

EXPANSION AND CONTRACTION

All piping products expand and contract with changes in temperature. Linear expansion and contraction of any pipe on the longitudinal axis relates to the coefficient of thermal expansion for the specific material used in the manufacturing of the product. Variation in pipe length due to thermal expansion or contraction depends on the coefficient of thermal expansion and the variation in temperature (ΔT). It should be noted that change in pipe diameter or wall thickness with piping material properties remaining constant does effect a change in rates of thermal expansion or contraction.

Approximate coefficients of thermal expansion for different pipe materials are presented below. Expansion and contraction of PVC piping in response to change in temperature will vary slightly with changes in PVC compounds. However, these coefficients can be considered reasonably accurate.

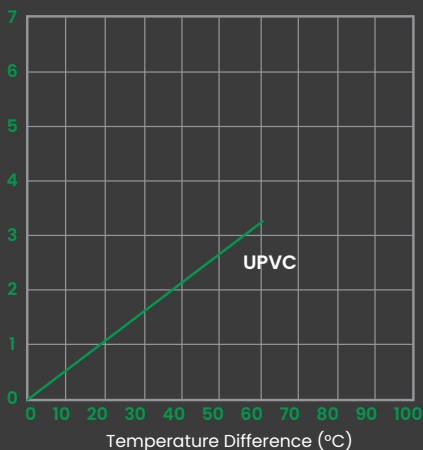
COEFFICIENTS OF THERMAL EXPANSION

Piping Material	Coefficient of Linear Thermal Expansion (K^{-1})	Thermal Conductivity ($W. K^{-1}. M^{-1}$)
UPVC	0.8×10^{-4}	0.16

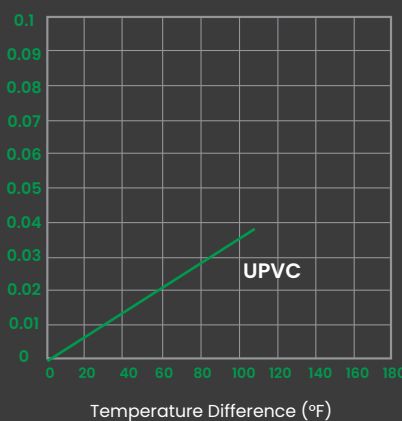
Thermal Linear Expansion and Contraction

Expansion or contraction of UPVC pipe can be calculated from the following formula;

S | Unit



inch-lb Unit



$\Delta L = Y.L.\Delta T$
 where;
 ΔL : length of expansion or contraction
 L : pipe length of a straight line
 Y : coefficient of thermal
 $0.8 \times 10^{-4} K^{-1}$ for UPVC
 ΔT : temperature difference between
 installation and operation.



THERMAL EXPANSION (ΔL) IN MM OF UPVC

Length of run 10 meter

Temp. Change ΔT °C	Thermal Expansion (ΔL) in mm of UPVC
10	15
15	17
20	19
30	22
35	25
40	26

Length of run 15 meter

Temp. Change ΔT °C	Thermal Expansion (ΔL) in mm of UPVC
10	23
15	27
20	32
30	37
35	41
40	46

Length of run 20 meter

Temp. Change ΔT °C	Thermal Expansion (ΔL) in mm of UPVC
10	32
15	38
20	45
30	51
35	58
40	64

Length of run 25 meter

Temp. Change ΔT °C	Thermal Expansion (ΔL) in mm of UPVC
10	36
15	44
20	51
30	58
35	66
40	73

Length of run 30 meter

Temp. Change ΔT °C	Thermal Expansion (ΔL) in mm of UPVC
10	46
15	55
20	64
30	73
35	82
40	91

