TDA = Total Display Area

METHOD TO COMPARE THE VISIBILITY OF FOODSTUFF LOADED INTO REFRIGERATED DISPLAY CABINETS

1 Definition

1.1 The total display area is determined by the sum of vertical and horizontal projected areas from visible foodstuff, in m^2.

1.2 Where foodstuff is visible through a glazing surface, the **light transmission T_g** is taken into account as follows :

. single glass :	90 %
. double glass or 2 single glasses :	81 %
. triple glass without coating :	73 %
. specific glass with reflective or heater face(s) :	figure obtained by measurement according to ISO 9050

1.3 The opaque areas from the **frames or hand rails are deducted.** Examples : counters, graduated and glass door cabinets (see figures).

1.4 For **multi-deck and graduated** cabinets, the horizontal projected area is measured from a plan located at 1,55 m from the ground in order to take into account the visible foodstuff located in the **front part of the shelves** (see figures).

2 The Total Display Area is calculated as follows :

$$TDA = (H_o \times L_{oh}) + (H_g \times T_{gh} \times L_{gh}) + (V_o \times L_{ov}) + (V_g \times T_{gv} \times L_{gv})$$

Where :

H = Horizontal projection, in m

V = Vertical projection, in m

o = open surface

g = glazing surface

T_{gh} = light Transmission through the glazing surface for horizontal projection

T_{gv} = light Transmission through the glazing surface for vertical projection

L = cabinet Length, in m

L_{oh} = horizontal open Length

L_{ov} = vertical open Length

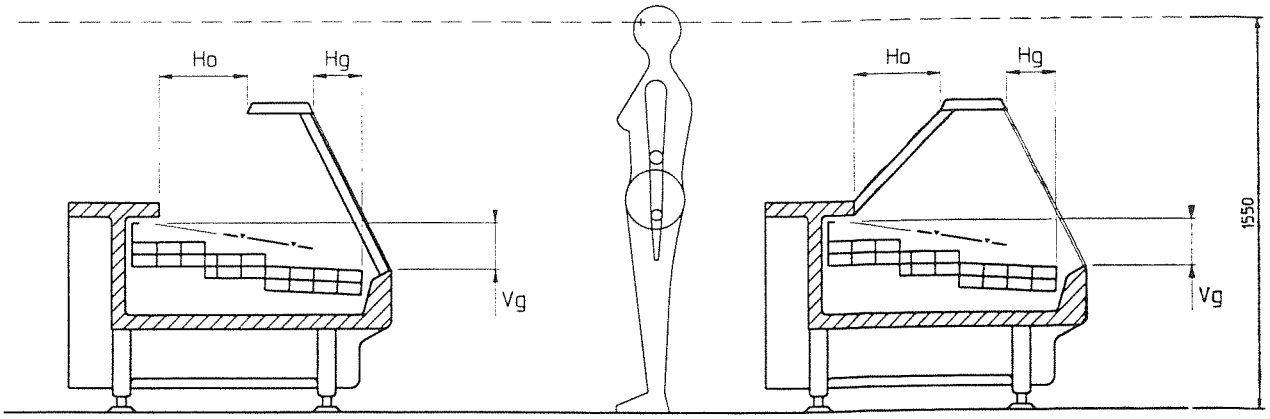
L_{gh} = horizontal glazing Length

L_{gv} = vertical glazing Length

NOTE : As an example, the glazing surface may be different for the front (T_{gv}) and for the lid (T_{gh})

Encl. : 7 figures

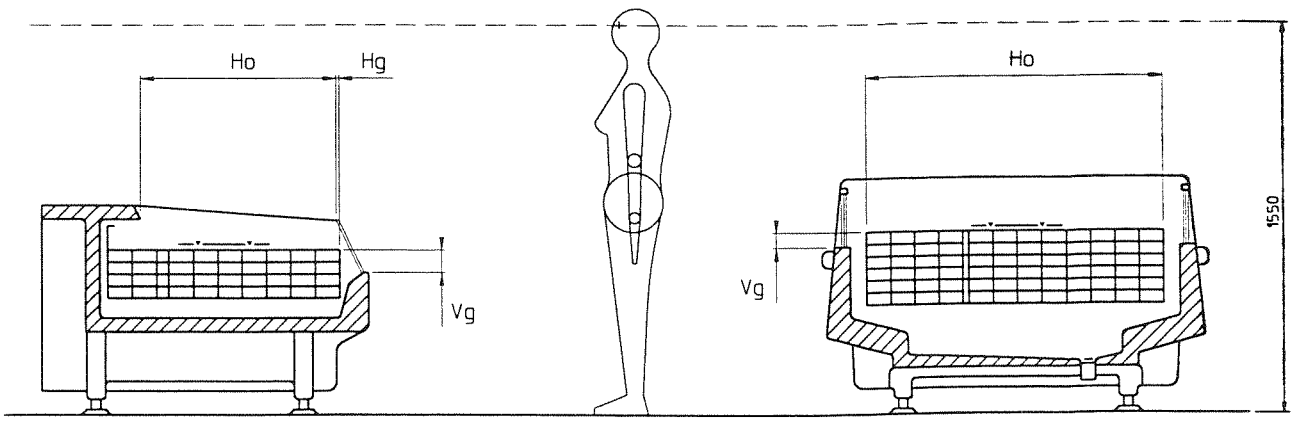
TDA calculation : examples with 2,5m length cabinets



	Loh = 2,50	Ho	0,350
Tgh = 90%	Lgh = 2,40	Hg	0,194
	Lov = 2,50	Vo	0
Tgv = 90%	Lgv = 2,40	Vg	0,185
TDA=(Ho*Loh)+(Hg*Tgh*Lgh)+(Vo*Lov)+(Vg*Tgv*Lgv)			1,694

	Loh = 2,40	Ho	0,350
Tgh = 90%	Lgh = 2,50	Hg	0,194
	Lov = 2,50	Vo	0
Tgv = 90%	Lgv = 2,50	Vg	0,185
TDA=(Ho*Loh)+(Hg*Tgh*Lgh)+(Vo*Lov)+(Vg*Tgv*Lgv)			1,693

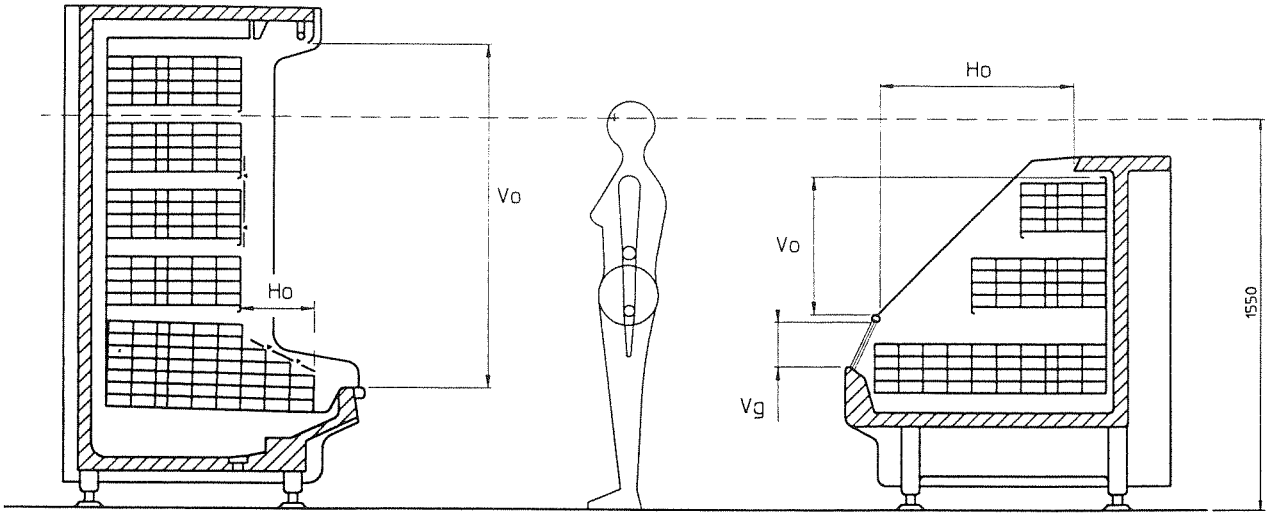
12 Counters **TDA-fig1**



	Loh = 2,50	Ho	0,770
Tgh = 90%	Lgh = 2,50	Hg	0,012
	Lov = 2,50	Vo	0
Tgv = 90%	Lgv = 2,50	Vg	0,090
TDA=(Ho*Loh)+(Hg*Tgh*Lgh)+(Vo*Lov)+(Vg*Tgv*Lgv)			2,155

	Loh = 2,50	Ho	1,176
Tgh = 100%	Lgh = 2,50	Hg	0
	Lov = 2,50	Vo	0
Tgv = 81%	Lgv = 2,40	Vg	0,058
TDA=(Ho*Loh)+(Hg*Tgh*Lgh)+(Vo*Lov)+(Vg*Tgv*Lgv)			3,053

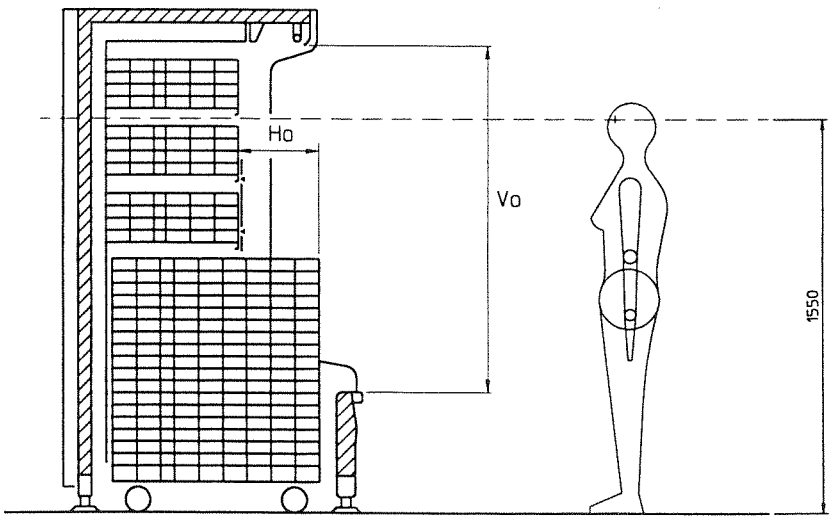
11, 13 Chest positive temperature (wall, island) **TDA-fig2**



	Loh = 2.50	Ho	0.291
Tgh = 100%	Lgh = 2.50	Hg	0
	Lov = 2.50	Vo	1.367
Tgv = 100%	Lgv = 2.50	Vg	0
TDA=(Ho*Loh)+(Hg*Tgh*Lgh)+(Vo*Lov)+(Vg*Tgv*Lgv)			4.145

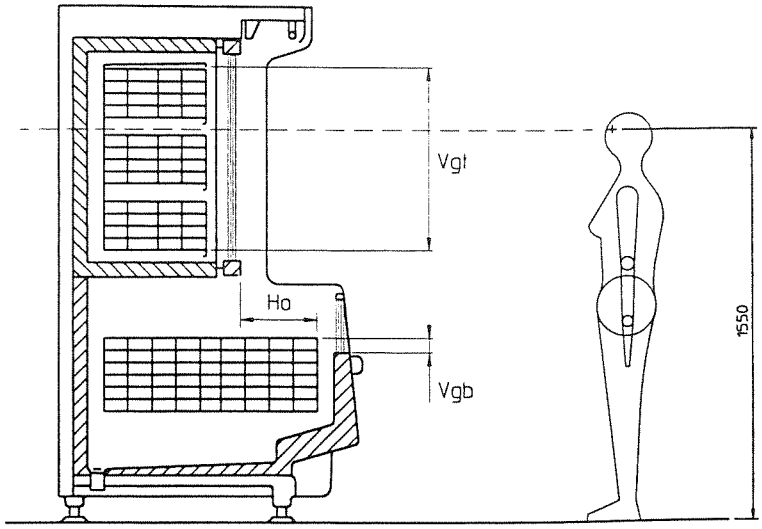
	Loh = 2.50	Ho	0.761
Tgh = 100%	Lgh = 2.50	Hg	0
	Lov = 2.50	Vo	0.546
Tgv = 81%	Lgv = 2.40	Vg	0.175
TDA=(Ho*Loh)+(Hg*Tgh*Lgh)+(Vo*Lov)+(Vg*Tgv*Lgv)			3.608

14, 15 Multi-deck (and graduated) **TDA-fig3**



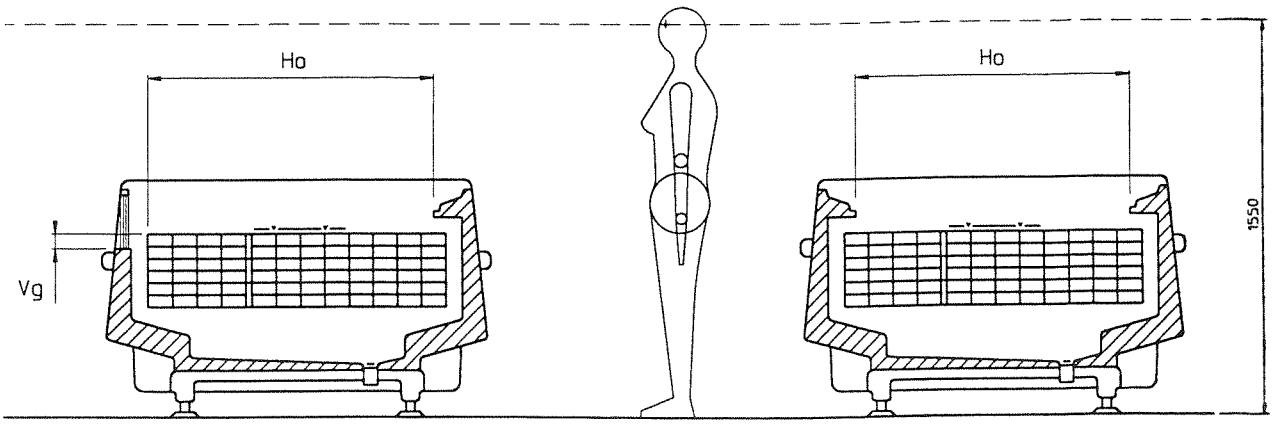
	Loh = 2.50	Ho	0.321
Tgh = 100%	Lgh = 2.50	Hg	0
	Lov = 2.50	Vo	1.367
Tgv = 100%	Lgv = 2.50	Vg	0
TDA=(Ho*Loh)+(Hg*Tgh*Lgh)+(Vo*Lov)+(Vg*Tgv*Lgv)			4.220

17 Roll-in **TDA-fig4**



	Loh = 2,50	Ho	0,306
Tgh = 100%	Lgh = 2,50	Hg	0
	Lov = 2,50	Vo	0
Tgvt = 73%	Lgv = 2,25	Vgt	0,731
Tgvb = 73%	Lgv = 2,40	Vgb	0,058
TDA=(Ho*Loh)+(Hg*Tgh*Lgh)+(Vo*Lov)+(Vg*Tgv*Lgv)			2,067

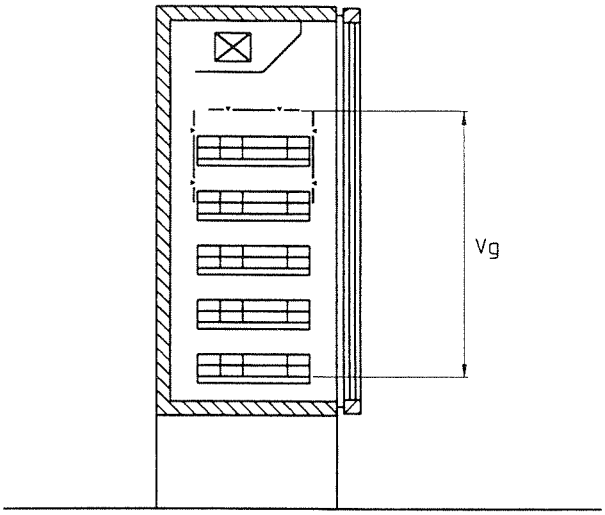
20 Combined negative temperature **TDA-fig5**



	Loh = 2,50	Ho	1,130
Tgh = 100%	Lgh = 2,50	Hg	0
	Lov = 2,50	Vo	0
Tgv = 73%	Lgv = 2,40	Vg	0,058
TDA=(Ho*Loh)+(Hg*Tgh*Lgh)+(Vo*Lov)+(Vg*Tgv*Lgv)			2,927

	Loh = 2,50	Ho	1,084
Tgh = 100%	Lgh = 2,50	Hg	0
	Lov = 2,50	Vo	0
Tgv = 100%	Lgv = 2,50	Vg	0
TDA=(Ho*Loh)+(Hg*Tgh*Lgh)+(Vo*Lov)+(Vg*Tgv*Lgv)			2,710

21, 23 Chest negative temperature (wall, island) **TDA-fig6**



	Loh = 2.50	Ho	0
Tgh = 100%	Lgh = 2.50	Hg	0
	Lov = 2.50	Vo	0
Tgv = 64%	Lgv = 2.25	Vg	1.053
TDA=(Ho*Loh)+(Hg*Tgh*Lgh)+(Vo*Lov)+(Vg*Tgv*Lgv)			1.516

26 Glass door TDA-fig7