Calculating the minimum efficiency levels

Fan type	Installation situation (A-D)	Efficiency (static or overall)	Power range P_1 in kW	Minimum efficiency	Efficiency N 2013-01-01	Efficiency N 2015-01-01
Axial fan	A, C	Static	$0.125 \le P_1 \le 10$	$\eta_{min} = 2.74 \cdot \ln(P_1) - 6.33 + N$	36	40
			$10 < P_1 \le 500$	$\eta_{min} = 0.78 \cdot \ln(P_1) - 1.88 + N$		
	B, D	Overall	$0.125 \le P_1 \le 10$	$\eta_{min} = 2.74 \cdot \ln(P_1) - 6.33 + N$	50	58
			$10 < P_1 \le 500$	$\eta_{min} = 0.78 \cdot \ln(P_1) - 1.88 + N$		
Centrifugal fan, forward curved and Centrifugal fan with radial blade ends	A, C	Static	$0.125 \le P_1 \le 10$	$\eta_{min} = 2.74 \cdot \ln(P_1) - 6.33 + N$	37	44
			$10 < P_1 \le 500$	$\eta_{min} = 0.78 \cdot \ln(P_1) - 1.88 + N$		
	B, D	Overall	$0.125 \le P_1 \le 10$	$\eta_{min} = 2.74 \cdot \ln(P_1) - 6.33 + N$	42	49
			$10 < P_1 \le 500$	$\eta_{min} = 0.78 \cdot \ln(P_1) - 1.88 + N$		
Centrifugal fan, backward curved without housing	A, C	Static	$0.125 \le P_1 \le 10$	$\eta_{min} = 4.56 \cdot \ln(P_1) - 10.5 + N$	58	62
			$10 < P_1 \le 500$	$\eta_{min} = 1.1 \cdot \ln(P_1) - 2.6 + N$		
Centrifugal fan, backward curved with housing	A, C	Static	$0.125 \le P_1 \le 10$	$\eta_{min} = 4.56 \cdot \ln(P_1) - 10.5 + N$	58	61
			$10 < P_1 \le 500$	$\eta_{min} = 1.1 \cdot \ln(P_1) - 2.6 + N$		
	B, D	Overall	$0.125 \le P_1 \le 10$	$\eta_{min} = 4.56 \cdot \ln(P_1) - 10.5 + N$	61	64
			$10 < P_1 \le 500$	$\eta_{min} = 1.1 \cdot \ln(P_1) - 2.6 + N$		
Diagonal fan	A,C	Static	$0.125 \le P_1 \le 10$	$\eta_{min} = 4.56 \cdot \ln(P_1) - 10.5 + N$	47	50
			$10 < P_1 \le 500$	$\eta_{min} = 1.1 \cdot \ln(P_1) - 2.6 + N$		
	B,D	Overall	$0.125 \le P_1 \le 10$	$\eta_{min} = 4.56 \cdot \ln(P_1) - 10.5 + N$	58	62
			$10 < P_1 \le 500$	$\eta_{min} = 1.1 \cdot \ln(P_1) - 2.6 + N$		
Tangential blower	B, D	Overall	$0.125 \le P_1 \le 10$	$\eta_{min} = 1.14 \cdot \ln(P_1) - 2.6 + N$	13	21
			$10 < P_1 \le 500$	$\eta_{min} = N$		

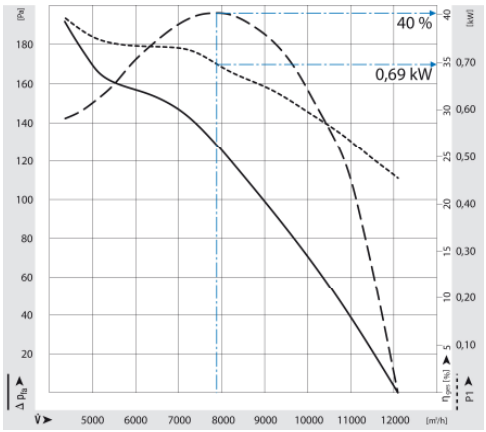
To determine the minimum efficiency levels, the EU specifies corresponding formulas that are used to calculate the limit value for each type of fan.

Example calculation for an axial fan:

Minimum efficiency η_{min} = 2.74 x ln (input capacity P_1 in kW) – 6.33 + N.

Where N is a constant defined in the directive.

This will be "36" for axial fans beginning January 2013
and "40" beginning January 2015.



For the HyBlade® axial fan illustrated with a drive output of 0.69 kW at best operating point, the formula states that an efficiency of at least 28.65% must be achieved by 2013 and at least 32.65% by 2015, based on the static pressure increase. The curve indicates 40% efficiency, which is already substantially higher than the minimum requirement for 2015. This fan thus already satisfies the future specifications.

Form 1101

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