part load ratio is calculated using the approach laid out for fixed capacity units.

(3) For bins representing other than above described operating conditions:

The COP_{bin} shall be established by interpolation, except for part load conditions above part load condition A, for which the same values as for condition A shall be used and for part load conditions below part load condition D, for which the same values as for condition D shall be used.

(b) *For heat pumps using fuels*

(i) The seasonal space heating energy efficiency $\eta_{S,heat}$ is defined as:

$$\eta_{S,h} = SPER_h - \sum F(i)$$

where:

— $SPER_h$ is the seasonal primary energy ratio for heating, expressed in %;

— $F(i)$ are the corrections calculated according to point 3.3, expressed in %.

(ii) Calculation of $SPER_h$ of heat pumps using internal combustion

$$SPER_h = \frac{1}{\frac{1}{SGUE_h} + \frac{CC}{SAEF_h}}$$

where:

$$SGUE_h = \frac{\sum_{j=i}^{n} hj * P_h(T_j)}{\sum_{j=i}^{n} hj * \left(\frac{P_h(T_j)}{GUE_{h,bin}(T_j)}\right)}$$

(iii) $GUE_{h,bin}$ and $SAEF_h$ are determined as follows:

$$GUE_{h,bin} = \frac{Q_{Eh} + Q_{Ehr,c}}{Q_{gmh}}$$

where:

— Q_{Eh} = effective heating capacity, in kW;

— $Q_{Ehr,c}$ = effective heat recovery capacity, in kW;

— Q_{gmh} = is the measured heating heat input, in kW;

— GUE_h shall also take into account degradation effects due to cycling in a manner similar to that of electric heat pumps.

and,

$$SAEF_h = \frac{Q_{ref,h}}{\left(\frac{Q_{ref,h}}{SAEF_{h,on}} + (H_{TO} * P_{TO}) + (H_{SB} * P_{SB}) + (H_{CK} * P_{CK}) + (H_{OFF} * P_{OFF})\right)}$$

in which,

$$Q_{ref,h} = P_{design,h} * H_{HE}$$

and,

$$SAEF_{h,on} = \frac{\sum_{j=i}^{n} hj * P_h(T_j)}{\sum_{j=i}^{n} hj * \left(\frac{P_h(T_j)}{AEF_{h,bin}(T_j)}\right)}$$

and,

$$AEF_{h,bin} = \frac{Q_{Eh} + Q_{Ehr,c}}{P_{Eh}}$$

and,

— Q_{Eh} = effective heating capacity, in kW;

— $Q_{Ehr,c}$ = effective heat recovery capacity, in kW;

— P_{Eh} = effective heating electrical power input, in kW;

— AEF_h shall also take into account degradation effects due to cycling in a manner similar to that of electric heat pumps.

(1) For fixed capacity units:

In case the lowest declared heating capacity exceeds the part load for heating (or capacity ratio $CR_u \leq 1,0$):

$$GUE_{h,bin}(T_j) = GUE_d * \{1 - C_d * (1 - CR_u)\}$$

and,

$$\text{AEF}_{h,bin}(T_j) = \text{AEF}_d * \{1 - C_d * (1 - CR_u)\}$$

where:

— $\text{GUE}_d(T_j)$ = declared gas utilization efficiency at outdoor temperature T_j;

— $\text{AEF}_d(T_j)$ = declared auxiliary energy factor at outdoor temperature T_j;

— C_d = 0,25 (default value) or established by a cycling test.

and,

$$CR_u = \frac{P_H}{Q_{Eh} + Q_{Ehr}}$$

(2) For staged or variable capacity units:

Determine the declared heating capacity at the closest step or increment of the capacity control of the unit to reach the required heat load.

If this step allows the heating capacity to reach the required heating load within ± 10 % (e.g. between 9,9 kW and 8,1 kW for a required heating load of 9 kW), then $\text{GUE}_{bin}(T_j)$ is assumed to be equal to $\text{GUE}_d(T_j)$ and $\text{AEF}_{bin}(T_j)$ is assumed to be equal to $\text{AEF}_d(T_j)$.

If this step does not allow the heating capacity to reach the required heating load within ± 10 % (e.g. between 9,9 kW and 8,1 kW for a required heating load of 9 kW), determine the capacity and $\text{GUE}_{bin}(T_j)$ and $\text{AEF}_{bin}(T_j)$ at the defined part load temperatures for the steps on either side of the required heating load. The heating capacity in part load, the $\text{GUE}_{bin}(T_j)$ and the $\text{AEF}_{bin}(T_j)$ at the required heating load are then determined by linear interpolation between the results obtained from these two steps.

If the smallest control step of the unit only allows a declared heating capacity higher than the required heating load, the $\text{GUE}_{bin}(T_j)$ and $\text{AEF}_{bin}(T_j)$ at the required part load ratio is calculated using the approach laid out for fixed capacity units.

For bins representing other than above described operating conditions the GUE_{bin} and AEF_{bin} shall be established by interpolation, except for part load conditions above part load condition A, for which the same values as for condition A shall be used and for part load conditions below part load condition D, for which the same values as for condition D shall be used.

3.2. **Calculation of the seasonal space cooling energy efficiency for chillers and air conditioners:**

(a) *For chillers and air conditioners using electricity*

(i) The seasonal space cooling energy efficiency $\eta_{S,c}$ is defined as:

$$\eta_{S,c} = \frac{\text{SEER}}{CC} - \sum F(i)$$

where:

— SEER is the seasonal space cooling energy efficiency in active mode, expressed in %;

— F(i) are the corrections calculated according to point 3.3 expressed in %.

(ii) Calculation of SEER:

$$SEER = \frac{Q_C}{Q_{CE}}$$

where:

$$Q_C = P_{design,c} * H_{CE}$$

and,

$$Q_{CE} = \frac{Q_C}{SEER_{on}} + (H_{TO} * P_{TO}) + (H_{SB} * P_{SB}) + (H_{CK} * P_{CK}) + (H_{OFF} * P_{OFF})$$

in which,

$$SEER_{on} = \frac{\sum_{j=i}^{n} hj * P_c(T_j)}{\sum_{j=i}^{n} hj * \left(\frac{P_c(T_j)}{EER_{bin}(T_j)}\right)}$$

(iii) $EER_{bin}(T_j)$ is calculated as follows:

(1) For electric air conditioners (connected to an air-based cooling system) of which the capacity control is fixed capacity:

In case the lowest declared cooling capacity exceeds the part load for cooling (or capacity ratio $CR_u \leq 1,0$):

$$EER_{bin}(T_j) = EER_d * \{1 - C_d * (1 - CR_u)\}$$

where:

— $EER_d(T_j)$ = declared coefficient of performance;

— $C_d = 0,25$ (default value) or established by a cycling test;

— $CR_u = \frac{P_C}{P_d}$.

(2) For electric comfort chillers and high temperature process chillers (connected to a water-based cooling system) of which the capacity control is fixed capacity

In case the lowest declared cooling capacity exceeds the part load for cooling (or capacity ratio $CR_u \leq 1,0$):

$$EER_{bin}(T_j) = EER_d(T_j) * \left(\frac{CR_u}{C_c * CR_u + (1 - C_c)}\right)$$

where:

— $EER_d(T_j)$ = declared coefficient of performance;

— $C_c = 0,9$ (default value) or established by a cycling test;

— $CR_u = \dfrac{P_C}{P_d}$.

(3) For staged or variable capacity air conditioners and comfort chillers:

Determine the declared cooling capacity and $EER_d(T_j)$ at the closest step or increment of the capacity control of the unit to reach the required cooling load.

If this step does allow to reach the required cooling load within ± 10 % (e.g. between 9,9 kW and 8,1 kW for a required cooling load of 9 kW), then $EER_{bin}(T_j)$ is assumed to be equal to $EER_d(T_j)$.

If this step does not allow to reach the required cooling load within ± 10 % (e.g. between 9,9 kW and 8,1 kW for a required cooling load of 9 kW), determine the capacity and $EER_{bin}(T_j)$ at the defined part load temperatures for the steps on either side of the required cooling load. The part load capacity and the $EER_{bin}(T_j)$ at the required cooling load are then determined by linear interpolation between the results obtained from these two steps.

If the smallest control step of the unit only allows a declared cooling capacity higher than the required cooling load, the $EER_{bin}(T_j)$ at the required part load ratio is calculated using the approach laid out for fixed capacity units.

(4) For high temperature process chillers:

The required cooling load shall be reached within a ± 3 % margin.

For bins representing other than above described operating conditions the EER_{bin} shall be established by interpolation, except for part load conditions above part load condition A, for which the same values as for condition A shall be used and for part load conditions below part load condition D, for which the same values as for condition D shall be used.

(b) *For chillers and air conditioners using fuels*

(i) The seasonal space cooling energy efficiency $\eta_{S,c}$ is defined as:

$$\eta_{S,c} = SPER_c - \sum F(i)$$

where:

— $SPER_c$ is the seasonal primary energy ratio for cooling, expressed in %;

— $F(i)$ are the corrections calculated according to point 3.3 expressed in %.

(ii) Calculation of $SPER_c$:

$$SPER_c = \dfrac{1}{\dfrac{1}{SGUE_c} + \dfrac{CC}{SAEF_c}}$$

where:

$$SGUE_c = \dfrac{\sum_{j=i}^{n} hj * P_c(T_j)}{\sum_{j=i}^{n} hj * \left(\dfrac{P_c(T_j)}{GUE_{c,bin}(T_j)}\right)}$$

and,

$$SAEF_h = \frac{Q_{ref,c}}{\left(\frac{Q_{ref,c}}{SAEF_{c,on}} + (H_{TO} * P_{TO}) + (H_{SB} * P_{SB}) + (H_{CK} * P_{CK}) + (H_{OFF} * P_{OFF})\right)}$$

in which,

$$Q_{ref,c} = P_{design,c} * H_{CE}$$

and,

$$SAEF_{c,on} = \frac{\sum_{j=i}^{n} hj * P_c(T_j)}{\sum_{j=i}^{n} hj * \left(\frac{P_c(T_j)}{AEF_{c,bin}(T_j)}\right)}$$

(iii) $GUE_{c,bin}(T_j)$ and $AEF_{c,bin}(T_j)$ are calculated as follows:

(1) For air conditioners with internal combustion (connected to an air-based cooling system) of which the capacity control is fixed capacity:

In case the lowest declared cooling capacity exceeds the part load for cooling (or capacity ratio $CR_u \leq 1,0$):

$$GUE_{c,bin}(T_j) = GUE_d * \{1 - C_d * (1 - CR_u)\}$$

and,

$$AEF_{c,bin}(T_j) = AEF_d * \{1 - C_d * (1 - CR_u)\}$$

where:

— $GUE_d(T_j)$ = declared gas utilization efficiency at outdoor temperature T_j;

— $AEF_d(T_j)$ = declared auxiliary energy factor at outdoor temperature T_j;

— C_d = 0,25 (default value) or established by a cycling test;

and,

$$CR_u = \frac{P_H}{Q_{Eh} + Q_{Ehr}}$$

(2) For comfort chillers with internal combustion (connected to a water-based cooling system) of which the capacity control is fixed capacity:

In case the lowest declared cooling capacity exceeds the part load for cooling (or capacity ratio $CR_u \leq 1,0$):

$$EER_{bin}(T_j) = EER_d(T_j) * \left(\frac{CR_u}{C_c * CR_u + (1 - C_c)}\right)$$

where:

— $EER_d(T_j)$ = declared coefficient of performance

— C_c = 0,9 (default value) or established by a cycling test

and,

$$CR_u = \frac{P_C}{P_d}$$

(3) For staged or variable capacity units:

Determine the declared cooling capacity at the closest step or increment of the capacity control of the unit to reach the required heat load.

If this step allows the cooling capacity to reach the required cooling load within ± 10 % (e.g. between 9,9 kW and 8,1 kW for a required cooling load of 9 kW), then $GUE_{bin}(T_j)$ is assumed to be equal to $GUE_d(T_j)$ and $AEF_{bin}(T_j)$ is assumed to be equal to $AEF_d(T_j)$.

If this step does not allow the cooling capacity to reach the required cooling load within ± 10 % (e.g. between 9,9 kW and 8,1 kW for a required cooling load of 9 kW), determine the capacity and $GUE_{bin}(T_j)$ and $AEF_{bin}(T_j)$ at the defined part load temperatures for the steps on either side of the required cooling load. The cooling capacity in part load, the $GUE_{bin}(T_j)$ and the $AEF_{bin}(T_j)$ at the required cooling load are then determined by linear interpolation between the results obtained from these two steps.

If the smallest control step of the unit only allows a declared cooling capacity higher than the required cooling load, the $GUE_{bin}(T_j)$ and $AEF_{bin}(T_j)$ at the required part load ratio is calculated using the approach laid out for fixed capacity units.

For bins representing other than above described operating conditions the GUE_{bin} and AEF_{bin} shall be established by interpolation, except for part load conditions above part load condition A, for which the same values as for condition A shall be used and for part load conditions below part load condition D, for which the same values as for condition D shall be used.

and,

$$GUE_d = \frac{Q_{Ec} + Q_{Ehr,c}}{Q_{gmc}}$$

where:

— Q_{Ec} = effective cooling capacity, in kW;

— $Q_{Ehr,c}$ = effective heat recovery capacity, in kW;

— Q_{gmc} = is the measured cooling heat input, in kW.

and,

$$AEF_d = \frac{Q_{Ec} + Q_{Ehr,c}}{P_{Ec}}$$

where:

— Q_{Ec} = effective cooling capacity, in kW;

— $Q_{Ehr,c}$ = effective heat recovery capacity, in kW;

— P_{Ec} = effective cooling electrical power input, in kW.

3.3. **Calculation of F(i) for comfort chillers, air conditioners and heat pumps:**

(a) The correction F(1) accounts for a negative contribution to the seasonal space heating or cooling energy efficiency of products due to adjusted contributions of temperature controls to seasonal space heating and cooling energy efficiency, expressed in %.

$$F(1) = 3 \ \%$$

(b) The correction F(2) accounts for a negative contribution to the seasonal space heating or cooling efficiency by electricity consumption of ground water pump(s), expressed in %.

$$F(2) = 5 \ \%$$

4. *Additional elements for calculations related to the seasonal space heating and cooling efficiency and the testing of multisplit air conditioners and multisplit heat pumps.*

The choice of the indoor unit for multisplit air conditioners and multisplit heat pumps related to the capacity shall be limited to:

— The same type of indoor units for the test;

— The same size of the indoor units if the system capacity ratio ±5 % can be reached. If the system capacity ratio of ±5 % with same sizes cannot be reached, sizes as similar as possible, with the number of indoor units as prescribed below to meet the system capacity ratio ±5 %;

— The number of indoor units shall be limited as follows:

— Capacity equal or above 12 kW and below 30 kW, 4 indoor units;

— Capacity equal or above 30 kW and below 50 kW, 6 indoor units;

— Capacity equal to or above 50 kW, 8 indoor units;

— Capacity equal to or above 50 kW with multiple outdoor units, the sum of the indoor units as defined for a single outdoor unit.

5. *Additional elements for calculations related to the seasonal energy performance ratio of high temperature process chillers*

5.1. **Calculation of the seasonal energy performance ratio (SEPR) for high temperature process chillers.**

(a) The SEPR is calculated as the reference annual refrigeration demand divided by the annual electricity consumption:

$$\textit{reference SEPR} \ = \ \frac{\sum_{j=1}^{n} \left[h_j \cdot P_R(T_j) \right]}{\sum_{j=1}^{n} \left[h_j \cdot \frac{P_R(T_j)}{EER_{PL}(T_j)} \right]}$$

where:

— T_j is the bin temperature;

— j is the bin number;

— n is the amount of bins;

— $P_R(T_j)$ is the refrigeration demand of the application for the corresponding temperature T_j;

— hj is the number of bin hours occurring at the corresponding temperature T_j;

— $EER_{PL}(T_j)$ is the EER value of the unit for the corresponding temperature T_j. This includes part load conditions.

NOTE: This annual electricity consumption includes the power consumption during active mode. Other modes, such as Off mode and standby modes are not relevant for process applications as the appliance is assumed to be running all year long.

(b) The refrigeration demand $P_R(T_j)$ can be determined by multiplying the full load value ($P_{designR}$) with the part load ratio (%) for each corresponding bin. These part load ratios are calculated using the formulas shown in Tables 22 and 23 in Regulation (EU) 2016/2281.

(c) The energy efficiency ratio $EER_{PL}(T_j)$ at part load conditions A, B, C, D is determined as explained below:

In part load condition A (full load), the declared capacity of a unit is considered equal to the refrigeration load ($P_{designR}$).

In part load conditions B, C, D, there can be two possibilities:

(i) If the declared capacity (DC) of a unit matches with the required refrigeration loads, the corresponding EER_{DC} value of the unit is to be used. This may occur with variable capacity units.

$$EER_{PL}(T_{B,C \text{ or } D}) = EER_{DC}$$

(ii) If the declared capacity of a unit is higher than the required refrigeration load, the unit has to cycle on/off. This may occur with fixed capacity or variable capacity units. In such cases, a degradation coefficient (C_c) has to be used to calculate the corresponding EER_{PL} value. Such calculation is explained below.

(1) For fixed capacity units:

In order to obtain a time averaged outlet temperature the inlet and outlet temperatures for the capacity test shall be determined using the equation below:

$$t_{outlet,average} = t_{inlet,capacity\ test} + (t_{outlet,capacity\ test} - t_{inlet,capacity\ test}) * CR$$

where:

— $t_{inlet,capacity\ test}$ = evaporator water inlet temperature (for conditions B, C or D as set out in Regulation (EU) 2016/2281, Annex III, table 22 and 23)

— $t_{outlet,capacity\ test}$ = evaporator water outlet temperature (for conditions B, C or D as set out in Regulation (EU) 2016/2281, Annex III, table 22 and 23)

— $t_{outlet,average}$ = mean evaporator water average outlet temperature over an on/off cycle (for instance + 7 °C as set out in Regulation (EU) 2016/2281, Annex III, table 22 and 23)

— CR = the capacity ratio, calculated as the refrigeration load (P_R) divided by the refrigeration capacity (Pd) at the same operating condition, as follows:

$$CR = \frac{P_R(T_j)}{P_d(T_j)}$$

For determining $t_{outlet,average}$ an iterative procedure is required at all conditions (B, C, D) where the chiller refrigeration capacity (control step) is higher than the required refrigeration load.

— Test at t_{outlet} from Table 22 or 23 of Regulation (EU) 2016/2281 with the water flow rate as determined for tests at condition 'A' for chillers with a fixed water flow rate or with a fixed temperature difference for chillers with a variable flow rate;

— Calculate CR;

— Apply calculation for $t_{outlet\_average}$ to calculate the corrected $t_{outlet,capacity}$ test at which the test shall be performed in order to obtain $t_{outlet,average}$ equal to the outlet temperature as defined in Tables 22 or 23 of Annex III of Regulation (EU) 2016/2281;

— Retest with the corrected t_{outlet} and the same water flow rate;

— Recalculate CR;

— Repeat previous steps until CR and $t_{outlet,capacity\ test}$ do not change any more.

Then, for each part load conditions B, C, D the EER_{PL} is calculated as follows:

$$EER_{PL(B,C,D)} = EER_{DC(B,C,D)} \cdot \frac{CR_{(B,C,D)}}{C_{c(B,C,D)} \cdot CR_{(B,C,D)} + \left(1 - C_{c(B,C,D)}\right)}$$

where:

— EER_{DC} is the EER corresponding to the declared capacity (DC) of the unit at the same temperature conditions as for part load conditions B, C, D;

— C_c is the degradation coefficient for chillers for part load conditions B, C, D;

— CR is the capacity ratio for part load conditions B, C, D.

For chillers, the degradation due to the pressure equalization effect when the unit restarts can be considered as negligible.

The only effect that will impact the EER at cycling is the remaining power input when the compressor is switched off.

The electrical power input during the compressor off state of the unit is measured when the compressor is switched off for at least 10 min.

The degradation coefficient C_c is determined for each part load ratio as follows:

$$C_c = 1 - \frac{measured\ power\ of\ compressor\ off\ state}{total\ power\ input\ (full\ capacity\ at\ the\ part\ load\ conditions)}$$

If C_c is not determined by test then the default degradation coefficient C_c is 0,9.

(2) For variable capacity units:

Determine the declared capacity and EER_{PL} at the closest step or increment of the capacity control of the unit to reach the required refrigeration load. If this step does not allow reaching the required refrigeration load within +/- 10 % (e.g. between 9,9 kW and 8,1 kW for a required refrigeration load of 9 kW), determine the capacity and EER_{PL} at the defined part load temperatures for the steps on either side of the required refrigeration load. The part load capacity and the EER_{PL} at the required refrigeration load are then determined by linear interpolation between the results obtained from these two steps.

If the smallest control step of the unit is higher than the required refrigeration load, the EER_{PL} at the required part load ratio is calculated using the equation for fixed capacity units.

(d) The energy efficiency ratio $EER_{PL}(T_j)$ at part load conditions, different than part load conditions A, B, C, D is determined as explained below:

The EER values at each bin are determined via interpolation of the EER values at part load conditions A, B, C, D as mentioned in the Tables 22 and 23 of Regulation (EU) 2016/2281.

For part load conditions above part load condition A, the same EER values as for condition A are used.

For part load conditions below part load condition D, the same EER values as for condition D are used.

Commission communication in the framework of the implementation of Directive 1999/5/EC of the European Parliament and of the Council on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity and Directive 2014/53/EU of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC

(Publication of titles and references of harmonised standards under Union harmonisation legislation)

(Text with EEA relevance)

(2017/C 229/02)

Directive 1999/5/EC

In accordance with the transitional provision of Article 48 of Directive 2014/53/EU (¹), Member States shall not impede the making available on the market or putting into service of radio equipment covered by Directive 2014/53/EU which is in conformity with Directive 1999/5/EC (²) and which was placed on the market before 13 June 2017. Accordingly, harmonised standards the references to which have been published under Directive 1999/5/EC, as lastly listed in the Commission communication published in the *Official Journal of the European Union C 249 of 8 July 2016, p. 1*, and corrected by the corrigendum published in the *Official Journal of the European Union C 342 of 17 September 2016, p. 15*, and the corrigendum published in the *Official Journal of the European Union C 403 of 1 November 2016, p. 26*, continue to confer a presumption of conformity with that Directive until 12 June 2017.

Directive 2014/53/EU

(Publication of titles and references of harmonised standards under Union harmonisation legislation)

ESO (¹)	Reference and title of the standard (and reference document)	First publication OJ	Reference of superseded standard	Date of cessation of presumption of conformity of superseded standard Note 1	Standard aims to cover Article(s) of Directive 2014/53/EU
(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 300 065 V2.1.2 Narrow-band direct-printing telegraph equipment for receiving meteorological or navigational information (NAVTEX); Harmonised Standard covering the essential requirements of articles 3.2 and 3.3(g) of the Directive 2014/53/EU	8.7.2016			Article 3(2); Article 3(3)(g)
ETSI	EN 300 086 V2.1.2 Land Mobile Service; Radio equipment with an internal or external RF connector intended primarily for analogue speech; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	9.12.2016			Article 3(2)

(¹)　OJ L 153, 22.5.2014, p. 62.
(²)　OJ L 91, 7.4.1999, p. 10.

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 300 113 V2.2.1 Land Mobile Service; Radio equipment intended for the transmission of data (and/or speech) using constant or non-constant envelope modulation and having an antenna connector; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	12.4.2017			Article 3(2)
ETSI	EN 300 219 V2.1.1 Land Mobile Service; Radio equipment transmitting signals to initiate a specific response in the receiver; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	12.4.2017			Article 3(2)
ETSI	EN 300 220-2 V3.1.1 Short Range Devices (SRD) operating in the frequency range 25 MHz to 1 000 MHz; Part 2: Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU for non specific radio equipment	10.3.2017			Article 3(2)
ETSI	EN 300 220-3-1 V2.1.1 Short Range Devices (SRD) operating in the frequency range 25 MHz to 1 000 MHz; Part 3-1: Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU; Low duty cycle high reliability equipment, social alarms equipment operating on designated frequencies (869 200 MHz to 869 250 MHz)	10.3.2017			Article 3(2)
ETSI	EN 300 220-3-2 V1.1.1 Short Range Devices (SRD) operating in the frequency range 25 MHz to 1 000 MHz; Part 3-2: Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU; Wireless alarms operating in designated LDC/HR frequency bands 868,60 MHz to 868,70 MHz, 869,25 MHz to 869,40 MHz, 869,65 MHz to 869,70 MHz	10.3.2017			Article 3(2)

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 300 220-4 V1.1.1 Short Range Devices (SRD) operating in the frequency range 25 MHz to 1 000 MHz; Part 4: Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU; Metering devices operating in designated band 169,400 MHz to 169,475 MHz	10.3.2017			Article 3(2)
ETSI	EN 300 224-2 V1.1.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); On-site paging service; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive	8.6.2017			Article 3(2)

This harmonised standard does not address requirements relating to receiver performance parameters and does not confer a presumption of conformity as regards those parameters.

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 300 296 V2.1.1 Land Mobile Service; Radio equipment using integral antennas intended primarily for analogue speech; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	12.4.2017			Article 3(2)
ETSI	EN 300 328 V2.1.1 Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU	13.1.2017			Article 3(2)
ETSI	EN 300 330 V2.1.1 Short Range Devices (SRD); Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU	10.3.2017			Article 3(2)

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 300 341 V2.1.1 Land Mobile Service; Radio equipment using an integral antenna transmitting signals to initiate a specific response in the receiver; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	12.4.2017			Article 3(2)
ETSI	EN 300 390 V2.1.1 Land Mobile Service; Radio equipment intended for the transmission of data (and speech) and using an integral antenna; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	12.4.2017			Article 3(2)
ETSI	EN 300 422-1 V2.1.2 Wireless Microphones; Audio PMSE up to 3 GHz; Part 1: Class A Receivers; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU	10.2.2017			Article 3(2)
ETSI	EN 300 422-2 V2.1.1 Wireless Microphones; Audio PMSE up to 3 GHz; Part 2: Class B Receivers; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU	10.3.2017			Article 3(2)
ETSI	EN 300 422-3 V2.1.1 Wireless Microphones; Audio PMSE up to 3 GHz; Part 3: Class C Receivers; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU	10.3.2017			Article 3(2)
ETSI	EN 300 433 V2.1.1 Citizens' Band (CB) radio equipment; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	12.4.2017			Article 3(2)

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 300 440 V2.1.1 Short Range Devices (SRD); Radio equipment to be used in the 1 GHz to 40 GHz frequency range; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU	This is the first publication		31.12.2018	Article 3(2)

This harmonised standard does not address, for receiver categories 2 and 3 as defined in Table 5, the requirements relating to receiver performance parameters and does not confer a presumption of conformity as regards those parameters.

ETSI	EN 300 440-2 V1.4.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Short range devices; Radio equipment to be used in the 1 GHz to 40 GHz frequency range; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive	8.6.2017			Article 3(2)

This harmonised standard does not address requirements relating to receiver performance parameters and does not confer a presumption of conformity as regards those parameters.

ETSI	EN 300 454-2 V1.1.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Wide band audio links; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive	8.6.2017			Article 3(2)

This harmonised standard does not address requirements relating to receiver performance parameters and does not confer a presumption of conformity as regards those parameters.

ETSI	EN 300 487 V2.1.2 Satellite Earth Stations and Systems (SES); Harmonised Standard for Receive-Only Mobile Earth Stations (ROMES) providing data communications operating in the 1,5 GHz frequency band; Radio Frequency (RF) specifications covering the essential requirements of article 3.2 of the Directive 2014/53/EU	13.1.2017			Article 3(2)

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 300 676-2 V2.1.1 Ground-based VHF hand-held, mobile and fixed radio transmitters, receivers and transceivers for the VHF aeronautical mobile service using amplitude modulation; Part 2: Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	8.7.2016			Article 3(2)
ETSI	EN 300 698 V2.1.1 Radio telephone transmitters and receivers for the maritime mobile service operating in the VHF bands used on inland waterways; Harmonised Standard covering the essential requirements of articles 3.2 and 3.3(g) of the Directive 2014/53/EU	13.1.2017			Article 3(2); Article 3(3)(g)
ETSI	EN 300 718-2 V1.1.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Avalanche Beacons; Transmitter-receiver systems; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive	8.6.2017			Article 3(2)

This harmonised standard does not address requirements relating to receiver performance parameters and does not confer a presumption of conformity as regards those parameters.

ETSI	EN 300 718-3 V1.2.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Avalanche Beacons; Transmitter-receiver systems; Part 3: Harmonized EN covering essential requirements of article 3.3e of the R&TTE Directive	8.6.2017			Article 3(3)(g)
ETSI	EN 300 720 V2.1.1 Ultra-High Frequency (UHF) on-board vessels communications systems and equipment; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	10.3.2017			Article 3(2)

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 301 025 V2.1.1 VHF radiotelephone equipment for general communications and associated equipment for Class 'D' Digital Selective Calling (DSC); Harmonised Standard covering the essential requirements of articles 3.2 and 3.3(g) of the Directive 2014/53/EU	12.8.2016			Article 3(2); Article 3(3)(g)
ETSI	EN 301 025 V2.2.1 VHF radiotelephone equipment for general communications and associated equipment for Class 'D' Digital Selective Calling (DSC); Harmonised Standard covering the essential requirements of articles 3.2 and 3.3(g) of Directive 2014/53/EU	12.4.2017	EN 301 025 V2.1.1 Note 2.1	30.11.2018	Article 3(2); Article 3(3)(g)
ETSI	EN 301 091-2 V1.3.2 Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices; Road Transport and Traffic Telematics (RTTT); Radar equipment operating in the 76 GHz to 77 GHz range; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive	8.6.2017			Article 3(2)

This harmonised standard does not address requirements relating to receiver performance parameters and does not confer a presumption of conformity as regards those parameters.

ETSI	EN 301 166 V2.1.1 Land Mobile Service; Radio equipment for analogue and/or digital communication (speech and/or data) and operating on narrow band channels and having an antenna connector; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	10.2.2017			Article 3(2)
ETSI	EN 301 178 V2.2.2 Portable Very High Frequency (VHF) radiotelephone equipment for the maritime mobile service operating in the VHF bands (for non-GMDSS applications only); Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU	12.5.2017			Article 3(2)

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 301 357 V2.1.1 Cordless audio devices in the range 25 MHz to 2 000 MHz; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU	This is the first publication	EN 301 357-2 V1.4.1 Note 2.1	28.2.2019	Article 3(2)
ETSI	EN 301 357-2 V1.4.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Cordless audio devices in the range 25 MHz to 2 000 MHz; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive	8.6.2017			Article 3(2)

This harmonised standard does not address requirements relating to receiver performance parameters and does not confer a presumption of conformity as regards those parameters.

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 301 360 V2.1.1 Satellite Earth Stations and Systems (SES); Harmonised Standard for Satellite Interactive Terminals (SIT) and Satellite User Terminals (SUT) transmitting towards satellites in geostationary orbit, operating in the 27,5 GHz to 29,5 GHz frequency bands covering the essential requirements of article 3.2 of the Directive 2014/53/EU	11.11.2016			Article 3(2)
ETSI	EN 301 406 V2.2.2 Digital Enhanced Cordless Telecommunications (DECT); Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	11.11.2016			Article 3(2)
ETSI	EN 301 426 V2.1.2 Satellite Earth Stations and Systems (SES); Harmonised Standard for Low data rate Land Mobile satellite Earth Stations (LMES) and Maritime Mobile satellite Earth Stations (MMES) not intended for distress and safety communications operating in the 1,5 GHz/1,6 GHz frequency bands covering the essential requirements of article 3.2 of the Directive 2014/53/EU	13.1.2017			Article 3(2)

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 301 427 V2.1.1 Satellite Earth Stations and Systems (SES); Harmonised Standard for low data rate Mobile satellite Earth Stations (MES) except aeronautical mobile satellite earth stations, operating in the 11/12/14 GHz frequency bands covering the essential requirements of article 3.2 of the Directive 2014/53/EU	12.4.2017			Article 3(2)
ETSI	EN 301 428 V2.1.2 Satellite Earth Stations and Systems (SES); Harmonised Standard for Very Small Aperture Terminal (VSAT); Transmit-only, transmit/receive or receive-only satellite earth stations operating in the 11/12/14 GHz frequency bands covering the essential requirements of article 3.2 of Directive 2014/53/EU	8.6.2017			Article 3(2)
ETSI	EN 301 430 V2.1.1 Satellite Earth Stations and Systems (SES); Harmonised Standard for Satellite News Gathering Transportable Earth Stations (SNG TES) operating in the 11 GHz to 12 GHz/13 GHz to 14 GHz frequency bands covering the essential requirements of article 3.2 of the Directive 2014/53/EU	14.10.2016			Article 3(2)
ETSI	EN 301 441 V2.1.1 Satellite Earth Stations and Systems (SES); Harmonised Standard for Mobile Earth Stations (MES), including hand-held earth stations, for Satellite Personal Communications Networks (S-PCN) operating in the 1,6 GHz/2,4 GHz frequency band under the Mobile Satellite Service (MSS) covering the essential requirements of article 3.2 of the Directive 2014/53/EU	12.4.2017			Article 3(2)

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 301 442 V2.1.1 Satellite Earth Stations and Systems (SES); Harmonised Standard for NGSO Mobile Earth Stations (MES) including handheld earth stations, for Satellite Personal Communications Networks (S-PCN) operating in the 1 980 MHz to 2 010 MHz (earth-to-space) and 2 170 MHz to 2 200 MHz (space-to-earth) frequency bands under the Mobile Satellite Service (MSS) covering the essential requirements of article 3.2 of the Directive 2014/53/EU	12.4.2017			Article 3(2)
ETSI	EN 301 443 V2.1.1 Satellite Earth Stations and Systems (SES); Harmonised Standard for Very Small Aperture Terminal (VSAT); Transmit-only, transmit-and-receive, receive-only satellite earth stations operating in the 4 GHz and 6 GHz frequency bands covering the essential requirements of article 3.2 of the Directive 2014/53/EU	12.4.2017			Article 3(2)
ETSI	EN 301 444 V2.1.2 Satellite Earth Stations and Systems (SES); Harmonised Standard for Land Mobile Earth Stations (LMES) providing voice and/or data communications, operating in the 1,5 GHz and 1,6 GHz frequency bands covering the essential requirements of article 3.2 of the Directive 2014/53/EU	13.1.2017			Article 3(2)
ETSI	EN 301 447 V2.1.1 Satellite Earth Stations and Systems (SES); Harmonised Standard for satellite Earth Stations on board Vessels (ESVs) operating in the 4/6 GHz frequency bands allocated to the Fixed Satellite Service (FSS) covering the essential requirements of article 3.2 of the Directive 2014/53/EU	12.4.2017			Article 3(2)

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 301 459 V2.1.1 Satellite Earth Stations and Systems (SES); Harmonised Standard for Satellite Interactive Terminals (SIT) and Satellite User Terminals (SUT) transmitting towards satellites in geostationary orbit, operating in the 29,5 GHz to 30,0 GHz frequency bands covering the essential requirements of article 3.2 of the Directive 2014/53/EU	14.10.2016			Article 3(2)
ETSI	EN 301 473 V2.1.2 Satellite Earth Stations and Systems (SES); Harmonised Standard for Aircraft Earth Stations (AES) providing Aeronautical Mobile Satellite Service (AMSS)/Mobile Satellite Service (MSS) and/or the Aeronautical Mobile Satellite on Route Service (AMS(R)S)/Mobile Satellite Service (MSS), operating in the frequency band below 3 GHz covering the essential requirements of article 3.2 of the Directive 2014/53/EU	13.1.2017			Article 3(2)
ETSI	EN 301 502 V12.5.2 Global System for Mobile communications (GSM); Base Station (BS) equipment; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU	12.4.2017			Article 3(2)
ETSI	EN 301 511 V9.0.2 Global System for Mobile communications (GSM); Harmonized EN for mobile stations in the GSM 900 and GSM 1800 bands covering essential requirements under article 3.2 of the R&TTE directive (1999/5/EC)	12.4.2017			Article 3(2)

Notice: This harmonised standard provides presumption of conformity with the essential requirements of Directive 2014/53/EU if also the receiving parameters in clause(s) 4.2.20, 4.2.21 and 4.2.26 are applied

ETSI	EN 301 559 V2.1.1 Short Range Devices (SRD); Low Power Active Medical Implants (LP-AMI) and associated Peripherals (LP-AMI-P) operating in the frequency range 2 483,5 MHz to 2 500 MHz; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	13.1.2017			Article 3(2)

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 301 598 V1.1.1 White Space Devices (WSD); Wireless Access Systems operating in the 470 MHz to 790 MHz TV broadcast band; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive	8.6.2017			Article 3(2)

This harmonised standard does not address requirements relating to receiver performance parameters and does not confer a presumption of conformity as regards those parameters.

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 301 681 V2.1.2 Satellite Earth Stations and Systems (SES); Harmonised Standard for Mobile Earth Stations (MES) of Geostationary mobile satellite systems, including handheld earth stations, for Satellite Personal Communications Networks (S-PCN) under the Mobile Satellite Service (MSS), operating in the 1,5 GHz and 1,6 GHz frequency bands covering the essential requirements of article 3.2 of the Directive 2014/53/EU	13.1.2017			Article 3(2)
ETSI	EN 301 721 V2.1.1 Satellite Earth Stations and Systems (SES); Harmonised Standard for Mobile Earth Stations (MES) providing Low Bit Rate Data Communications (LBRDC) using Low Earth Orbiting (LEO) satellites operating below 1 GHz frequency band covering the essential requirements of article 3.2 of the Directive 2014/53/EU	12.4.2017			Article 3(2)
ETSI	EN 301 783 V2.1.1 Commercially available amateur radio equipment; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	8.7.2016			Article 3(2)

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 301 839 V2.1.1 Ultra Low Power Active Medical Implants (ULP-AMI) and associated Peripherals (ULP-AMI-P) operating in the frequency range 402 MHz to 405 MHz; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	8.7.2016			Article 3(2)
ETSI	EN 301 841-3 V2.1.1 VHF air-ground Digital Link (VDL) Mode 2; Technical characteristics and methods of measurement for ground-based equipment; Part 3: Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	13.1.2017			Article 3(2)
ETSI	EN 301 842-5 V2.1.1 VHF air-ground Digital Link (VDL) Mode 4 radio equipment; Technical characteristics and methods of measurement for ground-based equipment; Part 5: Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	13.1.2017			Article 3(2)
ETSI	EN 301 893 V1.8.1 Broadband Radio Access Networks (BRAN); 5 GHz high performance RLAN; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive	8.6.2017			Article 3(2)

This harmonised standard does not address requirements relating to receiver performance parameters and does not confer a presumption of conformity as regards those parameters.

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 301 893 V2.1.1 5 GHz RLAN; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU	8.6.2017	EN 301 893 V1.8.1 Note 2.1	12.6.2018	Article 3(2)

(1)	(2)	(3)	(4)	(5)	(6)

As regards adaptivity, until 12.6.2018, either clause 4.2.7 of this harmonised standard or clause 4.8 of harmonised standard EN 301 893 v1.8.1 may be used; after that date, only clause 4.2.7 of this harmonised standard may be used.

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 301 908-1 V11.1.1 IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 1: Introduction and common requirements	9.12.2016			Article 3(2)
ETSI	EN 301 908-2 V11.1.1 IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 2: CDMA Direct Spread (UTRA FDD) User Equipment (UE)	12.4.2017			Article 3(2)
ETSI	EN 301 908-3 V11.1.3 IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU; Part 3: CDMA Direct Spread (UTRA FDD) Base Stations (BS)	12.5.2017			Article 3(2)
ETSI	EN 301 908-10 V4.2.2 Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS), Repeaters and User Equipment (UE) for IMT-2000 Third-Generation cellular networks; Part 10: Harmonised Standard for IMT-2000, FDMA/TDMA (DECT) covering the essential requirements of article 3.2 of the Directive 2014/53/EU	13.1.2017			Article 3(2)
ETSI	EN 301 908-11 V11.1.2 IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 11: CDMA Direct Spread (UTRA FDD) Repeaters	10.2.2017			Article 3(2)

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 301 908-12 V7.1.1 IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 12: CDMA Multi-Carrier (cdma2000) Repeaters	9.9.2016			Article 3(2)
ETSI	EN 301 908-13 V11.1.1 IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 13: Evolved Universal Terrestrial Radio Access (E-UTRA) User Equipment (UE)	12.5.2017			Article 3(2)
ETSI	EN 301 908-14 V11.1.2 IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU; Part 14: Evolved Universal Terrestrial Radio Access (E-UTRA) Base Stations (BS)	12.5.2017			Article 3(2)
ETSI	EN 301 908-15 V11.1.2 IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU; Part 15: Evolved Universal Terrestrial Radio Access (E-UTRA FDD) Repeaters	10.2.2017			Article 3(2)
ETSI	EN 301 908-18 V11.1.2 IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU; Part 18: E-UTRA, UTRA and GSM/EDGE Multi-Standard Radio (MSR) Base Station (BS)	12.5.2017			Article 3(2)
ETSI	EN 301 908-19 V6.3.1 IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 19: OFDMA TDD WMAN (Mobile WiMAXTM) TDD User Equipment (UE)	8.6.2017			Article 3(2)

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 301 908-20 V6.3.1 IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 20: OFDMA TDD WMAN (Mobile WiMAXTM) TDD Base Stations (BS)	14.10.2016			Article 3(2)
ETSI	EN 301 908-21 V6.1.1 IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 21: OFDMA TDD WMAN (Mobile WiMAXTM) FDD User Equipment (UE)	14.10.2016			Article 3(2)
ETSI	EN 301 908-22 V6.1.1 IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 22: OFDMA TDD WMAN (Mobile WiMAXTM) FDD Base Stations (BS)	9.12.2016			Article 3(2)
ETSI	EN 301 929 V2.1.1 VHF transmitters and receivers as Coast Stations for GMDSS and other applications in the maritime mobile service; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU	12.4.2017			Article 3(2)
ETSI	EN 302 017 V2.1.1 Transmitting equipment for the Amplitude Modulated (AM) sound broadcasting service; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU	12.5.2017			Article 3(2)
ETSI	EN 302 018 V2.1.1 Transmitting equipment for the Frequency Modulated (FM) sound broadcasting service; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU	8.6.2017	EN 302 018-2 V1.2.1 Note 2.1	31.12.2018	Article 3(2)

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 302 018-2 V1.2.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Transmitting equipment for the Frequency Modulated (FM) sound broadcasting service; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive	12.4.2017			Article 3(2)
ETSI	EN 302 054-2 V1.2.1 Meteorological Aids (Met Aids); Radiosondes to be used in the 400,15 MHz to 406 MHz frequency range with power levels ranging up to 200 mW; Part 2: Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	13.1.2017			Article 3(2)
ETSI	EN 302 064-2 V1.1.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless Video Links (WVL) operating in the 1,3 GHz to 50 GHz frequency band; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive	8.6.2017			Article 3(2)

This harmonised standard does not address requirements relating to receiver performance parameters and does not confer a presumption of conformity as regards those parameters.

ETSI	EN 302 065-1 V2.1.1 Short Range Devices (SRD) using Ultra Wide Band technology (UWB); Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 1: Requirements for Generic UWB applications	10.3.2017			Article 3(2)
ETSI	EN 302 065-2 V2.1.1 Short Range Devices (SRD) using Ultra Wide Band technology (UWB); Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 2: Requirements for UWB location tracking	10.3.2017			Article 3(2)

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 302 065-3 V2.1.1 Short Range Devices (SRD) using Ultra Wide Band technology (UWB); Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 3: Requirements for UWB devices for ground based vehicular applications	10.3.2017			Article 3(2)
ETSI	EN 302 065-4 V1.1.1 Short Range Devices (SRD) using Ultra Wide Band technology (UWB); Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 4: Material Sensing devices using UWB technology below 10,6 GHz	12.4.2017			Article 3(2)
ETSI	EN 302 066-2 V1.2.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Ground- and Wall-Probing Radar applications (GPR/WPR) imaging systems; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive	8.6.2017			Article 3(2)

This harmonised standard does not address requirements relating to receiver performance parameters and does not confer a presumption of conformity as regards those parameters.

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 302 077-2 V1.1.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Transmitting equipment for the Terrestrial — Digital Audio Broadcasting (T-DAB) service; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive	12.4.2017			Article 3(2)
ETSI	EN 302 186 V2.1.1 Satellite Earth Stations and Systems (SES); Harmonised Standard for satellite mobile Aircraft Earth Stations (AESs) operating in the 11/12/14 GHz frequency bands covering the essential requirements of article 3.2 of the Directive 2014/53/EU	12.4.2017			Article 3(2)

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 302 194-2 V1.1.2 Electromagnetic compatibility and Radio spectrum Matters (ERM); Navigation radar used on inland waterways; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive	8.6.2017			Article 3(2)

This harmonised standard does not address requirements relating to receiver performance parameters and does not confer a presumption of conformity as regards those parameters.

ETSI	EN 302 195 V2.1.1 Short Range Devices (SRD); Ultra Low Power Active Medical Implants (ULP-AMI) and accessories (ULP-AMI-P) operating in the frequency range 9 kHz to 315 kHz Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	11.11.2016			Article 3(2)
ETSI	EN 302 208 V3.1.1 Radio Frequency Identification Equipment operating in the band 865 MHz to 868 MHz with power levels up to 2 W and in the band 915 MHz to 921 MHz with power levels up to 4 W; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	12.4.2017			Article 3(2)
ETSI	EN 302 217-2 V3.1.1 Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 2: Digital systems operating in frequency bands from 1 GHz to 86 GHz; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU	8.6.2017	EN 302 217-2-2 V2.2.1 Note 2.1	31.12.2018	Article 3(2)
ETSI	EN 302 217-2-2 V2.2.1 Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 2-2: Digital systems operating in frequency bands where frequency coordination is applied; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive	12.4.2017			Article 3(2)

(1)	(2)	(3)	(4)	(5)	(6)

Notice: This harmonised standard provides presumption of conformity with the essential requirements of Directive 2014/53/EU if also the receiving parameters in clause(s) 4.3.1, 4.3.2, 4.3.3 and 4.3.4 are applied

ETSI	EN 302 245-2 V1.1.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Transmitting equipment for the Digital Radio Mondiale (DRM) broadcasting service Part 2: Harmonized EN under article 3.2 of the R&TTE Directive	12.4.2017			Article 3(2)
ETSI	EN 302 248 V2.1.1 Navigation radar for use on non-SOLAS vessels; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	10.3.2017			Article 3(2)
ETSI	EN 302 264-2 V1.1.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices; Road Transport and Traffic Telematics (RTTT); Short Range Radar equipment operating in the 77 GHz to 81 GHz band; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive	8.6.2017			Article 3(2)

This harmonised standard does not address requirements relating to receiver performance parameters and does not confer a presumption of conformity as regards those parameters.

ETSI	EN 302 288-2 V1.6.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices; Road Transport and Traffic Telematics (RTTT); Short range radar equipment operating in the 24 GHz range; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive	8.6.2017			Article 3(2)

This harmonised standard does not address requirements relating to receiver performance parameters and does not confer a presumption of conformity as regards those parameters.

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 302 296-2 V1.2.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Transmitting equipment for the digital television broadcast service, Terrestrial (DVB-T); Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive	12.4.2017			Article 3(2)
ETSI	EN 302 326-2 V1.2.2 Fixed Radio Systems; Multipoint Equipment and Antennas; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive for Digital Multipoint Radio Equipment	12.4.2017			Article 3(2)
ETSI	EN 302 340 V2.1.1 Satellite Earth Stations and Systems (SES); Harmonised Standard for satellite Earth Stations on board Vessels (ESVs) operating in the 11/12/14 GHz frequency bands allocated to the Fixed Satellite Service (FSS) covering the essential requirements of article 3.2 of the Directive 2014/53/EU	12.4.2017			Article 3(2)
ETSI	EN 302 372 V2.1.1 Short Range Devices (SRD); Tank Level Probing Radar (TLPR) equipment operating in the frequency ranges 4,5 GHz to 7 GHz, 8,5 GHz to 10,6 GHz, 24,05 GHz to 27 GHz, 57 GHz to 64 GHz, 75 GHz to 85 GHz; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	10.3.2017			Article 3(2)
ETSI	EN 302 448 V2.1.1 Satellite Earth Stations and Systems (SES); Harmonised Standard for tracking Earth Stations on Trains (ESTs) operating in the 14/12 GHz frequency bands covering the essential requirements of article 3.2 of the Directive 2014/53/EU	12.4.2017			Article 3(2)

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 302 454-2 V1.2.1 Meteorological Aids (Met Aids); Radiosondes to be used in the 1 668,4 MHz to 1 690 MHz frequency range; Part 2: Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	13.1.2017			Article 3(2)
ETSI	EN 302 480 V2.1.2 Mobile Communication On Board Aircraft (MCOBA) systems; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU	10.3.2017			Article 3(2)
ETSI	EN 302 502 V2.1.1 Wireless Access Systems (WAS); 5,8 GHz fixed broadband data transmitting systems; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU	12.5.2017			Article 3(2)
ETSI	EN 302 510-2 V1.1.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Radio equipment in the frequency range 30 MHz to 37,5 MHz for Ultra Low Power Active Medical Membrane Implants and Accessories; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive	8.6.2017			Article 3(2)

This harmonised standard does not address requirements relating to receiver performance parameters and does not confer a presumption of conformity as regards those parameters.

ETSI	EN 302 536-2 V1.1.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment in the frequency range 315 kHz to 600 kHz; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive	8.6.2017			Article 3(2)

This harmonised standard does not address requirements relating to receiver performance parameters and does not confer a presumption of conformity as regards those parameters.

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 302 537 V2.1.1 Ultra Low Power Medical Data Service (MEDS) Systems operating in the frequency range 401 MHz to 402 MHz and 405 MHz to 406 MHz; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	13.1.2017			Article 3(2)
ETSI	EN 302 561 V2.1.1 Land Mobile Service; Radio equipment using constant or non-constant envelope modulation operating in a channel bandwidth of 25 kHz, 50 kHz, 100 kHz or 150 kHz; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	12.4.2017			Article 3(2)
ETSI	EN 302 567 V1.2.1 Broadband Radio Access Networks (BRAN); 60 GHz Multiple-Gigabit WAS/RLAN Systems; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive	8.6.2017			Article 3(2)

This harmonised standard does not address requirements relating to receiver performance parameters and does not confer a presumption of conformity as regards those parameters.

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 302 571 V2.1.1 Intelligent Transport Systems (ITS); Radiocommunications equipment operating in the 5 855 MHz to 5 925 MHz frequency band; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU	8.6.2017			Article 3(2)
ETSI	EN 302 574-1 V2.1.2 Satellite Earth Stations and Systems (SES); Harmonised Standard for Mobile Earth Stations (MES) operating in the 1 980 MHz to 2 010 MHz (earth-to-space) and 2 170 MHz to 2 200 MHz (space-to-earth) frequency bands covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 1: Complementary Ground Component (CGC) for wideband systems	12.4.2017			Article 3(2)

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 302 574-2 V2.1.2 Satellite Earth Stations and Systems (SES); Harmonised Standard for Mobile Earth Stations (MES) operating in the 1 980 MHz to 2 010 MHz (earth-to-space) and 2 170 MHz to 2 200 MHz (space-to-earth) frequency bands covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 2: User Equipment (UE) for wideband systems	12.4.2017			Article 3(2)
ETSI	EN 302 574-3 V2.1.1 Satellite Earth Stations and Systems (SES); Harmonised Standard for Mobile Earth Stations (MES) operating in the 1 980 MHz to 2 010 MHz (earth-to-space) and 2 170 MHz to 2 200 MHz (space-to-earth) frequency bands covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 3: User Equipment (UE) for narrowband systems	12.4.2017			Article 3(2)
ETSI	EN 302 608 V1.1.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment for Eurobalise railway systems; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive	8.6.2017			Article 3(2)

This harmonised standard does not address requirements relating to receiver performance parameters and does not confer a presumption of conformity as regards those parameters.

ETSI	EN 302 609 V2.1.1 Short Range Devices (SRD); Radio equipment for Euroloop railway systems; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	8.6.2017			Article 3(2)
ETSI	EN 302 617-2 V2.1.1 Ground-based UHF radio transmitters, receivers and transceivers for the UHF aeronautical mobile service using amplitude modulation; Part 2: Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	13.1.2017			Article 3(2)

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 302 686 V1.1.1 Intelligent Transport Systems (ITS); Radiocommunications equipment operating in the 63 GHz to 64 GHz frequency band; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive	8.6.2017			Article 3(2)

This harmonised standard does not address requirements relating to receiver performance parameters and does not confer a presumption of conformity as regards those parameters.

ETSI	EN 302 729 V2.1.1 Short Range Devices (SRD); Level Probing Radar (LPR) equipment operating in the frequency ranges 6 GHz to 8,5 GHz, 24,05 GHz to 26,5 GHz, 57 GHz to 64 GHz, 75 GHz to 85 GHz; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	12.5.2017			Article 3(2)
ETSI	EN 302 752 V1.1.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Active radar target enhancers; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive	8.6.2017			Article 3(2)

This harmonised standard does not address requirements relating to receiver performance parameters and does not confer a presumption of conformity as regards those parameters.

ETSI	EN 302 858-2 V1.3.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Road Transport and Traffic Telematics (RTTT); Automotive radar equipment operating in the 24,05 GHz up to 24,25 GHz or 24,50 GHz frequency range; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive	8.6.2017			Article 3(2)

This harmonised standard does not address requirements relating to receiver performance parameters and does not confer a presumption of conformity as regards those parameters.

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 302 885 V2.1.1 Portable Very High Frequency (VHF) radiotelephone equipment for the maritime mobile service operating in the VHF bands with integrated handheld class D DSC; Harmonised Standard covering the essential requirements of articles 3.2 and 3.3(g) of the Directive 2014/53/EU	13.1.2017			Article 3(2); Article 3(3)(g)
ETSI	EN 302 885 V2.2.2 Portable Very High Frequency (VHF) radiotelephone equipment for the maritime mobile service operating in the VHF bands with integrated handheld class H DSC; Harmonised Standard covering the essential requirements of articles 3.2 and 3.3(g) of Directive 2014/53/EU	12.4.2017	EN 302 885 V2.1.1 Note 2.1	31.12.2018	Article 3(2); Article 3(3)(g)
ETSI	EN 302 885 V2.2.3 Portable Very High Frequency (VHF) radiotelephone equipment for the maritime mobile service operating in the VHF bands with integrated handheld class H DSC; Harmonised Standard covering the essential requirements of articles 3.2 and 3.3(g) of Directive 2014/53/EU	12.5.2017	EN 302 885 V2.2.2 Note 2.1	31.1.2019	Article 3(2); Article 3(3)(g)
ETSI	EN 302 961 V2.1.2 Maritime Personal Homing Beacon intended for use on the frequency 121,5 MHz for search and rescue purposes only; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	11.11.2016			Article 3(2)
ETSI	EN 302 977 V2.1.1 Satellite Earth Stations and Systems (SES); Harmonised Standard for Vehicle-Mounted Earth Stations (VMES) operating in the 14/12 GHz frequency bands covering the essential requirements of article 3.2 of the Directive 2014/53/EU	12.4.2017			Article 3(2)

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 303 039 V2.1.2 Land Mobile Service; Multichannel transmitter specification for the PMR Service; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	11.11.2016			Article 3(2)
ETSI	EN 303 084 V2.1.1 Ground Based Augmentation System (GBAS) VHF ground-air Data Broadcast (VDB); Technical characteristics and methods of measurement for ground-based equipment; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	11.11.2016			Article 3(2)
ETSI	EN 303 098 V2.1.1 Maritime low power personal locating devices employing AIS; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	13.1.2017			Article 3(2)
ETSI	EN 303 132 V1.1.1 Maritime low power VHF personal locating beacons employing Digital Selective Calling (DSC); Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU	12.5.2017			Article 3(2)
ETSI	EN 303 135 V2.1.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Coastal Surveillance, Vessel Traffic Services and Harbour Radars (CS/VTS/HR); Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	13.1.2017			Article 3(2)
ETSI	EN 303 203 V2.1.1 Short Range Devices (SRD); Medical Body Area Network Systems (MBANSs) operating in the 2 483,5 MHz to 2 500 MHz range; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	12.8.2016			Article 3(2)

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 303 204 V2.1.2 Network Based Short Range Devices (SRD); Radio equipment to be used in the 870 MHz to 876 MHz frequency range with power levels ranging up to 500 mW; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	11.11.2016			Article 3(2)
ETSI	EN 303 213-6-1 V2.1.1 Advanced Surface Movement Guidance and Control System (A-SMGCS); Part 6: Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU for deployed surface movement radar sensors; Subpart 1: X-band sensors using pulsed signals and transmitting power up to 100 kW	13.1.2017			Article 3(2)
ETSI	EN 303 339 V1.1.1 Broadband Direct Air-to-Ground Communications; Equipment operating in the 1 900 MHz to 1 920 MHz and 5 855 MHz to 5 875 MHz frequency bands; Fixed pattern antennas; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU	11.11.2016			Article 3(2)
ETSI	EN 303 340 V1.1.2 Digital Terrestrial TV Broadcast Receivers; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU	11.11.2016			Article 3(2)
ETSI	EN 303 354 V1.1.1 Amplifiers and active antennas for TV broadcast reception in domestic premises; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU	12.5.2017			Article 3(2)

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 303 372-1 V1.1.1 Satellite Earth Stations and Systems (SES); Satellite broadcast reception equipment; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 1: Outdoor unit receiving in the 10,7 GHz to 12,75 GHz frequency band	13.1.2017			Article 3(2)
ETSI	EN 303 372-2 V1.1.1 Satellite Earth Stations and Systems (SES); Satellite broadcast reception equipment; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 2: Indoor unit	9.9.2016			Article 3(2)
ETSI	EN 303 406 V1.1.1 Short Range Devices (SRD); Social Alarms Equipment operating in the frequency range 25 MHz to 1 000 MHz; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU	12.4.2017			Article 3(2)
ETSI	EN 303 609 V12.5.1 Global System for Mobile communications (GSM); GSM Repeaters; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU	13.1.2017			Article 3(2)
ETSI	EN 303 978 V2.1.2 Satellite Earth Stations and Systems (SES); Harmonised Standard for Earth Stations on Mobile Platforms (ESOMP) transmitting towards satellites in geostationary orbit, operating in the 27,5 GHz to 30,0 GHz frequency bands covering the essential requirements of article 3.2 of the Directive 2014/53/EU	11.11.2016			Article 3(2)

(1)	(2)	(3)	(4)	(5)	(6)
ETSI	EN 303 979 V2.1.2 Satellite Earth Stations and Systems (SES); Harmonised Standard for Earth Stations on Mobile Platforms (ESOMP) transmitting towards satellites in non-geostationary orbit, operating in the 27,5 GHz to 29,1 GHz and 29,5 GHz to 30,0 GHz frequency bands covering the essential requirements of article 3.2 of the Directive 2014/53/EU	11.11.2016			Article 3(2)
ETSI	EN 305 550-2 V1.2.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment to be used in the 40 GHz to 246 GHz frequency range; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive	8.6.2017			Article 3(2)

This harmonised standard does not address requirements relating to receiver performance parameters and does not confer a presumption of conformity as regards those parameters.

(^{1})   ESO: European standardisation organisation:
— CEN: Avenue Marnix 17, B-1000, Brussels, Tel. +32 2 5500811; fax + 32 2 5500819 (http://www.cen.eu)
— CENELEC: Avenue Marnix 17, B-1000, Brussels, Tel. +32 2 5196871; fax + 32 2 5196919 (http://www.cenelec.eu)
— ETSI: 650, route des Lucioles, F-06921 Sophia Antipolis, Tel. +33 492 944200; fax +33 493 654716, (http://www.etsi.eu)

Note 1:   Generally the date of cessation of presumption of conformity will be the date of withdrawal ('dow'), set by the European standardisation organisation, but attention of users of these standards is drawn to the fact that in certain exceptional cases this can be otherwise.

Note 2.1: The new (or amended) standard has the same scope as the superseded standard. On the date stated, the superseded standard ceases to give presumption of conformity with the essential or other requirements of the relevant Union legislation.

Note 2.2: The new standard has a broader scope than the superseded standard. On the date stated, the superseded standard ceases to give presumption of conformity with the essential or other requirements of the relevant Union legislation.

Note 2.3: The new standard has a narrower scope than the superseded standard. On the date stated, the (partially) superseded standard ceases to give presumption of conformity with the essential or other requirements of the relevant Union legislation for those products or services that fall within the scope of the new standard. Presumption of conformity with the essential or other requirements of the relevant Union legislation for products or services that still fall within the scope of the (partially) superseded standard, but that do not fall within the scope of the new standard, is unaffected.

Note 3:   In case of amendments, the referenced standard is EN CCCCC:YYYY, its previous amendments, if any, and the new, quoted amendment. The superseded standard therefore consists of EN CCCCC:YYYY and its previous amendments, if any, but without the new quoted amendment. On the date stated, the superseded standard ceases to give presumption of conformity with the essential or other requirements of the relevant Union legislation.

NOTE:

— Any information concerning the availability of the standards can be obtained either from the European standardisation organisations or from the national standardisation bodies the list of which is published in the *Official Journal of the European Union* according to Article 27 of the Regulation (EU) No 1025/2012 (³).

— Standards are adopted by the European standardisation organisations in English (CEN and Cenelec also publish in French and German). Subsequently, the titles of the standards are translated into all other required official languages of the European Union by the national standardisation bodies. The European Commission is not responsible for the correctness of the titles which have been presented for publication in the Official Journal.

— References to Corrigenda '…/AC:YYYY' are published for information only. A Corrigendum removes printing, linguistic or similar errors from the text of a standard and may relate to one or more language versions (English, French and/or German) of a standard as adopted by a European standardisation organisation.

— Publication of the references in the *Official Journal of the European Union* does not imply that the standards are available in all the official languages of the European Union.

— This list replaces all the previous lists published in the *Official Journal of the European Union* under Directive 1999/5/EC and Directive 2014/53/EU. The European Commission ensures the updating of this list.

— More information about harmonised standards and other European standards on the Internet at

http://ec.europa.eu/growth/single-market/european-standards/harmonised-standards/index_en.htm

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(³) OJ C 338, 27.9.2014, p. 31.

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