INTER-GOVERNMENTAL MARITIME CONSULTATIVE ORGANIZATION

IMCO

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INTERNATIONAL CONFERENCE
ON TONNAGE MEASUREMENT, 1969
Technical Committee

ALTERNATIVE PROPOSAL FOR A FORMULA FOR GROSS TONNAGE

Submitted by the Netherlands Delegation

As the formula proposed in TM/CONF/C.2/WP.4 contains all anomalies of the existing system, including the possibility of increasing the total volume (V) without any limit and at the same time keeping the gross tonnage constant if the $\frac{D}{V}$ ratio is below the limit at which q (see TM/CONF/C.2/WP.4) becomes zero, the Netherlands delegation submits hereunder an alternative proposal for formula for gross tonnage based on total volume (V) and moulded volume up to the certified load line (D).

$$\text{Gross tonnage} = C \times V$$

$$\text{where } C = \sqrt{\frac{D}{V}}$$

The above proposed formula does not provide values so near to existing figures as the original proposal, but it has the advantage of not containing the existing anomalies.

The results of the application of the proposed formula are given in the attached table and in the diagram.

TM/CONF/C.2/ P.8

CONVERSION FACTOR AS A FUNCTION OF THE RATIO D/V.

$$C = \sqrt{\frac{D}{V}}$$

$\frac{D}{V}$	C	$\frac{D}{V}$	C	$\frac{D}{V}$	C
0,250	0,500	0,440	0,663	0,630	0,794
0,260	0,510	0,450	0,671	0,640	0,800
0,270	0,520	0,460	0,678	0,650	0,806
0,280	0,529	0,470	0,686	0,660	0,812
0,290	0,539	0,480	0,693	0,670	0,819
0,300	0,548	0,490	0,700	0,680	0,825
0,310	0,557	0,500	0,707	0,690	0,831
0,320	0,566	0,510	0,714	0,700	0,837
0,330	0,574	0,520	0,721	0,710	0,843
0,340	0,583	0,530	0,728	0,720	0,849
0,350	0,592	0,540	0,735	0,730	0,854
0,360	0,600	0,550	0,742	0,740	0,860
0,370	0,608	0,560	0,748	0,750	0,866
0,380	0,616	0,570	0,755	0,760	0,872
0,390	0,625	0,580	0,762	0,770	0,878
0,400	0,632	0,590	0,768	0,780	0,883
0,410	0,640	0,600	0,775	0,790	0,889
0,420	0,648	0,610	0,781	0,800	0,894
0,430	0,656	0,620	0,787	0,810	0,900

CALCULATION OF "TONNAGE" FOR SEVERAL TYPES OF SHIPS

No.	Total moulded volume V M^3	Volume up to the certified load line D^3 M	$\frac{D}{V}$	C according to table formula	V x C (Tonnage) M^3	Present gross Tonnage M^3	Difference M^3	Difference %	
1	40809	22910	0.561	0.749	30566	35102	- 4536	12.9	
2	64808	37580	0.580	0.762	49384	56614	- 7230	12.8	
3	63456	32350	0.510	0.714	45308	55678	- 10 370	18.6	LPG Tanker (with freeboard)
4	40355	24734	0.613	0.783	31598	35300	- 3702	10.5	
5	77111	48900	0.634	0.797	61457	66748	- 5291	7.9	
6	98771	62935	0.637	0.798	78819	88426	- 9607	10.9	
7	97866	64705	0.661	0.813	79565	87903	- 8338	9.5	
8	121189	82900	0.684	0.828	100344	108022	- 7678	7.1	
9	184091	125550	0.682	0.826	152059	164038	- 11979	7.3	
12	5158	3100	0.601	0.776	4003	3612	+ 391	10.8	
17	1012	558	0.551	0.743	752	735	+ 17	2.3	
22	1592	850	0.534	0.731	1164	1131	+ 33	3	
28	19180	9030	0.471	0.687	13177	10924	+ 2253	20.6	
29	27352	12245	0.448	0.670	18326	14625	+ 3701	25.3	
30	29765	15040	0.505	0.711	21163	18618	+ 2545	13.7	
31	30066	15100	0.502	0.709	21317	19725	+ 1592	8	
23	5543	2183	0.394	0.628	3481	1407	+ 2074	147.4	Paragraph ship

ALTERNATE PROPOSAL BY THE NETHERLANDS

GROSS TONNAGE = C x V

V = TOTAL MOULDED VOLUME OF CLOSED SPACES.

D = MOULDED VOLUME UP TO CERTIFIED LOADLINE.

PROPOSAL C : TONNAGE = V x 0.833.

ALTERNATIVE PROPOSAL: " " = V x C (AS PER TABLE)

IF NO CONV. FACTOR IS WANTED: " " = V.

C = 1.0 (NO CONVERSION FACTOR)

"SHIP WITH FREEBOARD"

PROPOSAL C. C = 0.833.

$\frac{100}{120} = 0.833$

C (AS PROPOSED BY TABLE)

$\frac{D+V}{2}$

$C = D/V$ (RESULTING IN DISPLACEMENT D)

⊕ CALCULATED BY: $\frac{\text{PRESENT GROSS TONNAGE}}{V}$

⊕ 23 ← (TANKER EACH SHIP)

DANISH PROPOSAL: $V \times \frac{D}{V} = D$

C

0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0

$\frac{D}{V}$ → $\frac{D}{V}$ →