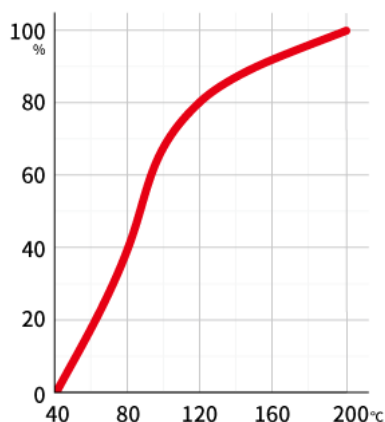


# Summary of Penntube® Properties

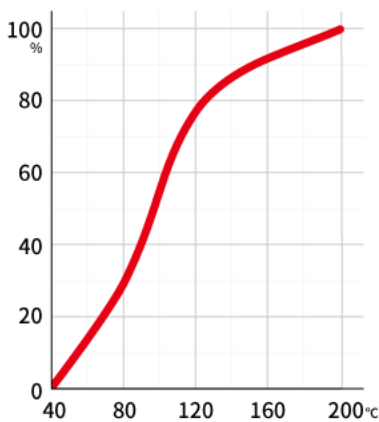
Property	Unit	Penntube®					
		SMT	SST	PFA	TFE	TFE4X	WTF
Material	—	FEP	FEP	PFA	PTFE	PTFE	PTFE/FEP
Max. Service Temperature	°C	-170 ~ +200	-170 ~ +200	-170 ~ +260	-170 ~ +260	-170 ~ +260	-170 ~ +260
shrinkage temperature	°C	120	140	140	327	327	327
Rate of shrinkage	%	25	40	25	50	75	67
Coating diameter	mm	0.68 ~ 53.3	0.45 ~ 50.8	0.62 ~ 26.0	0.38 ~ 11.94	0.64 ~ 101.6	0.00 ~ 25.40
Rate of change in length	%	<± 15	<± 15	<± 15	<± 25	<± 25	<± 25
Withstand voltage	MV/m [3.2mm thickness]	22	22	20	19	19	19
Linear Coefficient of Expansion	$\Omega \cdot \text{cm}$ [50%HR23°C]	> 10 <sup>18</sup>	> 10 <sup>18</sup>	> 10 <sup>18</sup>	> 10 <sup>18</sup>	> 10 <sup>18</sup>	> 10 <sup>18</sup>
Dielectric Constant	[10 <sup>6</sup> Hz]	2.1	2.1	2.1	2.1	2.1	2.1
Tensile Strength	MPa	20-30	20-30	25-35	20-35	20-35	20-35
Elongation	%	250-330	250-330	300-350	200-400	200-400	200-400
Water Absorption (24Hr.)	%	0.01	0.01	0.01	0.01	0.01	0.01
Specific Gravity	g/cm <sup>3</sup>	2.15-2.17	2.15-2.17	2.12-2.17	2.13-2.20	2.13-2.20	2.13-2.20
Flammability Rating	—	Incombustible					
weatherability	—	◎					
Chemical resistance alkali resistance	—	◎					

## Temperature and Change Rate

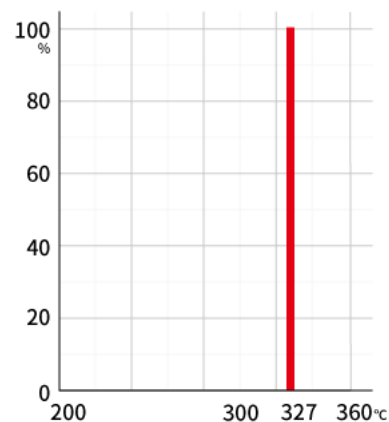
Penntube  
SMT/SST



Penntube  
PFA



Penntube  
TFE/TFE4X/WTF



The fully contracted state is considered 100%.