



Inspection Order No.: IN08191QD-B  
Boss No.: 11297780  
Page No.: 1 of 12  
Date of Issue: Sep 28, 2008

**INSPECTION REPORT**  
(non-negotiable)

- **Description and Quantity of Commodity:** Ductile iron Fittings 505pcs

- **Name & Address Of Buyer:** A\*\*\*\*\*

- **Name & Address Of Seller:** SHANXI SOLID INDUSTRIAL CO., LTD.  
1501, Building B, Dingyuan Times Center, Yingzenanjie, Taiyuan, Shanxi, China

- **Inspection Date & Place:** Sep 21-27, 2008 Zhucheng, Weifang, Shandong, China

- **L/C No.:** N/A

- **PI No.:** SANT-0802 Dated: August 21, 2008

- **Nature Of Inspection:** During production & FRI

- **Inspector:** Mr. Daniel Li & Robin Cui

This is to report that we, SGS-CSTC Qingdao Branch on Sep 21-27, 2008 at the request of SHANXI SOLID INDUSTRIAL CO., LTD conducted the following inspection:

**Inspection Finding:**

1. Quantity Check:

No.	Description	Model	PN	Order Qty	Inspected Qty
1	All Flanged Tee	DN800*600*800	PN16	1pcs	1pcs
2	All Flanged Tee	DN600*600*600	PN16	2pcs	2pcs
3	All Flanged Tee	DN600*500*600	PN16	2pcs	2pcs
4	All Flanged Tee	DN600*400*600	PN16	2pcs	2pcs
5	All Flanged Tee	DN600*300*600	PN16	4pcs	4pcs

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6	All Flanged Tee	DN600*250*600	PN16	2pcs	2pcs
7	All Flanged Tee	DN600*200*600	PN16	4pcs	4pcs
8	All Flanged Tee	DN500*500*500	PN16	2pcs	2pcs
9	All Flanged Tee	DN500*400*500	PN16	2pcs	2pcs
10	All Flanged Tee	DN500*300*500	PN16	2pcs	2pcs
11	All Flanged Tee	DN500*200*500	PN16	2pcs	2pcs
12	All Flanged Tee	DN400*400*400	PN16	4pcs	4pcs
13	All Flanged Tee	DN400*300*400	PN16	4pcs	4pcs
14	All Flanged Tee	DN400*200*400	PN16	4pcs	4pcs
15	All Flanged Tee	DN300*300*300	PN16	10pcs	10pcs
16	All Flanged Tee	DN300*200*300	PN16	5pcs	5pcs
17	All Flanged Tee	DN300*150*300	PN16	10pcs	10pcs
18	All Flanged Tee	DN200*200*200	PN16	5pcs	5pcs
19	All Flanged Tee	DN200*150*200	PN16	5pcs	5pcs
20	All Flanged Tee	DN200*100*200	PN16	10pcs	10pcs
21	Flange adaptor	DN800	PN16	2sets	2sets
22	Flange adaptor	DN600	PN16	20sets	20sets
23	Flange adaptor	DN500	PN16	10sets	10sets
24	Flange adaptor	DN400	PN16	15sets	15sets
25	Flange adaptor	DN300	PN16	15sets	15sets
26	Flange adaptor	DN200	PN16	30pcs	30pcs
27	Socket flange	DN600	PN16	10pcs	10pcs
28	Socket flange	DN500	PN16	10pcs	10pcs
29	Socket flange	DN400	PN16	15pcs	15pcs
30	Socket flange	DN300	PN16	30pcs	30pcs
31	Socket flange	DN200	PN16	30pcs	30pcs
32	Socket flange	DN150	PN16	40pcs	40pcs
33	Socket flange	DN100	PN16	50pcs	50pcs
34	Spigot flange	DN600	PN16	10pcs	10pcs
35	Spigot flange	DN500	PN16	10pcs	10pcs
36	Spigot flange	DN400	PN16	15pcs	15pcs
37	Spigot flange	DN300	PN16	30pcs	30pcs
38	Spigot flange	DN200	PN16	30pcs	30pcs
39	Coupling	DN450	PN25	4sets	4sets
40	Coupling	DN300	PN16	15sets	15sets
41	Coupling	DN250	PN16	2sets	2sets
42	Coupling	DN125	PN16	30sets	30sets
<b>Total (DI Fittings)</b>				<b>505pcs/sets</b>	<b>505pcs/sets</b>
43	Rubber rings	DN600	/	/	10pcs
44		DN500	/	/	10pcs
45		DN400	/	/	15pcs
46		DN300	/	/	30pcs
47		DN200	/	/	30pcs
48		DN150	/	/	40pcs
49		DN100	/	/	50pcs
50	Bolts & screws & washers	M36X140	/	/	48sets
51		M33X120	/	/	1100sets

52		M30X110	/	/	800sets
53		M27X100	/	/	1000sets
54		M24X85	/	/	1594sets
55		M20X70	/	/	1885sets
56		M16X65	/	/	490sets
<b>Total (Accessories)</b>					<b>7102pcs/sets</b>

### 2. Packing Check:

- Each flange adaptor & each coupling wrapped by bubble plastic sheet. And all fittings were packed with wooden cases or wooden pallets secured by steel bands, then wrapped by shrink film sheet.
- All accessories were packed into wooden cases secured by steel bands.

### Reference photos:



Packing for DN<300 TEE & spigot flange & socket flange



Packing for socket flange & spigot flange (DN600 & DN400)



Packing for TEE DN400X200X400



Packing for accessories

### 3. Marking Check:

(Mould mark on body surface)

- For all flanged TEE: (Take DN600X300X600 PN16 for example)  
SOLID ISO2531 PN16 DN600X300 DI 2008.08.14 WATER

- For Socket Flange: (Take DN300 PN16 for example)  
SOLID ISO2531 PN16 DN300 DI 2008.08.14 WATER
- For Spigot Flange: (Take DN400 PN16 for example)  
SOLID ISO2531 PN16 DN400 DI 2008.08.06 WATER
- For Flange Adaptor: (Take DN200 PN16 for example)  
SOLID ISO2531 PN16 DN200 DI 2008 09 10 WATER
- For Coupling: (Take DN125 PN16 for example)  
SOLID ISO2531 PN16 DN125 DI 2008 09 10 WATER
- For Coupling DN450 PN25  
SOLID ISO2531 PN25 DN450 DI 2008 09 21 WATER
- For Rubber Rings: (Take DN300 for example)  
A-300

Reference photos:



Mold marking on all flanged TEE



Mold marking on Spigot Flange



Mold marking on Socket Flange







Mold marking on flange adaptor

Mold marking on coupling DN125 PN16

Mold marking on coupling DN450 PN25

Marking on rubber ring

#### 4. Visual Quality Inspection:

According to the ANSI/ASQ Z1.4-2003 single planning for normal inspection Level II, total 80pcs DI fittings were selected at randomly for visual quality inspection, found inside of all flange TEE & socket flanges & spigot flanges were cement mortar lined and outer side with bitumen coated, found all flanged adaptors and couplings were painted with blue epoxy coating and found the visual quality of fittings we inspected was in normal condition.

#### 5. Dimension Check:

Total 13pcs (S-3) fittings were selected at randomly for dimension check according to ISO2531-1998, and the actual finding as following: (unit: mm)

- For all flanged TEE DN800X600X800 PN16:

Check point	D	K	n-d	C7	d1	f1	e	t (um)
Standard	1025	950	24-40/41	43	901	5	11.7	≥70um
Tolerance	/	±2	d: +1/-0	±4.5	+8.5/-5.5	+2.5/-4	-3.1	/
Actual findings	1022	951	24-40	38.5	901	6	16.91	151
Check point	D'	K'	n-d'	C7'	d1'	f1'		
Standard	840	770	20-37	36	720	5		
Tolerance	/	±2	d: +1/-0	±4.5	+6.5/-5	+2.5/-4		
Actual findings	840	769	20-37.3	34	719	5.8		

- For all flanged TEE DN600X300X600 PN16:

Check point	D	K	n-d	C7	d1	f1	e	t (um)
Standard	840	770	20-37	36	720	5	9.9	≥70um
Tolerance	/	±2	d: +1/-0	±4.5	+6.5/-5	+2.5/-4	-2.9	/
Actual findings	838	770	20-37.6	32.5	720	3.9	13.04	114
Check point	D'	K'	n-d'	C7'	d1'	f1'		
Standard	455	410	12-28	24.5	370	4		
Tolerance	/	±1.5	d: +1/-0	±4	+5.5/-4.5	+2/-3		
Actual findings	455	411	12- <b>27.2</b>	22	371	4.2		

- For all flanged TEE DN400X200X400 PN16:

Check point	D	K	n-d	C7	d1	f1	e	t (um)
Standard	580	525	16-31	28	480	4	8.1	≥70um
Tolerance	/	±2	d: +1/-0	±4	+6.5/-5	+2/-3	-2.7	/
Actual findings	580	526	16- <b>30</b>	26	480	3.5	9.90	150
Check point	D'	K'	n-d'	C7'	d1'	f1'		
Standard	340	295	12-23	20	266	3		
Tolerance	/	±1.5	d: +1/-0	±4	+5.5/-4.5	+1.5/-2		
Actual findings	339	295	12-23.3	19	266	2.8		

- For all flanged TEE DN300X200X300 PN16:

Check point	D	K	n-d	C7	d1	f1	e	t (um)
Standard	455	410	12-28	24.5	370	4	7.2	≥70um
Tolerance	/	±1.5	d: +1/-0	±4	+5.5/-4.5	+2/-3	-2.6	/
Actual findings	455	410	12-28	23.7	368	3.1	10.61	154
Check point	D'	K'	n-d'	C7'	d1'	f1'		
Standard	340	295	12-23	20	266	3		
Tolerance	/	±1.5	d: +1/-0	±4	+5.5/-4.5	+1.5/-2		
Actual findings	339	295	12-23	18.8	265	3		

- For socket flange DN400 PN16:

Check point	D3	P	D	K	n-d	C7	d1	f1	e	t (um)
Standard	431.5	110	580	525	16-31	28	480	4	8.1	≥70um
Tolerance	+2.1/-1	/	/	±2	d: +1/-0	±4	+6.5/-5	+2/-3	-2.7	/
Actual findings	432	110	579	525	16-31	24.3	478	4	11.51	170

- For socket flange DN300 PN16:

Check point	D3	P	D	K	n-d	C7	d1	f1	e	t (um)
Standard	328.5	110	455	410	12-28	24.5	370	4	7.2	≥70um
Tolerance	+1.8/-1	/	/	±1.5	d: +1/-0	±4	+5.5/-4.5	+2/-3	-2.6	/
Actual findings	329	110	455	411	12- <b>27.8</b>	23	367	3.9	11.5	140

- For socket flange DN200 PN16:

Check point	D3	P	D	K	n-d	C7	d1	f1	e	t (um)
Standard	224.5	100	340	295	12-23	20	266	3	6.3	≥70um
Tolerance	+1.5/-1	/	/	±1.5	d: +1/-0	±4	+5.5/-4.5	+1.5/-2	-2.3	/

Actual findings	224	100	339	295	12-23	18	267	2.2	8.17	112
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- For spigot flange DN600 PN16:

Check point	L	D	K	n-d	C7	d1	f1	e	t (um)
Standard	/	840	770	20-37	36	720	5	9.9	≥70um
Tolerance	/	/	±2	d: +1/-0	±4.5	+6.5/-5	+2.5/-4	-2.9	/
Actual findings	550	838	770	20- <b>41.4</b>	33.5	717	5.2	12.6	137

- For spigot flange DN400 PN16:

Check point	L	D	K	n-d	C7	d1	f1	e	t (um)
Standard	/	580	525	16-31	28	480	4	8.1	≥70um
Tolerance	/	/	±2	d: +1/-0	±4	+6.5/-5	+2/-3	-2.7	/
Actual findings	485	580	525	16- <b>30.7</b>	25	481	4.8	9.2	150

- For spigot flange DN300 PN16:

Check point	L	D	K	n-d	C7	d1	f1	e	t (um)
Standard	/	455	410	12-28	24.5	370	4	7.2	≥70um
Tolerance	/	/	±1.5	d: +1/-0	±4	+5.5/-4.5	+2/-3	-2.6	/
Actual findings	422	454	410	12- <b>27.8</b>	23	370	4	8.4	329

- For flange adaptor DN300 PN16:

Check point	D	K	n-d	C7	d1	f1	e	t (um)
Standard	455	410	12-28	24.5	370	4	7.2	≥70um
Tolerance	/	±1.5	d: +1/-0	±4	+5.5/-4.5	+2/-3	-2.6	/
Actual findings	455.5	410	12- <b>27</b>	22	367	2.5	9.2	346

- For flange adaptor DN200 PN16:

Check point	D	K	n-d	C7	d1	f1	e	t (um)
Standard	340	295	12-23	20	266	3	6.3	≥70um
Tolerance	/	±1.5	d: +1/-0	±4	+5.5/-4.5	+1.5/-2	-2.3	/
Actual findings	340	295	12- <b>22.5</b>	21	266	2.7	10.4	532

- For all flange tee DN500X400X500 PN16:

Check point	D	K	n-d	C7	d1	f1	e	t (um)
Standard	715	650	20-34	31.5	609	4	9.0	≥70um
Tolerance	/	±2	d: +1/-0	±4.5	+6.5/-5	+2/-3	-1.8	/
Actual findings	718	651	20-34.5	28.0	610	3.2	11.8	126
Check point	D'	K'	n-d'	C7'	d1'	f1'		
Standard	580	525	16-31	28	480	4		
Tolerance	/	±2	d: +1/-0	±4	+6.5/-5	+2/-3		
Actual findings	580	525	16-31	25	481	4.8		

Remark:

- The bold data were beyond tolerance due to the inside surface of holes with painting.

Result: Subject to client's evaluation.

DE: External diameter	D3: Smallest diameter of socket end
L: Total length	P: Socket depth
D: Outside diameter of flange	K: Diameter of bolt circle
n-d: Number of bolt holes-Diameter of bolt holes	C7: Flange thickness
d1: Facing diameter	e: Wall thickness
f1: Facing height	t: External coating thickness

6. Witness Testing:

6.1 Mechanical properties test:

Total 5pcs (1pc/batch) fittings were selected randomly for mechanical properties test according to ISO2531-1998, they were done by the manufacture and witnessed by SGS inspector, and actual finding as following:

Batch No.	Actual tested data		
	Tensile strength (Mpa)	Elongation (%)	Hardness (HB)
Requirement of ISO2531-1998	≥420	≥5	≤250
0811-23	565	16	172
0823-11	556	13.8	174
0828-26	539	16	179
0831-20	507	12.6	178
0911-23	567	14.4	178

Result: Passed

6.2 Hydrostatic test:

Total 13pcs (S-3) were randomly selected for hydrostatic test according to ISO2531-1998 during production, and the actual finding as following:

DI Fittings	Checked quantity (pcs)	Pressure and duration (Mpa x S)		Result
		Requirement of ISO2531-1998	Actual performed	
All flange tee DN800X600X800	1	1.0Mpa X 10S	1.0Mpa X 60S	Passed
All flange tee DN600X300X600	1	1.6Mpa X 10S	1.6Mpa X 60S	Passed
All flange tee DN500X200X500	1	1.6Mpa X 10S	1.6Mpa X 60S	Passed
All flange tee DN400X200X400	1	1.6Mpa X 10S	1.6Mpa X 60S	Passed
All flange tee DN300X200X300	1	2.5Mpa X 10S	2.5Mpa X 60S	Passed
All flange tee DN200X100X200	1	2.5Mpa X 10S	2.5Mpa X 60S	Passed
Spigot flange DN500	1	1.6Mpa X 10S	1.6Mpa X 60S	Passed
Spigot flange DN400	1	1.6Mpa X 10S	1.6Mpa X 60S	Passed
Spigot flange DN300	1	2.5Mpa X 10S	2.5Mpa X 60S	Passed
Spigot flange DN200	1	2.5Mpa X 10S	2.5Mpa X 60S	Passed
Socket flange DN200	1	2.5Mpa X 10S	2.5Mpa X 60S	Passed
Spigot flange DN600	1	1.6Mpa X 10S	1.6Mpa X 60S	Passed



Socket flange DN600	1	1.6Mpa X 10S	1.6Mpa X 60S	Passed
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Result: No visual leakage was found, Passed.

### 6.3 Zinc coating mass test:

Total 13pcs(S-3) fittings were randomly selected for zinc-rich coating thickness check during production according to ISO 8179, and the actual finding as following:

Description	Samples size	Zinc-rich coating thickness check (um)	
		Requirement of ISO 8179	Actual finding
All flange tee DN600X300X600	1	≥150g/m <sup>2</sup> (equal to ≥20um)	23
All flange tee DN400X400X400	1		21
All flange tee DN200X150X200	1		25
All flange tee DN500X200X500	1		22
All flange tee DN500X400X500	2		24, 23
Socket flange DN600	1		27
Socket flange DN150	2		27, 23
Socket flange DN400	2		33, 24
Spigot flange DN500	1		26
Spigot flange DN300	1		21

Result: passed

### 6.4 Cement lining thickness check for fittings:

Total 13pcs(S-3) were randomly selected for cement thickness check during production according to ISO4179. Found the fitting cement lining were smooth and covering uniformity and without obvious defect on the surface. The lining thickness measured as following:

Description	Samples size	Cement lining thickness (mm)	
		Requirement of ISO4179	Requirement of ISO4179
All flange tee DN600X300X600	2	≥3mm	7.8, 8.4
All flange tee DN400X400X400	2	≥3mm	9.2, 8.8
All flange tee DN500X400X500	2	≥3mm	10.0, 8.1
Socket flange DN600	4	≥3mm	6.9,8.3,9.3,8.0
Spigot flange DN500	2	≥3mm	11.2,8.4
Spigot flange DN300	1	≥2mm	9.1

Result: passed

### 7. Documentation Review:

The factory inspection reports were submitted to SGS inspector for reviewing, and it shows it is confirmed to the requirement of BS ISO2531-1998, we quote the date as following:

---Quoted---

- Performed standard: ISO2531:1998	Requirement of ISO2531-1998
- Hydrostatic test: 1.0-2.5Mpa x 60Sec. Passed	(ISO2531 Standard: 1.0-2.5Mpa x 10 Sec )
- Mechanical properties testing:	
Tensile Str.: 490-530Mpa	(ISO2531 standard: >=420 Mpa)
Elongation: 10-13%	(ISO2531 standard: >=5%)
Hardness: 163-195HB	(ISO2531 standard: <=250 HB)

- Thickness of Zinc-rich: 150-163g/m<sup>2</sup> (ISO2531 standard: ≥150 g/m<sup>2</sup>)
- Thickness of Bitumen: 72-83um (ISO2531 standard: ≥70um)
- Internal cement thickness: 7-13mm (ISO2531 standard: ≥3mm)
- Unquoted---

**8. Conclusion:**

According to requirement, the cargos were inspected for quantity, packing, marking, visual quality, dimension check, witness hydraulic test, witness zinc coating mass check, Cement Lining Inspection & document review, and found the cargo we inspected were met requirement of ISO2531-1998 and relative standard (ISO8179 & ISO4179) except for the packing, marking & dimension check were subject to client's evaluation.

**THIS REPORT ONLY REFLECTED OUR ACTUAL FINDINGS. THE INSPECTION WAS DONE TO THE BEST OF OUR KNOWLEDGE AND ABILITY AND WITH DUE CARE. THE FINDINGS ARE VALID AS FOR TIME AND PLACE OF INSPECTION.**

\*\*\*\*\*THE END\*\*\*\*\*

**Attachment:**

**Photos:**



**Socket flange DN300**



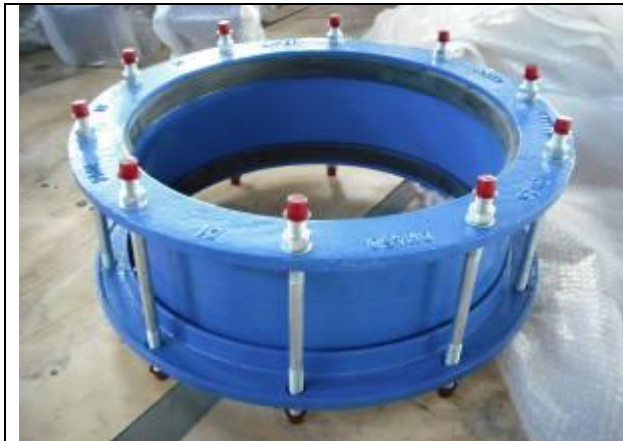
**Spigot flange DN400**



**All flange tee DN600X300X600**



**Flange adaptor DN200**



**Coupling DN450**



**Hardness test**



**Tensile testing**



**Wall thickness checking**



**Hydrostatic test**

