

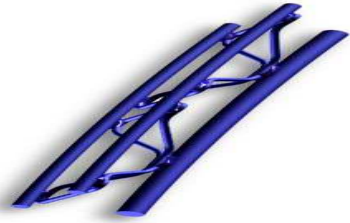
## PANTEX Lattice Girders

### Introduction

**PANTEX Lattice Girders System** has been designed and developed for the special demands of tunnel construction. Contrary to standard solid-web girders, PANTEX Lattice Girders can be totally surrounded by sprayed concrete and form a complete homogeneous composite structure with no unconsolidated areas, shotcrete spray shadows, or fissures visible.

The load-bearing capacity of PANTEX System has been inquired and analyzed by various loading test. Proved by those rigorous and extensive tests, the System has been used successfully in numerous tunnel projects throughout the world.

The PANTEX System, with its characteristics of flexibility regarding geometry and bearing capacity, is thought to be the most effective and economical way of immediate and reliable ground support in the field of tunneling.



**HCI is the only company authorized to manufacture the PANTEX Lattice Girder in Taiwan. With our high quality and best value service, we are not only the main supplier in Taiwan, but a regular supplier for famous international engineering companies in external market.**

### Main Advantages

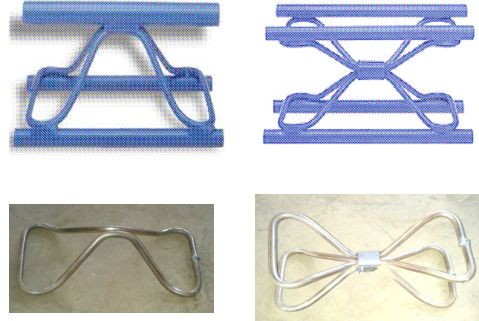


- Immediate and reliable ground support in the excavation area
- Can be fully integrated with the shotcrete lining and form a optimum bond to the ground supported
- Complete encapsulation in sprayed concrete with no voids or fissures visible
- Light weight for easy handling and quick assembly
- Guide for next round excavation
- Can be manufactured to suit all types of excavation geometry
- Welding has been proven by DIN 4099

## PANTEX Lattice Girders

### System Description

- Girder construction is composed of 3 or 4 steel bars and connected via stiffening elements (*stiffeners*) in the center.
- Single bar of the 3-bar girder can be set either at the excavation or ground side depending on application.
- Special designed **stiffeners** can effectively reduce the girder buckling lengths and increase the bending resistance of the bars.
- The full girder profile can be assembled easily by connecting the elements and adjusted to shape to the excavation geometry.
- Load transmission can be secured even before shotcrete or curing of the sprayed concrete



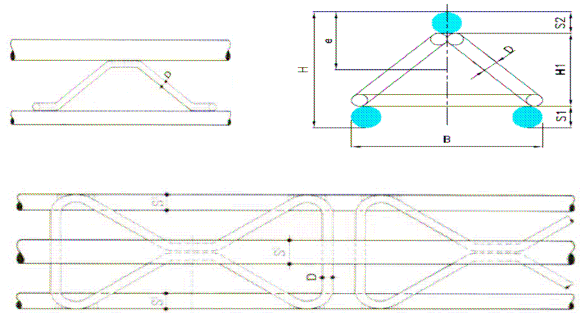
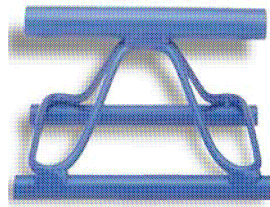
### System Components

- Girder Bars
  - Plain Round Bar :  
**ASTM A615/A615M-04a Gr. 75**
  - Deformed Bar :  
**CNS 560 A2006 SD-420W (Final Lining)**
- Stiffeners
  - Plain Round Bar :  
**ASTM A615/A615M-04a Gr. 60**
  - Deformed Bar :  
**CNS 560 A2006 SD-420W (Final Lining)**
- Connections
  - Connected Angle of flat steel Plate : **CNS 2473 G3039 SS400**
  - End Plate : **CNS 2473 G3039 SS400**
  - Bolt : **CNS 4236 B217 or ASTM A307**
  - Nut : **CNS 4236 B2170 or ASTM A194/A194M 2H**
  - Connection Bar between Sets : **CNS 560 A2006 SD-280**
  - Pedestal for Connection Bar : **ASTM A563**
- Welding Tin : **AWS 5.18-01 ER70S-G**
- Materials listed are used for our standard product. Modification can be made in according to customer specific requirements



## PANTEX Lattice Girders

### Specifications



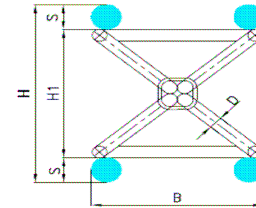
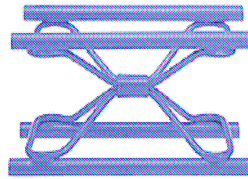
### 3-Bar Girder

Type	H1	S1	S2	H	B	D	F	e	Jx	Wx	Jy	Wy
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[cm <sup>2</sup> ]	[cm]	[cm <sup>2</sup> *2]	[cm <sup>3</sup> ]	[cm <sup>2</sup> *2]	[cm <sup>3</sup> ]
X	50	18	26	94	100	10	10.40	4.82	138	28.6	89	17.8
	70	18	26	114	140	10	10.40	5.79	223	38.5	192	27.4
G100	50	20	30	100	100	10	13.35	5.03	193	38.4	106	21.2
	70	20	30	120	140	10	13.35	5.97	306	51.3	232	33.1
	70	22	32	124	140	10	15.64	6.31	375	59.4	272	38.9
	75	22	22	119	140	10	11.40	7.57	242	32.0	268	38.3
	95	18	26	139	180	10	10.40	7.01	359	51.2	337	37.4
	95	20	26	141	180	10	11.59	7.69	405	52.7	406	45.1
	95	20	30	145	180	10	13.35	7.14	485	67.9	407	45.2
	115	18	26	159	220	12	10.40	7.99	491	61.5	521	47.4
	115	20	30	165	220	12	13.35	8.09	658	81.3	634	57.6
	130	18	26	174	220	12	10.40	8.72	603	69.2	521	47.4
130	20	30	180	220	12	13.35	8.79	805	91.6	634	57.6	
G125	70	26	34	130	140	10	19.70	7.09	501	70.7	356	50.9
	80	24	30	134	160	10	16.12	7.51	462	61.5	426	53.3
	95	22	32	149	180	10	15.64	7.35	589	80.1	482	53.6
	115	22	32	169	220	12	15.64	8.50	795	93.5	752	68.4
	130	22	32	184	220	12	15.64	9.23	971	105.2	752	68.4
G150	95	26	34	155	180	10	19.70	8.44	774	91.7	641	71.2
	115	26	34	175	220	12	19.70	9.52	1040	109.2	1010	91.8
	130	26	34	190	220	12	19.70	10.33	1264	122.4	1010	91.8

**Designation for ordering : Type-H1-S1-S2, e.g. X-50-18-26 or G100-50-20-30**

## PANTEX Lattice Girders

### Specifications



### 4-Bar Girder

Type	H1	S	H	B	D	F	Jx	Wx	Jy	Wy
	[mm]	[mm]	[mm]	[mm]	[mm]	[cm <sup>2</sup> ]	[cm <sup>2*2</sup> ]	[cm <sup>3</sup> ]	[cm <sup>2*2</sup> ]	[cm <sup>3</sup> ]
G100	100	18	136	100	10	10.18	356	52.4	173	34.6
	100	20	140	100	10	12.57	456	65.1	204	40.8
	140	18	176	140	10	10.18	637	72.4	381	54.4
	140	20	180	140	10	12.57	807	89.7	456	65.1
	190	18	226	180	10	10.18	1103	97.62	670	74.4
	230	18	266	220	12	10.18	1567	117.8	1040	94.5
G125	100	22	144	100	10	15.20	570	79.2	234	46.8
	130	24	178	140	10	18.10	1079	121.2	615	87.9
	140	22	184	140	10	15.20	1002	108.9	534	76.3
	190	20	230	180	10	12.57	1389	120.8	840	93.3
	190	22	234	180	10	15.20	1713	146.4	953	105.9
	230	20	270	220	12	12.57	1967	145.7	1399	127.2
	230	22	274	220	12	15.20	2420	176.7	1495	135.9
G150	100	25	150	130	10	19.63	774	103.3	549	84.4
	100	30	160	100	10	28.28	1210	151.3	302	60.4
	130	25	180	140	10	19.64	1187	131.9	657	93.9
	140	26	192	140	10	21.24	1472	153.3	699	99.6
	140	30	200	140	10	28.28	2059	205.9	871	124.4
	160	30	220	160	10	28.28	2568	233.5	1211	151.4
	190	26	242	180	10	21.24	2486	205.5	1268	140.9
	190	30	250	180	10	28.28	3437	275.0	1606	178.4
	190	32	254	180	10	32.17	3984	313.7	1782	198
	230	30	290	220	12	28.28	4795	330.7	2567	233.4
	G200	150	32	214	140	12	32.17	2684	250.8	959
190		34	258	180	10	36.32	4582	355.2	1962	217.9
230		32	294	220	12	32.17	5541	376.9	2863	260.3
230		34	298	220	12	36.32	6348	426.1	3162	287.4
260		32	324	220	12	32.17	6876	424.5	2863	260.3
260		34	328	220	12	36.32	7874	480.1	3167	287.9

**Designation for ordering : Type-H1-S, e.g. G100-100-18 or G125-100-22**



## PANTEX Lattice Girders

### Field of Application

#### Passive ground support for the excavated cross section



Tunnel portal support before excavating

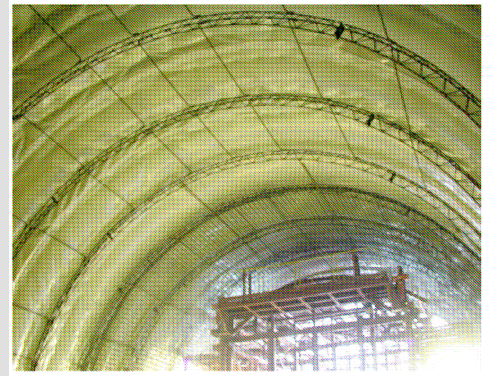


passive support for span area inside the tunnel

#### Passive support for Final Lining



Providing support for steel fabric to bear the loading of cement in Final Lining



#### Passive ground support for Vertical Shaft in bridge concrete pile construction

