

# DIN EN 14491:2007-08 (E)

## Dust explosion venting protective systems

---

<b>Contents</b>		<b>Page</b>
Foreword .....		4
1	Scope .....	5
2	Normative references .....	5
3	Terms and definitions .....	5
4	Venting of enclosures .....	7
5	Sizing of vent areas .....	8
5.1	General .....	8
5.2	Venting of isolated enclosures .....	8
5.3	Special dust cloud conditions .....	10
5.4	Protection of pipelines and interconnected enclosures .....	10
5.5	Protection of buildings .....	11
5.5.1	General .....	11
5.5.2	Calculating the vent area .....	12
5.5.3	Calculation of internal surface area .....	12
5.6	Influences of vent ducts .....	13
5.7	Hybrid mixtures .....	15
6	Positioning of vents .....	15
7	Supplementary design considerations .....	15
7.1	General .....	15
7.2	Explosion effects external to the vent .....	16
7.2.1	General .....	16
7.2.2	Flame effects .....	16
7.2.3	Pressure effects .....	17
7.2.4	Deflectors .....	18
7.2.5	Effects of flameless explosion venting devices .....	19
7.3	Deformation of the vented enclosure .....	19
7.3.1	Recoil forces .....	19
7.3.2	Vacuum breakers .....	20
8	Information for use .....	21
8.1	Marking .....	21
8.2	Accompanying documents .....	21
Annex A (informative)	Estimating the L/D ratio when calculating vent areas for elongated enclosures .....	22
Annex ZA (informative)	Relationship between this European Standard and the Essential Requirements of EU Directive 94/9/EC .....	27
Bibliography .....		29
Figures	Figure 1 -- Vent duct design to which Equations (10) to (11) apply .....	14
	Figure 2 -- Vent duct designs to which Equations (10) to (11) do not apply .....	14

<b>Figure 3 -- Design of a blast deflector plate .....</b>	<b>19</b>
<b>Figure A.1 -- Cylindrical enclosure with a vent in the roof .....</b>	<b>23</b>
<b>Figure A.2 -- Cylindrical enclosure with a vent in the side .....</b>	<b>23</b>
<b>Figure A.3 -- Cylindrical enclosure with a hopper and vented in the roof .....</b>	<b>24</b>
<b>Figure A.4 -- Cylindrical enclosure with a hopper and vented at the side .....</b>	<b>24</b>
<b>Figure A.5 -- Rectangular enclosure with a hopper and vented at the side .....</b>	<b>25</b>
<b>Figure A.6 -- Rectangular enclosure with a hopper and vented at the side, close to the hopper .....</b>	<b>25</b>
<b>Figure A.7 -- Calculation of a volume of a rectangular hopper .....</b>	<b>26</b>
<b>Tables Table ZA.1 -- Correspondence between this European Standard and Directive 94/9/EC .....</b>	<b>27</b>