

ISO/TR 16219:2024-08 (E)

Fans - System effects and system effect factors

Contents		Page
Foreword		iv
Introduction		v
1	Scope	1
2	Normative references	1
3	Terms, definitions and symbols	1
4	Origin of fan system effects	2
5	Definitions of system effect factor (SEF)	4
5.1	Inlet SEF	4
5.2	Outlet system effect	6
6	Examples of inlet SEF	9
6.1	Introduction	9
6.2	Axial fans	9
6.2.1	Experimental setups	9
6.2.2	Results	14
6.3	Centrifugal and mixed-flow fans	16
6.3.1	Experimental setups	16
6.3.2	Results	23
7	Examples of outlet SEF	27
7.1	Axial fans	27
7.1.1	General	27
7.1.2	Experimental setups	27
7.1.3	Results	28
7.2	Centrifugal and mixed-flow fans	29
7.2.1	Experimental setups	29
7.2.2	Results	30
8	Reducing system effects	31
8.1	General	31
8.2	Inlet effects	31
8.2.1	General	31
8.2.2	Non-uniform flow	32
8.2.3	Swirl or vorticity	33
8.2.4	Inlet blockage	33
8.3	Outlet effects	36
8.3.1	General	36
8.3.2	Insufficient duct length	36
8.3.3	Outlet obstruction	37
8.3.4	Non-uniform flow	37
8.4	Examples of the effects of poor inlet and outlet connections	40
9	Conclusions	40
Annex A (informative)	Basic principles on fan performance representation	42

Annex B (informative) Fansystem calculation	70
Annex C (informative) Changes in fanshaft input power (absorbed) in relation to system effects	79
Bibliography	80