Maximal Pressure at Ground-Zero Atomic Device Detonation 1KT

Radius of the Fireball 1KT = 75 m

Deton.Height	Pressure Max.	Radius on Ground
120 m	14 bar	76 m
150 m	7 bar	120 m
198 m	3,5 bar	135 m
240 m	2 bar	170 m
280 m	1,4 bar	210 m

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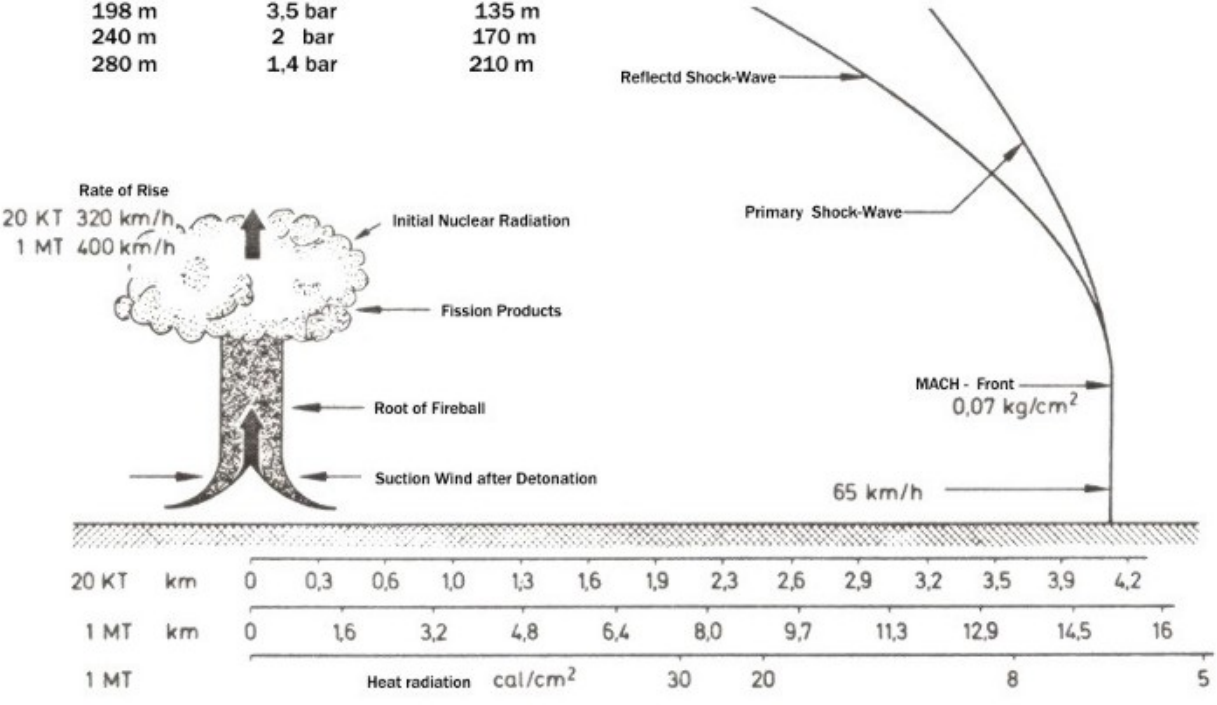
Security & Rescue System



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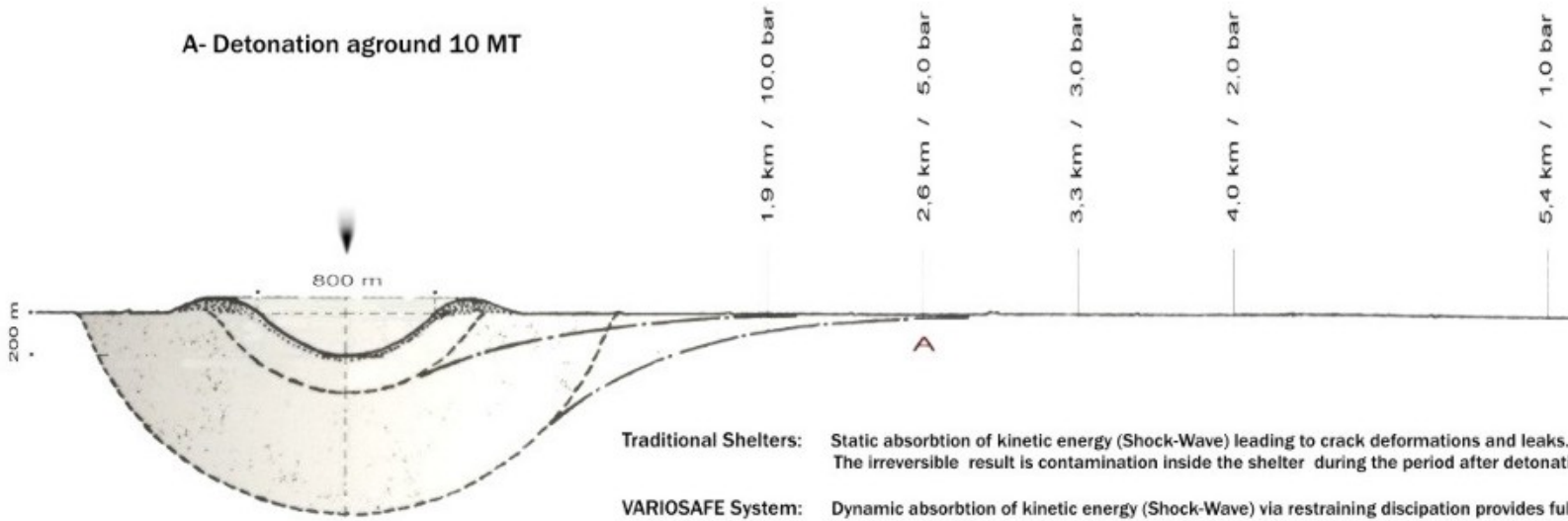
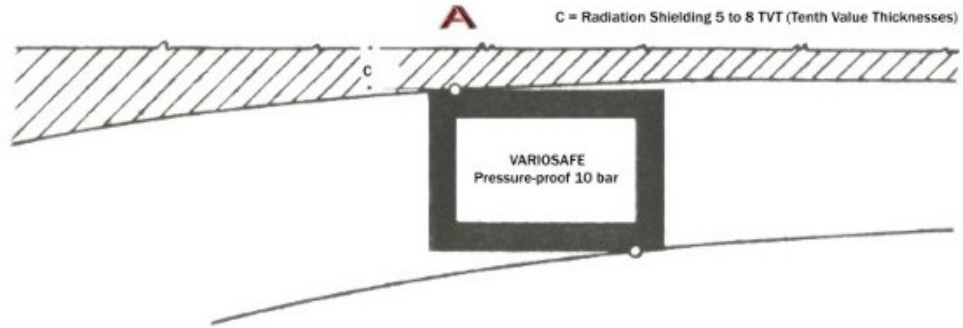
A- Detonation aground 10 MT



Traditional Shelters: Static absorbtion of kinetic energy (Shock-Wave) leading to crack deformations and leaks. The irreversible result is contamination inside the shelter during the period after detonation

VARIOSAFE System: Dynamic absorbtion of kinetic energy (Shock-Wave) via restraining discipation provides full protection by sealing off against outside contamination hazard just after detonation



Effects of Nuclear Weapons

(Physical Sight)

Initial Radiation Maximum

EMP	1 msec
Lightning	1 sec
Alpha Radiation	2 sec
Beta Radiation	2 sec
Gamma Radiation	2 sec
Neutron Radiation	2 sec
Thermal Radiation	1 – 15 sec

Subsiding Radiation

Gamma from Nuclear Cloud 1 min

Neutron Induced Gamma Radiation (NIGA)
Contamination with half-life of 15 hours.

Vagabonding Radiation
Fluctuating contamination during the sedimen-tation of Fission Products falling out of the nuclear cloud in wind-direction.

Residual Radiation
Long-term contamination from the Fallout, means mainly Alpha and Beta Radiation from the already sedimented Fission Products of high half-life and enduring danger of incorporation.

Shock-Wave

Supersonic reflected shock-wave, resulting from 14 bar at the outer border of the fireball, respectively 7 bar near outside the fireball; at greater distance soon decreasing to 5 bar, then extensively spreading with 3 bar up to the greatest possible range of destruction of 0,5 bar, consistently decreasing – subsequent turning to suction with approx. $^1/_3$ of the quoted data.

Radius of the Fireball

1	KT	75 m
20	KT	100 m
2	MT	600 m
20	MT	1.500 m

Standard Altitude of the Detonation

1 KT	100 – 300 m
20 KT	180 – 800 m
2 MT	1.200 – 3.800 m
5 MT	1.700 – 5.200 m

Radiation - Maximum Dose

Distance 500 m to ground zero of a nuclear detonation at standard altitude - average calculation without consideration of ground formation, humidity, sight, fog, clouds and air temperature measured in **rem** (Röntgen Equivalent Men)

1	KT	2.000 rem
10	KT	20.000 rem
100	KT	200.000 rem
1	MT	2.000.000 rem
10	MT	20.000.000 rem

Protection against Radiation

Civil Defense during and after Atomic Device Detonation or Atomic Power Plant Accident

X **Initial Radiation**
(Gamma / Neutrons)
Duration 1 Minute

Y **Neutron Induced Radiation**
(Gamma)
Duration 14 Days

Z **Residual Radiation**
(Alpha / Beta)
Duration 300 Days

Protection only being aimed to **X** and **Y** according to the official technical recommendation for a basic protection against Fall-Out, as well as the analogical recommendation for an intensified protection only make some sense under the precondition of a sufficient evacuation. Without evacuation within, respectively, no later than 14 days a protection like this seems to be definitely senseless due to the dangers resulting from component **Z**

Regarding the different possible strategies of military scenarios, there will be neither the necessary infrastructure needed for evacuation, nor will be left sufficient large areas without contamination - both essential requirements for an evacuation.

An effective and enduring Civil Defense Concept therefore has to be propagated without evacuation, as already stated in the valid NATO-Doctrine, defined as the so-called STAY PUT. Finally this knowledge has to lead to create an adequate Civil Defense Concept, with a residence time of up to 300 days, whereas the shelter serves first only as refuge and later, after increasing fade of contamination, as a repeatedly used survival-base.

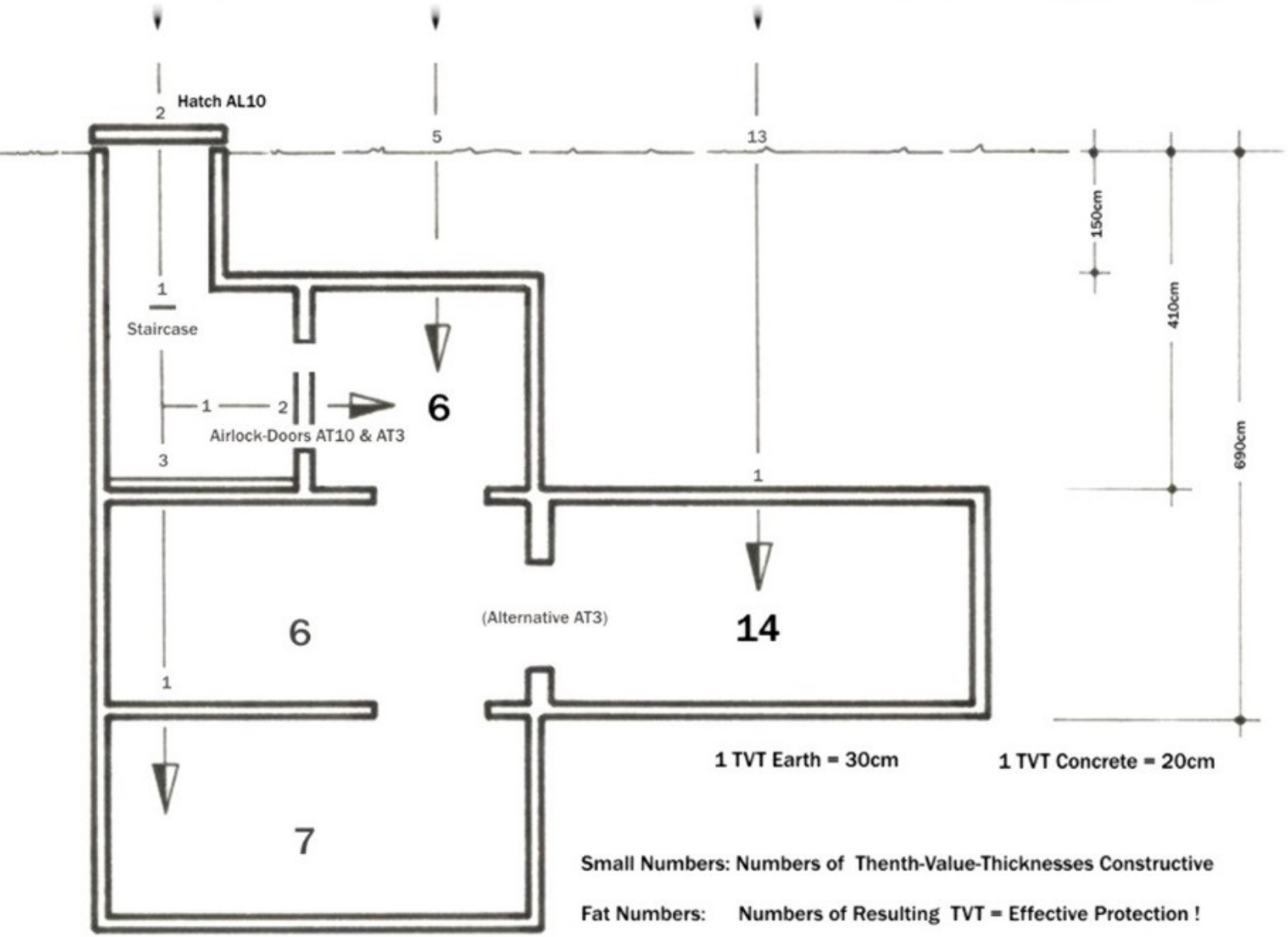
Unfortunately traditional shelters are technically not up to date and not able to meet the drastically changed requirements of today's military and civilian emergency situations.

In addition to that within such traditional shelters there is to meet not a bit of quality of life - simple reason is, that all traditional shelters represent the absolutely outdated technical standard of World War II. The world of today offers better technical solutions.

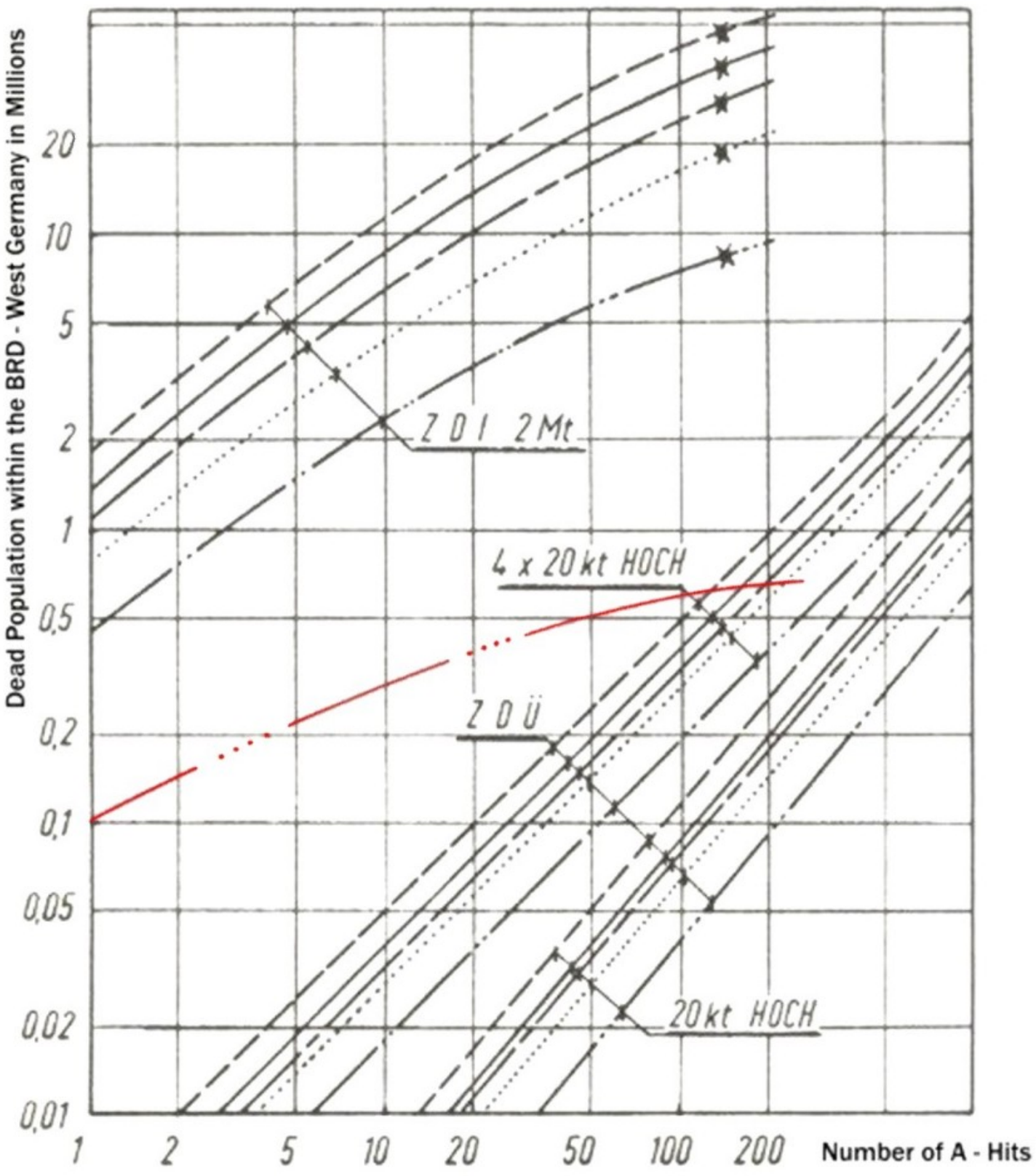
An effective, convenient, technological up to date Civil Defense Concept therefore has to reflect not the outdated, but the entire spectrum of today's hazards. It is necessary to make use of the bundle of already existing scientific perceptions finally leading to adaption to all kinds of available modern techniques.

Protection against Initial Radiation Gamma & Neutrons
Protection against Neutron Induced Radiation
Protection against Residual Radiation

VARIOSAFE®
Security & Rescue System



Mathematic Analysis of the Effects of Nuclear Weapons



— · · · · — VARIOSAFE Safety & Rescue System 10 bar

——— Average

— — — Inside Buildings

— · — Falout Shelter

· · · · · · · Traditional Shelter 0,5 bar ref. to Official Recommendations

— · · — Traditional Shelter Systems 3 bar

VARIOSAFE®
Security & Rescue System

Protection against Initial Gamma Radiation

PF	Penetration %	Steel cm	Concrete cm	Earth cm	rem	rem	rem	rem	rem	rem	
0	100	-	-	-	100	500	1000	10000	100000	1000000	Range of
1	10	6	20	30	10	50	100	1000	10000	100000	exposed stay
2	1	12	40	60	1	5	10	100	1000	10000	Range of
3	0.1	18	60	90	-	-	1	10	100	1000	conventional
4	0.01	24	80	120	-	-	-	1	10	100	shelter systems
5	0.001	30	100	150	-	-	-	-	1	10	
6	0.0001	36	120	180	-	-	-	-	-	1	
7	0.00001	42	140	210	-	-	-	-	-	-	Range of VARIOSAFE
8	0.000001	48	160	240	-	-	-	-	-	-	
9	0.0000001	54	180	270	-	-	-	-	-	-	
10	0.00000001	60	200	300	-	-	-	-	-	-	

Admissible maximal radiation stress, civil scope: Men per quarter 3rem - Women per quarter 1,5rem - Both per year 5rem
(Only this data guarantees real safety) Only in some individual case maximal 12rem

Admissible maximal radiation stress, military scope: Age minus 18 x 5rem "Still able to fight"
(This data is absolute unsuitable for efficient and credible civil defense)

PF = Penetration Factor = Number of Tenth-Value-Thicknesses according to shielding material

Filters

Preliminary Filter

Conventional sand filters (as low cost aerosol preliminary-filter) hold back only contaminated aerosols and dusts and serve mainly as a first protection against penetration of radiated or chemically contaminated particles inside the shelter. However, condensed water inside the sand filter must hold back too before being eliminated in the airlock area. The living area of the shelter has to remain absolutely free from such highly contaminated material. The fatal impact of chemical weapons as well as industrial contaminants is not to eliminate only by sand filters, because such simple filters are not able to bind or to neutralise toxic warfare agents or industrial contaminants.

Active Filter

Only active filters are able to hold back gaseous or volatile toxins and contaminants due to chemical binding, neutralisation or catalytic procedure.

To prevent a contamination of the air inside the shelter it is necessary to provide different precautions due to the various toxins and contaminants. This requirement is met by two identically constructed, thus convertible, chemically differently operating active filter elements.

Active Filter Element R3:

SOMAN – SARIN – TABUN – CYAN
PHOSGEN – HCN - ASH^3 - VX - TOLUOL

Active Filter Element K3:

CARBON DIOXIDE CO^2

Reduction of Carbon Dioxyde seems to be useful only during a limited internal air-regeneration combined by dosed short-term Oxygene supply only in case of an outside firestorm or in case of an other lack of Oxygene. Thus a suitable storage of Oxygene only needs to be dimensioned for a short period of time.

The durability of all active filters is not only based on the time of use, but rather depending to the actual concentration of contamination that is really to eliminate. Thus the capacity of the filter elements as well as the modalities of their exchange is of greatest importance.

Also the positioning of the active filters within the shelter installation is of greatest significance. Only a position within the airlock-area guarantees safe exchange and disposal of used up and just then highly contaminated filter elements.