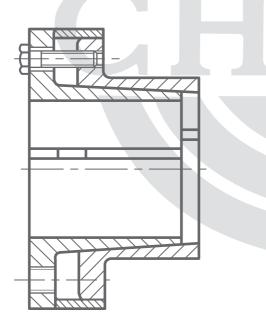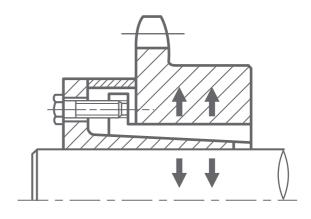# NSPT-LOCKS

New Standard Power Transmission

Suitable of Shaft Diameters
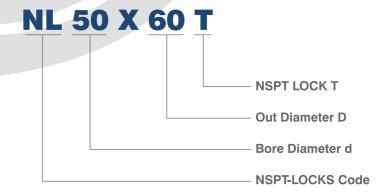Metric: $\phi 6 \sim \phi 130$(mm)
Inch: 1/4"-5 1/8"

T NSPT-LOCKS has very small difference between the outside diameter and the inner bore diameter. It is designed for connecting shafts with small or medium diameters especially when small space is left between the inner hub bore and the shaft.

T NSPT-LOCKS is formed by one inner ring, one outer rings, a locating ring and relevant tightening bolts. They have the characteristics of structure simplicity, easy installation, good durability, low production and maintenance costs, and dust/water resistance.

The installation of T NSPT-LOCKS is as followed:

When the inner ring with flange and taper surface is fixed to the outer ring taper surface, tightening the relevant bolts to move the inner ring axially. The pressures and frictional forces are then created between the connected shaft and hub. Use a locating ring between the inner and the out rings to seal the connection.

Expression of NSPT-LOCK T

NL 50 X 60 T

- NSPT LOCK T
- Out Diameter D
- Bore Diameter d
- NSPT-LOCKS Code

T NSPT-LOCKS

Conversion: 1 inch = 25.40mm

Conversion
1 ft-lbs. = 0.1382 kgf.m = 1.3550 N.m
1 Psi = 0.0007 kgf/mm^2 = 0.0069 Mpa

NSPT

New Standard Power Transmission

NSPT-LOCKS   *Inches*

T NSPT-LOCKS

METRIC SIZES INCHES				INCHES				Mt ft-lb	Axial force lb	PW psi	PN psi	LOCKING SCREW	
Size	d	D	L1	L2	L	Ls	E					No.x Type	Ms ft-lb
6X14	0.236	0.551	0.394	0.728	0.827	0.945	0.984	9	900	26825	11600	3 X M3	1.5
7X15	0.276	0.591	0.472	0.866	0.984	1.142	1.063	19	1575	34075	15950	3 X M4	4
8X15	0.315	0.591	0.472	0.866	0.984	1.142	1.063	21	1575	29725	15950	3 X M4	4
9X16	0.354	0.630	0.551	0.906	1.024	1.181	1.102	33	2250	29725	16675	4 X M4	4
10X16	0.394	0.630	0.551	0.906	1.024	1.181	1.102	36	2250	26825	16675	4 X M4	4
11X18	0.433	0.709	0.551	0.906	1.024	1.181	1.260	39	2250	24650	15225	4 X M4	4
12X18	0.472	0.709	0.551	0.906	1.024	1.181	1.260	43	2250	23200	15225	4 X M4	4
13X23	0.512	0.906	0.551	0.906	1.024	1.181	1.496	47	2250	20300	11600	4 X M4	4
14X23	0.551	0.906	0.551	0.906	1.024	1.181	1.496	50	2250	18850	11600	4 X M4	4
15X23	0.591	0.906	0.551	0.945	1.181	1.378	1.535	88	3600	29725	19575	4 X M5	7
15X24	0.591	0.945	0.630	1.142	1.417	1.654	1.772	94	3825	26825	16675	3 X M6	13
16X24	0.630	0.945	0.630	1.142	1.417	1.654	1.772	101	3825	25375	16675	3 X M6	13
17X26	0.669	1.024	0.709	1.220	1.496	1.732	1.850	133	4950	27550	18125	4 X M6	13
18X26	0.709	1.024	0.709	1.220	1.496	1.732	1.850	148	4950	26100	18125	4 X M6	13
19X27	0.748	1.063	0.709	1.220	1.496	1.732	1.929	155	4950	24650	17400	4 X M6	13
19X28	0.748	1.102	0.709	1.220	1.496	1.693	1.929	111	3600	18125	12325	4 X M5	7
20X28	0.787	1.102	0.709	1.220	1.496	1.732	1.969	163	4950	23200	16675	4 X M6	13
22X32	0.866	1.260	0.984	1.496	1.772	2.008	2.126	185	4950	16675	11600	4 X M6	13
24X34	0.945	1.334	0.984	1.496	1.772	2.008	2.205	200	4950	15225	10875	4 X M6	13
25X34	0.984	1.334	0.984	1.496	1.772	2.008	2.205	207	4950	14500	10875	4 X M6	13
28X39	1.102	1.535	0.984	1.496	1.772	2.008	2.402	344	7425	19575	14065	6 X M6	13
30X41	1.181	1.614	0.984	1.496	1.772	2.008	2.441	377	7425	18415	13050	6 X M6	13
32X43	1.260	1.693	0.984	1.496	1.772	2.008	2.559	400	7425	18400	13050	6 X M6	13
35X47	1.378	1.850	1.260	1.772	2.047	2.283	2.717	585	10125	15225	11600	8 X M6	13
38X50	1.496	1.969	1.260	1.772	2.047	2.283	2.835	636	10125	14500	10875	8 X M6	13
40X53	1.575	2.087	1.260	1.772	2.047	2.283	2.953	666	10125	13775	10150	8 X M6	13
42X55	1.654	2.165	1.260	1.772	2.047	2.283	3.071	703	10125	13050	10150	8 X M6	13
45X59	1.772	2.323	1.772	2.441	2.756	3.071	3.386	1399	18900	15950	12325	8 X M8	30
48X62	1.890	2.441	1.772	2.441	2.756	3.071	3.425	1487	18900	15225	11600	8 X M8	30
50X65	1.969	2.559	1.772	2.441	2.756	3.071	3.622	1554	18900	14500	10875	8 X M8	30
55X71	2.165	2.795	2.165	2.838	3.150	3.465	3.858	1924	21150	12325	9425	9 X M8	30
60X77	2.362	3.031	2.165	2.835	3.150	3.465	4.094	2102	21150	10875	8700	9 X M8	30
65X84	2.559	3.307	2.165	2.835	3.150	3.465	4.370	2272	21150	10150	7975	9 X M8	30
70X90	2.756	3.543	2.559	3.386	3.780	4.173	4.685	3885	33750	13050	10150	9 X M10	61
75X95	2.953	3.740	2.559	3.386	3.780	4.173	4.961	4114	33750	11600	9425	9 X M10	61
80X100	3.150	3.937	2.559	3.386	3.780	4.173	5.157	5935	45000	14500	11600	12 X M10	61
85X106	3.346	4.173	2.559	3.386	3.780	4.173	5.394	6290	45000	13775	10875	12 X M10	60
90X112	3.543	4.409	2.559	3.386	3.780	4.173	5.669	6660	45000	13050	10875	12 X M10	61
95x120	3.740	4.724	2.559	3.386	3.780	4.173	5.886	8140	51750	14500	11600	14 X M10	61
100x125	3.937	4.921	2.559	3.386	3.780	4.173	6.063	11100	67500	17400	13775	18 X M10	61
110x140	4.331	5.512	3.543	4.488	5.039	5.512	7.087	11840	65250	11600	9425	12 X M12	107
120x155	4.724	6.102	3.543	4.488	5.039	5.512	7.795	12950	65250	10150	7975	12 X M12	107
130x165	5.118	6.496	3.543	4.488	5.039	5.512	8.189	18500	86400	13050	10150	16 X M12	107

* For unlisted diameters please contact NSPT

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NSPT-LOCKS

Metric

T NSPT-LOCKS

Catalog	Fundamental Dimensions						Internal Hexagon Headed Bolt		Rated Load		Pf	Ma	G
dxD	E	F	L1	L2	L	Ls	SizesxN	QTY	Ft KN	Mt KN.M	Mpa	N.m	Kg
CL6x14T	25	23	10	18.5	21	24	M3x10	3	4.2	0.012	185	2.2	0.15
CL7x15T	27	24	12	22	25	29	M4x10	3	7.4	0.025	235	4.9	0.15
CL8x15T	27	24	12	22	25	29	M4x10	3	7.4	0.029	205	4.9	0.16
CL9X16T	28	25	14	23	26	30	M4x10	4	9.4	0.044	205	4.9	0.16
CL10x16T	28	25	14	23	26	30	M4x10	4	9.8	0.049	185	4.9	0.17
CL11x18T	32	28	14	23	26	30	M4x10	4	9.8	0.053	170	4.9	0.17
CL12x18T	32	28	14	23	26	30	M4x10	4	9.8	0.058	160	4.9	0.18
CL13x23T	38	33	14	23	26	30	M4x10	4	9.8	0.063	140	4.9	0.19
CL14x23T	38	33	14	23	26	30	M4x10	4	9.8	0.068	130	4.9	0.2
CL15x24T	45	40	16	29	36	42	M6x18	3	17	0.127	185	17	0.21
CL16x24T	45	40	16	29	36	42	m6x18	3	17	0.136	175	17	0.23
CL17x26T	47	42	18	31	38	44	M6x18	4	22	0.18	190	17	0.25
CL18x26T	47	42	18	31	38	44	M6x18	4	22	0.20	180	17	0.27
CL19x27T	49	43	18	31	38	44	M6x18	4	22	0.21	170	17	0.29
CL20x28T	50	44	18	31	38	44	M6x18	4	22	0.22	160	17	0.30
CL22x32T	54	48	25	38	45	51	M6x18	4	22	0.25	115	17	0.38
CL24x34T	56	50	25	38	45	51	M6x18	4	22	0.27	105	17	0.41
CL25x34T	56	50	25	38	45	51	M6x18	4	22	0.25	100	17	0.45
CL28x39T	61	55	25	38	45	51	M6x18	6	33	0.465	135	17	0.47
CL30x41T	62	57	25	38	45	51	M6x18	6	33	0.51	127	17	0.48
CL32x43T	65	59	25	38	45	51	M6x18	6	33	0.54	120	17	0.52
CL35x47T	69	62	32	45	52	58	M6x18	8	45	0.79	105	17	0.63
CL38x50T	72	66	32	45	52	58	M6x18	8	45	0.86	100	17	0.67
CL40x53T	75	69	32	45	52	58	M6x18	8	45	0.90	95	17	0.73
CL42x55T	78	71	32	45	52	58	M6x18	8	45	0.95	90	17	0.78
CL45x59T	86	80	45	62	70	78	M8x22	8	84	1.89	110	41	1.23
CL48x62T	87	81	45	62	70	78	M8x22	8	84	2.01	105	41	1.24
CL50x65T	92	84	45	62	70	78	M8x22	8	84	2.10	100	41	1.40
CL55x71T	98	92	55	72	80	88	M8x22	9	94	2.60	85	41	1.70
CL60x77T	104	98	55	72	80	88	M8x22	9	94	2.84	75	41	1.90
CL65x84T	111	105	55	72	80	88	M8x22	9	94	3.07	70	41	2.21
CL70x90T	119	113	65	86	96	106	M10x25	9	150	5.25	90	83	3.05
CL75x95T	126	119	65	86	96	106	M10x25	9	150	5.60	80	83	3.32
CL80x100T	131	125	65	86	96	106	M10x25	12	200	8.02	100	83	3.50
CL85x106T	137	131	65	86	96	106	M10x25	12	200	8.50	95	83	3.81
CL90x112T	144	137	65	86	96	106	M10x25	12	200	9.00	90	83	4.20
CL95x120T	149	142	65	86	96	106	M10x25	14	230	11.0	100	83	4.75
CL100x125T	154	147	65	86	96	106	M10x25	18	300	15.0	120	83	5.46
CL110x140T	180	172	90	114	128	140	M12x35	12	290	16.0	80	145	6.05
CL120x155T	198	187	90	114	128	140	M12x35	12	290	17.5	70	145	7.18
CL130x165T	208	197	90	144	128	140	M12x35	16	384	25.0	90	145	8.03

Key Elements for Designing and Calculation of T NSPT-LOCKS

1. Determine max torque needed and max axial load

$$M_{max} = \frac{30000H}{\pi . n} \cdot K(N\ m)$$

$$F_{max} = F \cdot K$$
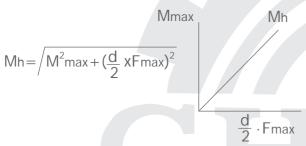
H--Transmission power KW
n--Rotational speed r/min
F--nominal axial force N
K--coefficient needed

Used coefficient sheet for K

No shock load, transmitting with little inertia	$1.5 - 2.5$
Slight shock load,transmitting with middle inertia	$2.0 - 4.0$
Big shock load, transmitting with heavy inertia	$3.0 - 5.0$

2. Calculate synthetic load and transmitted torque

$$Mh = \sqrt{M^2_{max} + (\frac{d}{2} xF_{max})^2}$$

M_{max}--Required transmitted torque Nm
F_{max}--Required transmitted axial force N
M_h--synthetic transmitted torque Nm
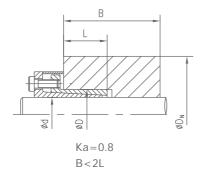d--Transmission shaft diameter mm
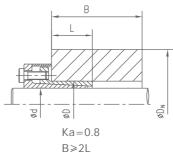M_t--NSPT LOCK rated transmitted torque Nm

$M_t \geqslant M_h$ can be used
$M_t < M_h$ need bigger type of NSPT lock or to be installed by two
NSPT locks or more together

3. Calculation for the hub diameter

$$Da \geqslant D\sqrt{\frac{Ob + Ka \cdot Ph}{Ob - Ka \cdot Ph}}$$

Ka=0.8
B<2L

Ka=0.8
B≥2L

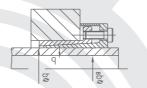Da--outside diameter of hub mm
D--inside diameter of hub mm
Ph--surface pressures on hub Mpa
Ob--tensile strength of material
Ka--It should be 0.6 for single CAPT lock, it will be 0.8 when two
NSPT locks or more are installed together

4. Calculation for the inside diameter of hollow shaft

$$dB \leqslant d\sqrt{\frac{Ob - 2xPs . K3}{Ob}}$$

dB--inside diameter of hollow shaft mm
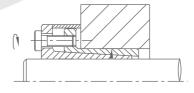d--outside diameter of hollow shaft mm
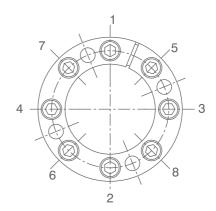6b--tensile strength of shaft material Mpa
Ps--pressure on the surface of shaft Mpa

5. Settlement for the surface roughness and dimension tolerance

Fitting Section	Ra(um) Surface Roughness	Dimension Precision
Shaft Diameter d	1.6	h8
Bore Diameter D	1.6	H8

6. Installation and disassembling for NSPT-LOCKS Type T.
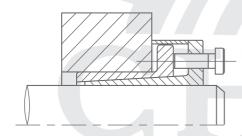
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Tighten the bolts one by one until all of them reach the specified torques. After the installation, inspect the runouts as shown above. The run out Ⓐ Should be less than 0.05mm and Ⓑ should be less than 0.002Rmm.

To disassemble, take off all tightening bolts. Insert the unloading bolts into the unloading tap holes and tighten them. NSPT lock can then be loosened and separated from the hub and shaft.

Conversion:1 inch=25.40mm

― **Conversion** ―
| 1 ft-Ibs. = 0.1382 kgf·m = 1.3550 N.m |
| 1 Psi = 0.0007 kgf/mm² = 0.0069 Mpa |

1 ft-Ibs. = 0.1382 kgf·m = 1.3550 N.m
1 Psi = 0.0007 kgf/mm^2 = 0.0069 Mpa

When installing without locating rings, the inner ring moves in axial direction while tightening.

When installing with locating rings, the outer ring moves in axial direction while tightening.

Installed with counter bored hubs. The NSPT-LOCKS can be completely installed into the hub.

Symmetrical installation of paired NSPT-LOCKS on both sides for greater power

When using in pairs and mounted with hubs, it can replace couplings in some cases.

While installed with cams, the position and angle of the cams can be adjusted at will.