EUCAST EUROPEAN COMMITTEE ON ANTIMICROBIAL SUSCEPTIBILITY TESTING
European Society of Clinical Microbiology and Infectious Diseases

European Committee on Antimicrobial Susceptibility Testing

Overview of antifungal ECOFFs and clinical breakpoints for yeasts, moulds and dermatophytes using the EUCAST E.Def 7.4, E.Def 9.4 and E.Def 11.0 procedures

Version 6.1, valid from 2026-04-18

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Overview of antifungal ECOFFs and clinical breakpoints for yeasts, moulds and dermatophytes using the EUCAST E.Def 7.4, E.Def 9.4 and E.Def 11.0 procedures

Version 6.1, valid from 2026-04-18

Version 6.1, valid from 2026-04-18	**Changes** Cells containing a change or an addition from document v.5.0 are marked yellow (Format changes are not marked yellow).
Yeasts	The clinical breakpoints and ECOFFs for anidulafungin, micafungin, and amphotericin B against *C. auris* were added An ECOFF for rezafungin and *C. auris* was added. (T)ECOFFs for flucytosine were added for *C. albicans, C. auris, C. parapsilosis, C. tropicalis and C. neoformans.* The column with the 'I' category was removed. Finally, the micafungin breakpoint and ECOFF for *C. glabrata* has been elevated to 0.06 mg/L.
Moulds	The ECOFF and clinical breakpoint of isavuconazole for *Aspergillus nidulans* were adjusted from 0.25 mg/L to 0.5 mg/L. The column with the 'I' category was removed The posaconazole and/or isavuconazole resistance breakpoints were adjusted for *Aspergillus fumigatus* , *Aspergillus flavus* and *Aspergillus terreus* to also cover the ATU range
Dermatophytes	

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For species not in the table, please consult: **Guidance for interpretation of MICs for yeasts when there are no breakpoints**

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Species	Drug	(T)ECOFF (mg/L)[1]	Clinical Breakpoints (mg/L)		ATU (mg/L)	Comments
		WT ≤	S ≤	R >		
C. albicans	Amphotericin B	1	1	1		
	Anidulafungin	0.016	0.016	0.016		
	Micafungin	0.03	0.03	0.03		
	Rezafungin	0.008	0.008	0.008		Breakpoints apply for MICs determined with Tween 20 supplemented medium according to the EUCAST E.Def 7.4 method.
	Fluconazole	0.5	2	4		
	Isavuconazole	ND	ND	ND		
	Itraconazole	0.03	0.06	0.06		
	Posaconazole	0.06	0.06	0.06		
	Voriconazole	0.03	0.06	0.25		
	Flucytosine	0.5	ND	ND		
C. auris	Amphotericin B	2	0.001	2		The entire *C. auris* wild-type population is in the I category
	Anidulafungin	0.25	0.25	0.25		
	Micafungin	0.25	0.25	0.25		
	Rezafungin	0.125	ND	ND		
	Fluconazole	Note	Note	ND		Note: The fluconazole susceptibility of the earliest *Candida auris* strains (likely representing the wild-type, e.g. CBS10913) was low (4 mg/L, determined in-house by EUCAST), and *C. auris* isolates with low azole MICs are still reported, particularly from South America. However, most *C. auris* isolates exhibit fluconazole MIC values >16 mg/L and harbour acquired resistance mechanisms. Due to the paucity of true wild-type, non-outbreak isolates, a fluconazole ECOFF cannot be established. Clinical data on isolates with lower MICs (≤ 16 mg/L) are very limited. Therefore, EUCAST has insufficient data to support fluconazole therapy for *C. auris*, even when the MIC is low.
	Isavuconazole	ND	ND	ND		
	Itraconazole	ND	ND	ND		
	Posaconazole	ND	ND	ND		
	Voriconazole	ND	ND	ND		
	Flucytosine	0.5	ND	ND		
C. dubliniensis	Amphotericin B	0.25	1	1		
	Anidulafungin	0.03	0.03	0.03		
	Micafungin	0.06	0.06	0.06		
	Rezafungin	0.016	0.016	0.016		Breakpoints apply for MICs determined with Tween 20 supplemented medium according to the EUCAST E.Def 7.4 method.
	Fluconazole	(0.5)*	2	4		
	Isavuconazole	ND	ND	ND		
	Itraconazole	0.06	0.06	0.06		
	Posaconazole	0.06	0.06	0.06		
	Voriconazole	0.03	0.06	0.25		
	Flucytosine	ND	ND	ND		

Overview of antifungal ECOFFs and clinical breakpoints for yeasts, moulds and dermatophytes using the EUCAST E.Def 7.4, E.Def 9.4 and E.Def 11.0 procedures

For species not in the table, please consult: **Guidance for interpretation of MICs for yeasts when there are no breakpoints**

Version 6.1, valid from 2026-04-18

Species	Drug	(T)ECOFF (mg/L)[1]	Clinical Breakpoints (mg/L)		ATU (mg/L)	Comments
		WT ≤	S ≤	R >		
C. glabrata	Amphotericin B	1	1	1		
	Anidulafungin	0.06	0.06	0.06		
	Micafungin	0.06	0.06	0.06		
	Rezafungin	0.016	0.016	0.016		Breakpoints apply for MICs determined with Tween 20 supplemented medium according to the EUCAST E.Def 7.4 method.
	Fluconazole	16	0.001	16		
	Isavuconazole	ND	ND	ND		
	Itraconazole	2	ND	ND		
	Posaconazole	1	ND	ND		
	Voriconazole	1	ND	ND		
	Flucytosine	ND	ND	ND		
C. krusei	Amphotericin B	1	1	1		
	Anidulafungin	0.06	0.06	0.06		
	Micafungin	0.25	ND	ND		
	Rezafungin	0.03	0.03	0.03		Breakpoints apply for MICs determined with Tween 20 supplemented medium according to the EUCAST E.Def 7.4 method.
	Fluconazole	128	ND	ND		
	Isavuconazole	ND	ND	ND		
	Itraconazole	1	ND	ND		
	Posaconazole	0.5	ND	ND		
	Voriconazole	1	ND	ND		
	Flucytosine	(8)	ND	ND		
C. parapsilosis	Amphotericin B	1	1	1		
	Anidulafungin	4	4	4		
	Micafungin	4	4	4		
	Rezafungin	4	4	4		Breakpoints apply for MICs determined with Tween 20 supplemented medium according to the EUCAST E.Def 7.4 method.
	Fluconazole	2	2	4		
	Isavuconazole	ND	ND	ND		
	Itraconazole	0.125	0.125	0.125		
	Posaconazole	0.06	0.06	0.06		
	Voriconazole	0.06	0.125	0.25		
	Flucytosine	(0.5)	ND	ND		

Overview of antifungal ECOFFs and clinical breakpoints for yeasts, moulds and dermatophytes using the EUCAST E.Def 7.4, E.Def 9.4 and E.Def 11.0 procedures

For species not in the table, please consult: **Guidance for interpretation of MICs for yeasts when there are no breakpoints**

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Species	Drug	(T)ECOFF (mg/L)[1]	Clinical Breakpoints (mg/L)		ATU (mg/L)	Comments
		WT ≤	S ≤	R >		
C. tropicalis	Amphotericin B	1	1	1		
	Anidulafungin	0.06	0.06	0.06		
	Micafungin	0.06	0.06	0.06		
	Rezafungin	0.03	0.03	0.03		Breakpoints apply for MICs determined with Tween 20 supplemented medium according to the EUCAST E.Def 7.4 method.
	Fluconazole	1	2	4		
	Isavuconazole	ND	ND	ND		
	Itraconazole	0.125	0.125	0.125		
	Posaconazole	0.06	0.06	0.06		
	Voriconazole	0.125	0.125	0.25		
	Flucytosine	(0.5)	ND	ND		
C. guilliermondii	Amphotericin B	(0.5)	ND	ND		Guidance for MIC interpretation found in the "What to do when there are no breakpoints - guidance for rare yeasts!" document
	Anidulafungin	2	ND	ND		Guidance for MIC interpretation found in the "What to do when there are no breakpoints - guidance for rare yeasts!" document
	Micafungin	1	ND	ND		
	Rezafungin	ND	ND	ND		
	Fluconazole	(16)	ND	ND		Guidance for MIC interpretation found in the "What to do when there are no breakpoints - guidance for rare yeasts!" document
	Isavuconazole	ND	ND	ND		
	Itraconazole	(1)	ND	ND		
	Posaconazole	0.25	ND	ND		
	Voriconazole	ND	ND	ND		Guidance for MIC interpretation found in the "What to do when there are no breakpoints - guidance for rare yeasts!" document
	Flucytosine	ND	ND	ND		
C. lusitaniae	Amphotericin B	(0.5)	ND	ND		Guidance for MIC interpretation found in the "What to do when there are no breakpoints - guidance for rare yeasts!" document
	Anidulafungin	(0.125)	ND	ND		Guidance for MIC interpretation found in the "What to do when there are no breakpoints - guidance for rare yeasts!" document
	Micafungin	0.125	ND	ND		
	Rezafungin	ND	ND	ND		
	Fluconazole	ND	ND	ND		Guidance for MIC interpretation found in the "What to do when there are no breakpoints - guidance for rare yeasts!" document
	Isavuconazole	ND	ND	ND		
	Itraconazole	0.125	ND	ND		
	Posaconazole	ND	ND	ND		
	Voriconazole	ND	ND	ND		Guidance for MIC interpretation found in the "What to do when there are no breakpoints - guidance for rare yeasts!" document
	Flucytosine	ND	ND	ND		

Overview of antifungal ECOFFs and clinical breakpoints for yeasts, moulds and dermatophytes using the EUCAST E.Def 7.4, E.Def 9.4 and E.Def 11.0 procedures

For species not in the table, please consult: **Guidance for interpretation of MICs for yeasts when there are no breakpoints**

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Species	Drug	(T)ECOFF (mg/L)[1]	Clinical Breakpoints (mg/L)		ATU (mg/L)	Comments
		WT ≤	S ≤	R >		
S. cerevisiae	Amphotericin B	(0.5)	ND	ND		Guidance for MIC interpretation found in the "What to do when there are no breakpoints - guidance for rare yeasts!" document
	Anidulafungin	(0.25)	ND	ND		Guidance for MIC interpretation found in the "What to do when there are no breakpoints - guidance for rare yeasts!" document
	Micafungin	(0.5)	ND	ND		
	Rezafungin	ND	ND	ND		
	Fluconazole	ND	ND	ND		Guidance for MIC interpretation found in the "What to do when there are no breakpoints - guidance for rare yeasts!" document
	Isavuconazole	ND	ND	ND		
	Itraconazole	(2)	ND	ND		
	Posaconazole	ND	ND	ND		
	Voriconazole	ND	ND	ND		Guidance for MIC interpretation found in the "What to do when there are no breakpoints - guidance for rare yeasts!" document
	Flucytosine	ND	ND	ND		
C. kefyr	Amphotericin B	(1)	ND	ND		Guidance for MIC interpretation found in the "What to do when there are no breakpoints - guidance for rare yeasts!" document
	Anidulafungin	0.125	ND	ND		Guidance for MIC interpretation found in the "What to do when there are no breakpoints - guidance for rare yeasts!" document
	Micafungin	0.125	ND	ND		
	Rezafungin	ND	ND	ND		
	Fluconazole	(1)	ND	ND		Guidance for MIC interpretation found in the "What to do when there are no breakpoints - guidance for rare yeasts!" document
	Isavuconazole	ND	ND	ND		
	Itraconazole	ND	ND	ND		
	Posaconazole	ND	ND	ND		
	Voriconazole	ND	ND	ND		Guidance for MIC interpretation found in the "What to do when there are no breakpoints - guidance for rare yeasts!" document
	Flucytosine	ND	ND	ND		
C. neoformans	Amphotericin B	(1)	1	1		
	Anidulafungin	ND	ND	ND		
	Micafungin	ND	ND	ND		
	Rezafungin	ND	ND	ND		
	Fluconazole	ND	ND	ND		
	Isavuconazole	ND	ND	ND		
	Itraconazole	ND	ND	ND		
	Posaconazole	0.5	ND	ND		
	Voriconazole	0.5	ND	ND		
	Flucytosine	(16)	ND	ND		

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For species not in the table, please consult: **Guidance for interpretation of MICs for yeasts when there are no breakpoints**

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Species	Drug	(T)ECOFF (mg/L)[1]	Clinical Breakpoints (mg/L)		ATU (mg/L)	Comments
		WT ≤	S ≤	R >		
C. gattii	Amphotericin B	(0.5)	ND	ND		
	Anidulafungin	ND	ND	ND		
	Micafungin	ND	ND	ND		
	Rezafungin	ND	ND	ND		
	Fluconazole	ND	ND	ND		
	Itraconazole	ND	ND	ND		
	Posaconazole	1	ND	ND		
	Voriconazole	ND	ND	ND		
	Isavuconazole	ND	ND	ND		
	Flucytosine	ND	ND	ND		

Comments: [1](T)ECOFFs: Tentative ECOFFs are indicated in parenthesis (x)
ND: Not determined.

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Species	Drug	(T)ECOFF (mg/L)[1]	Clinical Breakpoints (mg/L)		ATU (mg/L)	Comments
		WT ≤	S ≤	R >		
A. flavus	Amphotericin B	4	-	-		
	Anidulafungin	ND	ND	ND		
	Micafungin	ND	ND	ND		
	Fluconazole	ND	ND	ND		
	Isavuconazole	2	1	1	2	If voriconazole wild-type (voriconazole MIC ≤ 2 mg/L) report as isavuconazole S and add the following comment: The MIC of 2 mg/L is one dilution above the S breakpoint but within the wild-type isavuconazole MIC range for *A. flavus*. Clinically documented isavuconazole resistance in absence of voriconazole resistance is extremely rare and mechanisms conferring isavuconazole monoresistance have not been described. See rationale documents for more information. If voriconazole non wild-type report as isavuconazole R and refer to reference laboratory for CYP51A sequencing and confirmation of MICs[3]
	Itraconazole	1	1	1		For isolates with confirmed MIC 2 mg/L (one dilution above the breakpoint), itraconazole may be considered for treatment of chronic pulmonary aspergillosis when no alternative is available and when sufficient exposure (>2 mg/L) is ensured via TDM.
	Posaconazole	0.5	ND	ND		
	Voriconazole	2	ND	ND		
A. fumigatus	Amphotericin B	1	1	1		
	Anidulafungin	ND	ND	ND		
	Micafungin	ND	ND	ND		
	Fluconazole	ND	ND	ND		
	Isavuconazole	2	1	1	2	If voriconazole S, report as isavuconazole S and add the following comment: The MIC of 2 mg/L is wild type but one dilution above the S breakpoint due to overlapping wt and non-wt populations.* Clinically documented isavuconazole resistance in absence of voriconazole resistance is extremely rare and mechanisms conferring isavuconazole monoresistance have not been described. See rationale documents for more information. If not S to voriconazole, report as isavuconazole R and refer to reference laboratory for CYP51A sequencing and confirmation of MICs*
	Itraconazole	1	1	1		For isolates with confirmed MIC 2 mg/L (one dilution above the breakpoint), itraconazole may be considered for treatment of chronic pulmonary aspergillosis when no alternative is available and when sufficient exposure (>2 mg/L) is ensured via TDM.
	Posaconazole	0.25	0.125	0.125	0.25	If S to itraconazole, report as S and add the following comment: The MIC is 0.25 mg/L and thus one dilution above the S breakpoint due to overlapping wt and non-wt populations. If not S to itraconazole, report as R and refer to reference laboratory for *CYP51A* sequencing and confirmation of MICs.
	Voriconazole	1	1	1		For isolates with confirmed MIC 2 mg/L (one dilution above the breakpoint), voriconazole may be considered for treatment of chronic pulmonary aspergillosis when no alternative is available and when sufficient exposure (>2 mg/L) is ensured via TDM.

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Species	Drug	(T)ECOFF (mg/L)[1]	Clinical Breakpoints (mg/L)		ATU (mg/L)	Comments
		WT ≤	S ≤	R >		
A. nidulans	Amphotericin B	(4)**	-	-		
	Anidulafungin	ND	ND	ND		
	Micafungin	ND	ND	ND		
	Fluconazole	ND	ND	ND		
	Isavuconazole	0.5	0.5	0.5		
	Itraconazole	(1)	1	1		For isolates with confirmed MIC 2 mg/L (one dilution above the breakpoint), itraconazole may be considered for treatment of chronic pulmonary aspergillosis when no alternative is available and when sufficient exposure (>2 mg/L) is ensured via TDM.
	Posaconazole	0.5	ND	ND		
	Voriconazole	1	1	1		For isolates with confirmed MIC 2 mg/L (one dilution above the breakpoint), voriconazole may be considered for treatment of chronic pulmonary aspergillosis when no alternative is available and when sufficient exposure (>2 mg/L) is ensured via TDM.
A. niger	Amphotericin B	(0.5)	1	1		
	Anidulafungin	ND	ND	ND		
	Micafungin	ND	ND	ND		
	Fluconazole	ND	ND	ND		
	Isavuconazole	4	ND	ND		
	Itraconazole	2	ND	ND		
	Posaconazole	0.5	ND	ND		
	Voriconazole	2	ND	ND		
A. terreus	Amphotericin B	8	-	-		
	Anidulafungin	ND	ND	ND		
	Micafungin	ND	ND	ND		
	Fluconazole	ND	ND	ND		
	Isavuconazole	1	1	1		
	Itraconazole	0.5	1	1		For isolates with confirmed MIC 2 mg/L (one dilution above the breakpoint), itraconazole may be considered for treatment of chronic pulmonary aspergillosis when no alternative is available and when sufficient exposure (>2 mg/L) is ensured via TDM.
	Posaconazole	0.25	0.125	0.125	0.25	If S to itraconazole, report as S and add the following comment: The MIC is 0.25 mg/L and thus one dilution above the S breakpoint due to overlapping wt and non-wt populations.* If not S to itraconazole, report as R and refer to reference laboratory for *CYP51A* sequencing and confirmation of MICs.*
	Voriconazole	2	ND	ND		
***Fusarium* (*Gibberella*) *fujikuroi* SC**	Amphotericin B	(8)	ND	ND		
***Fusarium solani* SC**	Amphotericin B	(8)	ND	ND		

Comments:
ND: Not determined.
"-" indicates that susceptibility testing is not recommended as the species is a poor target for therapy with the drug. Isolates may be reported as R without prior testing.
* Itraconazole and posaconazole R isolates but S to voriconazole and isavuconazole are not uncommon in azole treated patients. Refer the isolate to a reference laboratory for CYP51A sequencing and confirmation of MICs.
[1](T)ECOFFs: Tentative ECOFFs are indicated in parenthesis (x)

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Species	Drug	(T)ECOFF (mg/L)[1]	Clinical Breakpoints (mg/L)			ATU (mg/L)	Recommendation for area of technical uncertainty (ATU) results
		WT ≤	S ≤	I	R >		
T. indotineae [2]	Amorolfin	(0.5)	ND		ND		
	Amphotericin B	ND	ND		ND		
	Anidulafungin	ND	ND		ND		
	Micafungin	ND	ND		ND		
	Fluconazole	ND	ND		ND		
	Isavuconazole	ND	ND		ND		
	Itraconazole	(0.25)[2]	ND		ND		
	Posaconazole	ND	ND		ND		
	Terbinafine	(0.125)	ND		ND		
	Voriconazole	(1)	ND		ND		
T. rubrum	Amorolfin	(0.125)	ND		ND		
	Amphotericin B	ND	ND		ND		
	Anidulafungin	ND	ND		ND		
	Micafungin	ND	ND		ND		
	Fluconazole	ND	ND		ND		
	Isavuconazole	ND	ND		ND		
	Itraconazole	(0.25)[2,3]	ND		ND		
	Posaconazole	ND	ND		ND		
	Terbinafine	(0.03)	ND		ND		
	Voriconazole	(0.125)	ND		ND		

Comments:

[1] (T)ECOFFs: Tentative ECOFFs are indicated in parenthesis (x).

[2] TECOFFs against *T. indotineae* (formerly the Indian variant of *T. interdigitale* and *T. mentagrophytes* ITS genotype VIII) and *T. rubrum* were determined based on a shared isolate collection tested in 10 laboratories as part of a recently published study (Multicentre validation of a EUCAST method for the antifungal susceptibility testing of microconidia-forming dermatophytes; J Antimicrob Chemother, 2020) and a comment supporting the name change (J Antimicrob Chemother, 2022).

[3] MIC distributions were wider than normally, the TECOFF is therefore associated with uncertainty. They apply to MICs determined using E.Def 11.0 and with 50% endpoint criteria.