

THERMIC

Sheathed Thermocouple

(熱電對)

THERMIC[®]

?

(Thermic)

MgO()

(充塵)

(引拔)

(Sheathed

Thermocouple)

山里(YAMARI)

KS, JIS(C1605-1982), ANSI, BS, DIN
(EMF)

THERMIC[®]

1)

2)

가 ,

2

3)

, ,

(耐久性)

MgO 가

500Kg/ m²

4)

()

0.25 12.7mm

300M

가

2 3

5)

- 200

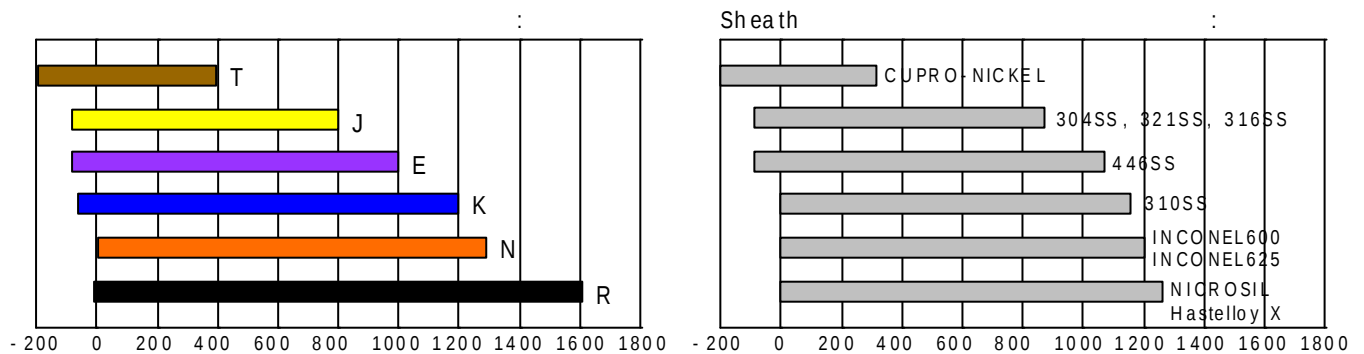
+1,200



THERMIC®

- : (高爐), Soaking Pits, Annealing (爐),
(Continuous Caster),
- : 가 , ; & ;
가 , 가 , LPG, LNG .
- : , , IC, LSI
- : 가 (), 가 (), 가 (),
(煙道), 가 ()
- : 가 , ; , , ,
,
- : , 가 ,
- : LNG LPG : ,
- : - , , 가 ,
- : , , Single Crystal Growth

THERMIC®



THERMIC® Hot Junction (,)



Type 1 ()



Type 2 ()



Type 3 ()

	mm	mm	mm	Type	Sheath	(M)	g/M
Single Pair 	0.25	0.04	0.05	K	Inconel600	5	0.4
	0.5	0.09	0.09	K · E · J	Inconel600 304SS,321SS,316SS	50	1.3
	1.0	0.18	0.15	K · E · J · T	Inconel600 304SS,321SS,316SS,310SS,347SS	100	5
	1.6	0.28	0.23	K · E · J · T	Inconel600 304SS,321SS,316SS,310SS,347SS	300	13
	2.2	0.40	0.31	K · E · J · T	Inconel600 304SS,321SS,316SS,310SS,347SS	300	24
	3.2	0.58	0.41	K · E · J · T	Inconel600,Cupro - Nickel, 347SS 304SS,321SS,316SS,310SS,Nicrosil	200	51
	4.8	0.84	0.61	K · E · J · T	Inconel600,Cupro - Nickel, HastelloyX,347SS 304SS,321SS,316SS,310SS,446SS,Nicrosil	100	115
	6.4	1.12	0.81	K · E · J · T	Inconel600,Cupro - Nickel, HastelloyX,347SS 304SS,321SS,316SS,310SS,446SS,Nicrosil	60	193
	8.0	1.37	1.02	K · E · J · T	Inconel600,Cupro - Nickel, HastelloyX,347SS 304SS,321SS,316SS,310SS,446SS,Nicrosil	35	300
Dual Pair 	1.6	0.23	0.23	K · E · J · T	Inconel600 304SS,321SS,316SS,310SS,347SS	300	13
	2.2	0.33	0.33	K · E · J · T	Inconel600 304SS,321SS,316SS,310SS,347SS	300	22
	3.2	0.46	0.48	K · E · J · T	Inconel600 304SS,321SS,316SS,310SS,347SS,446SS	157	45
	4.8	0.71	0.74	K · E · J · T	Inconel600,Cupro - Nickel, HastelloyX 304SS,321SS,316SS,310SS,446SS,347SS	68	102
	6.4	0.94	1.02	K · E · J · T	Inconel600,Cupro - Nickel, HastelloyX 304SS,321SS,316SS,310SS,446SS,347SS	38	222
	8.0	1.24	1.24	K · E · J · T	Inconel600,Cupro - Nickel, HastelloyX 304SS,321SS,316SS,310SS,446SS,347SS	24	350
Triple Pair 	3.2	0.28	0.33	K · E · J · T	Inconel600 304SS,321SS,316SS,310SS,347SS,446SS	160	33
	4.8	0.38	0.46	K · E · J · T	Inconel600 304SS,321SS,316SS,310SS,347SS,446SS	70	80
	6.4	0.48	0.64	K · E · J · T	Inconel600 304SS,321SS,316SS,310SS,347SS,446SS	41	130
	8.0	0.61	0.79	K · E · J · T	Inconel600 304SS,321SS,316SS,310SS,347SS,446SS	24	210

: 304L, 316L, Inconel 625, Incoloy 825 , 가
 , 1.5mm, 2.0mm, 3.0mm, 4.5mm, 6.0mm, 9.5mm, 10.5mm, 12.7mm,
 15.9mm, 19.1mm 가 .

THERMIC®

Loop

: Ω/m at 20

	($\varnothing$ mm)	($\varnothing$ mm)	K	E	J	T
	0.25	0.04	600.0	-	-	-
	0.5	0.09	152.5	191.9	106.3	-
	1.0	0.18	38.6	48.6	26.4	22.2
	1.6	0.28	15.5	19.6	10.7	9.1
	2.2	0.40	8.1	10.5	5.6	4.7
	3.2	0.58	3.9	5.5	2.7	2.3
	4.8	0.84	1.8	2.3	1.3	1.0
	6.4	1.12	1.1	1.3	-	-
	8.0	1.37	0.7	0.8	0.5	0.4
	1.6	0.23	21.0	28.7	14.11	12.3
	2.2	0.33	10.7	-	7.4	6.3
	3.2	0.46	5.9	7.2	3.8	2.8
	4.8	0.71	2.5	2.9	1.5	1.1
	6.4	0.94	1.6	1.7	1.0	0.7
	8.0	1.24	1.0	1.1	0.6	0.5
	3.2	0.28	26.8	-	-	-
	4.8	0.38	11.9	-	-	-
	6.4	0.48	6.7	-	-	-
	8.0	0.61	4.3	-	-	-

THERMIC®

Sheath

: %

Sheath	C	Si	Mn	P	S	Ni	Cr	Mo	
Inconel 600	<0.15	<1.0	<1.0	-	<0.15	>72.0	14 27	-	Fe 6 10 Cu<0.5
304SS	<0.08	<1.0	<2.0	<0.04	<0.03	8 11	18 20	-	
321SS	<0.08	<1.0	<2.0	<0.04	<0.03	9 13	17 19	-	Ti 5 x C min
316SS	<0.08	<1.0	<2.0	<0.04	<0.03	11 14	16 18	2 3	
310SS	<0.15	<1.0	<2.0	<0.04	<0.03	19 22	24 26	-	
446SS	<0.2	<1.0	<1.5	<0.04	<0.03	-	23 27	-	N<0.1 0.25
Cupro - Nickel	-	-	<1.5	-	-	11	-	-	Fe<1.0 Zn<1.0 Cu Bal
Hastelloy X	-	-	-	-	-	Bal	22	9	Fe 18.5 Co 1.5 W 0.6
Nicrosil	<0.03	1.4	-	-	-	Bal	14.2	-	Fe 0.1

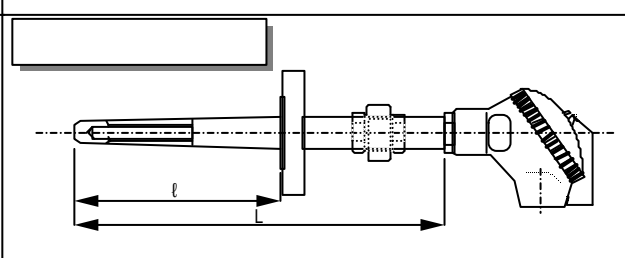
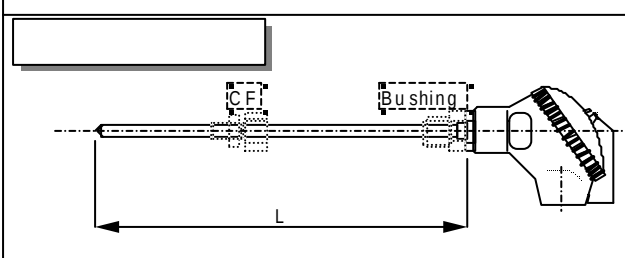
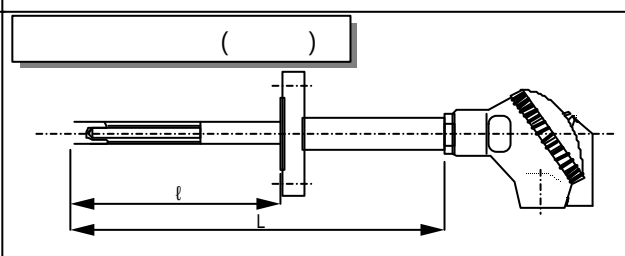
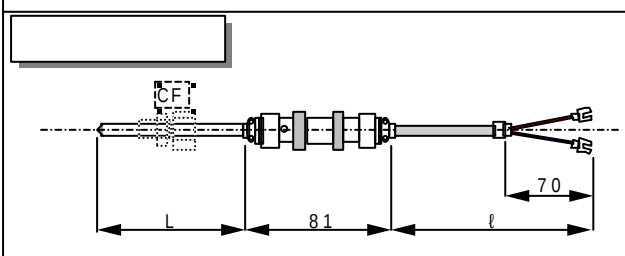
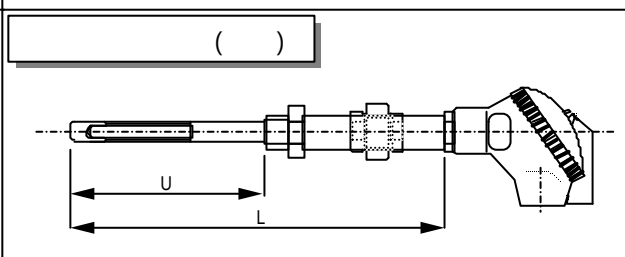
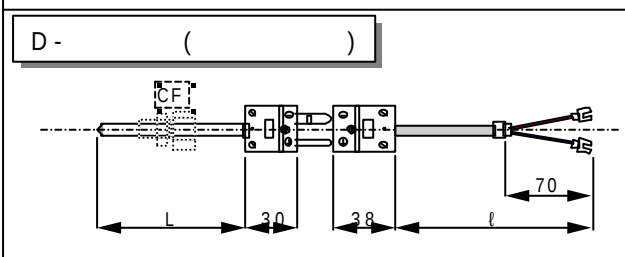
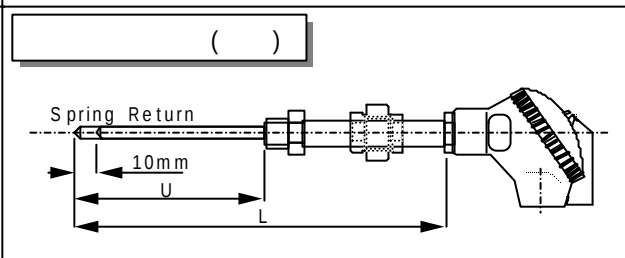
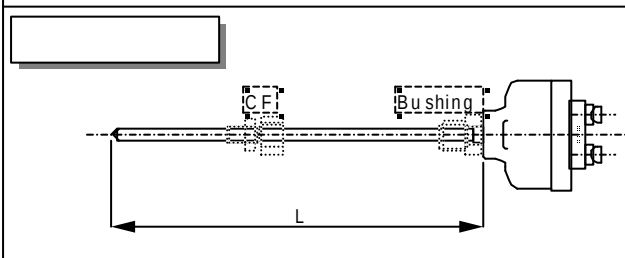
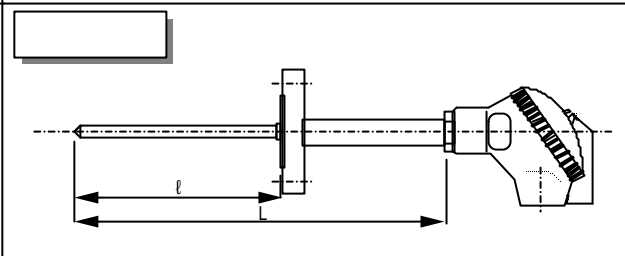
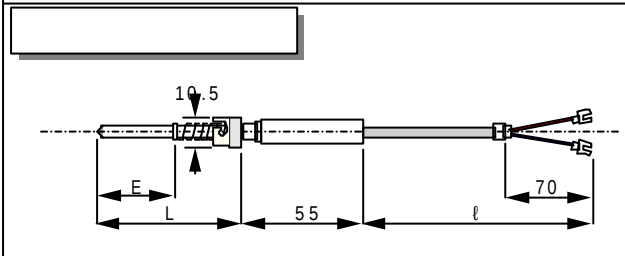
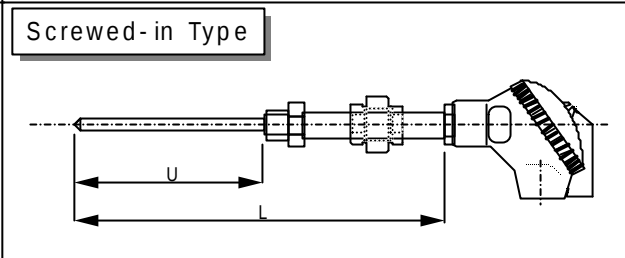
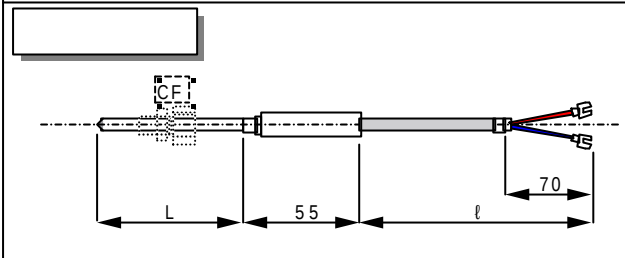
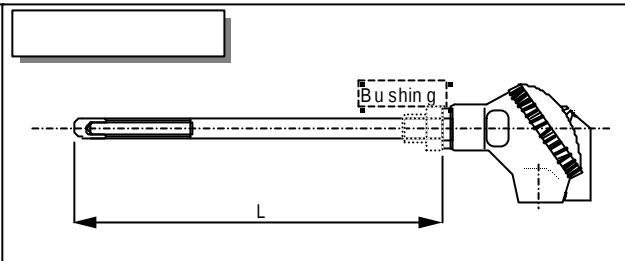
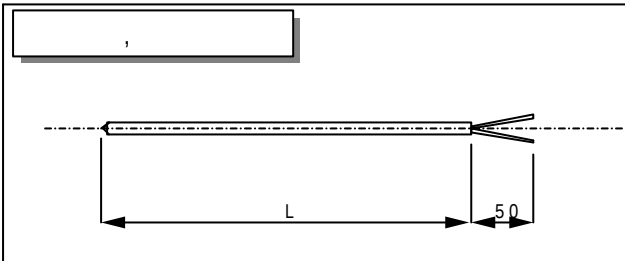
THERMIC®

Purity ()

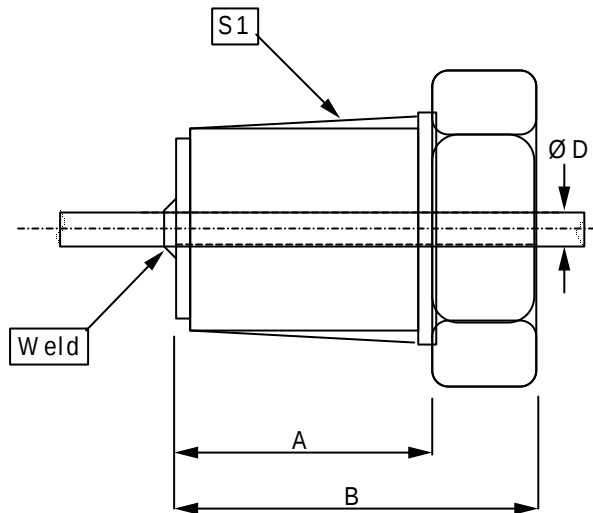
: %

	MgO	SiO ₂	CaO	Fe ₂ O ₃	Al ₂ O ₃	B	Cd	S	C
	96.3 97.3	1.45 2.06	0.73 1.25	0.16 0.30	0.06 0.30	85 1,000ppm	<10ppm	<50ppm	<200ppm
	99.47 99.72	0.042 0.14	0.14 0.21	0.034 0.104	0.30 0.08	10 20ppm	<10ppm	<50ppm	<200ppm

				(E) ⁻¹		Cal · sec ⁻¹ · cm ⁻² · cm ⁻¹		Moh's (硬度)	(密度) G · cm ⁻³
		Ω/cm		E x 10 ⁻⁷			Cx10 ⁴		
MgO	2,800	980	3x10 ⁷	20 1,400	140	1,200	22	61	6 3.58

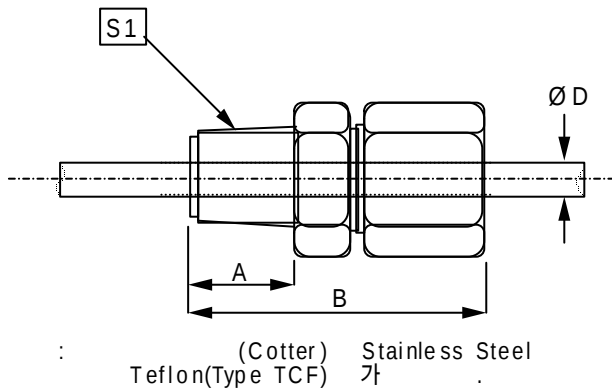


1. Bushing(Fixed) 304 S.S.



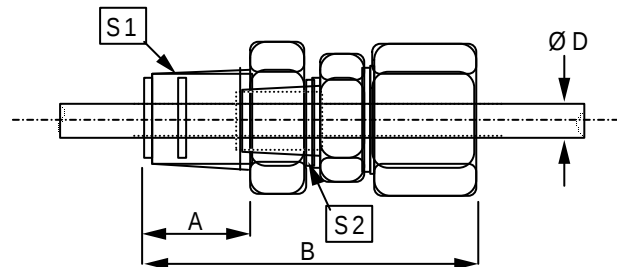
Ø D	Type	S1	S2	A	B
1.0	BN101	PT1/8	-	10	16
1.6	BN161	PT1/8	-	10	16
2.2	BN221	PT1/8	-	10	16
3.2	BN321	PT1/8	-	10	16
	BN322	PT1/4	-	12	20
	BN324	PT1/2	-	20	30
4.8	BN481	PT1/8	-	10	35
	BN482	PT1/4	-	12	16
	BN484	PT1/2	-	20	20
	BN486	PT3/4	-	20	35
6.4	BN642	PT1/4	-	12	35
	BN644	PT1/2	-	20	20
	BN646	PT3/4	-	20	35
8.0	BN802	PT1/4	-	12	35
	BN804	PT1/2	-	20	20
	BN806	PT3/4	-	20	35

2. Compression Fitting 304 S.S.



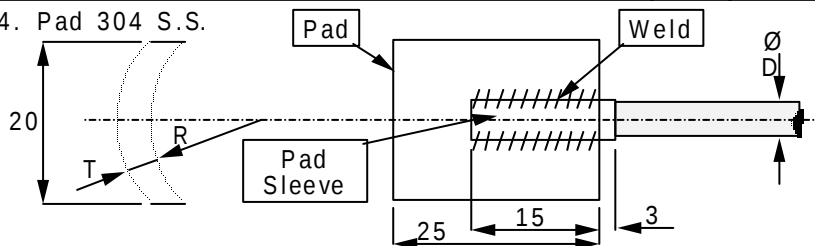
1.0	CF101	PT1/8	-	10	33
1.6	CF161	PT1/8	-	10	35
	CF162	PT1/4	-	12	35
2.2	CF221	PT1/8	-	10	33
	CF222	PT1/4	-	12	35
3.2	CF321	PT1/8	-	10	33
	CF322	PT1/4	-	12	35
4.8	CF481	PT1/8	-	10	33
	CF482	PT1/4	-	12	35
6.4	CF642	PT1/4	-	12	35
8.0	CF802	PT1/4	-	12	35

3. Compression Fitting with Bushing 304 S.S.



3.2	CF324	PT1/2	PT1/8	20	59
	CF326	PT3/4	PT1/8	20	59
4.8	CF484	PT1/2	PT1/8	20	59
	CF486	PT3/4	PT1/8	20	59
6.4	CF644	PT1/2	PT1/4	20	59
	CF646	PT3/4	PT1/4	20	59
8.0	CF804	PT1/2	PT1/4	20	59
	CF806	PT3/4	PT1/4	20	59

4. Pad 304 S.S.



Ø D	T
3.2	4
4.8	5

 "R"
 , R ≥ 50mm