UG943 Single Seals

Standard Mechanical Seals - Elastomer Bellows Seals



Product Description

- 1. Single seal configuration
- 2. Unbalanced design
- 3. Independent of direction of rotation
- 4. For plain shafts
- 5. Rotary elastomer bellows design

Technical Features

- 1. Low cost seal solution
- 2. Suitable for mild sterile applications
- 3. No damage to the shaft

Typical Industrial Applications

Performance Capabilities

Hydrocarbons

Marine

Solvents

Lubricating liquid

d₁ = 10 ... 100 mm (0.375" ... 4") $p_1 = 12 \text{ bar} (174 \text{ PSI}), \text{ vacuum}$

up to 0.5 bar (7.25 PSI), up to 1 bar (14.5 PSI) with seat locking

t = -20 °C ...+ 140 °C

(-4°F...+284 °F) 10 m/s(33ft/s)

± 0.5 mm

Standards

Materials

Carbon graphite antimony impregnated (A),Carbon graphite resin impregnated (B),Silicon

carbide (Q1) Seat: Silicon

oxide (V) Elastomer:

HNBR (X4)

CrNiMo steel (G)

carbide (Q1,Q2),Aluminum

NBR(P), EPDM (E), FKM (D),

Water and waste water

Acids

Caustics

Chemicals

Aqueous solutions

Crystallizing fluids Food and beverage

Shaft diameter

Pressure

Temperature

Axial movement

Speed

EN 12756 FDA

Seal face

Metal parts

- 4. Can be employed for low solids content
- 5. Multifaceted application usage

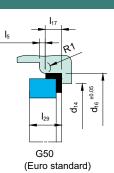
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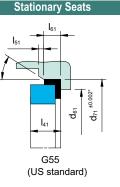
Note: The item numbers as depicted above are based on our technical experience and knowledge and are placed in the chronological order of their assembly procedure.

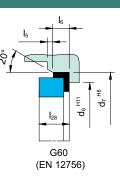
Note

A modular principle comprising a bellows unit for each shaft diameter and a corresponding cylindrical spring for individual length compensation to I₁ installation length. UG943 can also be used as a multiple seal in tandem or in a back-to-back arrangement.

The entire UG943 series is available in metric and inch sizes.







Item Description 1.1 Seal face Bellows 1.2 Driver collar 1.3 1.4 "L" ring (spring collar) Washer 1.5 1.6 Corner Ring 2 Spring 3 Seat 4 O-ring DIN 24250





Jimone	sions in	inch						isional								
d ₁		d ₆	d ₇	d ₁₄	d ₁₆	d ₆₁	d ₇₁	4	l5	I ₆	I ₁₇	I ₂₈	I ₂₉	l ₄₁	1-4	امد
	0.787								0.059						I ₅₁	I ₆₁
0.375		0.669	0.827	0.433	0.969	0.625	0.875	0.941		0.157	0.295	0.260	0.354	0.313	0.050	0.250
0.500	0.866	0.748	0.906	0.531	1.094	0.750	1.000	0.941	0.059	0.157	0.295	0.260	0.354	0.313	0.050	0.250
0.625	1.024	0.906	1.063	0.669	1.219	0.937	1.250	1.039	0.059	0.157	0.354	0.260	0.413	0.406	0.050	0.344
0.750	1.339	1.142	1.378	0.846	1.406	1.062	1.375	1.083	0.079	0.197	0.354	0.295	0.413	0.406	0.050	0.344
0.875	1.417	1.220	1.457	0.906	1.469	1.187	1.500	1.083	0.079	0.197	0.354	0.295	0.413	0.406	0.050	0.344
1.000	1.535	1.339	1.575	1.043	1.594	1.312	1.625	1.181	0.079	0.197	0.354	0.295	0.413	0.437	0.050	0.375
1.125	1.654	1.457	1.693	1.161	1.876	1.437	1.750	1.280	0.079	0.197	0.413	0.295	0.472	0.437	0.050	0.375
1.250	1.811	1.654	1.890	1.280	2.000	1.563	1.875	1.280	0.079	0.197	0.413	0.295	0.472	0.437	0.050	0.375
1.375	1.929	1.732	1.969	1.437	2.126	1.687	2.000	1.280	0.079	0.197	0.413	0.295	0.472	0.437	0.050	0.375
1.500	2.126	1.929	2.205	1.555	2.250	1.813	2.125	1.339	0.079	0.236	0.413	0.354	0.472	0.437	0.050	0.375
1.625	2.205	2.008	2.283	1.673	2.376	2.000	2.375	1.339	0.079	0.236	0.413	0.354	0.472	0.500	0.050	0.437
	2.402	2.205	2.480	1.811	2.500	2.125	2.500	1.339	0.079	0.236		0.354	0.472	0.500	0.050	0.437
1.750											0.413					
1.875	2.520	2.323	2.598	1.929	2.626	2.250	2.625	1.339	0.079	0.236	0.413	0.354	0.472	0.500	0.050	0.437
2.000	2.598	2.441	2.756	2.047	2.750	2.375	2.750	1.358	0.098	0.236	0.472	0.374	0.531	0.500	0.050	0.437
2.125	2.717	2.559	2.874	2.185	2.876	2.375	3.000	1.358	0.098	0.236	0.472	0.433	0.531	0.562	0.050	0.500
2.250	3.071	2.756	3.071	2.421	3.126	2.437	3.125	1.555	0.098	0.236	0.472	0.433	0.531	0.562	0.050	0.500
2.375	3.150	2.835	3.150	2.421	3.126	2.563	3.250	1.555	0.098	0.236	0.472	0.433	0.531	0.562	0.050	0.500
2.500	3.268	2.953	3.268	2.559	3.250	2.687	3.375	1.465	0.098	0.236	0.472	0.433	0.531	0.562	0.050	0.500
2.625	3.465	3.189	3.543	2.795	3.750	2.812	3.375	1.465	0.098	0.276	0.571	0.445	0.630	0.625	0.100	0.562
2.750	3.543	3.268	3.622	2.795	3.750	2.937	3.500	1.760	0.098	0.276	0.571	0.445	0.630	0.625	0.100	0.562
2.875	-	-	- 0.022	2.100	-	3.062	3.750	1.760	-		-	-		0.625	0.100	0.562
3.000	3.898	3.465	3.819	3.051	4.000	3.187	3.875	1.760	0.098	0.276	0.571	0.445	0.630	0.625	0.100	0.562
							3.075 4.000			0.276	0.571	0.445				
3.125	4.094	3.740	4.134	3.307	4.500	3.312		1.744	0.118	0.270			0.787	0.781	0.100	0.656
3.250	-	-	-	-	-	3.437	4.125	1.744	-	-	-	-	-	0.781	0.100	0.656
3.375	4.291	3.937	4.331	3.425	4.626	3.562	4.250	1.744	0.118	0.276	0.728	0.551	0.787	0.781	0.100	0.656
3.500	4.488	4.134	4.528	3.681	4.876	3.687	4.375	1.941	0.118	0.276	0.728	0.551	0.787	0.781	0.100	0.656
3.625	-	-	-	-	-	3.812	4.500	1.941	-	-	-	-	-	0.781	0.100	0.656
3.750	4.685	4.331	4.724	3.799	5.000	3.937	4.625	1.941	0.118	0.276	0.728	0.551	0.787	0.781	0.100	0.656
3.875	-	-	-	-	-	4.062	4.750	1.941	-	-	-	-	-	0.781	0.100	0.656
4.000	4.882	4.528	4.921	4.055	5.250	4.187	4.875	1.941	0.118	0.276	0.728	0.551	0.787	0.781	0.100	0.656
Dimens	sions in	millime	ter													
Dimens d1	sions in _{d3}	millime d6	d7	d ₁₄	d ₁₆	d ₆₁	d ₇₁	I ₁	I5	I ₆	I ₁₇	I ₂₈	I ₂₉	I ₄₁	I ₅₁	I ₆₁
d ₁	d ₃	d ₆	d ₇													
d ₁ 10	d ₃ 20	d ₆ 17	d ₇ 21	11.0	24.60	15.88	22.23	3 23.	9 1.5	4	7.5	6.6	9.0	7.95	1.27	6.35
d ₁ 10 12	d₃ 20 22	d ₆ 17 19	d7 21 23	11.0 13.5	24.60 27.80			3 23. 0 23.	9 1.5 9 1.5	4 4	7.5 7.5	6.6 6.6	9.0 9.0			
d ₁ 10 12 14	d₃ 20 22 24	d ₆ 17 19 21	d7 21 23 25	11.0 13.5 17.0	24.60 27.80 30.95	15.88	22.23	3 23.	9 1.5 9 1.5 4 1.5	4 4 4	7.5 7.5 9.0	6.6 6.6 6.6	9.0 9.0 10.5	7.95	1.27	6.35
d ₁ 10 12 14 15	d3 20 22 24	d ₆ 17 19 21	d7 21 23 25	11.0 13.5 17.0 17.0	24.60 27.80 30.95 30.95	15.88 19.05 -	22.23 25.40	3 23.9 0 23.9 - 26.4 -	9 1.5 9 1.5 4 1.5 	4 4 4	7.5 7.5 9.0 9.0	6.6 6.6 6.6	9.0 9.0 10.5 10.5	7.95 7.95 -	1.27 1.27 -	6.35 6.35 -
d ₁ 10 12 14 15 16	d3 20 22 24 - 26	d ₆ 17 19 21 - 23	d7 21 23 25 27	11.0 13.5 17.0 17.0 17.0	24.60 27.80 30.95 30.95 30.95	15.88	22.23	3 23.9 0 23.9 - 26.4 - 5 26.4	9 1.5 9 1.5 4 1.5 4 1.5	4 4 4 - 4	7.5 7.5 9.0 9.0 9.0	6.6 6.6 6.6 - 6.6	9.0 9.0 10.5 10.5 10.5	7.95	1.27	6.35
d1 10 12 14 15 16 18	d3 20 22 24 - 26 32	d ₆ 17 19 21 - 23 27	d7 21 23 25 - 27 33	11.0 13.5 17.0 17.0 17.0 20.0	24.60 27.80 30.95 30.95 30.95 34.15	15.88 19.05 - 23.80	22.23 25.40 31.75	3 23. 0 23. - 26. - 5 26. - 27.	9 1.5 9 1.5 4 1.5 4 1.5 5 2.0	4 4 - 4 5	7.5 7.5 9.0 9.0 9.0 9.0	6.6 6.6 - 6.6 7.5	9.0 9.0 10.5 10.5 10.5 10.5	7.95 7.95 - 10.31	1.27 1.27 - 1.27 1.27	6.35 6.35 - - 8.74 -
d1 10 12 14 15 16 18 20	d₃ 20 22 24 - 26 32 34	d ₆ 17 19 21 - 23 27 29	d7 21 23 25 25 27 33 35	11.0 13.5 17.0 17.0 17.0 20.0 21.5	24.60 27.80 30.95 30.95 30.95 34.15 35.70	15.88 19.05 - 23.80 - 26.97	22.23 25.40 31.75 34.93	3 23. 0 23. - 26. - 5 26. - 27. 3 27.	9 1.5 9 1.5 4 1.5 4 1.5 5 2.0 5 2.0	4 4 - 4 5 5	7.5 7.5 9.0 9.0 9.0 9.0 9.0 9.0	6.6 6.6 - 6.6 7.5 7.5	9.0 9.0 10.5 10.5 10.5 10.5 10.5	7.95 7.95 - 10.31 10.31	1.27 1.27 - 1.27 - 1.27	6.35 6.35 - 8.74 - 8.74
d1 10 12 14 15 16 18 20 22	d₃ 20 22 24 - 26 32 34 36	d ₆ 17 19 21 - 23 27 29 31	d7 21 23 25 27 33 35 37	11.0 13.5 17.0 17.0 17.0 20.0 21.5 23.0	24.60 27.80 30.95 30.95 30.95 34.15 35.70 37.30	15.88 19.05 - 23.80	22.23 25.40 31.75	3 23.9 0 23.9 - 26.9 - 26.9 5 26.9 - 27.9 3 27.9 0 27.9	9 1.5 9 1.5 4 1.5 4 1.5 5 2.0 5 2.0 5 2.0	4 4 - 4 5 5 5 5	7.5 7.5 9.0 9.0 9.0 9.0 9.0 9.0 9.0	6.6 6.6 - 6.6 7.5 7.5 7.5	9.0 9.0 10.5 10.5 10.5 10.5 10.5 10.5	7.95 7.95 - 10.31	1.27 1.27 - 1.27 1.27	6.35 6.35 - - 8.74 -
d1 10 12 14 15 16 18 20	d₃ 20 22 24 - 26 32 34	d ₆ 17 19 21 - 23 27 29	d7 21 23 25 25 27 33 35	11.0 13.5 17.0 17.0 17.0 20.0 21.5	24.60 27.80 30.95 30.95 30.95 34.15 35.70	15.88 19.05 - 23.80 - 26.97	22.23 25.40 31.75 34.93 38.10	3 23. 0 23. - 26. - 5 26. - 27. 3 27.	9 1.5 9 1.5 4 1.5 4 1.5 5 2.0 5 2.0 5 2.0	4 4 - 4 5 5	7.5 7.5 9.0 9.0 9.0 9.0 9.0 9.0	6.6 6.6 - 6.6 7.5 7.5	9.0 9.0 10.5 10.5 10.5 10.5 10.5	7.95 7.95 - 10.31 10.31	1.27 1.27 - 1.27 - 1.27	6.35 6.35 - 8.74 - 8.74
d1 10 12 14 15 16 18 20 22	d₃ 20 22 24 - 26 32 34 36	d ₆ 17 19 21 - 23 27 29 31	d7 21 23 25 27 33 35 37	11.0 13.5 17.0 17.0 17.0 20.0 21.5 23.0	24.60 27.80 30.95 30.95 30.95 34.15 35.70 37.30	15.88 19.05 - 23.80 - 26.97 30.15	22.23 25.40 31.75 34.93 38.10	3 23.3 0 23.3 - 26.4 - 26.4 - 27.3 3 27.3 0 27.3 - 30.1	9 1.5 9 1.5 4 1.5 4 1.5 5 2.0 5 2.0 5 2.0 0 2.0	4 4 - 4 5 5 5 5	7.5 7.5 9.0 9.0 9.0 9.0 9.0 9.0 9.0	6.6 6.6 - 6.6 7.5 7.5 7.5	9.0 9.0 10.5 10.5 10.5 10.5 10.5 10.5	7.95 7.95 - 10.31 10.31 10.31	1.27 1.27 - 1.27 1.27 1.27 1.27	6.35 6.35 - - 8.74 8.74 8.74 8.74
d1 10 12 14 15 16 18 20 22 24 24 25	d₃ 20 22 24 26 32 34 36 38 39	d ₆ 17 19 21 23 27 29 31 33 34	d7 21 23 25 27 33 35 37 39 40	11.0 13.5 17.0 17.0 20.0 21.5 23.0 26.5 26.5	24.60 27.80 30.95 30.95 30.95 34.15 35.70 37.30 40.50	15.88 19.05 - 23.80 - 26.97 30.15 - 33.32	22.23 25.40 31.75 34.93 38.10 41.28	3 23.3 0 23.3 - 26. - 5 26.3 - 27.3 3 27.3 0 27.3 - 30.0 8 30.1	9 1.5 9 1.5 4 1.5 - - 4 1.5 5 2.0 5 2.0 5 2.0 5 2.0 0 2.0 0 2.0 0 2.0	4 4 - 4 5 5 5 5 5 5 5	7.5 7.5 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0	6.6 6.6 6.6 7.5 7.5 7.5 7.5 7.5 7.5	9.0 9.0 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10	7.95 7.95 - 10.31 10.31 10.31 10.31 - 11.10	1.27 1.27 1.27 1.27 1.27 1.27 1.27	6.35 6.35 - 8.74 8.74 8.74 8.74 9.53
d1 10 12 14 15 16 18 20 22 24 25 28	d₃ 20 22 24 26 32 34 36 38 39 42	d ₆ 17 19 21 - 23 27 29 31 33 34 37	d7 21 23 25 27 33 35 37 39 40 43	11.0 13.5 17.0 17.0 20.0 21.5 23.0 26.5 26.5 29.5	24.60 27.80 30.95 30.95 34.15 35.70 37.30 40.50 40.50 47.65	15.88 19.05 - 23.80 - 26.97 30.15	22.23 25.40 31.75 34.93 38.10 41.28 44.45	3 23.3 0 23.2 - 26.7 5 26.2 - 27.3 3 27.3 0 27.3 - 30.1 8 30.2 5 32.5	9 1.5 9 1.5 4 1.5 - - 4 1.5 5 2.0 5 2.0 5 2.0 0 2.0 0 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0	4 4 - 4 5 5 5 5 5 5 5 5 5 5	7.5 7.5 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 10.5	6.6 6.6 6.6 7.5 7.5 7.5 7.5 7.5 7.5 7.5	9.0 9.0 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10	7.95 7.95 10.31 10.31 10.31 10.31 11.10 11.10	1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27	6.35 6.35 - - 8.74 8.74 8.74 8.74
d1 10 12 14 15 16 18 20 22 24 25 28 30	d3 20 22 24 26 32 34 36 38 39 42 44	d ₆ 17 19 21 - 23 27 29 31 33 34 37 39	d7 21 23 25 27 33 35 37 39 40 43 45	11.0 13.5 17.0 17.0 20.0 21.5 23.0 26.5 29.5 32.5	24.60 27.80 30.95 30.95 34.15 35.70 37.30 40.50 40.50 47.65 50.80	15.88 19.05 - 23.80 - 26.97 30.15 - 33.32 36.50	22.23 25.40 31.75 34.93 38.10 41.28 44.45	3 23.3 0 23.2 - 26 5 26 5 26 - 27 3 27 30.0 27 - 30.0 5 32 - 32	9 1.5 9 1.5 4 1.5 - - 4 1.5 5 2.0 5 2.0 0 2.0 0 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0	4 4 - 4 5 5 5 5 5 5 5 5 5 5 5 5	7.5 7.5 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 10.5 10.5	6.6 6.6 6.6 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5	9.0 9.0 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10	7.95 7.95 10.31 10.31 10.31 10.31 11.10 11.10	1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27	6.35 6.35 - 8.74 8.74 8.74 8.74 9.53 9.53
d1 10 12 14 15 16 18 20 22 24 25 28 30 32	 d₃ 20 22 24 26 32 34 36 38 39 42 44 46 	d6 17 19 21 - 23 27 29 31 33 34 37 39 42	d7 21 23 25 - 27 33 35 37 39 40 43 45 48	11.0 13.5 17.0 17.0 20.0 21.5 23.0 26.5 20.5 32.5 32.5	24.60 27.80 30.95 30.95 34.15 35.70 37.30 40.50 40.50 47.65 50.80	15.88 19.05 - 23.80 - 26.97 30.15 - 33.32 36.50 - 39.70	22.23 25.40 31.75 34.93 38.10 41.28 44.45	3 230 - 260 - - 5 262 - - 3 273 0 273 - 30.1 8 30.1 5 323 - 323	9 1.5 9 1.5 1.5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0	4 4 - 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	7.5 7.5 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 10.5 10.5	6.6 6.6 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5	9.0 9.0 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10	7.95 7.95 10.31 10.31 10.31 10.31 11.10 11.10 11.10	1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27	6.35 6.35 - 8.74 8.74 8.74 8.74 9.53 9.53 9.53
d1 10 12 14 15 16 18 20 22 24 25 28 30 32 33	d3 20 22 24 - 26 32 34 36 38 39 42 44 46 47	d6 17 19 21 - 23 27 29 31 33 34 37 39 42 42	d7 21 23 25 27 33 35 37 39 40 43 45 48 48	11.0 13.5 17.0 17.0 20.0 21.5 23.0 26.5 29.5 32.5 32.5 36.5	24.60 27.80 30.95 30.95 33.95 35.70 37.30 40.50 40.50 47.65 50.80 50.80	15.88 19.05 23.80 26.97 30.15 33.32 36.50 	22.23 25.40 31.75 34.90 38.10 41.20 44.45 47.60 47.60	3 230 2 260 - 260 - 270 3 270 - 30.0 8 30.0 5 320 - 320 3 320 3 320 3 320	9 1.5 9 1.5 1.5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0	4 4 - 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	7.5 7.5 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 10.5 10.5 10.5	6.6 6.6 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5	9.0 9.0 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10.5 12.0 12.0 12.0	7.95 7.95 10.31 10.31 10.31 10.31 11.10 11.10 11.10 11.10	1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27	6.35 6.35 - 8.74 8.74 8.74 8.74 9.53 9.53 9.53
d1 10 12 14 15 16 18 20 22 24 25 28 30 32 33 35	d3 20 22 24 - 26 32 34 36 38 39 42 44 46 47 49	d6 17 19 21 - 23 27 29 31 33 34 37 39 42 42 44	d7 21 23 25 27 33 35 37 39 40 43 45 48 48 50	11.0 13.5 17.0 17.0 20.0 21.5 23.0 26.5 29.5 32.5 32.5 36.5 36.5	24.60 27.80 30.95 30.95 34.15 35.70 37.30 40.50 40.50 47.65 50.80 50.80 54.00	15.88 19.05 - 23.80 - 26.97 30.15 - 33.32 36.50 - 39.70 39.70 39.70 42.85	22.23 25.40 31.73 34.90 38.10 41.20 44.43 47.63 47.63 50.80	3 23. 0 23. - 26. - 25. 5 26. - 27 3 27 0 27 - 30 5 32 - 32 3 32 3 32 0 32	9 1.5 99 1.5 4 1.5 - - 4 1.5 5 2.0 5 2.0 5 2.0 5 2.0 5 2.00 5 2.00 5 2.00 5 2.00 5 2.00 5 2.00 5 2.00 5 2.00 5 2.00 5 2.00	4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	7.5 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0	6.6 6.6 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5	9.0 9.0 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10.5 12.0 12.0 12.0 12.0 12.0	7.95 7.95 10.31 10.31 10.31 10.31 11.10 11.10 11.10 11.10	1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27	6.35 6.35 - 8.74 8.74 8.74 9.53 9.53 9.53 9.53
d1 10 12 14 15 16 18 20 22 24 25 28 30 32 33 35 38	d3 20 22 24 - 26 32 34 36 38 39 42 44 46 47 49 54	d6 17 19 21 - 23 27 29 31 33 34 37 39 42 42 44 49	d7 21 23 25 - 27 33 35 37 39 40 43 45 48 48 50 56	11.0 13.5 17.0 17.0 20.0 21.5 23.0 26.5 29.5 32.5 36.5 36.5 39.5	24.60 27.80 30.95 30.95 34.15 35.70 37.30 40.50 40.50 47.65 50.80 50.80 54.00 54.00	15.88 19.05 23.80 26.97 30.15 33.32 36.50 39.70 39.70 39.70 42.85 46.05	22.23 25.40 31.73 34.93 38.10 41.26 44.43 47.63 47.63 50.80 53.96	3 23.3 0 23.3 - 26.7 5 26.7 - 27.3 3 27.3 0 27.3 - 30.0 5 32.5 - 32.3 3 32.3 3 32.3 3 32.3 8 34.1	9 1.5 9 1.5 4 1.5 - - 4 1.5 5 2.0	4 4 - 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	7.5 7.5 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 10.5 10.5 10.5 10.5 10.5	6.6 6.6 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5	9.0 9.0 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10.5 12.0 12.0 12.0 12.0 12.0 12.0 12.0	7.95 7.95 10.31 10.31 10.31 10.31 11.10 11.10 11.10 11.10 11.10	1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27	6.35 6.35 - 8.74 8.74 8.74 9.53 9.53 9.53 9.53 9.53
d1 10 12 14 15 16 18 20 22 24 25 28 30 32 33 35 38 40	d3 20 22 24 - 26 32 34 36 38 39 42 44 46 47 49 54 56	d6 17 19 21 - 23 27 29 31 33 34 37 39 42 42 44 49 51	d7 21 23 25 27 33 35 37 39 40 43 45 48 48 50 56 58	11.0 13.5 17.0 17.0 20.0 21.5 23.0 26.5 29.5 32.5 36.5 36.5 39.5 42.5	24.60 27.80 30.95 30.95 34.15 35.70 37.30 40.50 40.50 47.65 50.80 50.80 54.00 54.00 57.15 60.35	15.88 19.05 - 23.80 - 26.97 30.15 - 33.32 36.50 - 39.70 39.70 39.70 42.85	22.23 25.40 31.73 38.10 41.20 44.43 47.63 47.63 50.80 53.96 60.33	3 23. 0 23. - 26. - 7. 5 26. - 27. 3 27. 0 27. - 30. 5 32. - 32. 3 32. 3 32. 0 32. 8 34. 3 34.	9 1.5 9 1.5 4 1.5 - - 4 1.5 5 2.0	4 4 - 4 5 5 5 5 5 5 5 5 5 5 5 5 5 6 6 6	7.5 7.5 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 10.5 10.5 10.5 10.5 10.5	6.6 6.6 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5	9.0 9.0 10.5 10.5 10.5 10.5 10.5 10.5 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0	7.95 7.95 10.31 10.31 10.31 10.31 11.10 11.10 11.10 11.10 11.10 11.10	1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27	6.35 6.35 - 8.74 8.74 8.74 9.53 9.53 9.53 9.53
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d1 10 12 14 15 16 18 20 22 24 25 28 30 32 33 35 38 40 43 45	d3 20 22 24 - 26 32 34 36 38 39 42 44 46 47 49 54 56	d6 17 19 21 - 23 27 29 31 33 34 37 39 42 42 44 49 51	d7 21 23 25 27 33 35 37 39 40 43 45 48 48 50 56 58	11.0 13.5 17.0 17.0 20.0 21.5 23.0 26.5 29.5 32.5 36.5 36.5 39.5 42.5	24.60 27.80 30.95 30.95 34.15 35.70 37.30 40.50 40.50 47.65 50.80 50.80 54.00 54.00 57.15 60.35	15.88 19.05 23.80 26.97 30.15 33.32 36.50 39.70 39.70 39.70 42.85 46.05	22.23 25.40 31.73 38.10 41.20 44.43 47.63 47.63 50.80 53.96 60.33	3 23. 0 23. - 26. - 7. 5 26. - 27. 3 27. 0 27. - 30. 8 30. 5 32. - 32. 3 32. 0 32. 8 34. 3 34. - 34.	9 1.5 9 1.5 4 1.5 - - 4 1.5 5 2.0 0 2.0 0 2.0 0 2.0 0 2.0	4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 6 6 6 6 6	7.5 7.5 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 10.5 10.5 10.5 10.5 10.5	6.6 6.6 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5	9.0 9.0 10.5 10.5 10.5 10.5 10.5 10.5 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0	7.95 7.95 10.31 10.31 10.31 10.31 11.10 11.10 11.10 11.10 11.10 11.10	1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27	6.35 6.35 - 8.74 8.74 8.74 9.53 9.53 9.53 9.53 9.53
d1 10 12 14 15 16 18 20 22 24 25 28 30 32 33 35 38 40 43	d3 20 22 24 - 26 32 34 36 38 39 42 44 46 47 49 54 56 59	d6 17 19 21 - 23 27 29 31 33 34 37 39 42 42 44 49 51 54	d7 21 23 25 27 33 35 37 39 40 43 45 48 48 50 56 58 61	11.0 13.5 17.0 17.0 20.0 21.5 23.0 26.5 29.5 32.5 36.5 36.5 39.5 42.5	24.60 27.80 30.95 30.95 34.15 35.70 37.30 40.50 40.50 47.65 50.80 54.00 54.00 54.00 57.15 60.35 63.50	15.88 19.05 23.80 26.97 30.15 33.32 36.50 39.70 39.70 39.70 42.85 46.05 50.80	22.22 25.40 31.73 34.90 38.10 41.28 44.45 47.60 47.60 50.80 53.98 60.33	3 23. 0 23. - 26. - 27. 3 27. 0 27. - 30. 5 32. - 32. 3 32. 3 32. 0 32. 3 34. - 34. 0 34.	9 1.5 9 1.5 4 1.5 - - 4 1.55 5 2.00 6 2.00 7 2.00 0 2.00	4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 6 6 6 6 6	7.5 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0	6.6 6.6 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5	9.0 9.0 10.5 10.5 10.5 10.5 10.5 10.5 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0	7.95 7.95 10.31 10.31 10.31 10.31 11.10 11.10 11.10 11.10 11.10 11.10 11.10	1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27	6.35 6.35 - 8.74 8.74 8.74 9.53 9.53 9.53 9.53 9.53 9.53 11.10
d1 10 12 14 15 16 18 20 22 24 25 28 30 32 33 35 38 40 43 45	d3 20 22 24 - 26 32 34 36 38 39 42 44 46 47 56 59 61	d6 17 19 21 - 23 27 29 31 33 34 37 39 42 44 49 51 54 56	d7 21 23 25 - 27 33 35 37 39 40 43 40 43 50 56 58 61 63	11.0 13.5 17.0 17.0 20.0 21.5 23.0 26.5 29.5 32.5 36.5 39.5 42.5 46.0	24.60 27.80 30.95 30.95 34.15 35.70 37.30 40.50 40.50 47.65 50.80 54.00 54.00 54.00 57.15 60.35 63.50	15.88 19.05 - 23.80 - 26.97 30.15 - 33.32 36.50 - 39.70 39.70 39.70 42.85 46.05 50.80	22.22 25.40 31.73 34.90 38.10 41.28 44.45 47.60 50.80 53.99 60.33	3 23. 0 23. - 26. - 27. 3 27. - 30.0 5 32. - 32. 3 32. 3 32. 3 32. 3 32. 3 34. - 34. 0 34. 8 34.	9 1.5 9 1.5 4 1.5 5 2.0 5 2.0 5 2.0 0 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 5 2.0 0 2.0 0 2.0 0 2.0 0 2.0 0 2.0 0 2.0	4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 6 6 6 6	7.5 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0	6.6 6.6 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5	9.0 9.0 10.5 10.5 10.5 10.5 10.5 10.5 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0	7.95 7.95 10.31 10.31 10.31 10.31 11.10 11.10 11.10 11.10 11.10 11.10 11.10 12.70	1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.27	6.35 6.35 - 8.74 8.74 8.74 9.53 9.53 9.53 9.53 9.53 9.53 11.10 - 11.10
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