

SICAKLIK BİRİMLERİ ÇEVİRİM FORMÜLLERİ

| İlk Ölçek | Çevrilerin Ölçek | Formül |
|------------|------------------|---|
| Celsius | Fahrenheit | $^{\circ}\text{F} = (^{\circ}\text{C} \times 1.8) + 32$ |
| Fahrenheit | Celsius | $^{\circ}\text{C} = (^{\circ}\text{F} - 32) / 1.8$ |
| Celsius | Kelvin | $\text{K} = (^{\circ}\text{C} + 273.15)$ |
| Kelvin | Celsius | $^{\circ}\text{C} = \text{K} - 273.15$ |

SICAKLIK KARŞILAŞTIRMA TABLOSU
°C-°F

| C | F | C | F | C | F |
|------|------|-----|-------|-----|-------|
| -200 | -328 | 22 | 71.6 | 180 | 356 |
| -190 | -310 | 23 | 73.4 | 190 | 374 |
| -180 | -292 | 24 | 75.2 | 210 | 410 |
| -170 | -274 | 25 | 77 | 212 | 413.6 |
| -160 | -256 | 26 | 78.8 | 220 | 428 |
| -150 | -238 | 27 | 80.6 | 230 | 446 |
| -140 | -220 | 28 | 82.4 | 240 | 464 |
| -130 | -202 | 29 | 84.2 | 250 | 482 |
| -120 | -184 | 30 | 86 | 260 | 500 |
| -110 | -166 | 31 | 87.8 | 270 | 518 |
| -100 | -148 | 32 | 89.6 | 280 | 536 |
| -90 | -130 | 33 | 91.4 | 290 | 554 |
| -80 | -112 | 34 | 93.2 | 300 | 572 |
| -70 | -94 | 35 | 95 | 310 | 590 |
| -60 | -76 | 36 | 96.8 | 320 | 608 |
| -50 | -58 | 37 | 98.6 | 330 | 626 |
| -40 | -40 | 38 | 100.4 | 340 | 644 |
| -30 | -22 | 39 | 102.2 | 350 | 662 |
| -20 | -4 | 40 | 104 | 360 | 680 |
| -10 | 14 | 41 | 105.8 | 370 | 698 |
| 0 | 32 | 42 | 107.6 | 380 | 716 |
| 1 | 33.8 | 43 | 109.4 | 390 | 734 |
| 2 | 35.6 | 44 | 111.2 | 400 | 752 |
| 3 | 37.4 | 45 | 113 | 410 | 770 |
| 4 | 39.2 | 46 | 114.8 | 420 | 788 |
| 5 | 41 | 47 | 116.6 | 430 | 806 |
| 6 | 42.8 | 48 | 118.4 | 440 | 824 |
| 7 | 44.6 | 49 | 120.2 | 450 | 842 |
| 8 | 46.4 | 50 | 122 | 460 | 860 |
| 9 | 48.2 | 55 | 131 | 470 | 878 |
| 10 | 50 | 60 | 140 | 480 | 896 |
| 11 | 51.8 | 70 | 158 | 490 | 914 |
| 12 | 53.6 | 80 | 176 | 500 | 932 |
| 13 | 55.4 | 90 | 194 | 510 | 950 |
| 14 | 57.2 | 100 | 212 | 520 | 968 |
| 15 | 59 | 110 | 230 | 530 | 986 |
| 16 | 60.8 | 120 | 248 | 540 | 1004 |
| 17 | 62.6 | 130 | 266 | 550 | 1022 |
| 18 | 64.4 | 140 | 284 | 560 | 1040 |
| 19 | 66.2 | 150 | 302 | 570 | 1058 |
| 20 | 68 | 160 | 320 | 580 | 1076 |
| 21 | 69.8 | 170 | 338 | 600 | 1112 |

ÜLKERE GÖRE MALZEME NOMLARI

| Ws. no. | DIN Almanya | BS* İngiltere |
|-----------|--------------------|------------------|
| 0.6020 | GG-20 | Grade 220 |
| 0.6025 | GG-25 | Grade 260 |
| 0.6030 | GG-30 | Grade 300 |
| 0.7040 | GGG-40 | Grade 420/12 |
| 0.7043 | GGG-40.3 | Grade 370/17 |
| 1.0037 | St.37-2 | Fe 360 B |
| 1.0065 | St.37-1 | A40 A20 |
| 1.0305 | St.35.8 | |
| 1.0308 | St.35 | |
| 1.0402 | C22 | 070 M 20 |
| 1.0425 | H11 | 1501 Gr. 161-400 |
| 1.0460 | C 22.8 | |
| 1.0501 | C35 | 060 A 35 |
| 1.0503 | C 45 | 080 M 46 |
| 1.0570 | St.52.3 | Fe 510 D1 FF |
| 1.0619 | GS-C 25 | 1504-161 Gr.B |
| 1.0619.01 | GS-C 25N | 1504-161 Gr.B |
| 1.0711 | 9S20 | |
| 1.0718 | 9SMn Pb 28K | |
| 1.1151 | Ck22 | 055 M 15 |
| 1.1156 | GS-Ck24 | |
| 1.1181 | Ck 35 | 080 A 35 |
| 1.1203 | Ck 55 | 2 C 55/XC 55 H1 |
| 1.3964 | X4CrNiMnMon19 16 5 | |
| 1.4000 | X6Cr13 | 403 S 17 |
| 1.4001 | X6Cr17 | 403 S 17 |
| 1.4006 | X10Cr13 | 403 S 21 |
| 1.4016 | X6Cr17 | 430 S 15 |
| 1.4021 | X20Cr13 | 420 S 37 |
| 1.4024 | X15Cr13 | 420 S 29 |
| 1.4034 | X46Cr13 | 420 S 45 |
| 1.4057 | X20CrNi 17 2 | 431 S 29 |
| 1.4104 | X12CrMoS17 | |
| 1.4110 | X55CrMo14 | |
| 1.4119 | X15CrMo13 | |
| 1.4122 | X35CrMo17 | |
| 1.4136 | G-X70CrMo29 2 | |
| 1.4300 | X12CrNi18 8 | 302 S 25 |
| 1.4301 | X5CrNi18 10 | 304 S 17 |
| 1.4305 | X10CrNiS 18 9 | 303 S 22/31 |
| 1.4306 | G-X2CrNi 18 9 | 304/305 S 11 |
| 1.4308 | G-X6CrNi 18 9 | 304 C/15 |
| 1.4310 | X12CrNi17 7 | 301 S 21/22 |
| 1.4312 | G-X10CrNi 18 8 | 302 C 25 |
| 1.4401 | X5CrNiMo 17 12 2 | 316 S 13/17/19 |
| 1.4404 | G-x2CrNiMo 18 10 | 316 S11/13/14 |
| 1.4408 | G-x6CrNiMo 18 10 | 316 C 16 |
| 1.4410 | G-x10CrNiMo 18 9 | |
| 1.4435 | X2CrNiMo 18 14 3 | 316 S 11/13/14 |

BORULARDA GENLEŞME MİKTARININ HESAPLANMASI

Borulardaki genleşme; sıcaklık farkı, boru uzunluğu ve malzeme cinsine göre tesbit edilir.

$$\Delta L = \alpha \cdot L \cdot \Delta T$$

ΔL : Boru genleşmesi (mm)

α : Sıcaklığa bağlı katsayı (mm/m°C)

0-100 °C için 0,011

100 - 200 °C için 0,012

200 - 300 °C için 0,013

300 - 400 °C için 0,0134

L : Boru uzunluğu (m)

ΔT : Sıcaklık farkı ($T_1 - T_2$)

ÇELİK BORULARDAKİ GENLEŞME MİKTARI (16 °C' den)

| Boru Yüzeyindeki Sıcaklık | Her 30m'deki genleşme miktarı |
|---------------------------|-------------------------------|
| 65°C | 19 mm |
| 95°C | 30 mm |
| 120°C | 40 mm |
| 150°C | 51 mm |
| 175°C | 60 mm |
| 205°C | 74 mm |
| 235°C | 85 mm |
| 260°C | 97 mm |