eurofins | Expert Services

Kivimiehentie 4,
FI-02150 Espoo, FINLAND
www.eurofins.fi/expertservices

Designated according to Article 29 of Regulation (EU) No 305/2011

Member of EOTA
www.eota.eu

European Technical Assessment ETA 13/0338 of 13/03/2020

I General Part

Technical Assessment Body issuing the ETA	Eurofins Expert Services Oy
Trade name of the construction product	Taizhou Homer Angle Bracket
Product family to which the construction product belongs	Three-dimensional nailing plates
Manufacturer	Jiangsu Homer Hardware Manufacturing Co., Ltd 516 Keji Road, The Economic Development Zone, Jiangyan District, Taizhou City, Jiangsu Province China 225500
Manufacturing plant	Jiangsu Homer Hardware Manufacturing Co., Ltd 516 Keji Road, The Economic Development Zone, Jiangyan District, Taizhou City, Jiangsu Province China 225500
This European Technical Assessment contains	75 pages including 2 Annexes which form an integral part of this assessment
This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of	ETAG 015 used as EAD, 2012, Three-dimensional nailing plates
This ETA replaces	ETA 13/0338, issued on May 14, 2019

II Specific Part

1 Technical description of the product

Taizhou Homer Angle Brackets are one-piece non-welded three-dimensional nailing plates manufactured from hot-dip zinc coated steel sheet of grade S250 GD Z 275 MA according to EN 10346 or SS GR340 Z275 according to ASTM A653M or from cold rolled austenitic stainless steel plate of grade 1.4301 according to EN 10088-2 or AISI 304 (SS304) according to ASTM A240/A240M.

Figure 1. Examples of Taizhou Homer Angle Brackets. Flanges A and B marked.

In the zinc coated connectors, the yield strength R_{el} or R_{02} of the steel is at least 250 N/mm², the tensile strength R_m at least 330 N/mm² and elongation at failure A_{80} at least 19 %. Amount of the zinc coating is at least 275 g/m². In stainless steel connectors, the yield strength R_{02} of the steel is at least 230 N/mm², the tensile strength R_m at least 520 N/mm² and the elongation at failure A_{80} at least 45 %.

The product drawings are in Annex 1 and the sizes of Taizhou Homer Angle Brackets are listed in tables of Annex 2. The steel material thickness of the zinc coated connectors is 2,00 ± 0,14 mm, 2,50 ± 0,16 mm or 3,00 ± 0,18 mm. The material thickness of stainless steel connectors is 2,00 ± 0,10 mm; 2,50 ± 0,12 mm or 3,00 ± 0,14 mm. Tolerance for the position of the holes is within ± 1,00 mm.

2 Specification of the intended uses in accordance with the applicable EAD

2.1 Intended uses

Intended use of Taizhou Homer Angle Brackets are timber constructions, where both flanges of the bracket are fixed to strength graded timber according to EN 14081-1, glulam according to EN 14080, softwood- or laminated logs, laminated veneer lumber (LVL) according to EN 14374, plywood according to EN 13986, cross laminated timber (CLT) with edge glued lamellas, or corresponding timber material. The characteristic density ρ_k of the timber shall not be greater than 500 kg/m³. This ETA does not cover angle brackets fixed in the end of a timber member or in the edge of a LVL member.

The forces to be transferred by the angle bracket shall act at the centre of the fastener group on the plane defined by flange A. For non-symmetric connections the flange A means always the bigger flange. For unclear cases the flange A is presented in figures of Appendix 1. Shear capacity represents the force component that is in effect in direction of a flange surface. Tensile and compression force are the force components that are in effect in direction perpendicular to a flange surface. The long adjustable hole brackets J-LAB-100 and J-LAB-130 are used typically for fixing non-settling construction members to a log wall and they may be loaded only by tension loads. The log bracket named J-LBJ-160 is a two-part connector used as a wind uplift restraint.

Taizhou Homer Angle Brackets shall be fixed to timber by anchor nails or anchor screws (see Figure 2) according to EN 14592. The diameter of the anchor nails shall be d = 4,0 mm and the profiled length at least 24 mm. The anchor screw shall have a conical head, the diameter of the smooth part of the screw shall be d = 4,5…5,0 mm and the inner diameter of the threaded part $d_1 \geq$ 3,0 mm. The length of the threaded part of the screw shall be at least 6d.

a)

b)

Figure 2. Fasteners: a) anchor nail and b) anchor screw.

Connections with Taizhou Homer Angle Brackets shall fulfil the minimum spacing and edge distance requirement specified in EN 1995-1-1. Timber parts shall not be pre-drilled for the nails or screws. Fasteners shall be perpendicular to the grain of the timber.

For Taizhou Homer Angle Brackets made of hot-dip zinc coated steel, the intended service classes according to EN 1995-1-1 are classes 1 and 2. Angle Brackets made of stainless steel can also be used in service class 3.

In service class 2, the nails or screws shall have an electroplated zinc coating according to EN ISO 2081 at least of type and thickness Fe/Zn 12c, or they shall be hot dip zinc coated according to EN ISO 1461, thickness at least 39 μm. In service class 3, the nails or screws shall be made of stainless steel.

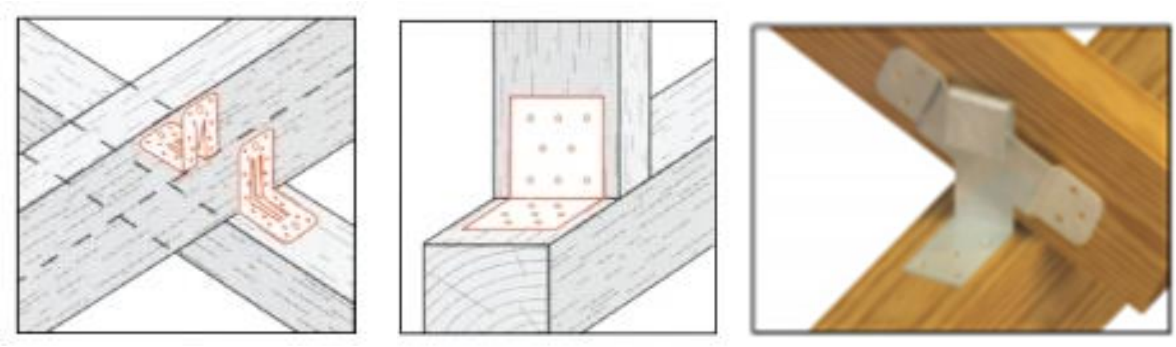


Figure 3. Typical use of Taizhou Homer Angle Brackets.

2.2 Working life

The provisions made in this European Technical Assessment are based on an assumed intended working life of the angle brackets of 50 years.[1]

2.3 Identification

Taizhou Homer Angle Brackets are identified having "TAIZHOU HOMER" stamped on each connector.

[1] This means that it is expected that when this working life has elapsed, the real working life may be, in normal use conditions, considerably longer without major degradation affecting the essential requirements of the works. The indications given as to the working life of a product cannot be interpreted as a guarantee given by the producer or the assessment body. They should only be regarded as a means for the specifiers to choose the appropriate criteria for products in relation to the expected, economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment

Table 1. Basic requirements for construction works and essential characteristics

Basic requirement and essential characteristics	Performance
BWR 1. Mechanical resistance and stability	
Joint strength	Clause 3.1
Joint stiffness	No performance assessed
Joint ductility	No performance assessed
Resistance to corrosion and deterioration	Clause 3.1
Dimensional stability	No performance assessed
BWR 2. Safety in case of fire	
Reaction to fire	Clause 3.2
Resistance to fire	No performance assessed
BWR 3. Hygiene, health and the environment	
Content, emission and/or release of dangerous substances	Clause 3.3
BWR 7. Sustainable use of natural resources	
Sustainable use of natural resources	No performance assessed

3.1 Mechanical resistance and stability, BWR 1

3.1.1 Joint strength

Characteristic resistance values of Taizhou Homer Angle Brackets are given in Annex 2.

3.1.2 Resistance to corrosion and deterioration

Taizhou Homer Angle Brackets have been assessed as having satisfactory durability and serviceability when used in timber structures when the timber species (including timbers preserved with organic solvent, boron diffusion and related preservatives) described in Eurocode 5 (EN 1995-1-1:2004) are used and the structures are subject to the dry, internal conditions defined by service classes 1 and 2. Angle Brackets manufactured from stainless steel can also be used in service class 3 provided that also the nails and screws used together with them are made of stainless steel.

3.2 Safety in case of fire, BWR 2

3.2.1 Reaction to fire

Taizhou Homer Angle Brackets are made of materials classified to have reaction to fire class A1 according to EN 13501-1.

3.3 Hygiene, health and environment, BWR 3

3.3.1 Content, emission and/or release of dangerous substances

The product does not contain harmful or dangerous substances listed in EOTA TR 34 dated May 2014.

In addition to the specific clauses relating to dangerous substances contained in this European Technical Assessment, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the EU Construction Products Directive, these requirements need also to be complied with, when and where they apply.

4 Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base

According to the Decision 97/638/EC of the European Commission[2], the system of assessment and verification of constancy of performance (see Annex V to the regulation (EU) No 305/2011) is System 2+.

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD.

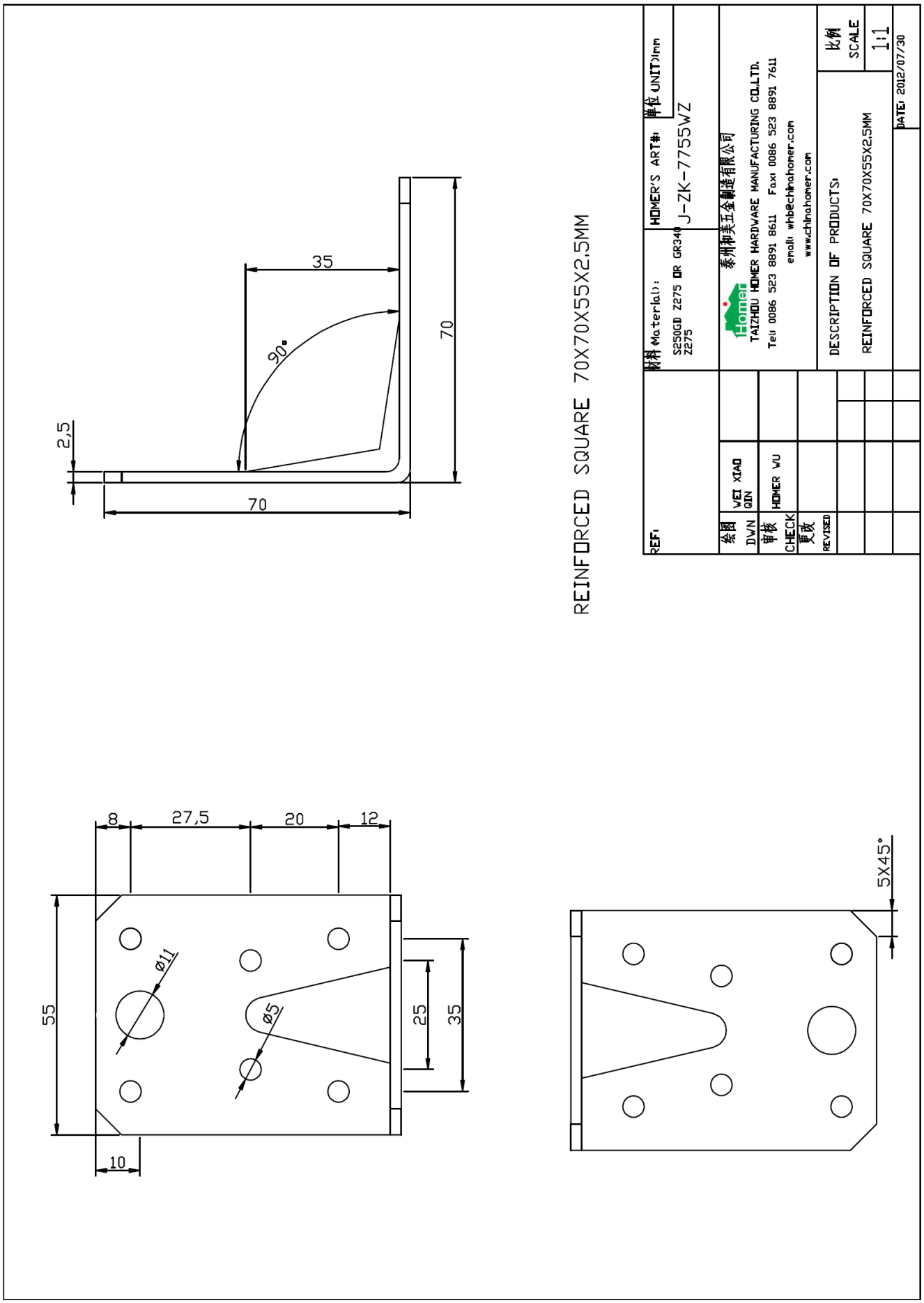
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at Eurofins Expert Services Oy.

Issued in Espoo on March 13, 2020
by Eurofins Expert Services Oy

Tiina Ala-Outinen
Business Development Manager

Ari Kevarinmäki
Leading Expert

[2] Official Journal of the European Communities L 268 of 1/10/1997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70
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27.5
20
12
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ø5
25
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10
5X45°
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S250GD Z275 OR GR340 Z275
HOMER'S ART#: J-ZK-7755WZ
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
REINFORCED SQUARE 70X70X55X2.5MM
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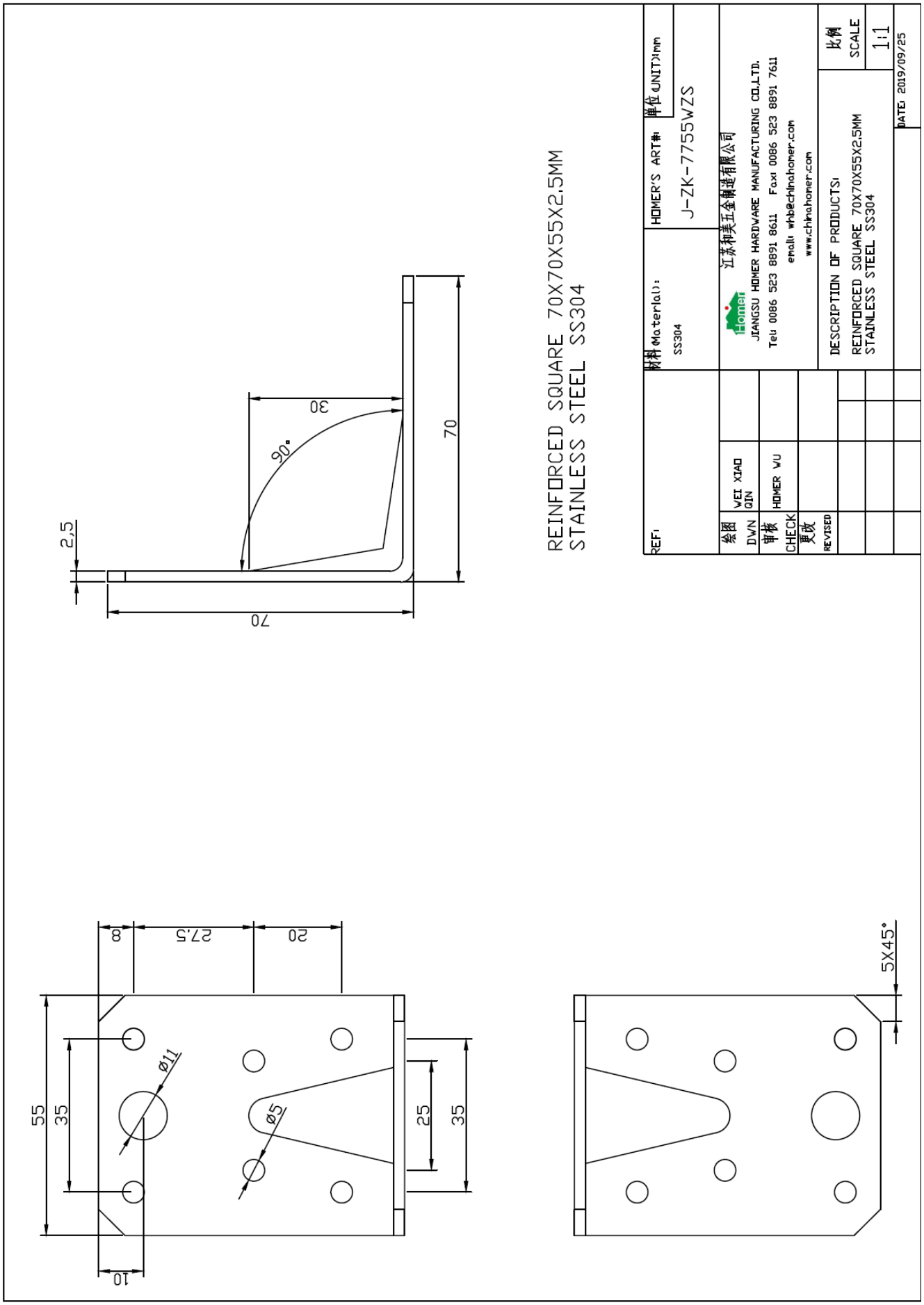
更改 REVISED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单位UNIT:mm
江苏和美五金制造有限公司
JIANGSU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
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70
8
27,5
20
55
35
Ø11
Ø5
25
35
10
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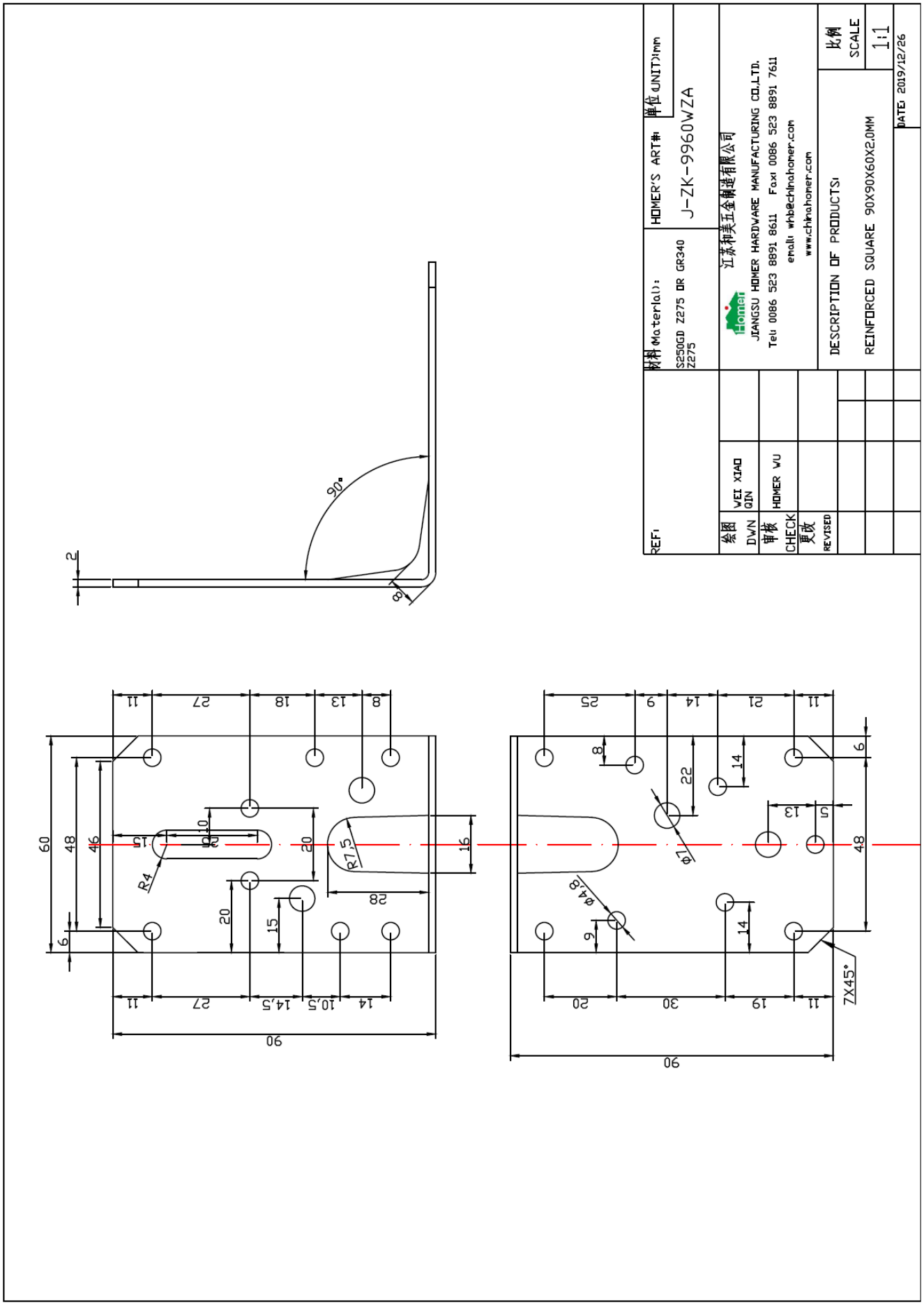
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JIANGSU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
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2
8
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60
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46
9
15
R10
20
R4
R7,5
16
28
11
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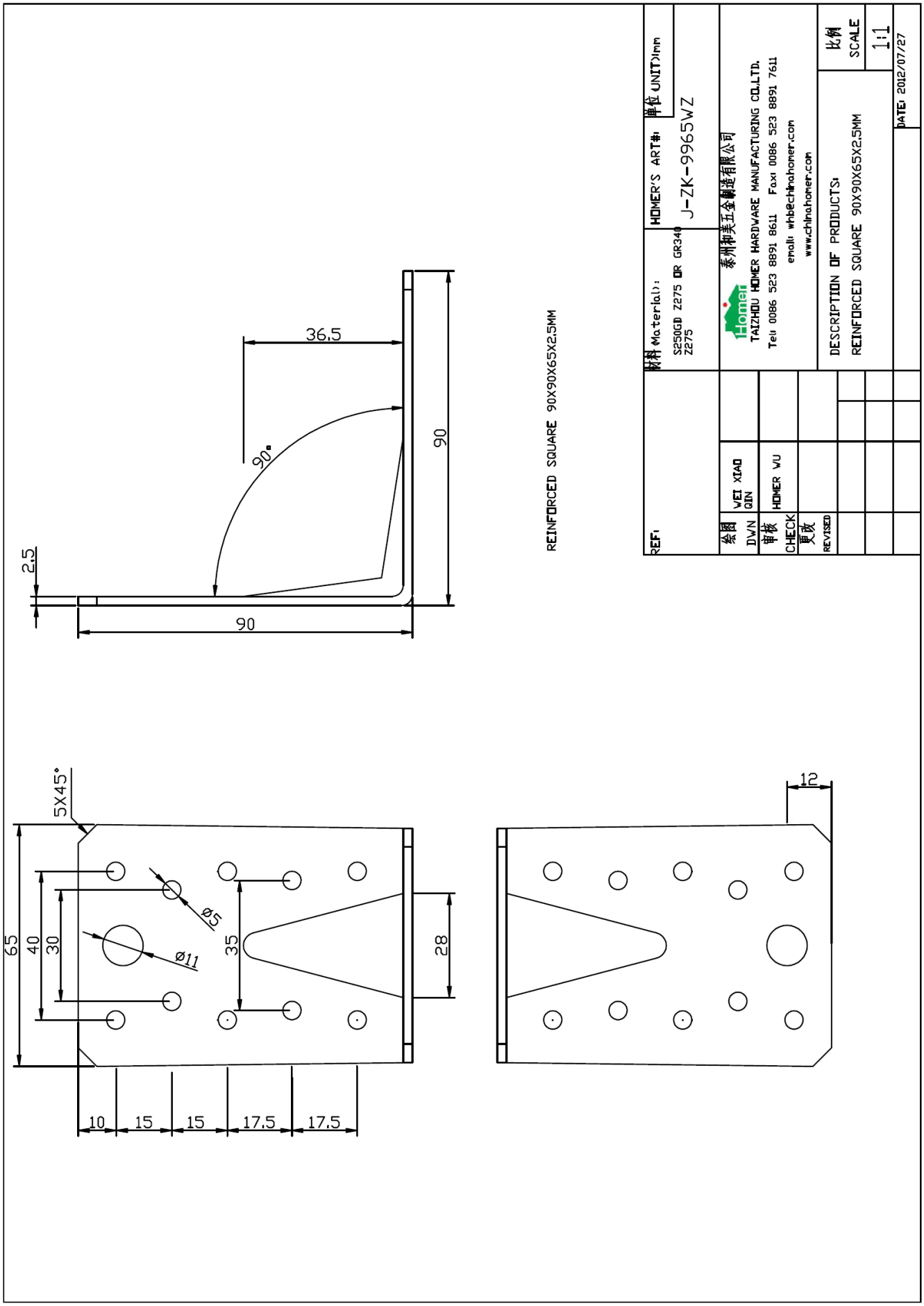
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17.5
17.5
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J-ZK-9965WZ
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
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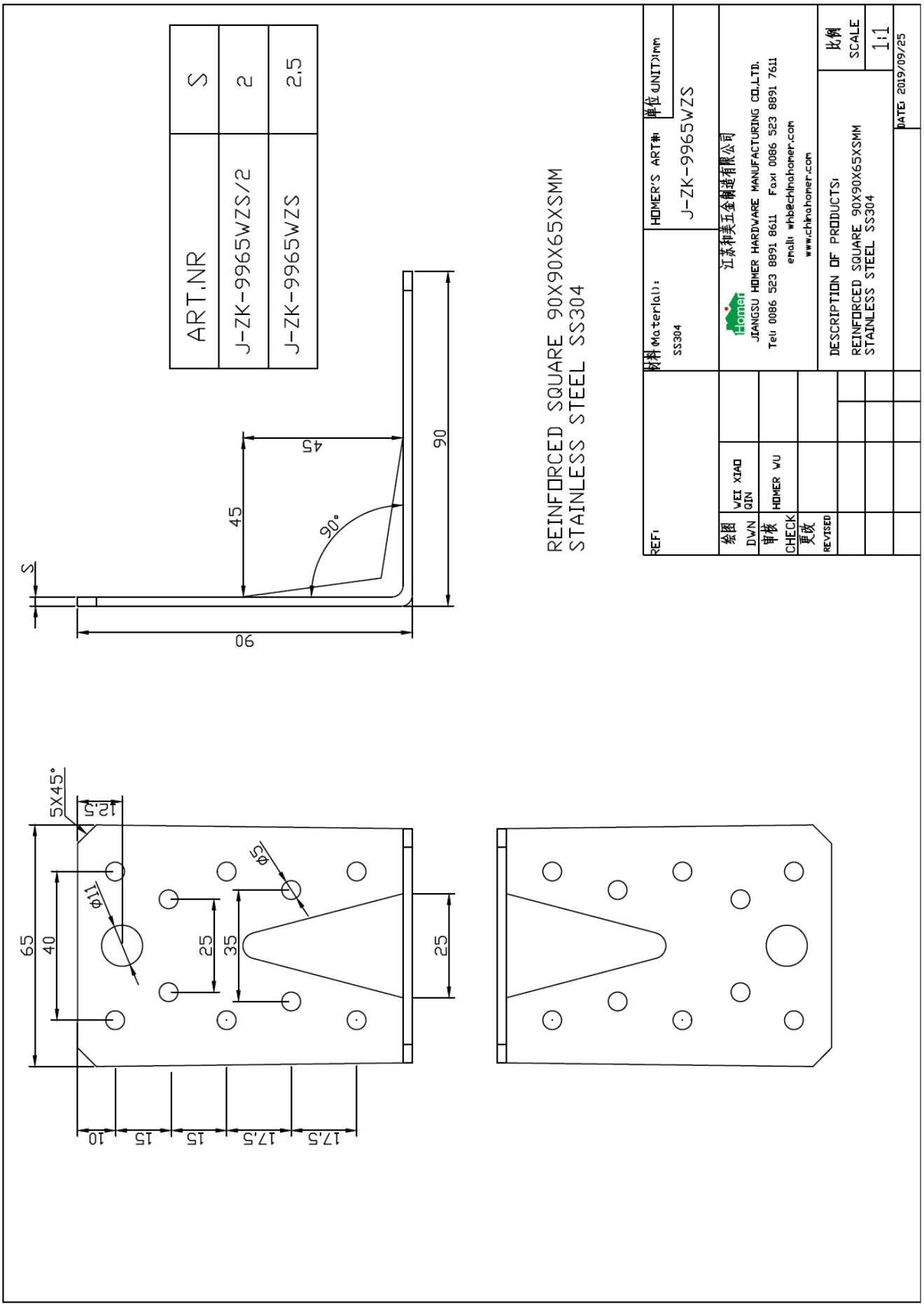
更改 REVISED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江苏和美五金制造有限公司
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email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
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45
45
90°
S
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R2
Φ11
Φ5
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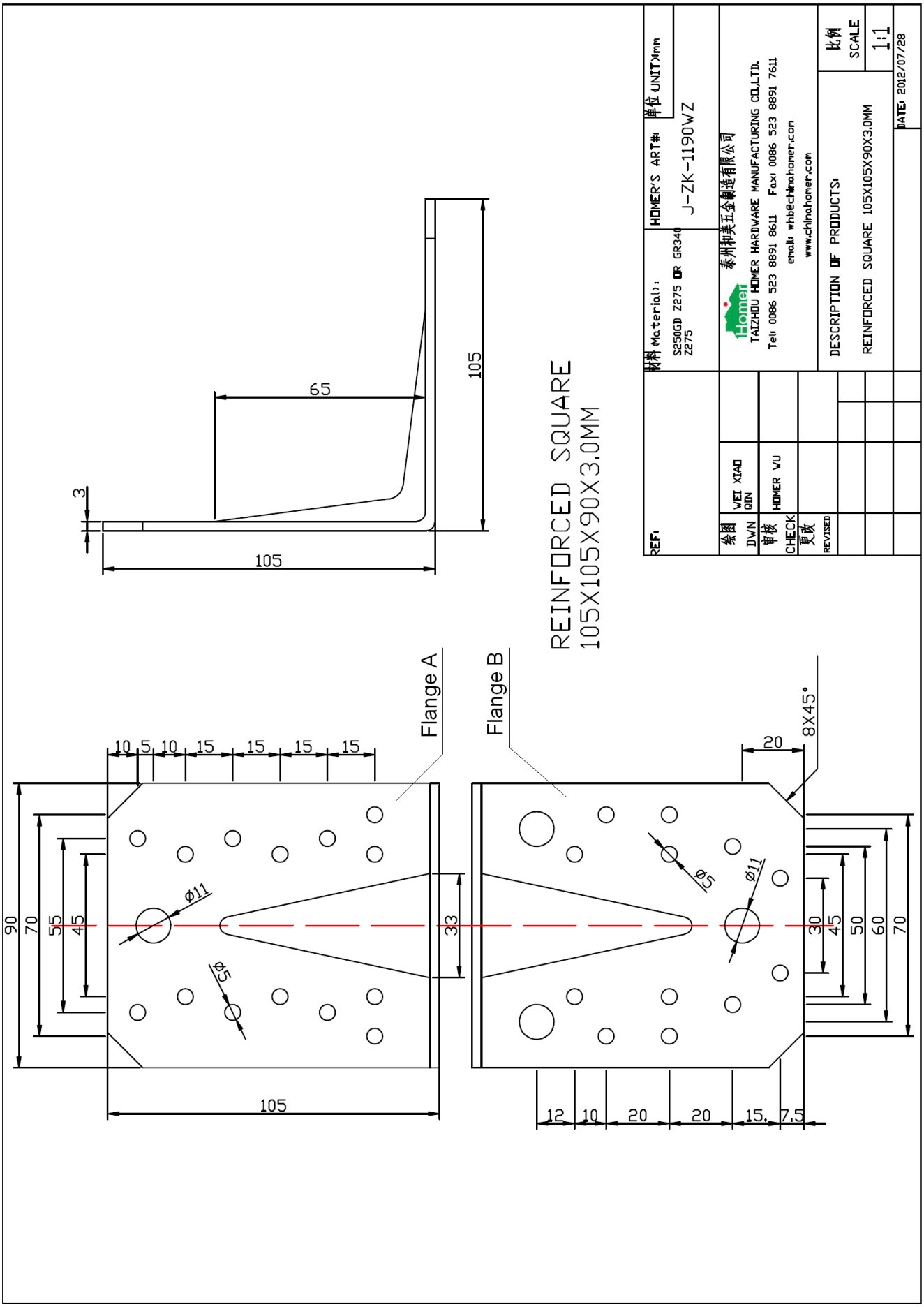
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Flange A
Flange B
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65
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Ø11
Ø5
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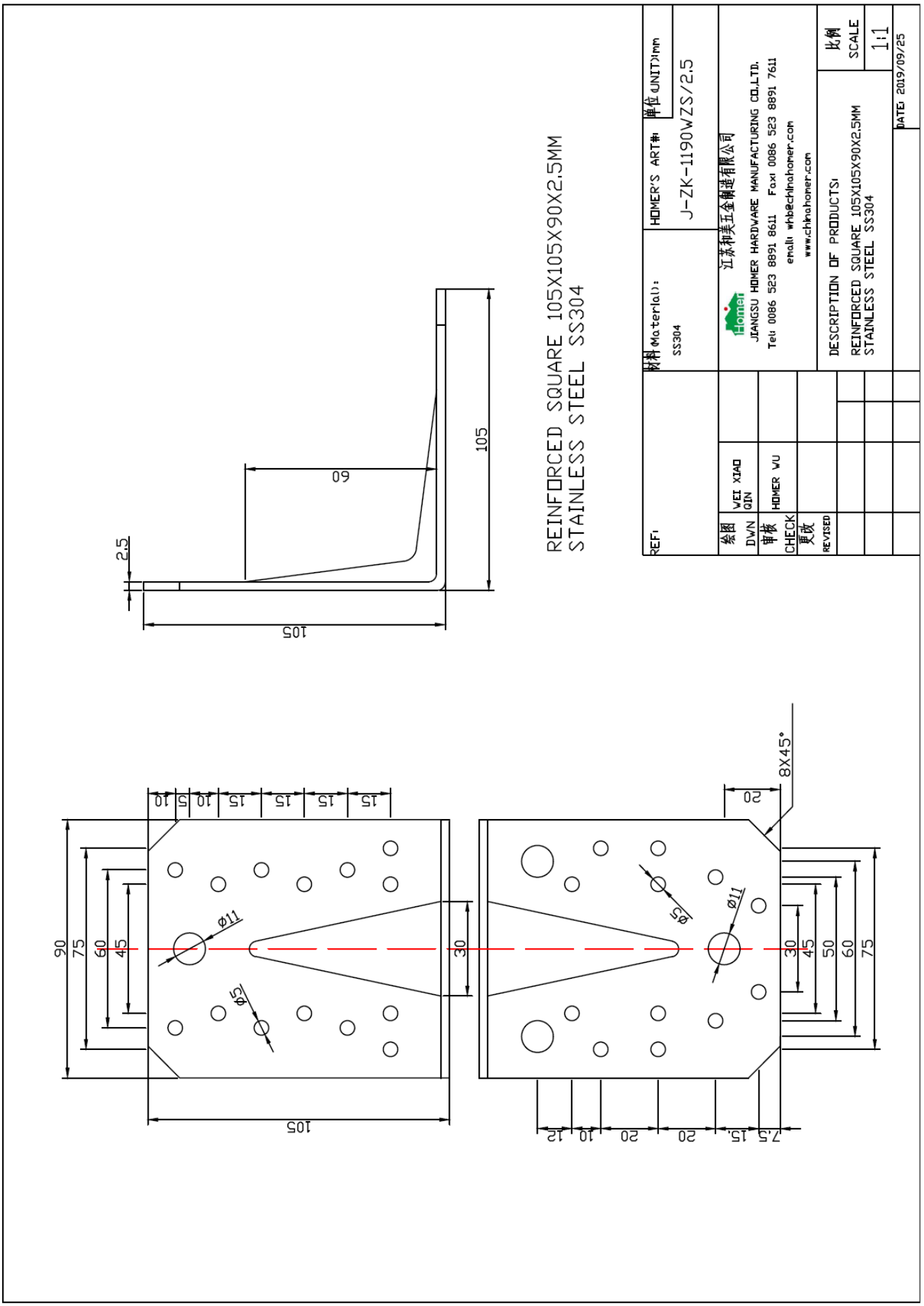
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JIANGSU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
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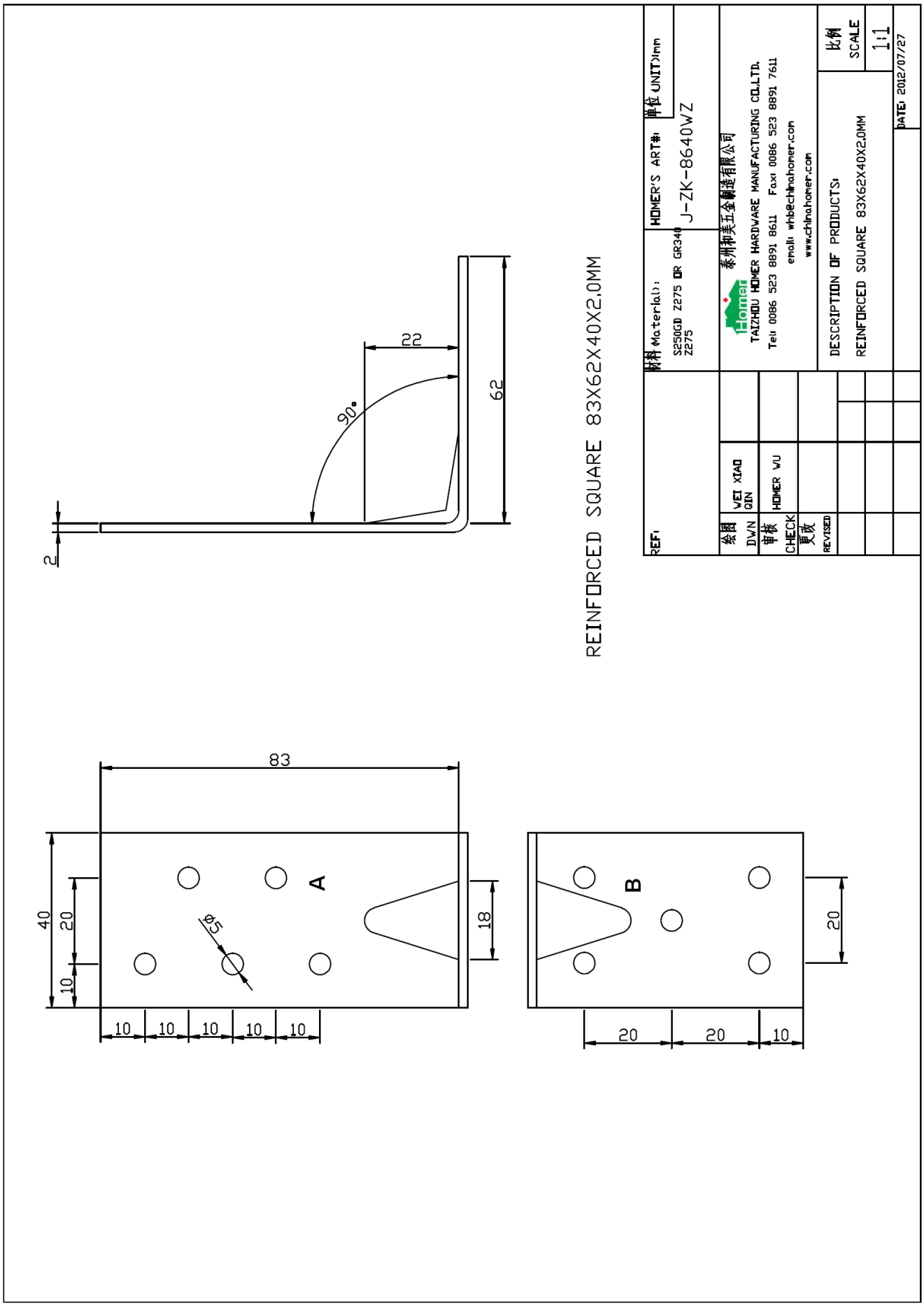
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J-ZK-8640WZ
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED
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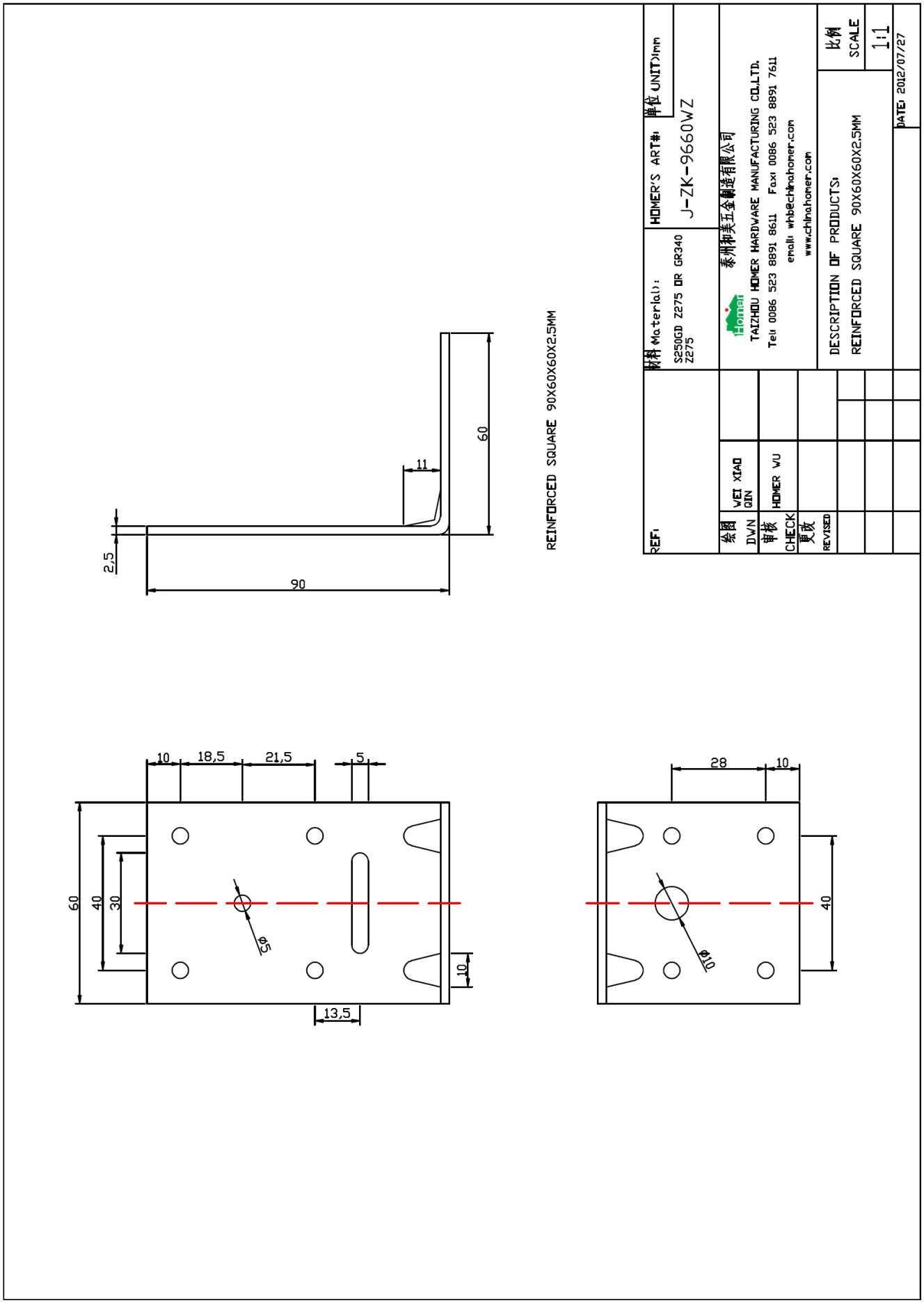
1:1
DATE: 2012/07/27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Φ5
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S250GD Z275 OR GR340
Z275
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泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
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email: whb@chinahomer.com
www.chinahomer.com
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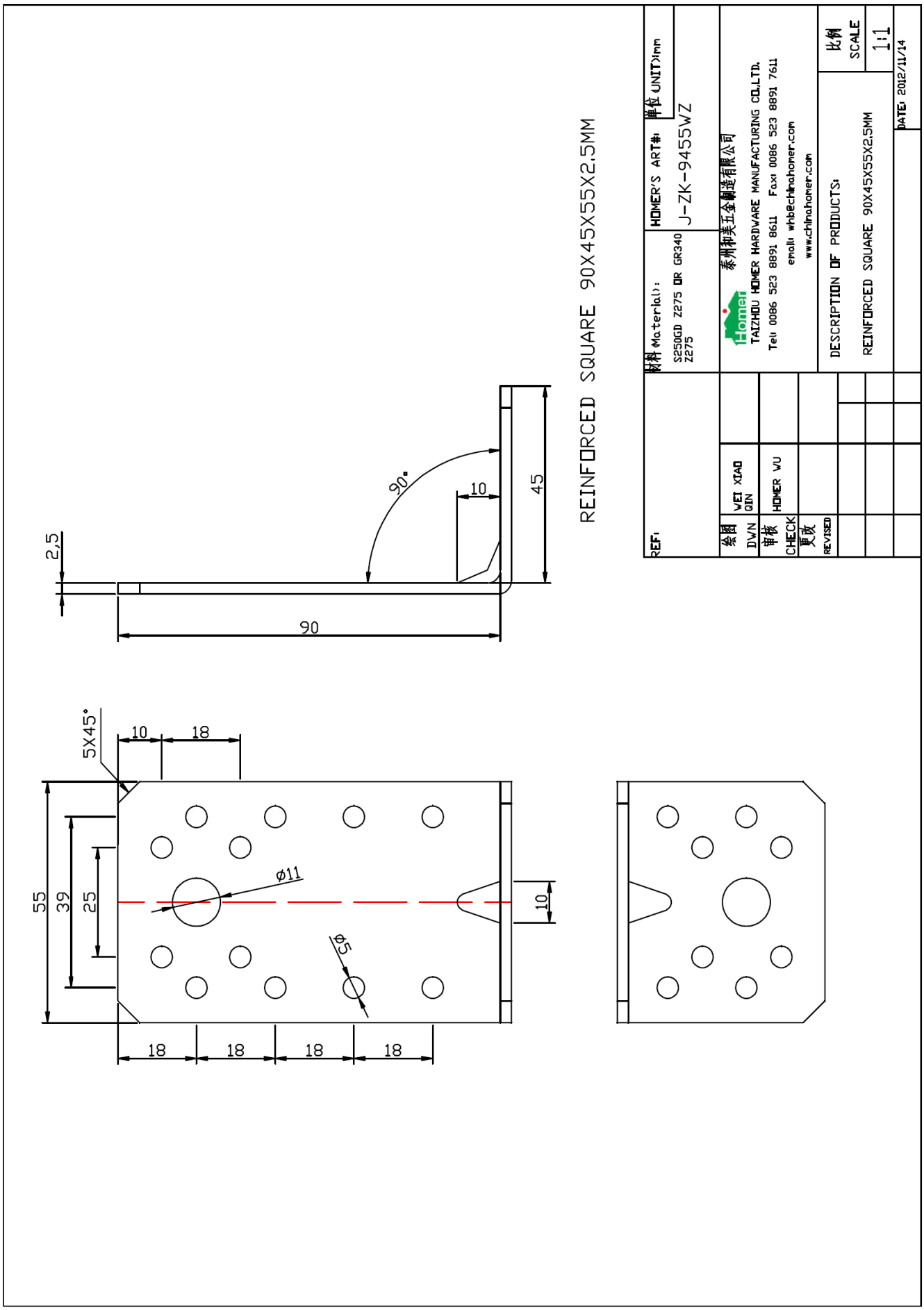
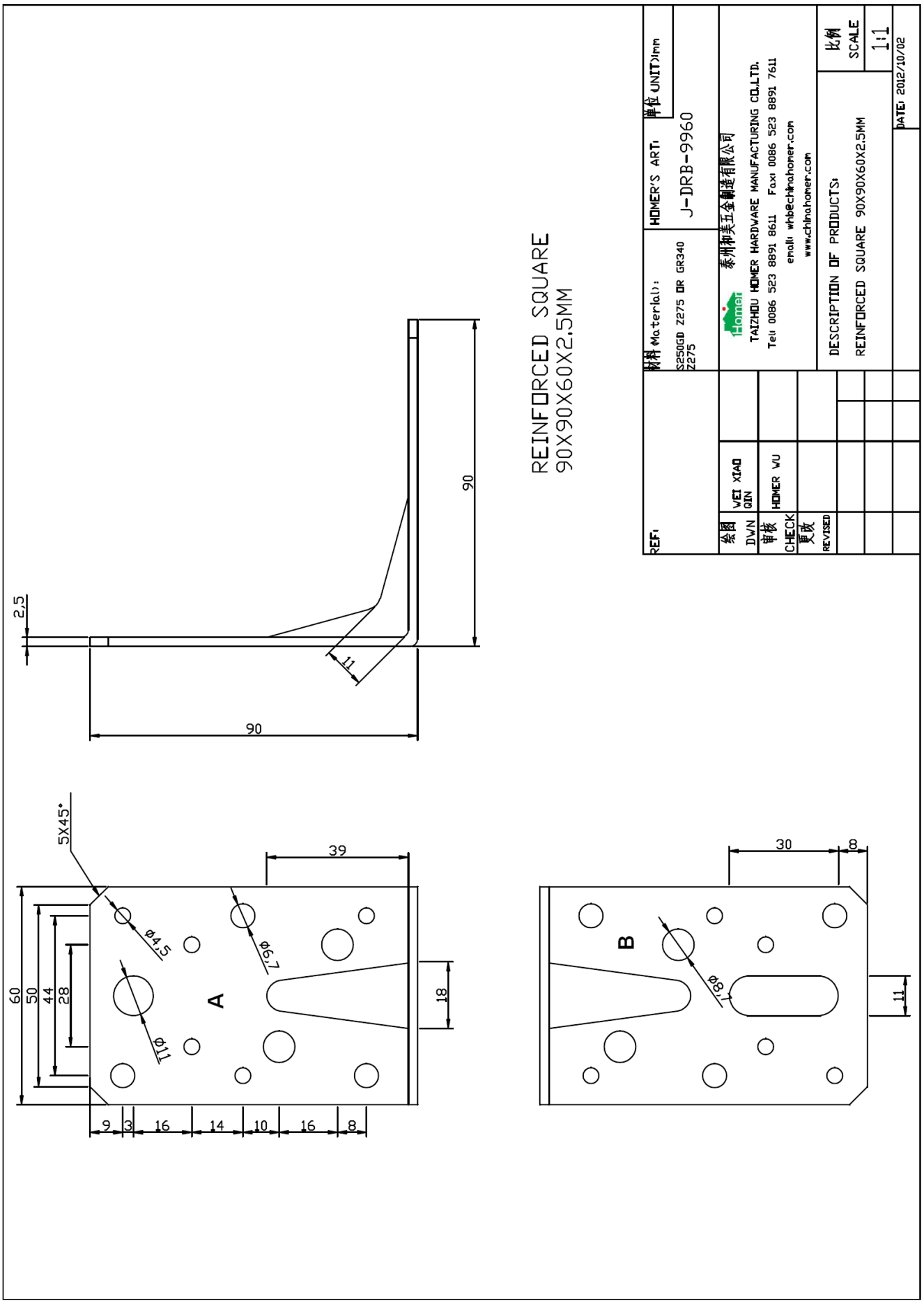
审核 CHECK
HOMER WU
更改 REVISED

ANNEX 1: Product details and definitions

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Φ6.7
Φ11
A
18
9
3
16
14
10
16
8
B
30
8
Φ8.1
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材料 Material:
S250GD Z275 OR GR340 Z275
HOMER'S ART:
J-DRB-9960
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
绘图 DWN
WEI XIAO QIN
审核 CHECK
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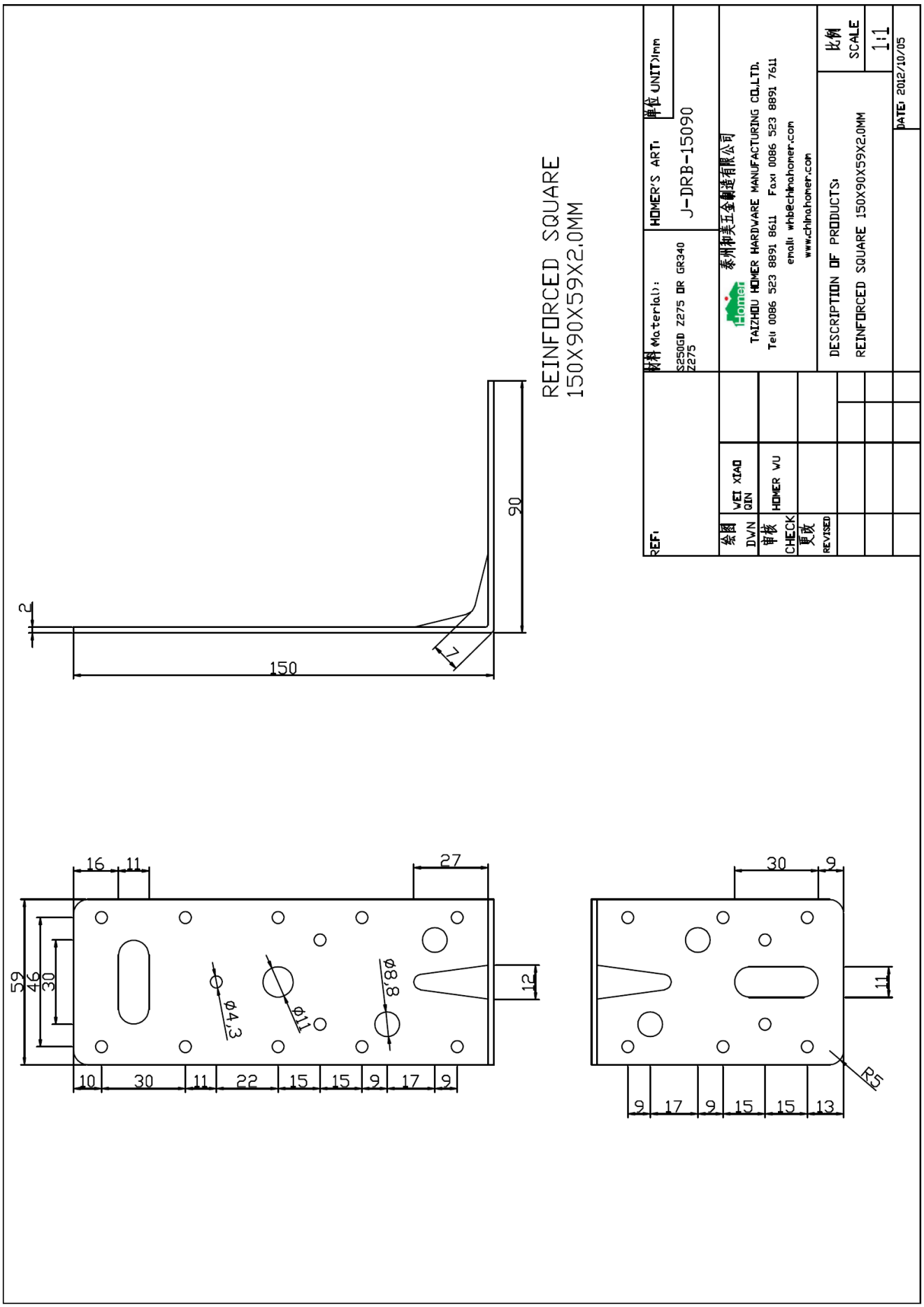
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泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
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DATE: 2012/10/05
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150
90
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59
46
30
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Φ4.3
Φ11
Φ8.8
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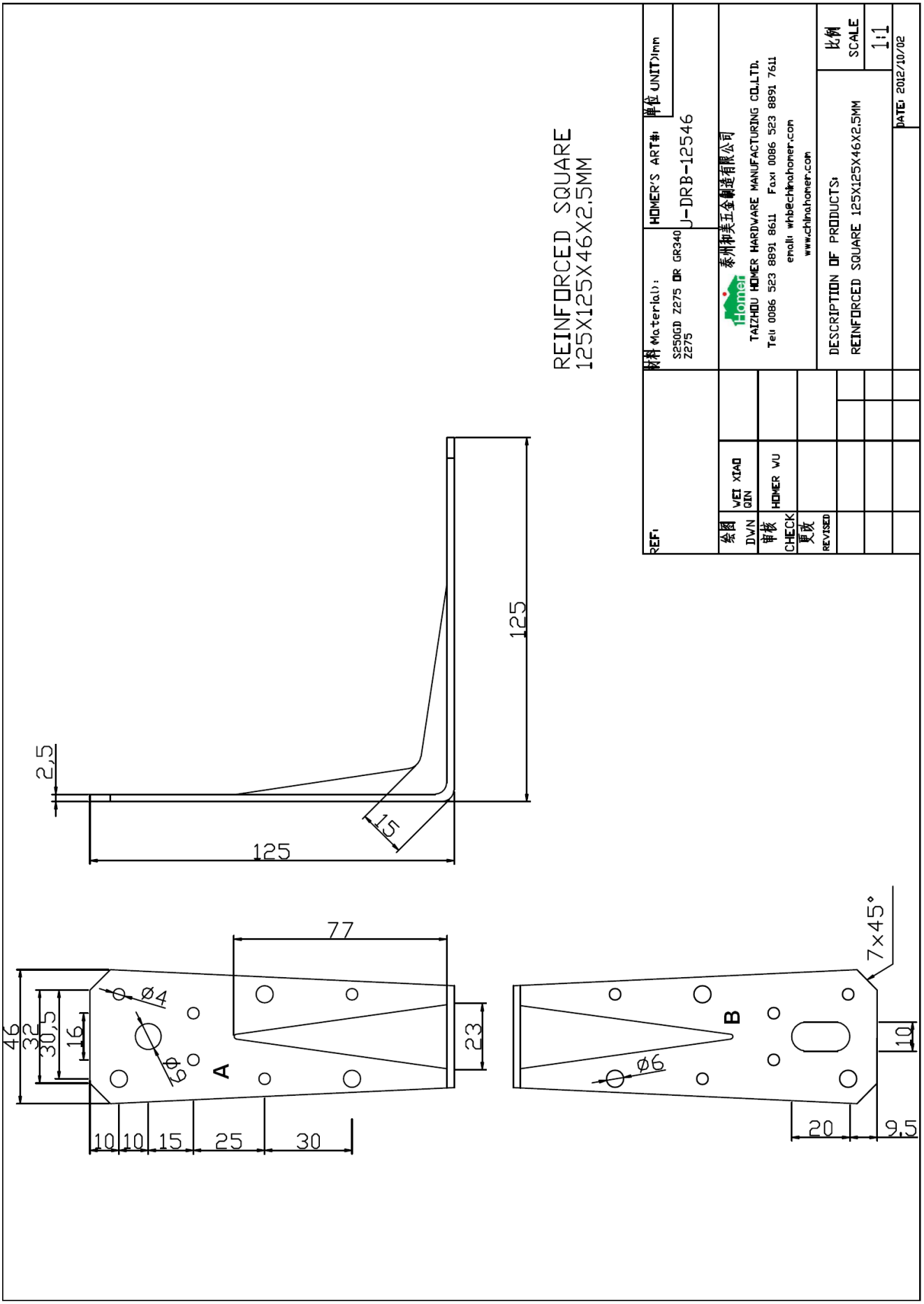
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Z275
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泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
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比例
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更改 REVISED
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125
15
125
77
46
32
30.5
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10
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25
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B
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Ø6
10
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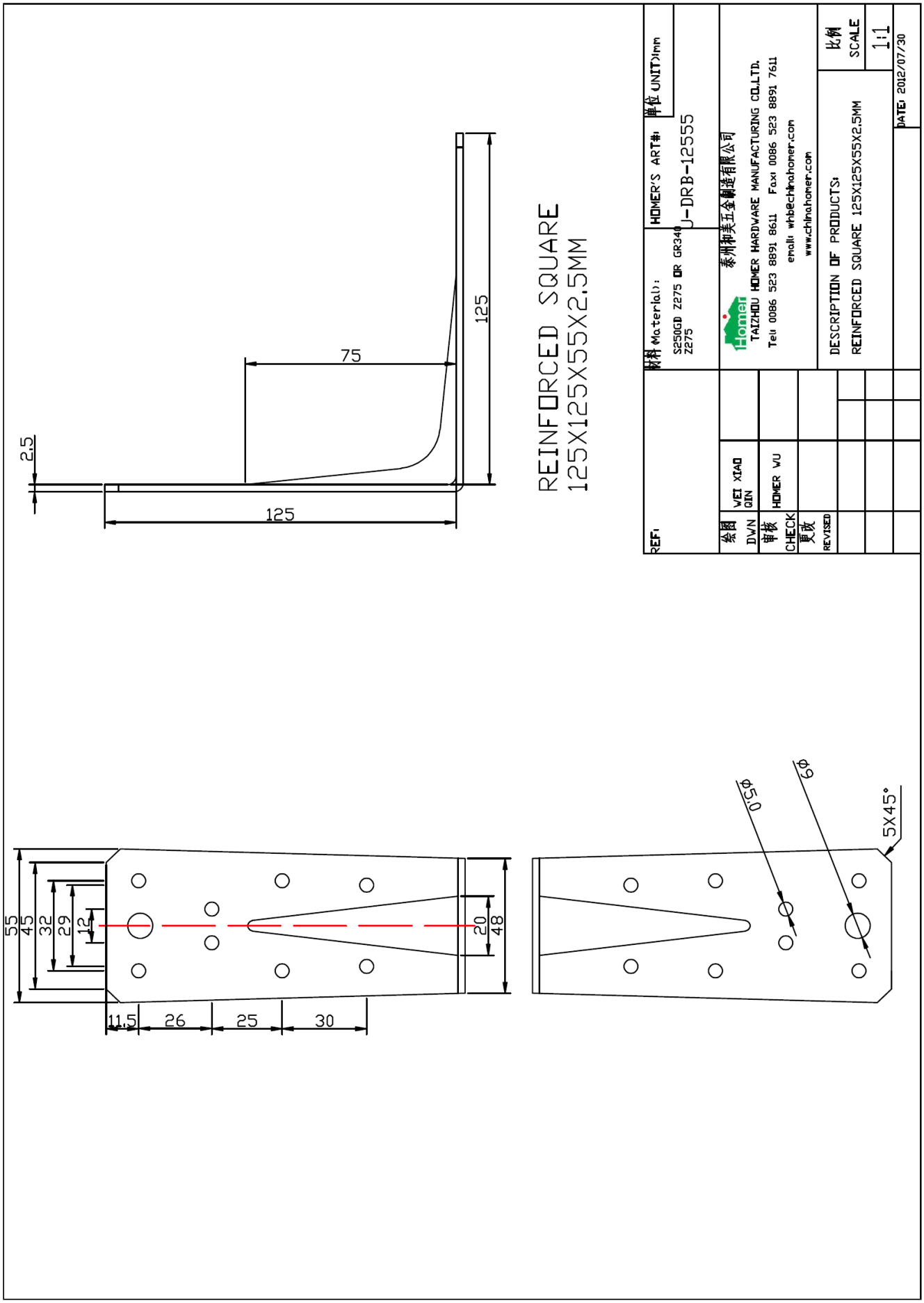
9.5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125
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11.5
26
25
30
20
48
Φ5.0
Φ9
5X45°
REF:
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审核 CHECK HOMER WU
更改 REVISED
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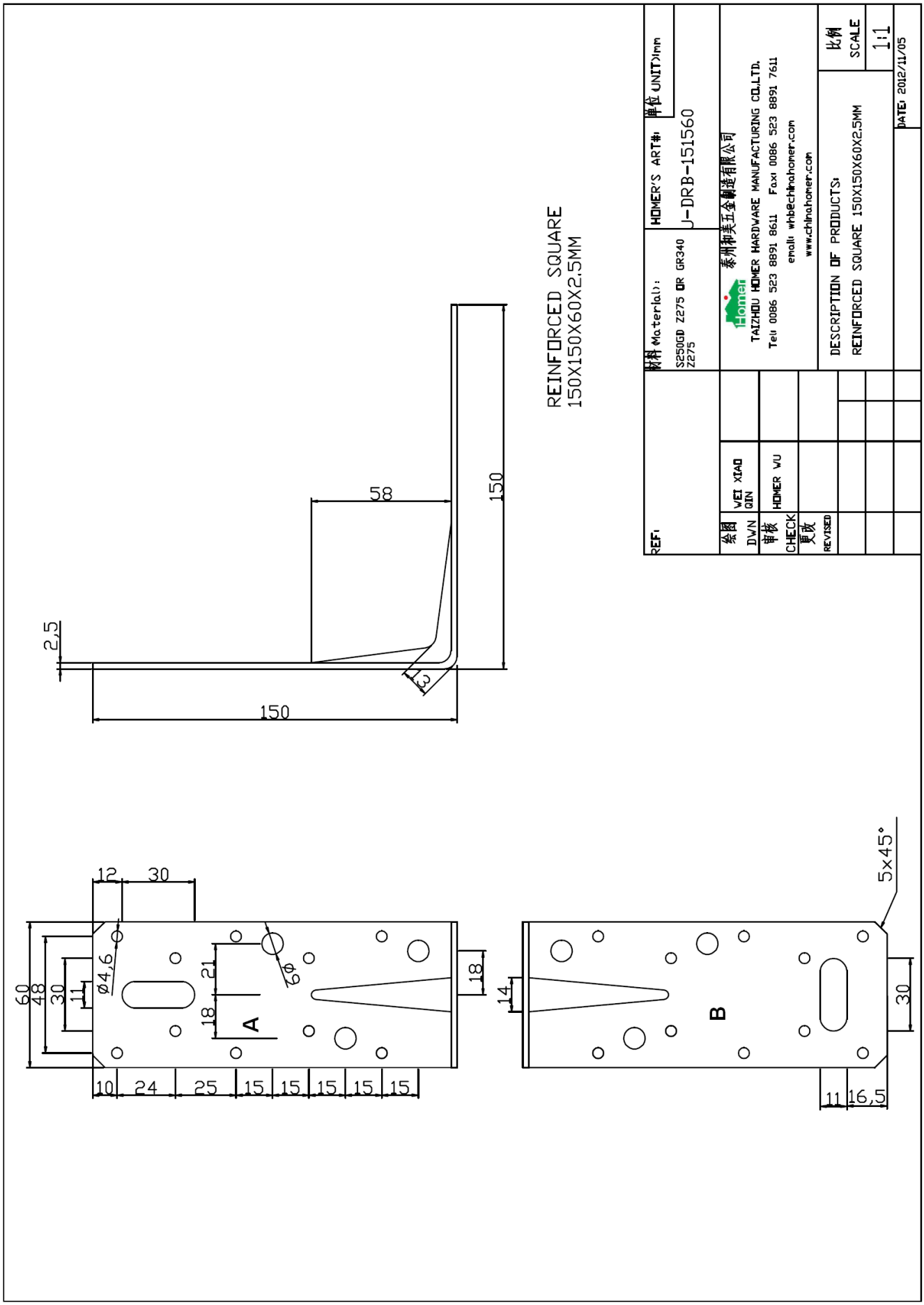
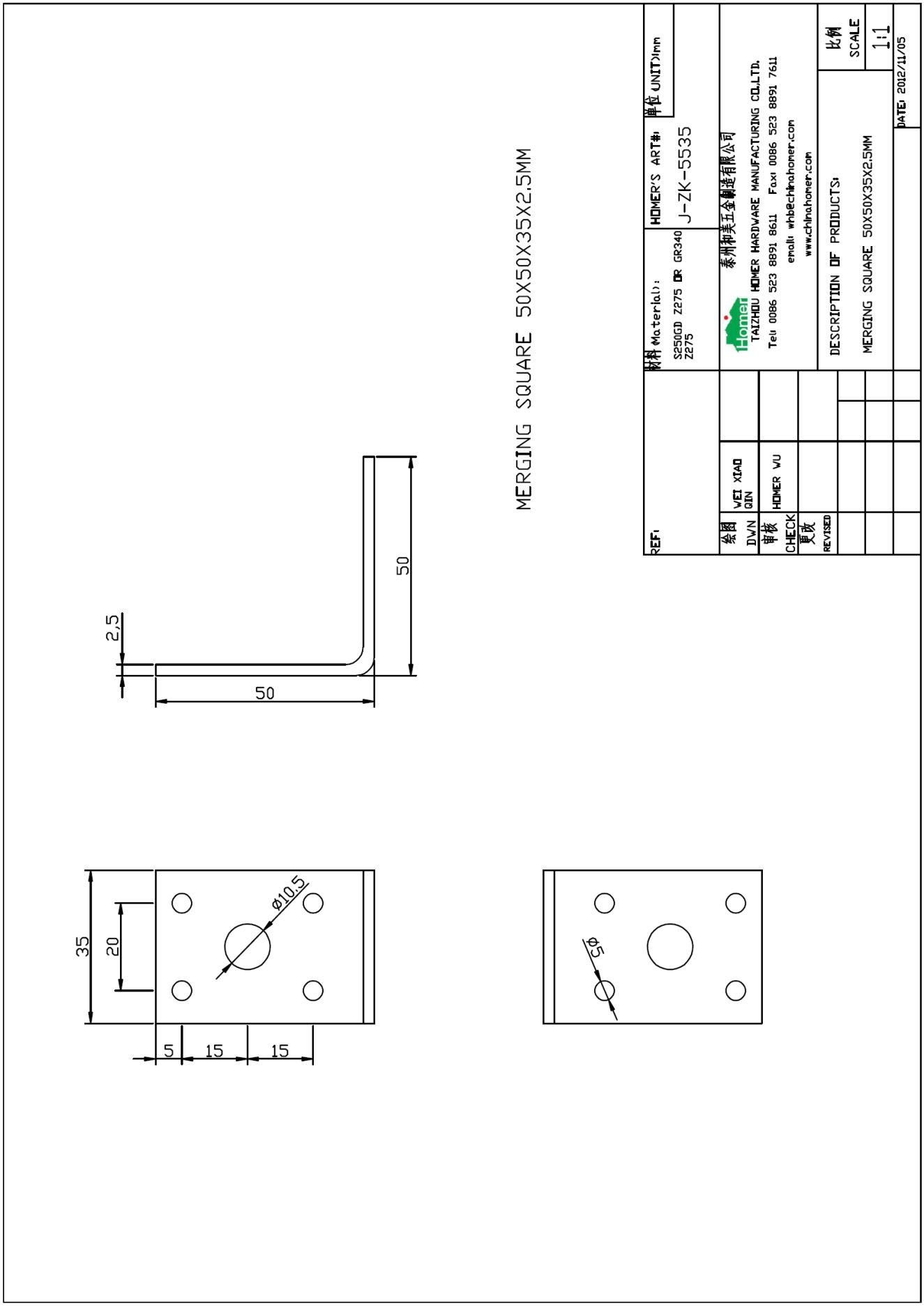
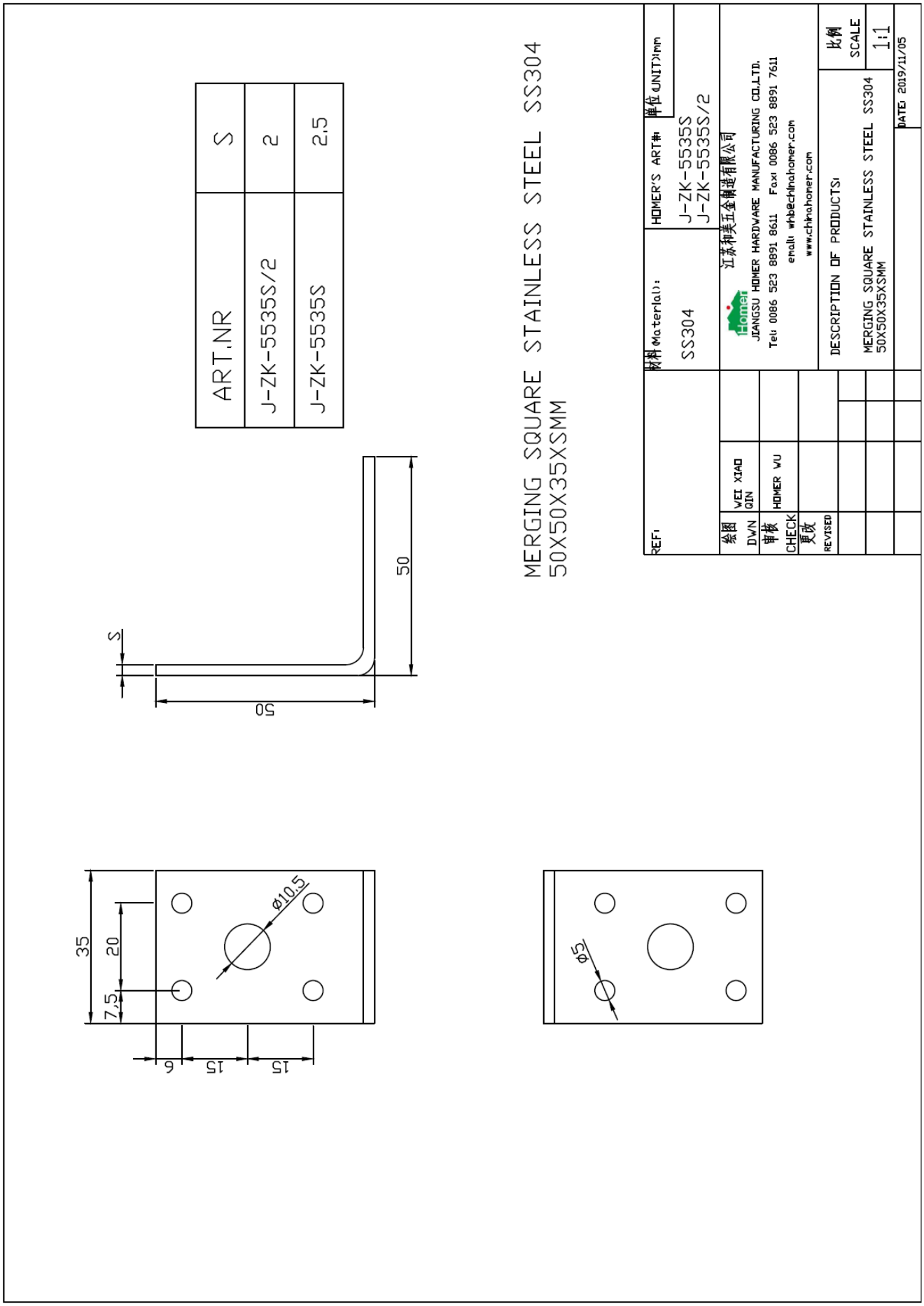
HOMER'S ART#: J-DRB-12555
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
REINFORCED SQUARE 125X125X55X2.5MM
比例 SCALE 1:1
DATE: 2012/07/30


REINFORCED SQUARE
150X150X60X2.5MM
HOMER'S ART#: J-DRB-151560
单位 UNIT:mm
材料 Material: S250GD Z275 OR GR340 Z275
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
泰州神美五金制造有限公司
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
REINFORCED SQUARE 150X150X60X2.5MM
比例 SCALE 1:1
DATE: 2012/11/05
REF:
绘图 DWN WEI XIAO QIN
审核 CHECK HOMER WU
更改 REVISED
2.5
58
150
150
3
12
30
60
48
30
11
Ø4.6
21
18
6Ø
18
A
10
24
25
15
15
15
15
15
14
B
5x45°
30
11
16.5


MERGING SQUARE 50X50X35X2.5MM
2.5
50
50
35
20
ø10.5
5
15
15
5ø
REF:
材料 Material:
S250GD Z275 OR GR340 Z275
HOMER'S ART#:
J-ZK-5535
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED
DESCRIPTION OF PRODUCTS:
MERGING SQUARE 50X50X35X2.5MM
比例 SCALE
1:1
DATE: 2012/11/05


MERGING SQUARE STAINLESS STEEL SS304
50X50X35XSMM
ART.NR
S
J-ZK-5535S/2
2
J-ZK-5535S
2,5
S
50
50
35
20
7,5
Ø10,5
6
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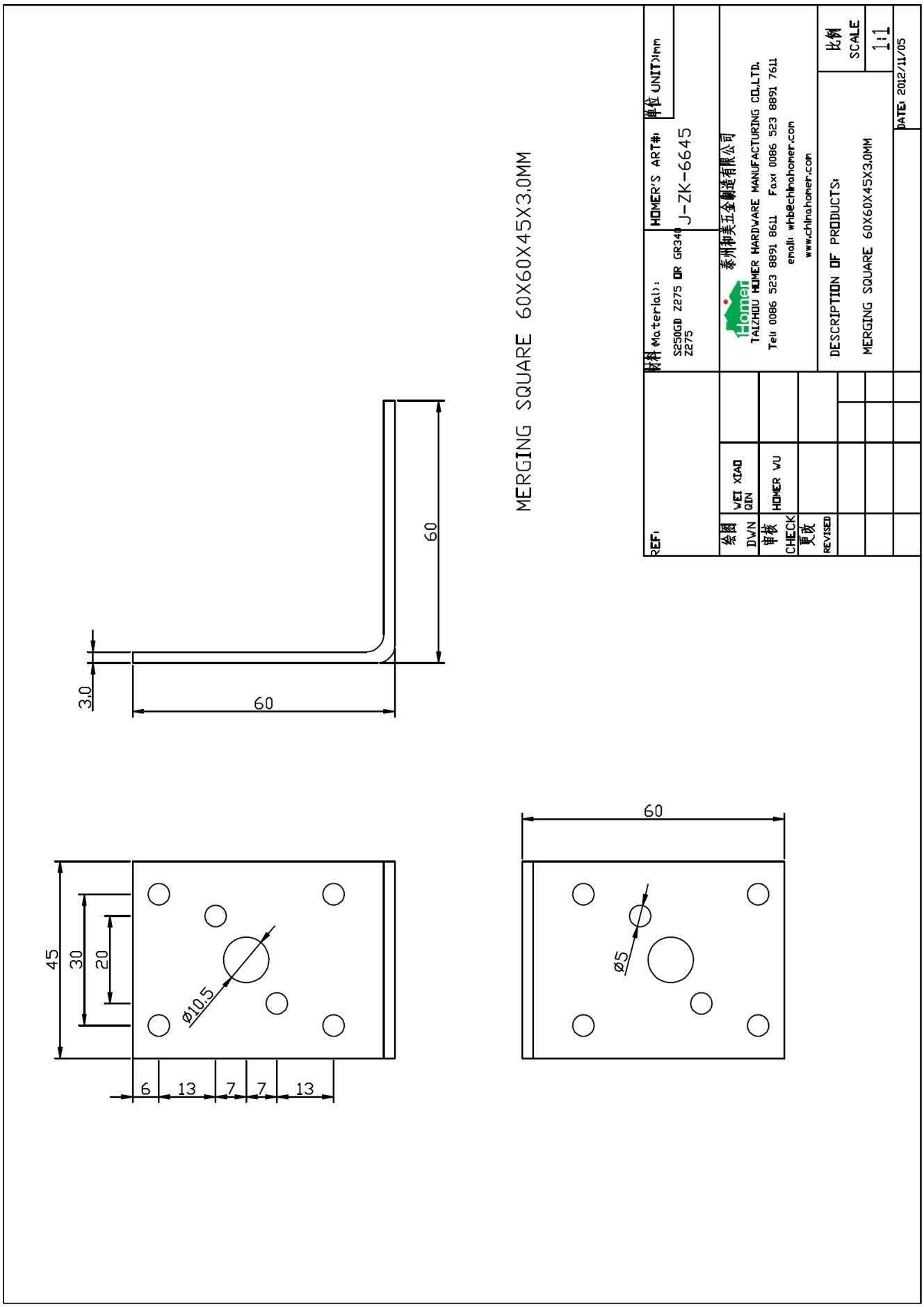
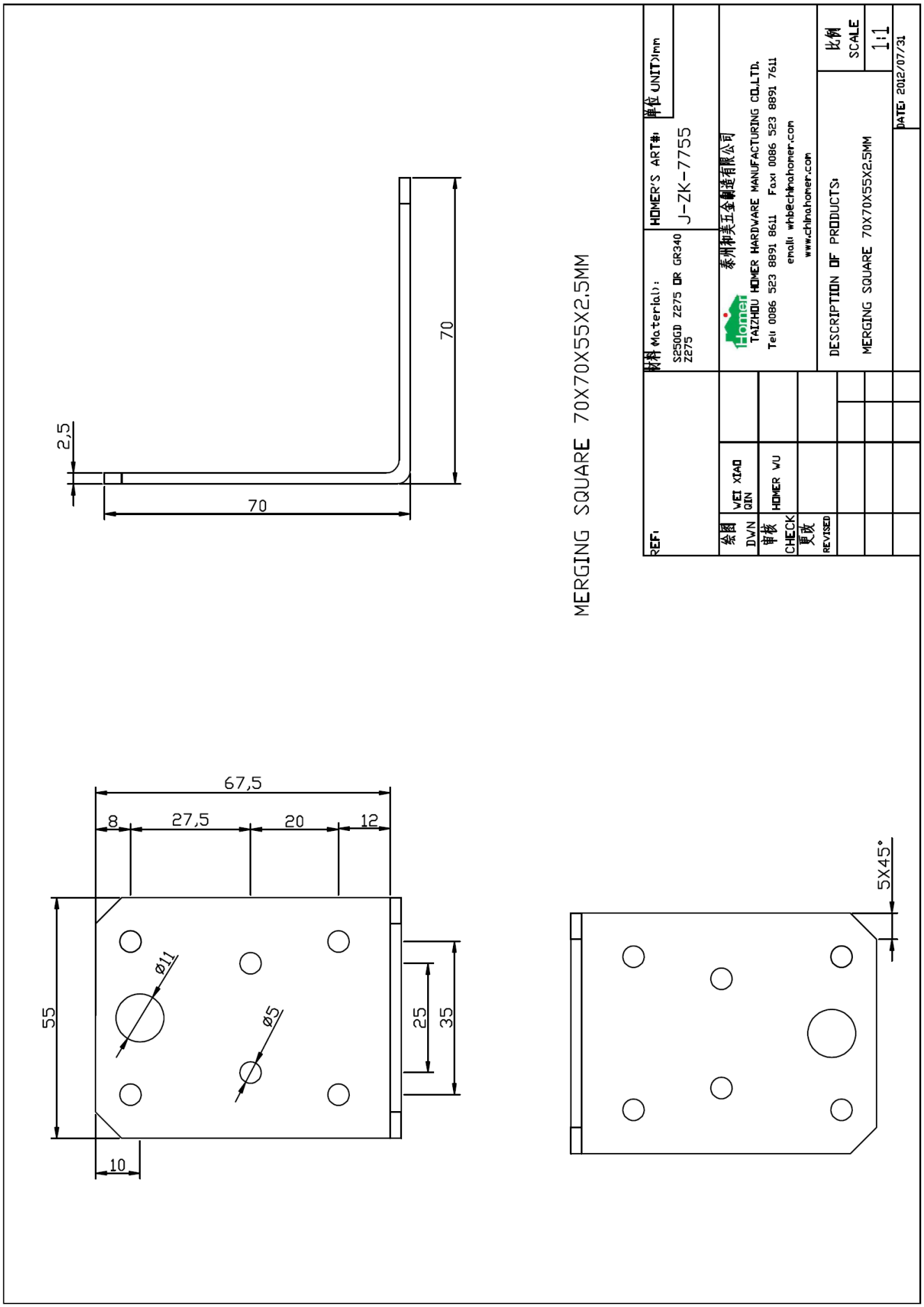
15
Ø5
REF:
材料 Material:
SS304
HOMER'S ART#
J-ZK-5535S
J-ZK-5535S/2
单位 UNIT:mm
江苏和美五金制造有限公司
JIANGSU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED
DESCRIPTION OF PRODUCTS:
MERGING SQUARE STAINLESS STEEL SS304
50X50X35XSMM
比例 SCALE
1:1
DATE 2019/11/05


MERGING SQUARE 60X60X45X3.0MM
材料 Material:
S250GD Z275 OR GR340 Z275
HOMER'S ART#: J-ZK-6645
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
MERGING SQUARE 60X60X45X3.0MM
比例 SCALE 1:1
DATE: 2012/11/05
绘图 DWN WEI XIAO QIN
审核 CHECK HOMER WU
更改 REVISED
REF:
3.0
60
60
60
45
30
20
Ø10.5
6
13
7
7
13
Ø5


MERGING SQUARE 70X70X55X2.5MM
2,5
70
70
67,5
8
27,5
20
12
55
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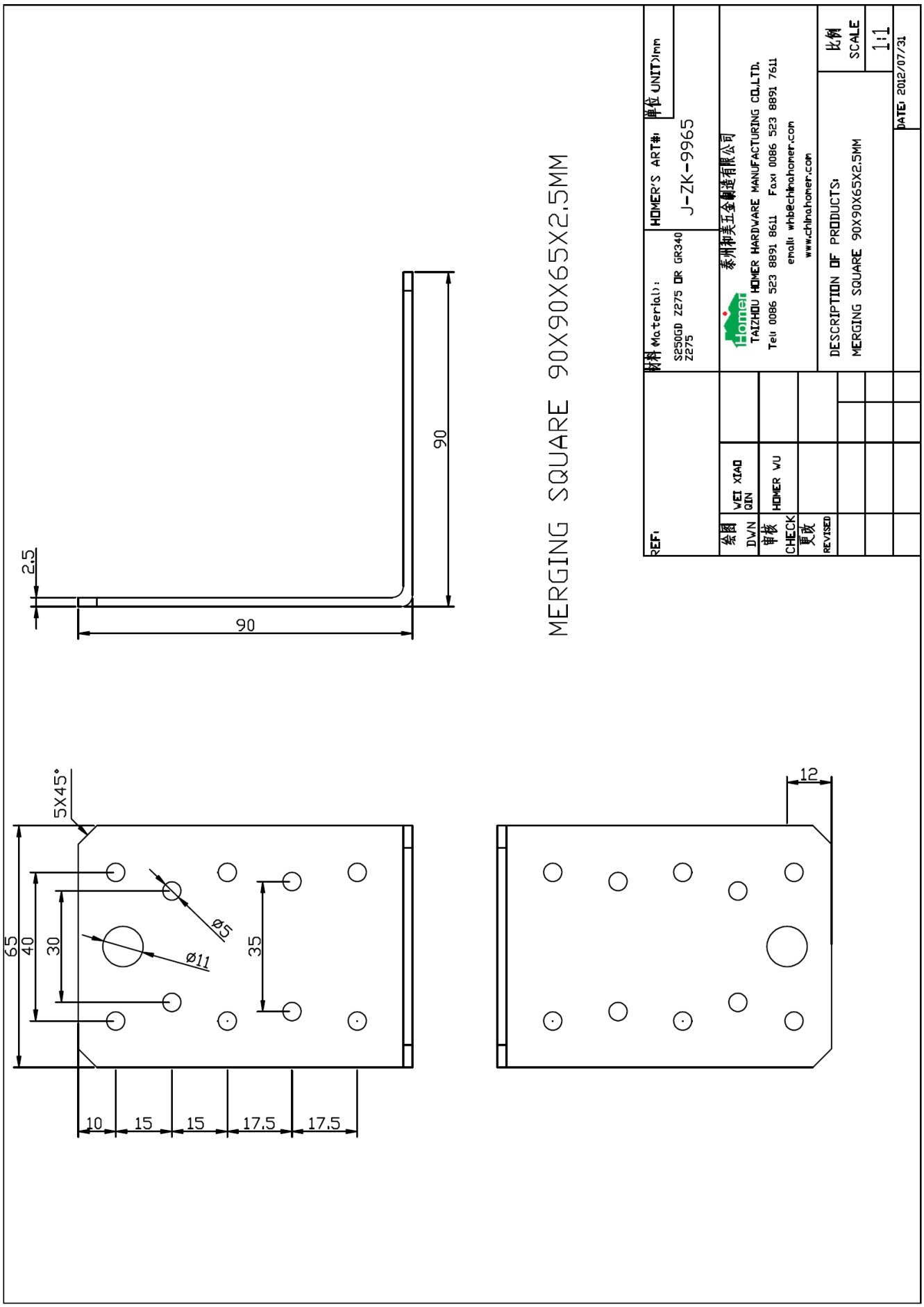
25
35
10
5X45°
REF:
材料 Material:
S250GD Z275 OR GR340 Z275
HOMER'S ART#:
J-ZK-7755
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED
DESCRIPTION OF PRODUCTS:
MERGING SQUARE 70X70X55X2.5MM
比例 SCALE
1:1
DATE: 2012/07/31


MERGING SQUARE 90X90X65X2.5MM
2.5
90
90
5X45°
65
40
30
Ø5
Ø11
35
10
15
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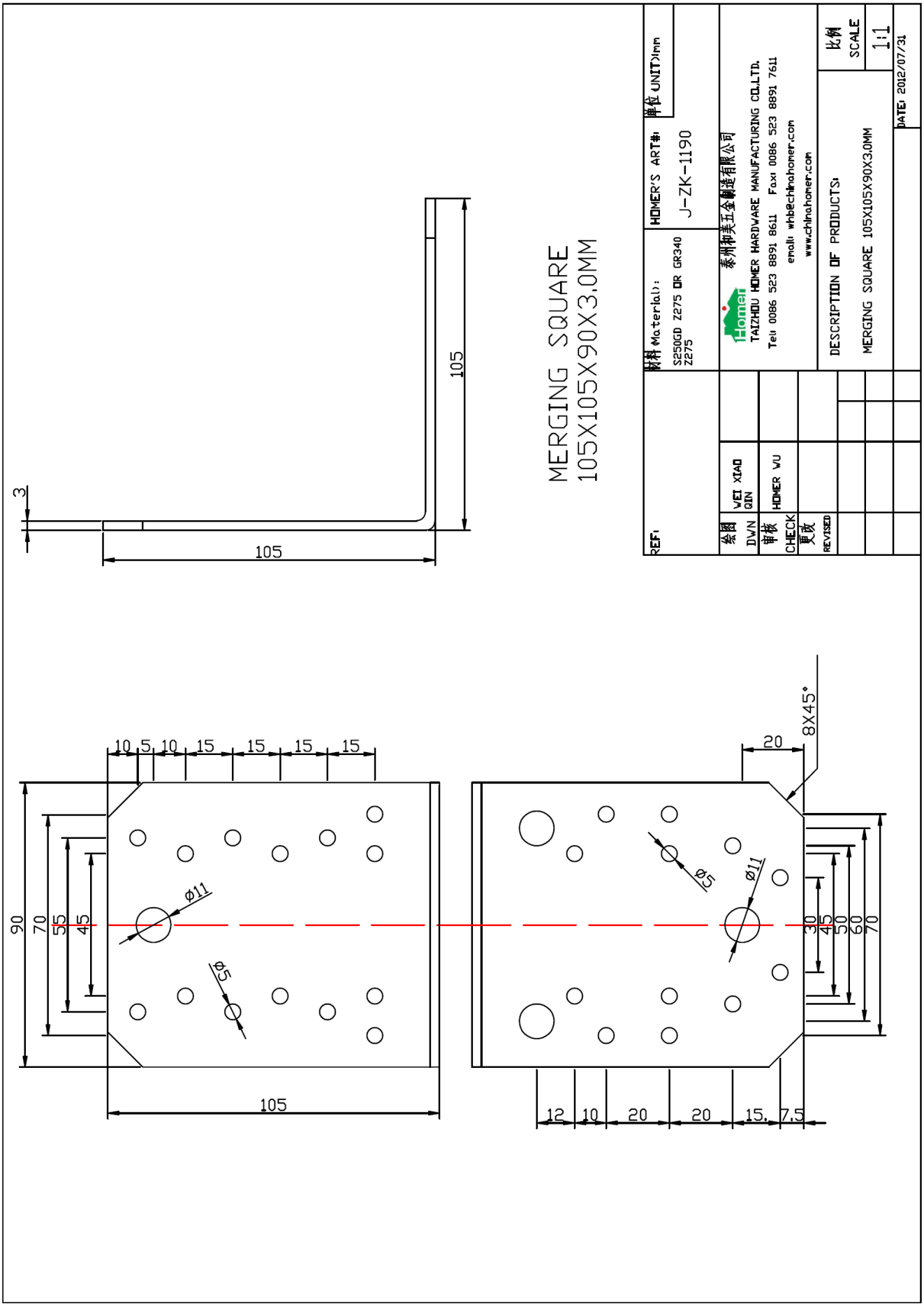
17.5
17.5
12
REF:
材料 Material:
S250GD Z275 OR GR340 Z275
HOMER'S ART#:
J-ZK-9965
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
MERGING SQUARE 90X90X65X2.5MM
比例 SCALE
1:1
DATE: 2012/07/31
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED


MERGING SQUARE
105X105X90X3.0MM
3
105
105
8X45°
20
10
5
10
15
15
15
15
90
70
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45
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Ø5
105
12
10
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20
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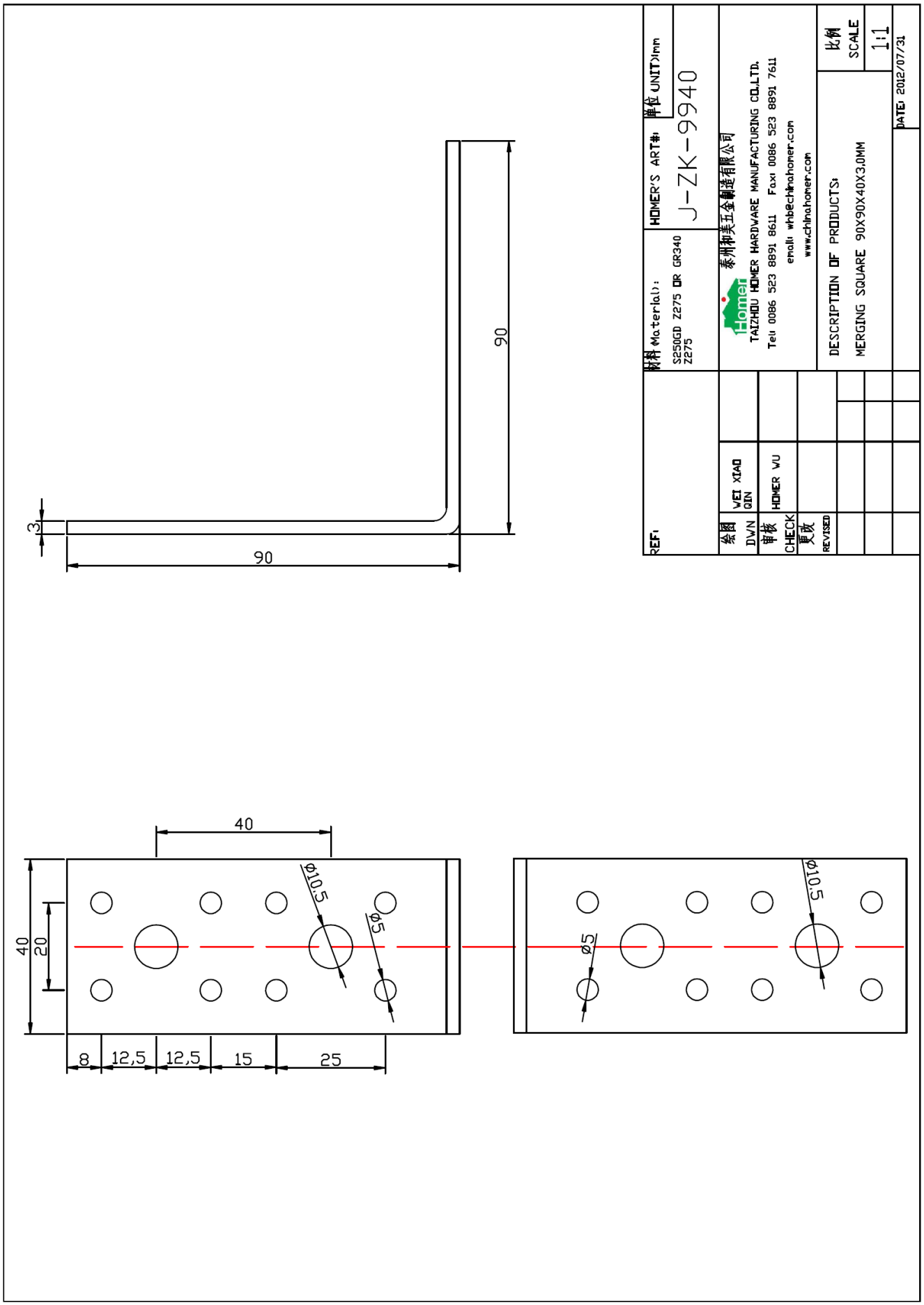
7.5
30
45
50
60
70
REF:
材料 Material:
S250GD Z275 OR GR340 Z275
HOMER'S ART#:
J-ZK-1190
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
MERGING SQUARE 105X105X90X3.0MM
比例 SCALE
1:1
DATE: 2012/07/31
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED


90
3
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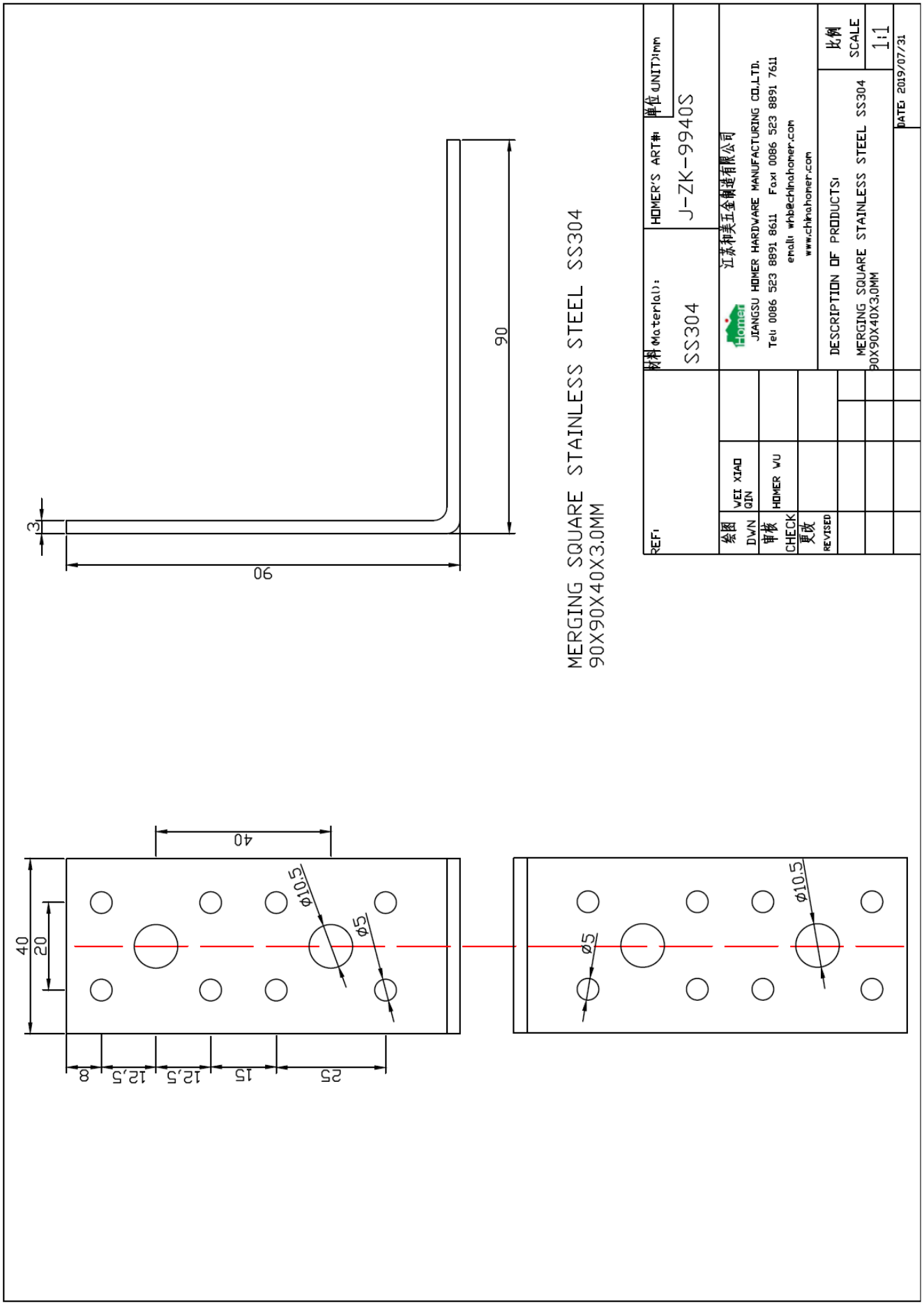
20
Φ10.5
Φ5
8
12,5
12,5
15
25
Ø5
Ø10.5
REF:
材料 Material:
S250GD Z275 OR GR340
Z275
HOMER'S ART#:
J-ZK-9940
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
MERGING SQUARE 90X90X40X3.0MM
比例 SCALE
1:1
DATE: 2012/07/31
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED


MERGING SQUARE STAINLESS STEEL SS304
90X90X40X3.0MM
90
90
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20
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12,5
12,5
15
25
ø10.5
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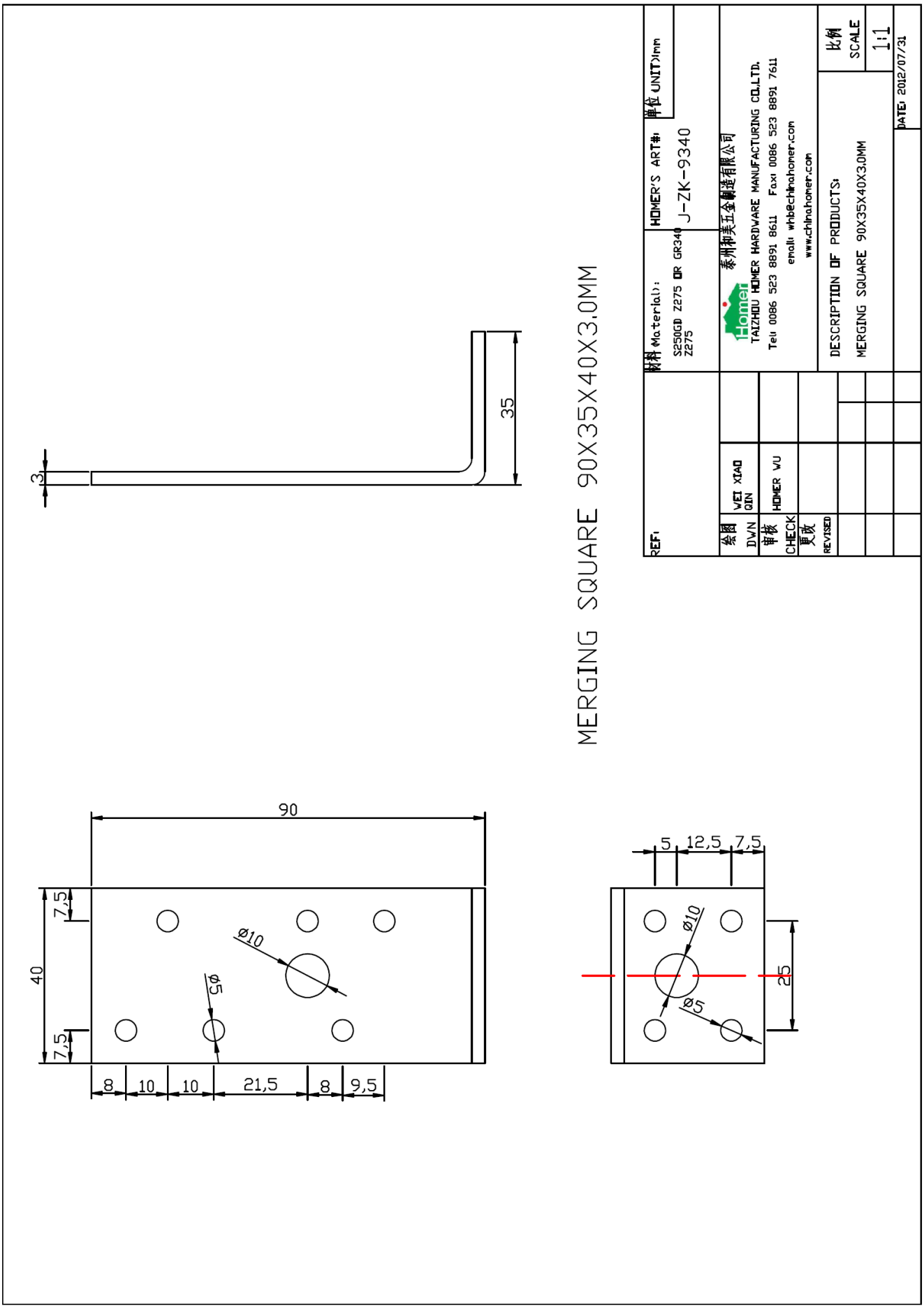
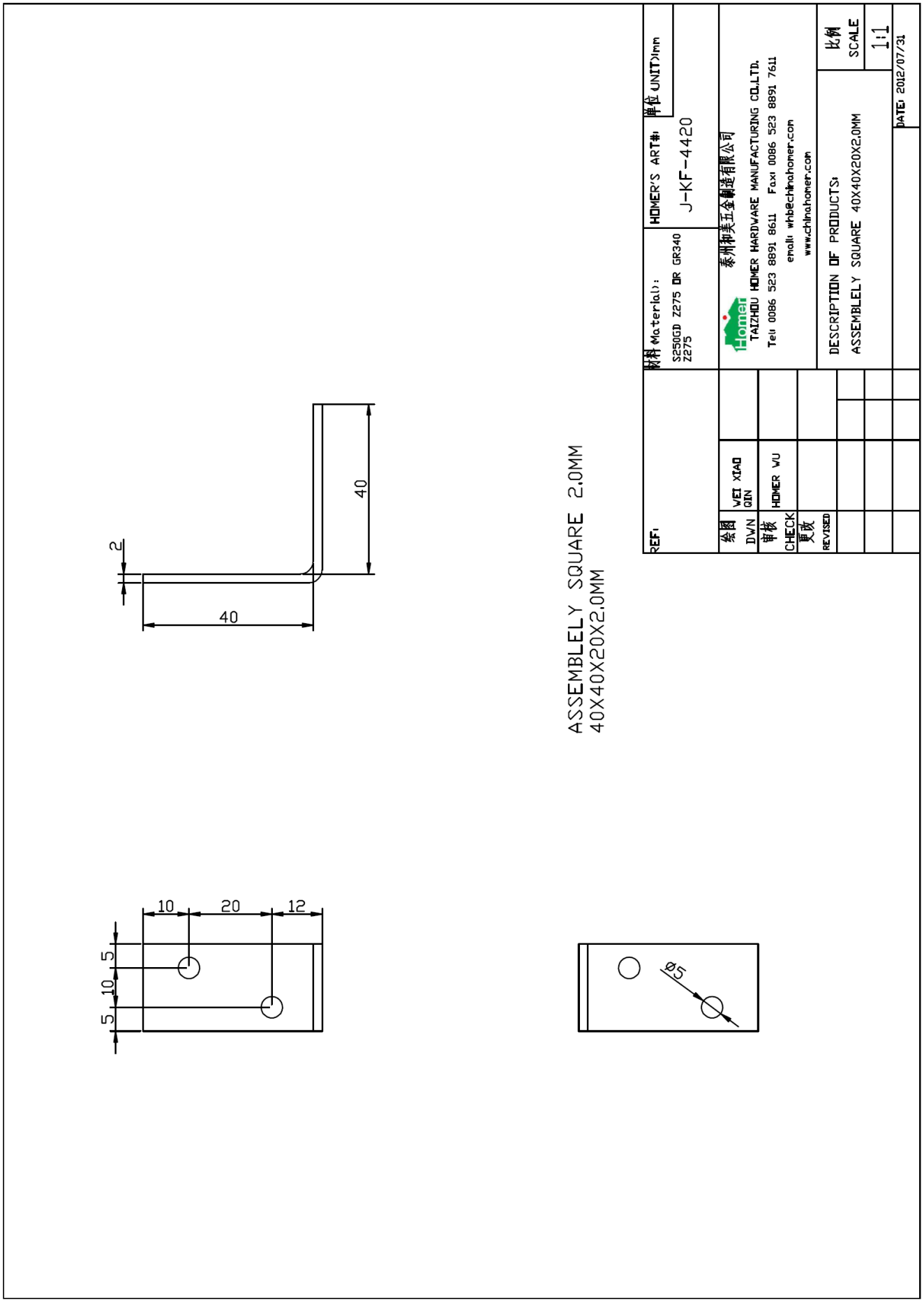
ø10.5
材料 Material:
SS304
HOMER'S ART#:
J-ZK-9940S
单位 UNIT:mm
江苏和美五金制造有限公司
JIANGSU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
MERGING SQUARE STAINLESS STEEL SS304
90X90X40X3.0MM
比例 SCALE
1:1
DATE: 2019/07/31
REF:
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED


MERGING SQUARE 90X35X40X3.0MM
3
35
90
40
7,5
7,5
8
10
10
21,5
8
9,5
ø10
ø5
5
12,5
7,5
25
ø10
ø5
REF:
材料 Material:
S250GD Z275 OR GR340 Z275
HOMER'S ART#:
J-ZK-9340
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
MERGING SQUARE 90X35X40X3.0MM
比例 SCALE
1:1
DATE: 2012/07/31
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED


ASSEMBLELY SQUARE 2.0MM
40X40X20X2.0MM
2
40
40
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20
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5
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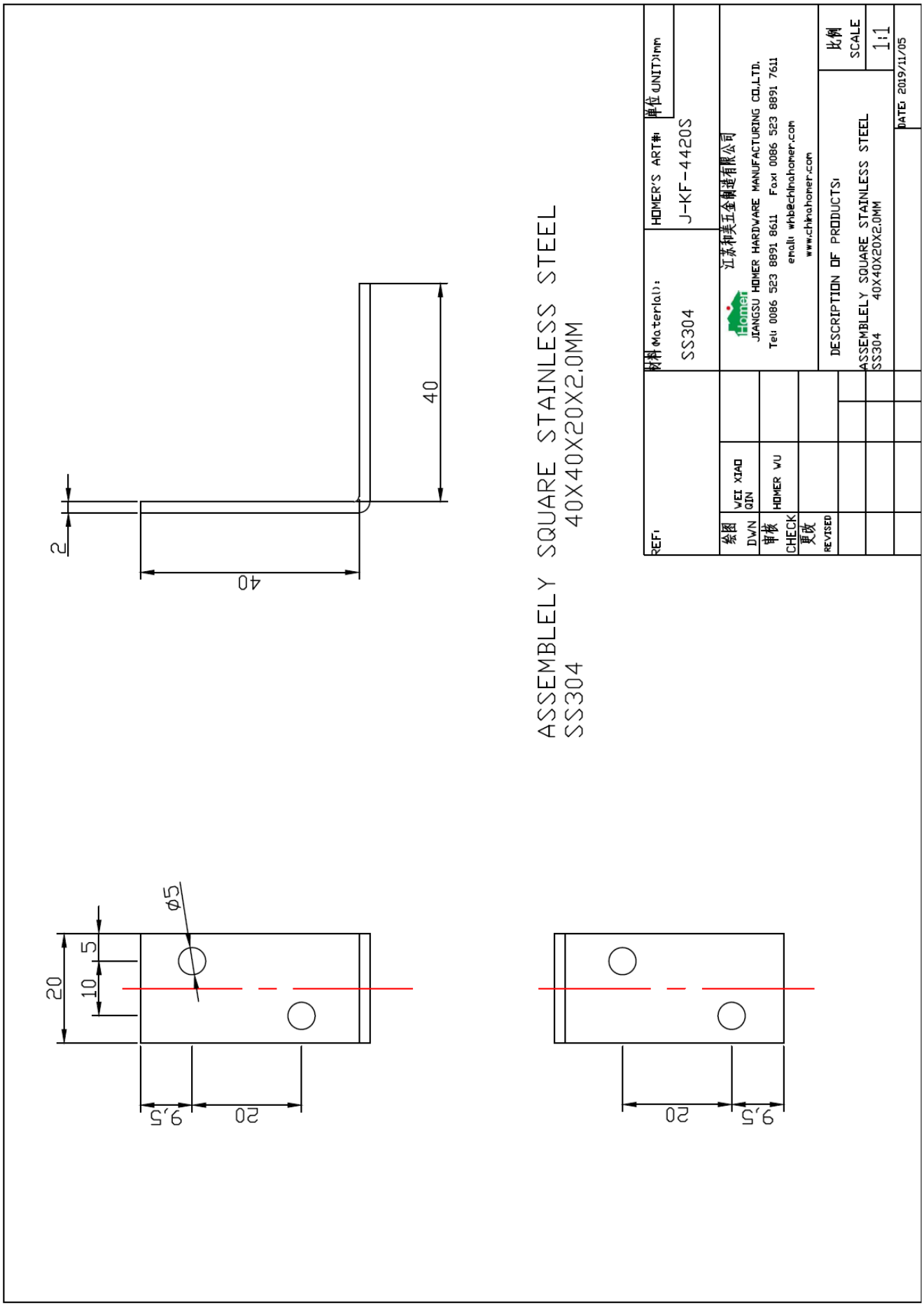
5
Ø5
REF:
材料 Material:
S250GD Z275 OR GR340
Z275
HOMER'S ART#:
J-KF-4420
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED
DESCRIPTION OF PRODUCTS:
ASSEMBLELY SQUARE 40X40X20X2.0MM
比例 SCALE
1:1
DATE: 2012/07/31


ASSEMBLELY SQUARE STAINLESS STEEL
SS304
40X40X20X2.0MM
2
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40
ϕ5
20
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5
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9.5
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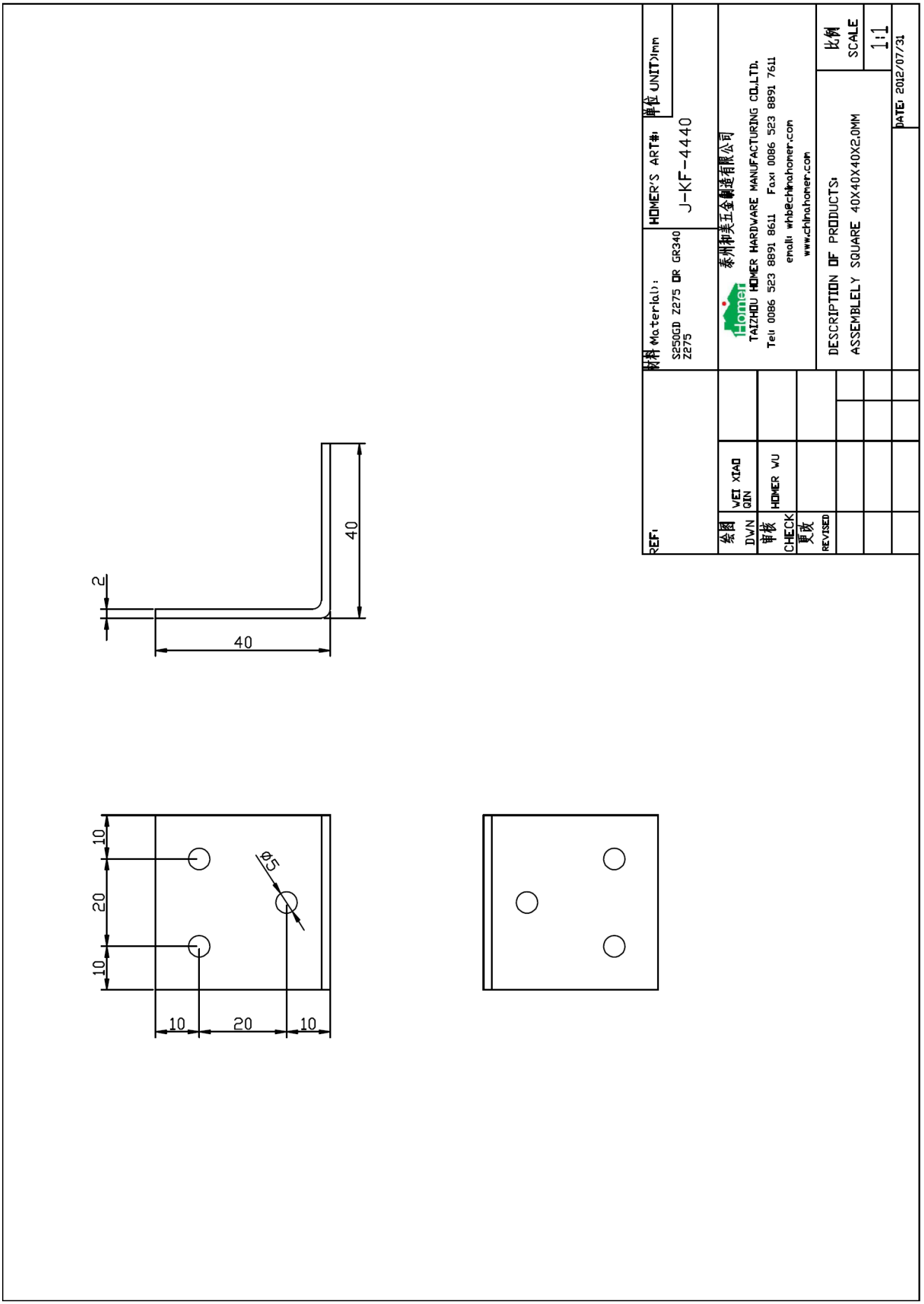
9.5
REF:
材料 Material:
SS304
HOMER'S ART#:
J-KF-4420S
单位 UNIT:mm
江苏和美五金制造有限公司
JIANGSU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ASSEMBLELY SQUARE STAINLESS STEEL
SS304 40X40X20X2.0MM
比例 SCALE
1:1
DATE: 2019/11/05
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED


材料 Material):
S250GD Z275 OR GR340
Z275
HOMER'S ART#:
J-KF-4440
单位 UNIT:mm
泰州市美玉金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ASSEMBLELY SQUARE 40X40X40X2.0MM
比例 SCALE
1:1
DATE: 2012/07/31
REF:
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED
2
40
40
10
20
10
φ5
10
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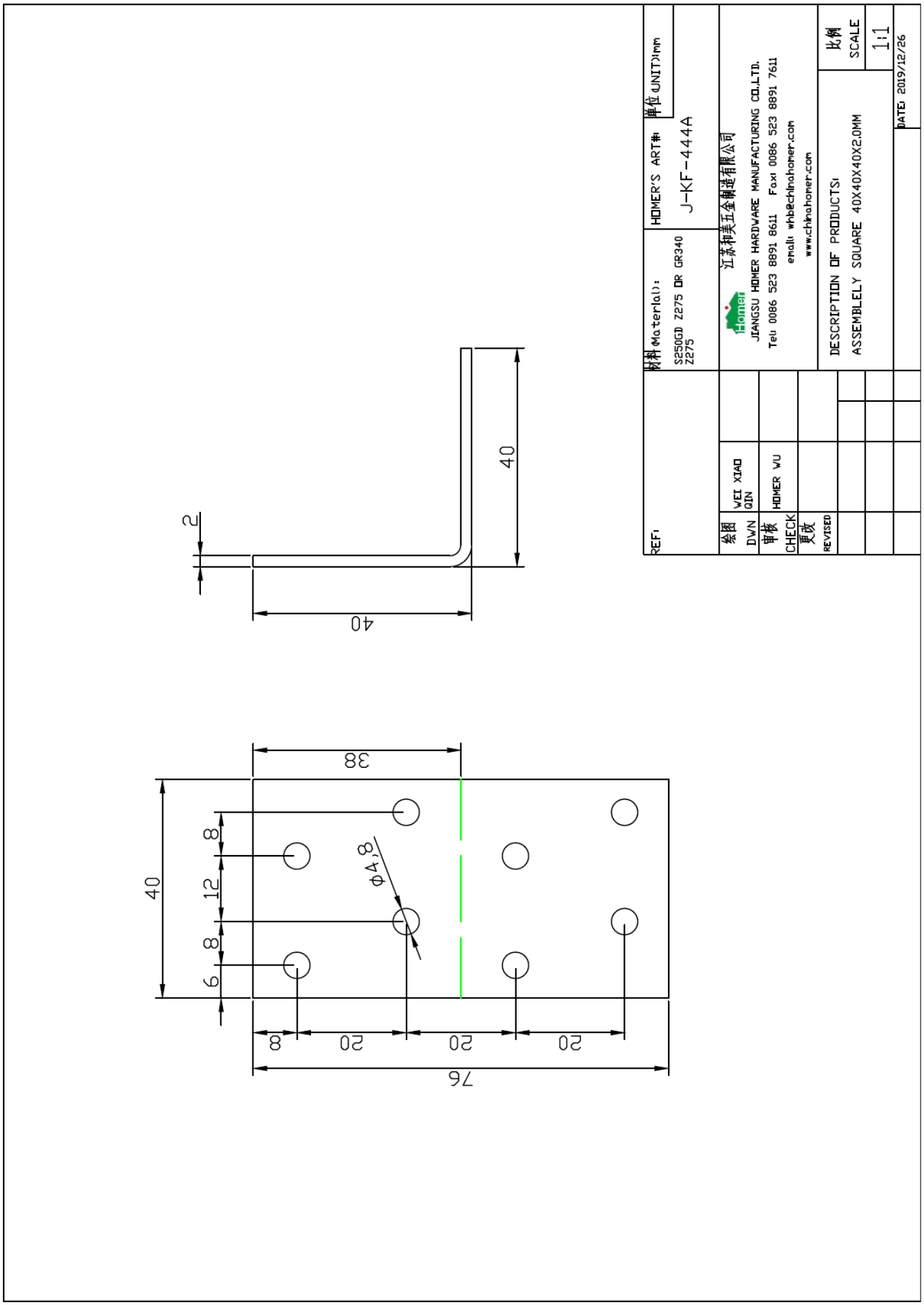
10


REF:
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED
材料 Material:
S250GD Z275 OR GR340 Z275
HOMER'S ART#
J-KF-444A
单位 UNIT:mm
江苏和美五金制造有限公司
JIANGSU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ASSEMBLELY SQUARE 40X40X40X2.0MM
比例 SCALE
1:1
DATE: 2019/12/26
2
40
40
38
40
8
12
8
6
φ4.8
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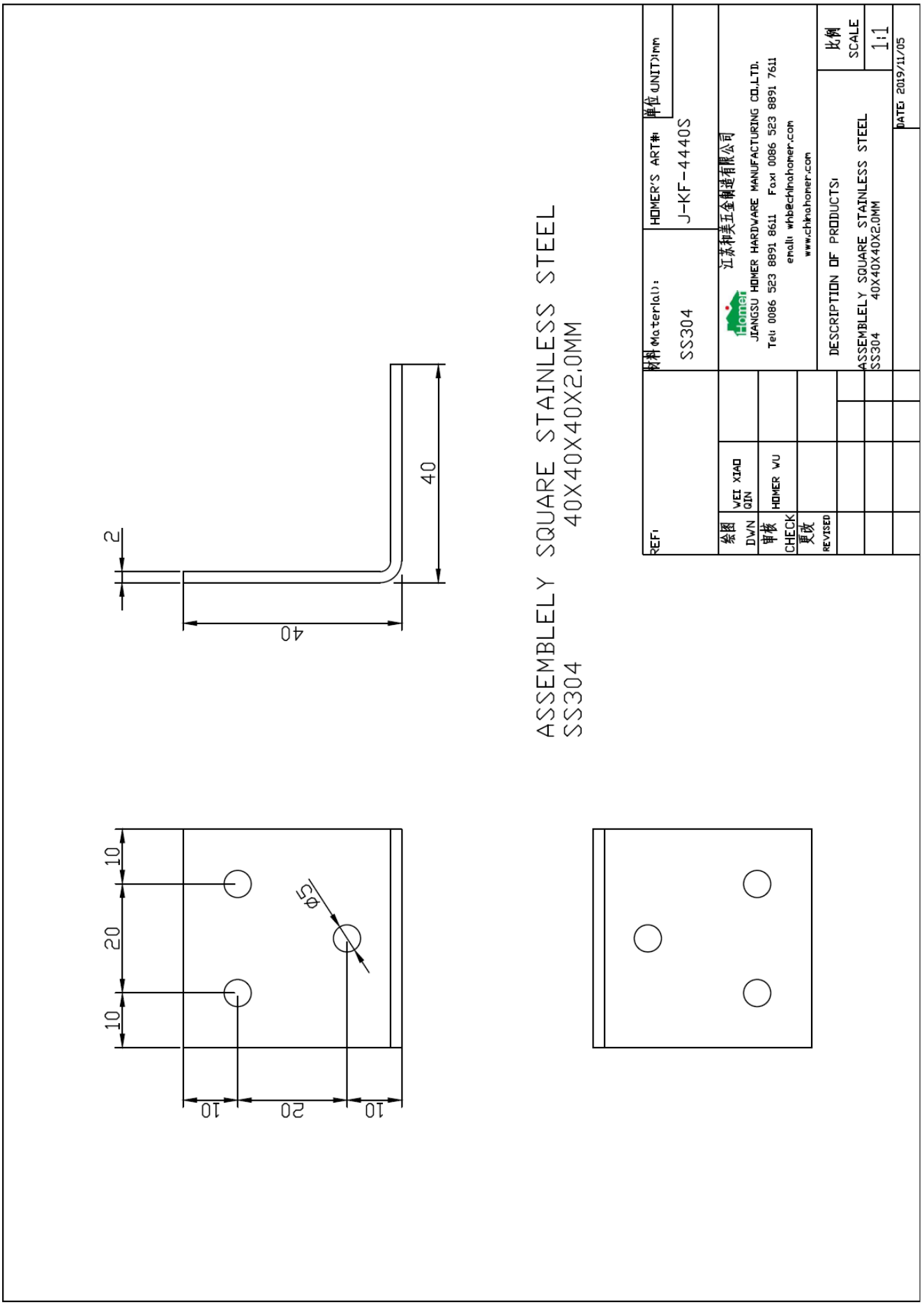
76


ASSEMBLELY SQUARE STAINLESS STEEL
SS304 40X40X40X2.0MM
2
40
40
10
20
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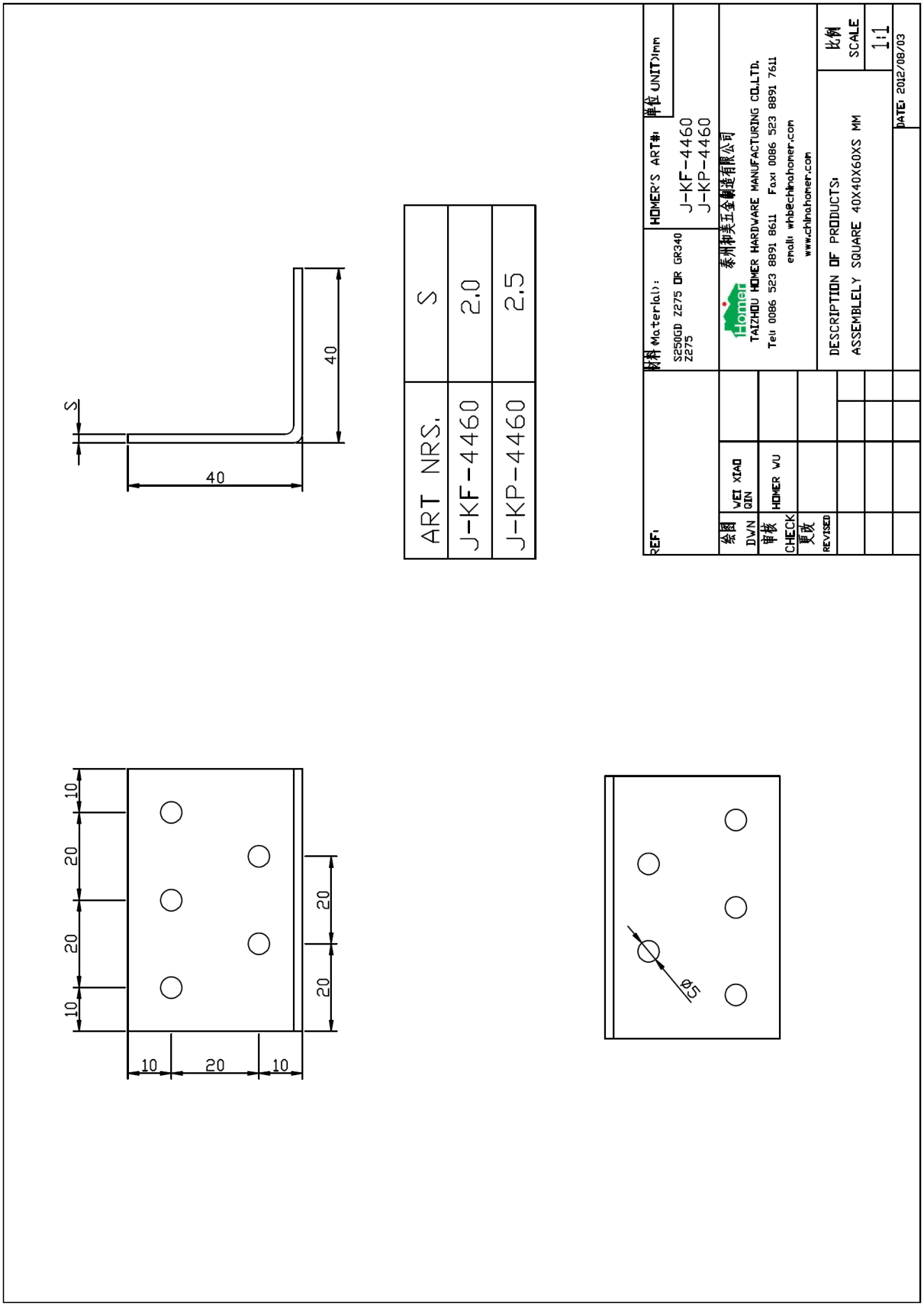
Φ5
REF:
材料 Material):
SS304
HOMER'S ART#
J-KF-4440S
单位 UNIT):mm
江苏和美五金制造有限公司
JIANGSU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ASSEMBLELY SQUARE STAINLESS STEEL
SS304 40X40X40X2.0MM
比例 SCALE
1:1
DATE: 2019/11/05
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED


S
40
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ART NRS.
S
J-KF-4460
2.0
J-KP-4460
2.5
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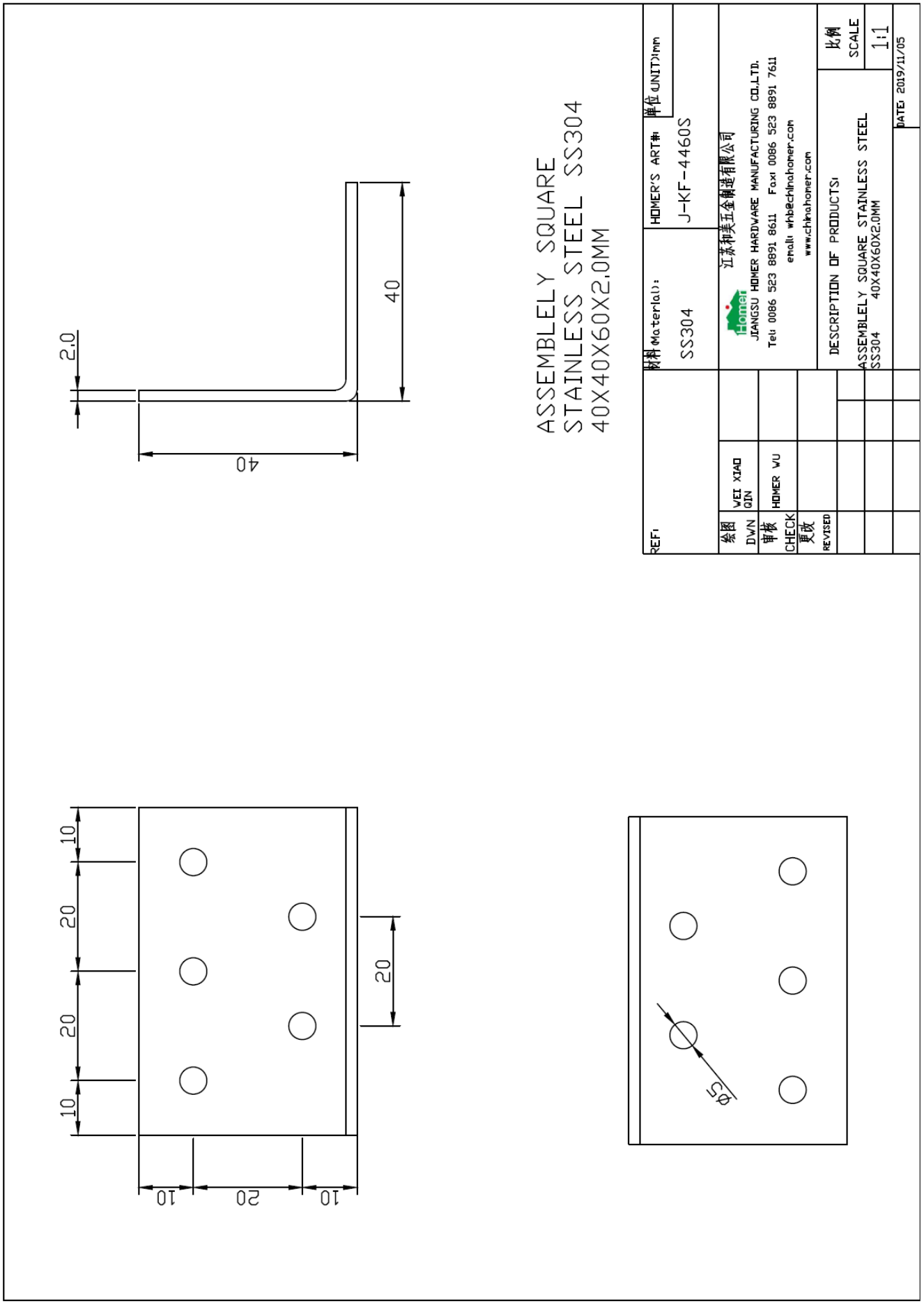
REF:
材料 Material:
S250GD Z275 OR GR340 Z275
HOMER'S ART#:
J-KF-4460
J-KP-4460
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ASSEMBLELY SQUARE 40X40X60XS MM
比例 SCALE
1:1
DATE 2012/08/03
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED


ASSEMBLELY SQUARE
STAINLESS STEEL SS304
40X40X60X2.0MM
2.0
40
40
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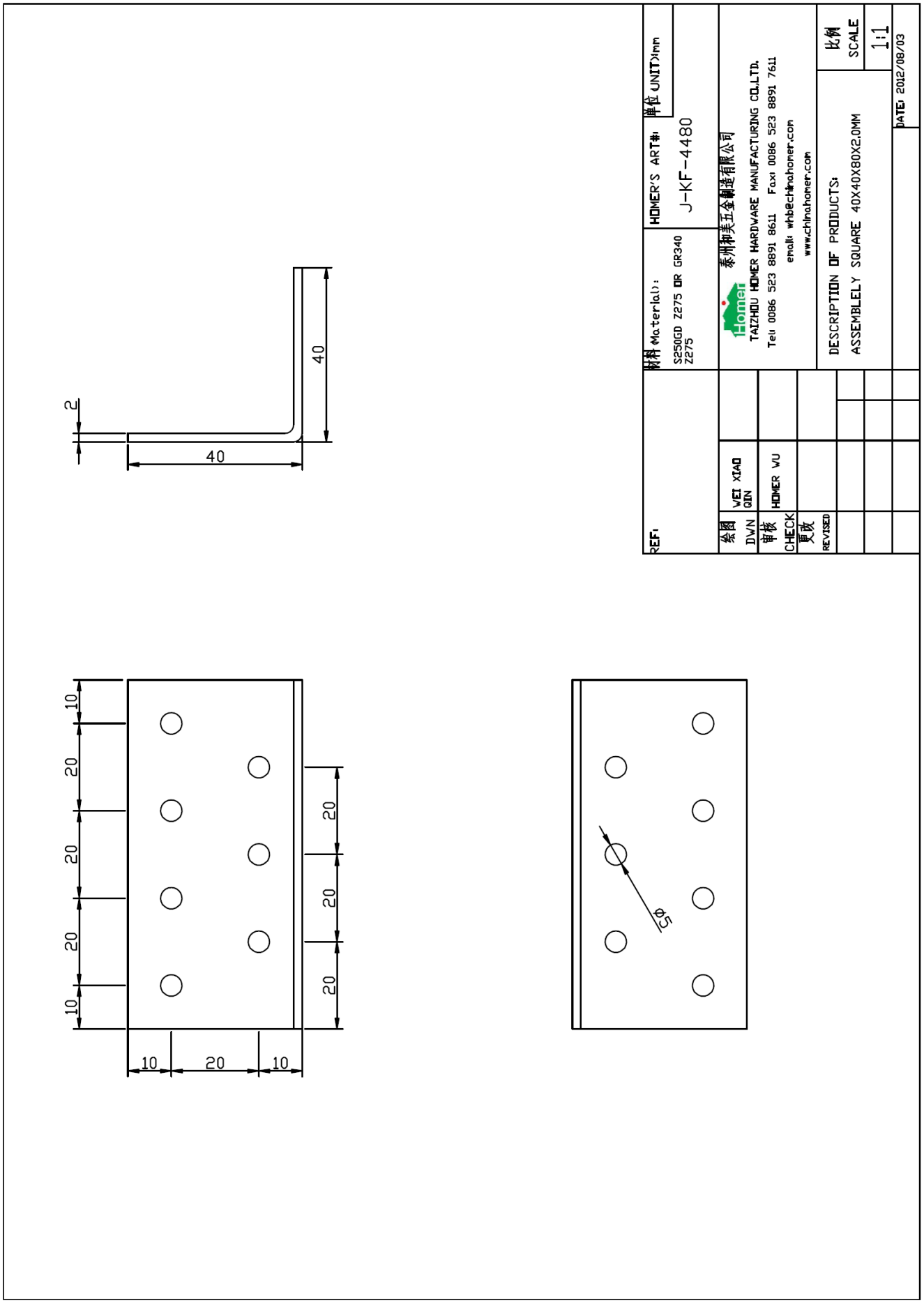
Φ5
材料 Material:
SS304
HOMER'S ART#
J-KF-4460S
单位 UNIT:mm
江苏和美五金制造有限公司
JIANGSU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ASSEMBLELY SQUARE STAINLESS STEEL
SS304 40X40X60X2.0MM
比例 SCALE
1:1
DATE: 2019/11/05
REF:
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED


2
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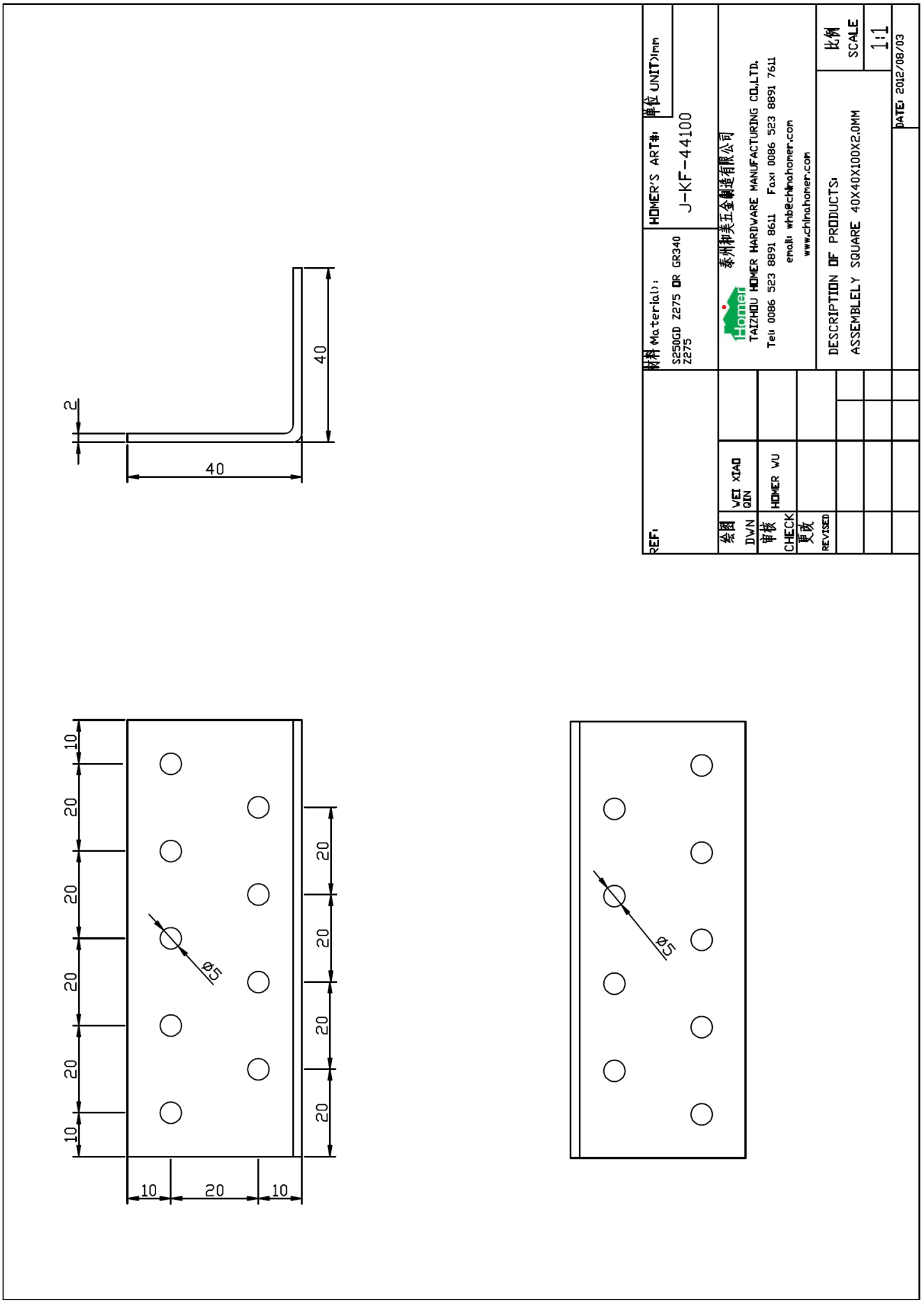
10
Φ5
REF:
材料 Material:
S250GD Z275 OR GR340 Z275
HOMER'S ART#:
J-KF-4480
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ASSEMBLELY SQUARE 40X40X80X2.0MM
比例 SCALE
1:1
DATE: 2012/08/03
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED


2
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40
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20
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10
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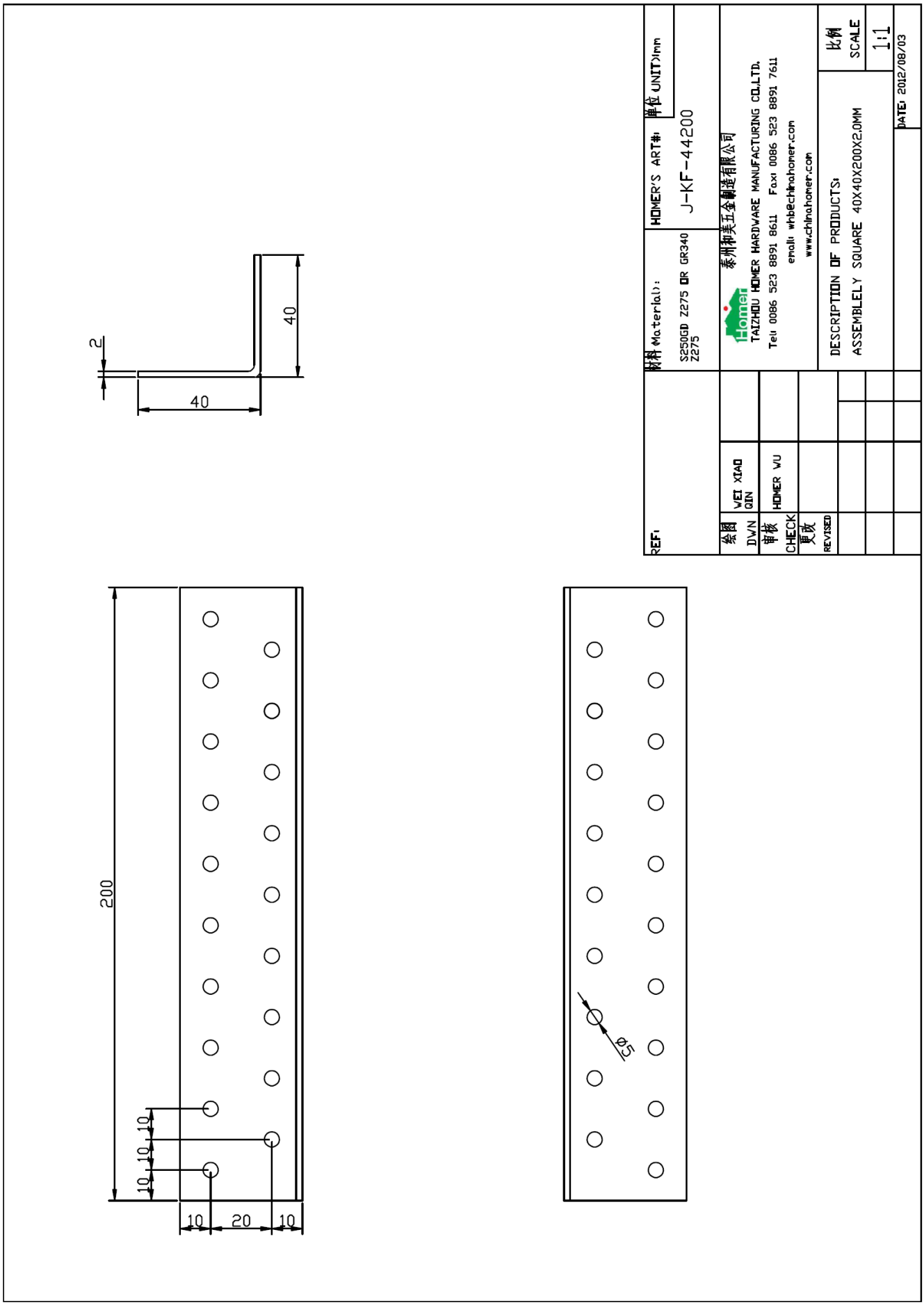
Ø5
REF:
材料 Material:
S250GD Z275 OR GR340
Z275
HOMER'S ART#:
J-KF-44100
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED
DESCRIPTION OF PRODUCTS:
ASSEMBLELY SQUARE 40X40X100X2.0MM
比例 SCALE
1:1
DATE: 2012/08/03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40
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200
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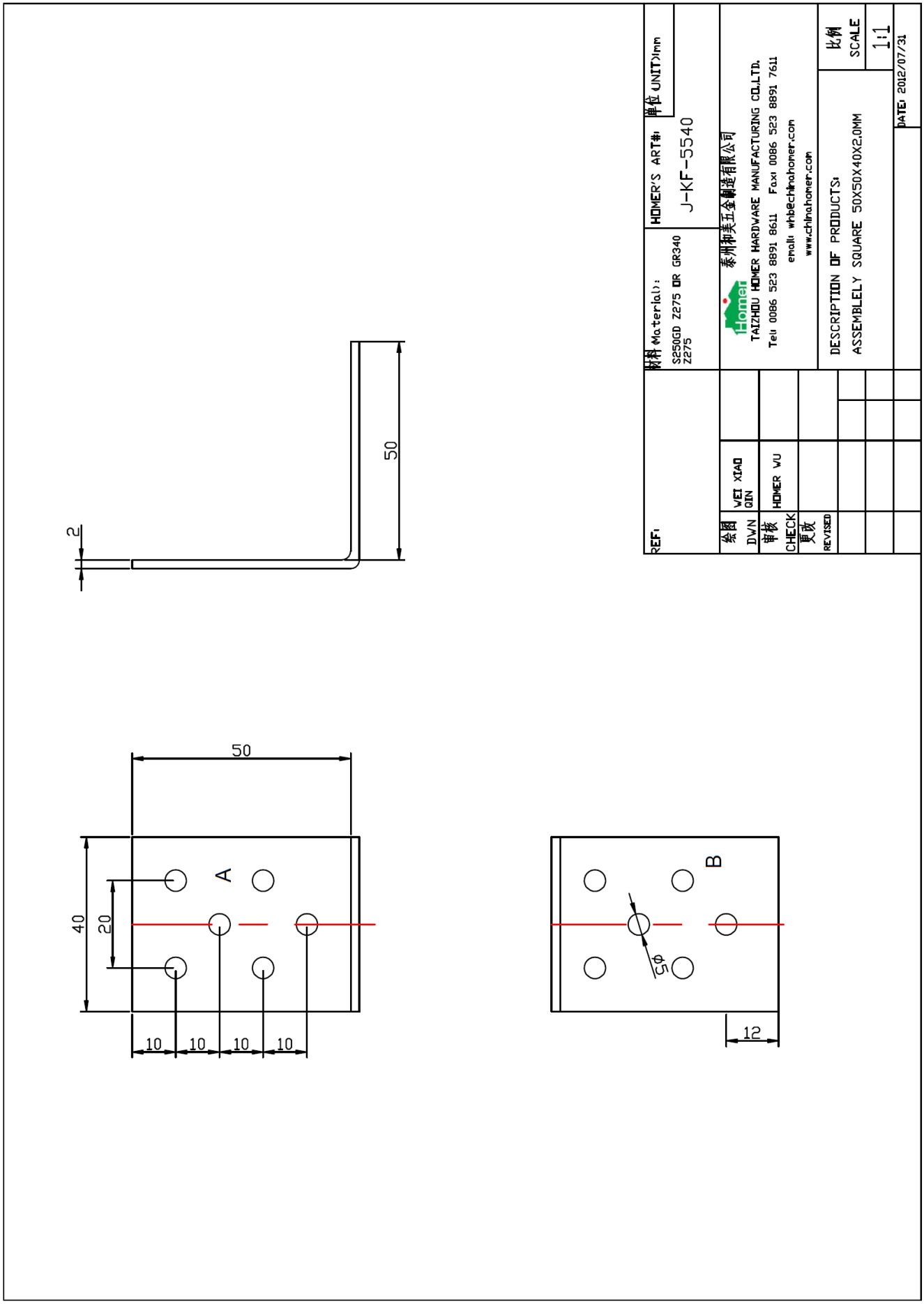
Φ5
REF:
材料 Material:
S250GD Z275 OR GR340 Z275
HOMER'S ART#:
J-KF-44200
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ASSEMBLELY SQUARE 40X40X200X2.0MM
比例 SCALE
1:1
DATE: 2012/08/03
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED


HOMER'S ART#: J-KF-5540
单位 UNIT:mm
材料 Material: S250GD Z275 OR GR340 Z275
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ASSEMBLELY SQUARE 50X50X40X2.0MM
比例 SCALE 1:1
DATE: 2012/07/31
REF:
绘图 DWN WEI XIAO QIN
审核 CHECK HOMER WU
更改 REVISED
2
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A
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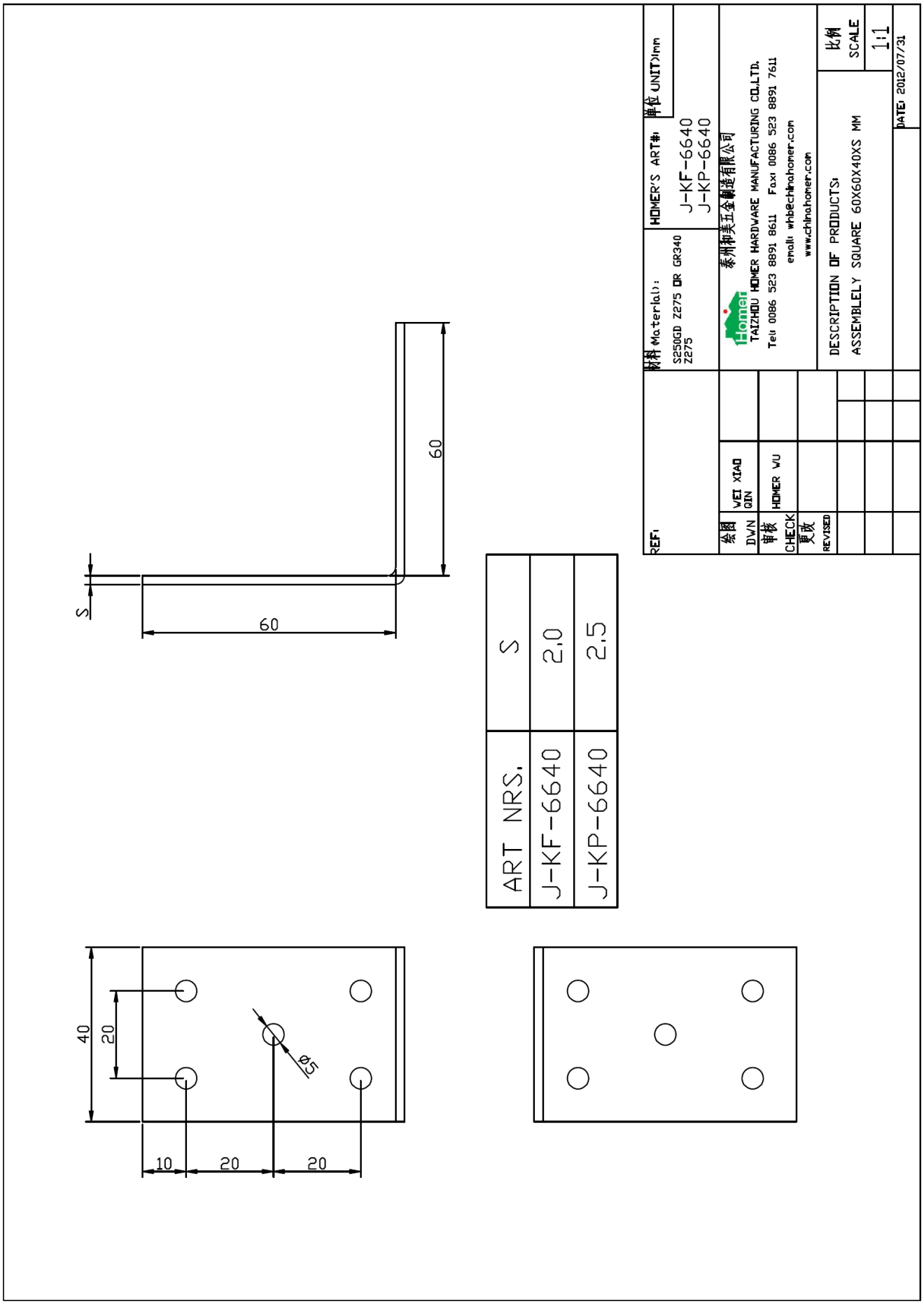
B
Φ5
12


S
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ART NRS.
S
J-KF-6640
2,0
J-KP-6640
2,5
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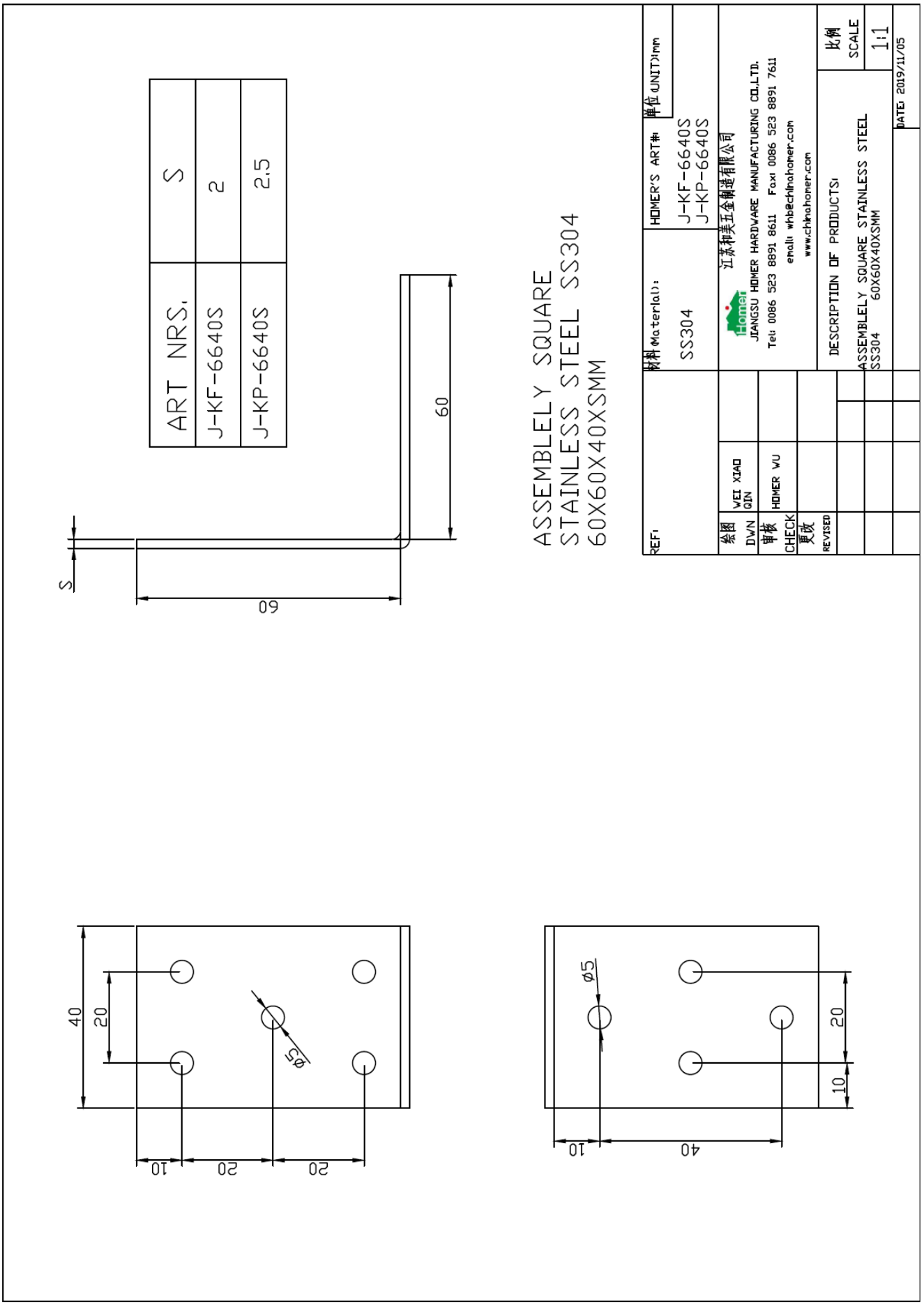
Ø5
10
20
20
REF:
材料 Material:
S250GD Z275 OR GR340 Z275
HOMER'S ART#:
J-KF-6640
J-KP-6640
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED
DESCRIPTION OF PRODUCTS:
ASSEMBLELY SQUARE 60X60X40XS MM
比例 SCALE
1:1
DATE: 2012/07/31


ART NRS.
S
J-KF-6640S
2
J-KP-6640S
2.5
S
60
60
ASSEMBLELY SQUARE
STAINLESS STEEL SS304
60X60X40XSMM
REF:
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER VU
更改 REVISED
材料 Material:
SS304
HOMER'S ART#
J-KF-6640S
J-KP-6640S
单位 UNIT:mm
江苏和美五金制造有限公司
JIANGSU HOMER HARDWARE MANUFACTURING CO.LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ASSEMBLELY SQUARE STAINLESS STEEL
SS304 60X60X40XSMM
比例 SCALE
1:1
DATE: 2019/11/05
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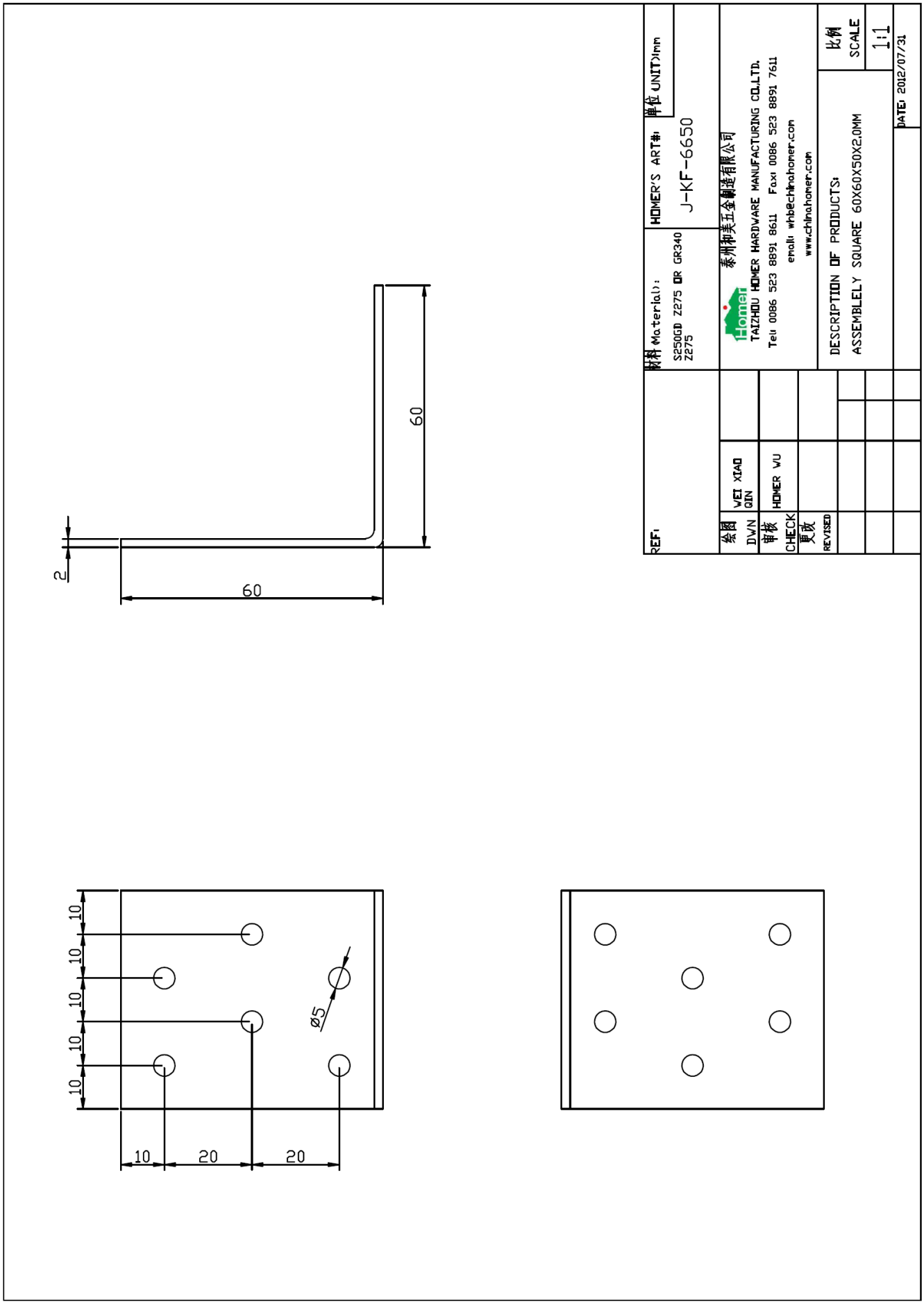
10


2
60
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10
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Ø5
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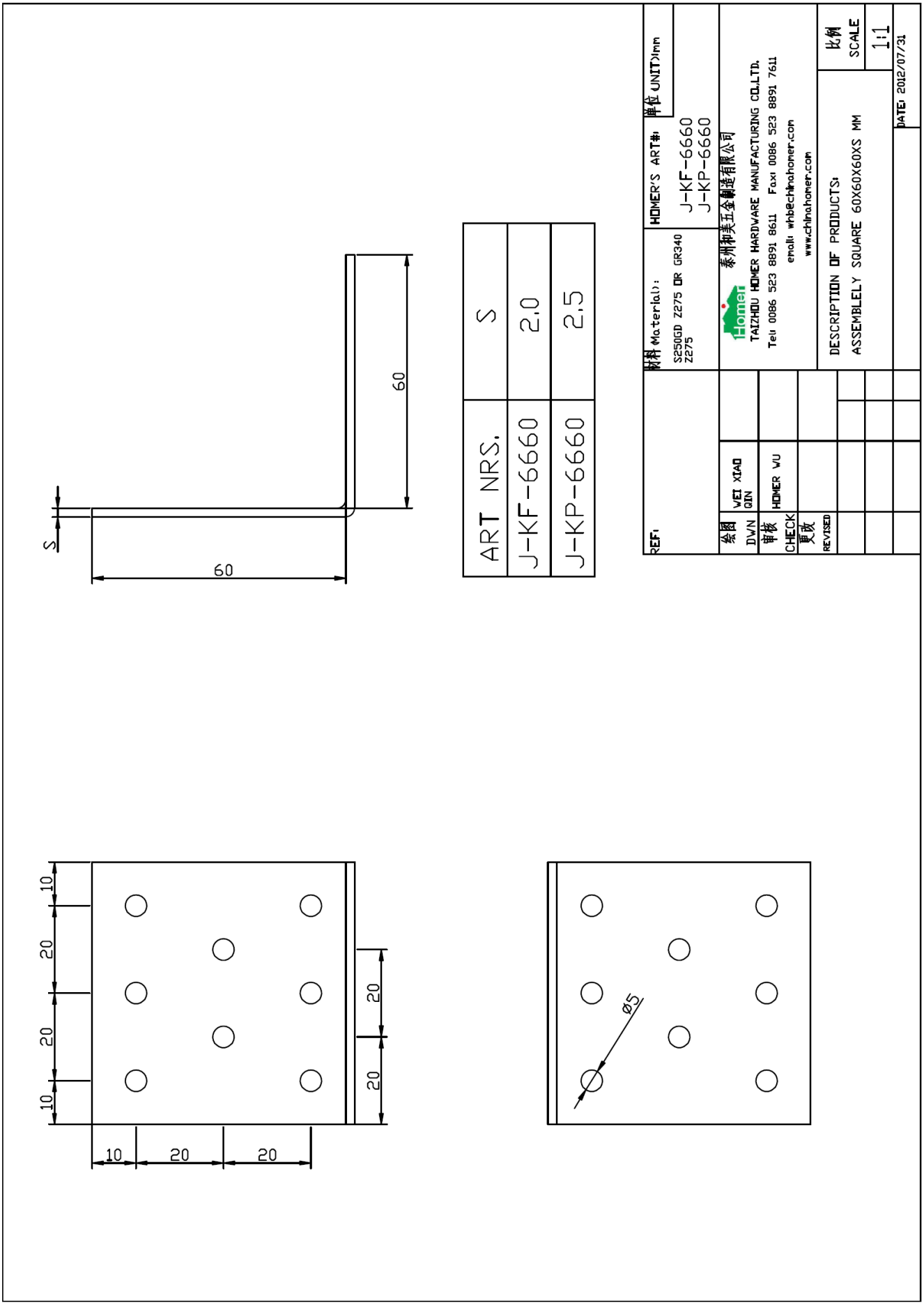
20
材料 Material:
S250GD Z275 OR GR340 Z275
HOMER'S ART#:
J-KF-6650
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ASSEMBLELY SQUARE 60X60X50X2.0MM
比例 SCALE
1:1
DATE: 2012/07/31
REF:
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED


S
60
60
ART NRS.
S
J-KF-6660
2.0
J-KP-6660
2.5
10
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20
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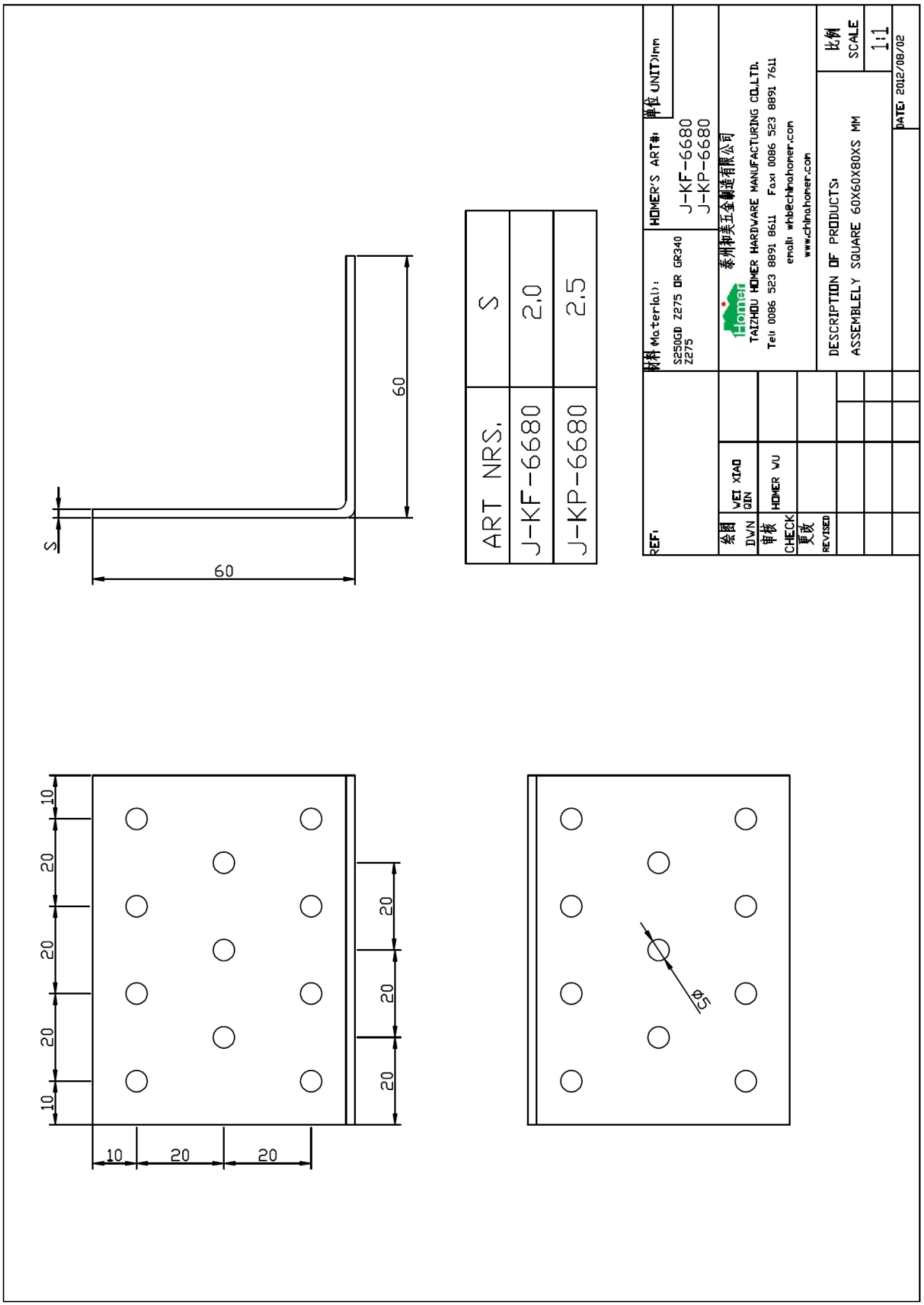
Ø5
REF:
材料 Material:
S250GD Z275 OR GR340
Z275
HOMER'S ART#:
J-KF-6660
J-KP-6660
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED
DESCRIPTION OF PRODUCTS:
ASSEMBLELY SQUARE 60X60X60XS MM
比例 SCALE
1:1
DATE: 2012/07/31


S
60
60
ART NRS.
S
J-KF-6680
2,0
J-KP-6680
2,5
REF:
材料 Materials:
S250GD Z275 OR G340 Z275
HOMER'S ART#:
J-KF-6680
J-KP-6680
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ASSEMBLELY SQUARE 60X60X80XS MM
比例 SCALE
1:1
DATE: 2012/08/02
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED
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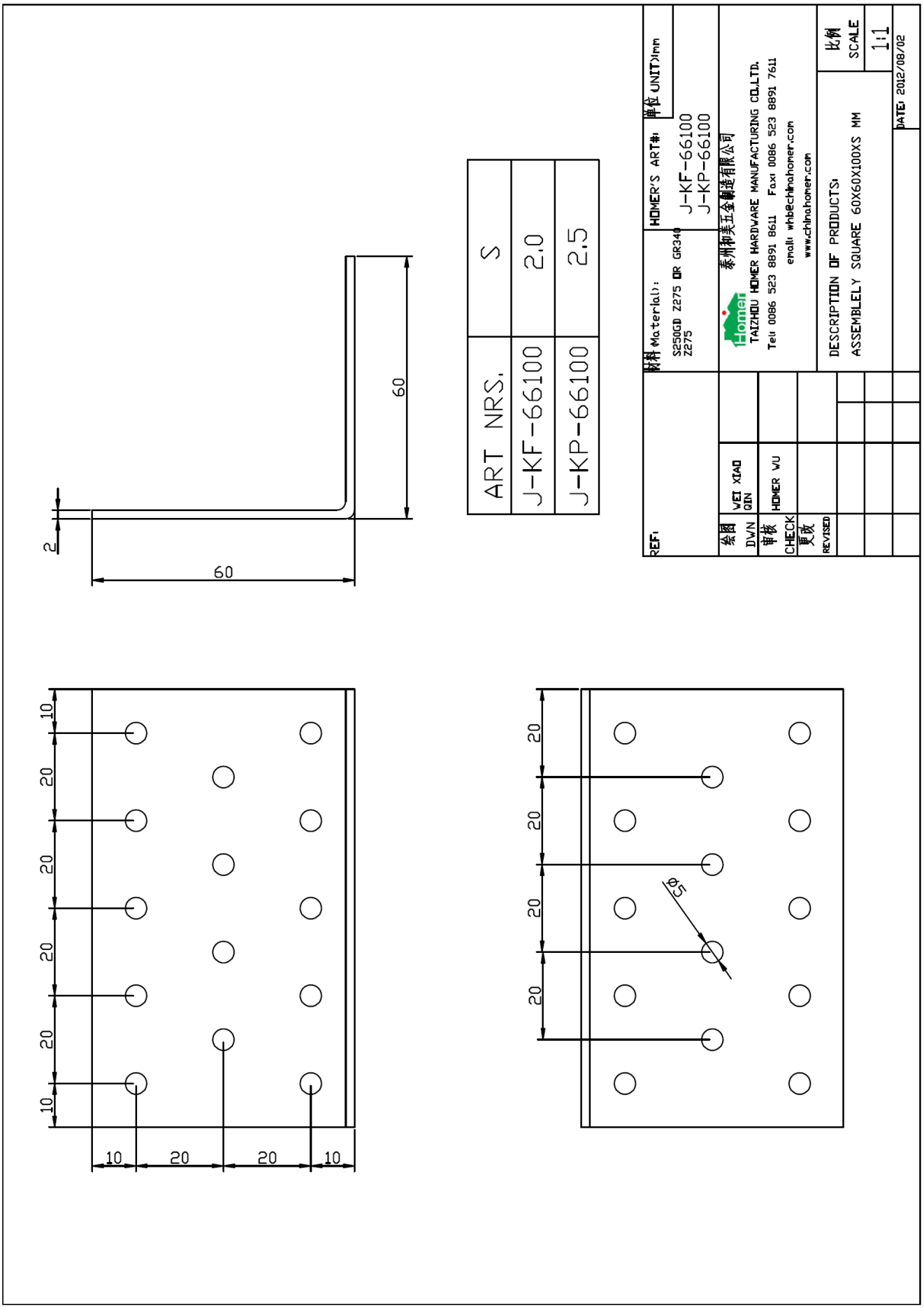
Φ5


ART NRS.
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J-KF-66100
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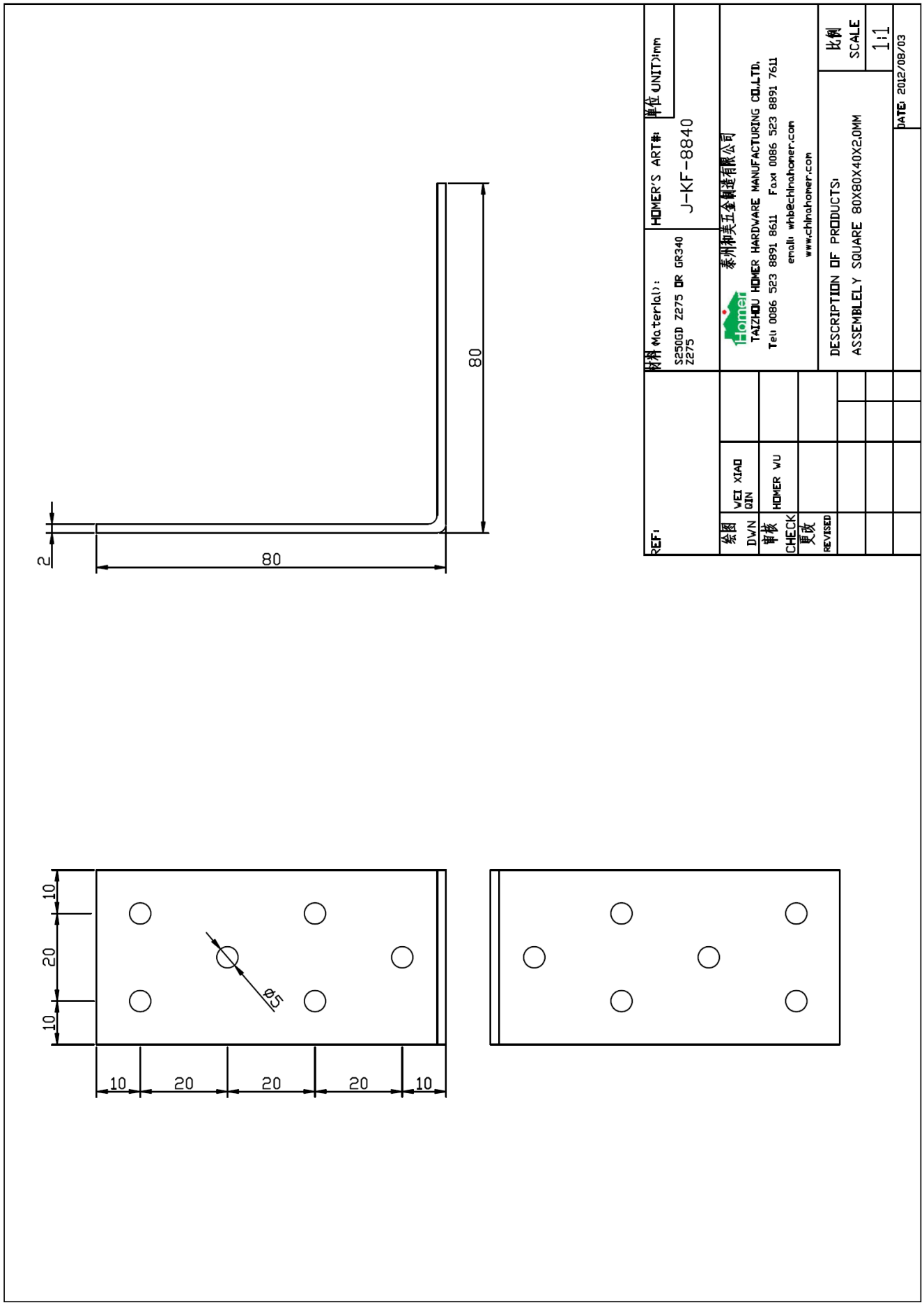
J-KP-66100
2.5
60
2
60
10
20
20
20
20
10
10
20
20
20
20
20
Φ5
REF:
材料 Material:
S250GD Z275 OR GR340 Z275
HOMER'S ART#:
J-KF-66100
J-KP-66100
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ASSEMBLELY SQUARE 60X60X100XS MM
比例 SCALE
1:1
DATE: 2012/08/02
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED


2
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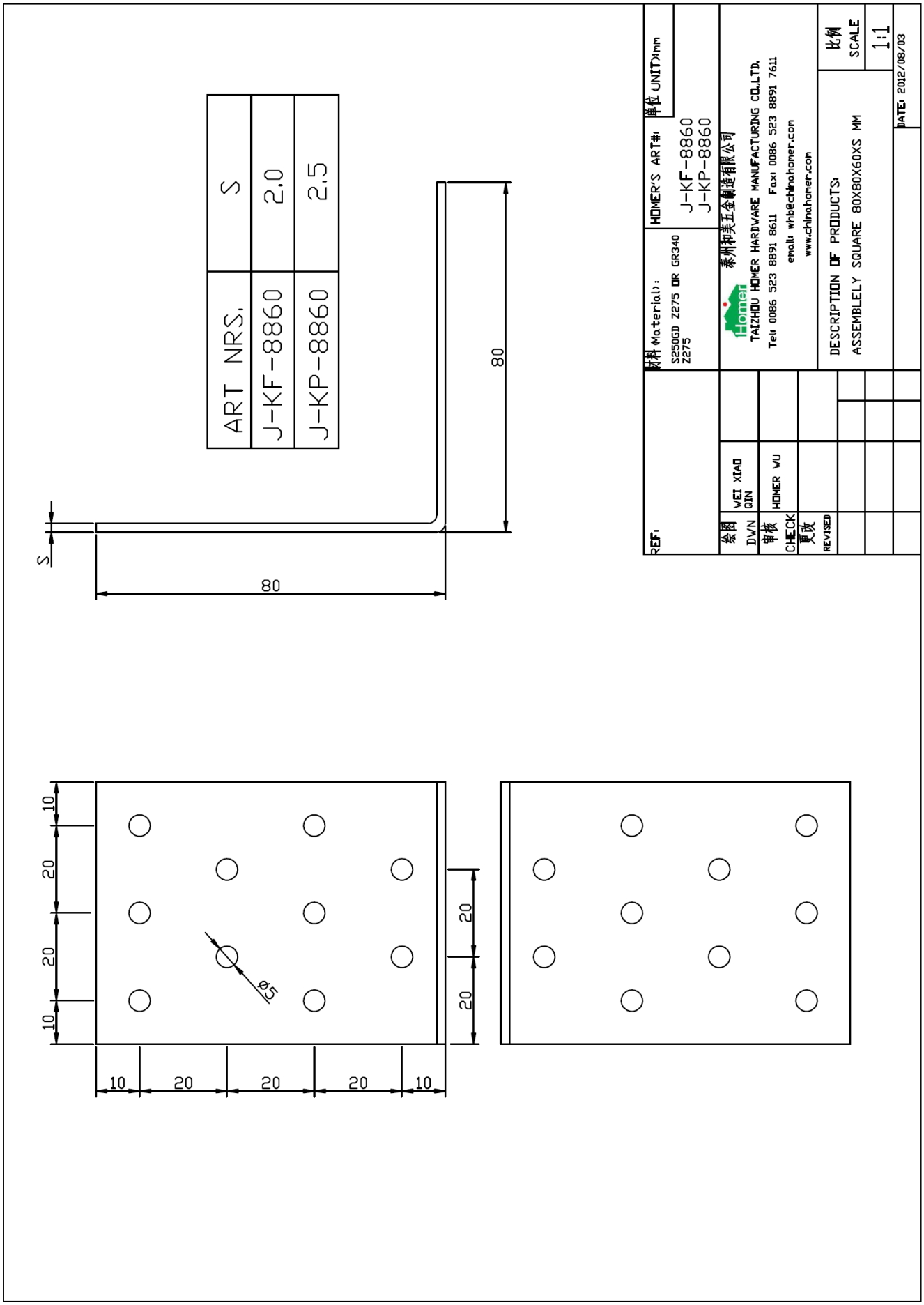
REF:
材料 Material:
S250GD Z275 OR GR340 Z275
HOMER'S ART#:
J-KF-8840
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ASSEMBLELY SQUARE 80X80X40X2.0MM
比例 SCALE
1:1
DATE 2012/08/03
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED


ART NRS.
S
J-KF-8860
2.0
J-KP-8860
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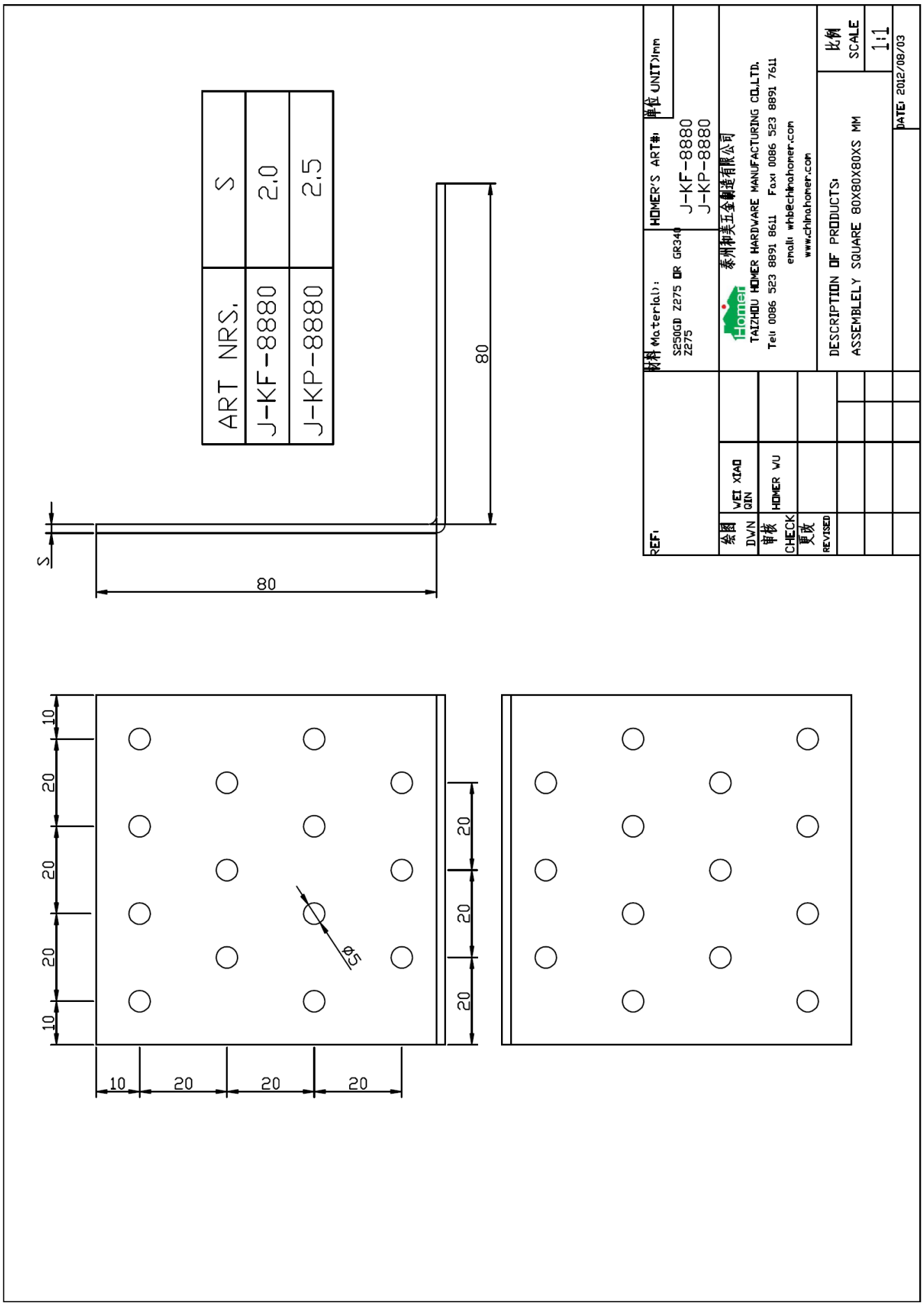
20
20
REF:
材料 Material:
S250GD Z275 OR GR340
Z275
HOMER'S ART#:
J-KF-8860
J-KP-8860
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ASSEMBLELY SQUARE 80X80X60XS MM
比例 SCALE
1:1
DATE: 2012/08/03
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED


ART NRS.
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J-KF-8880
2,0
J-KP-8880
2,5
80
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80
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10
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20
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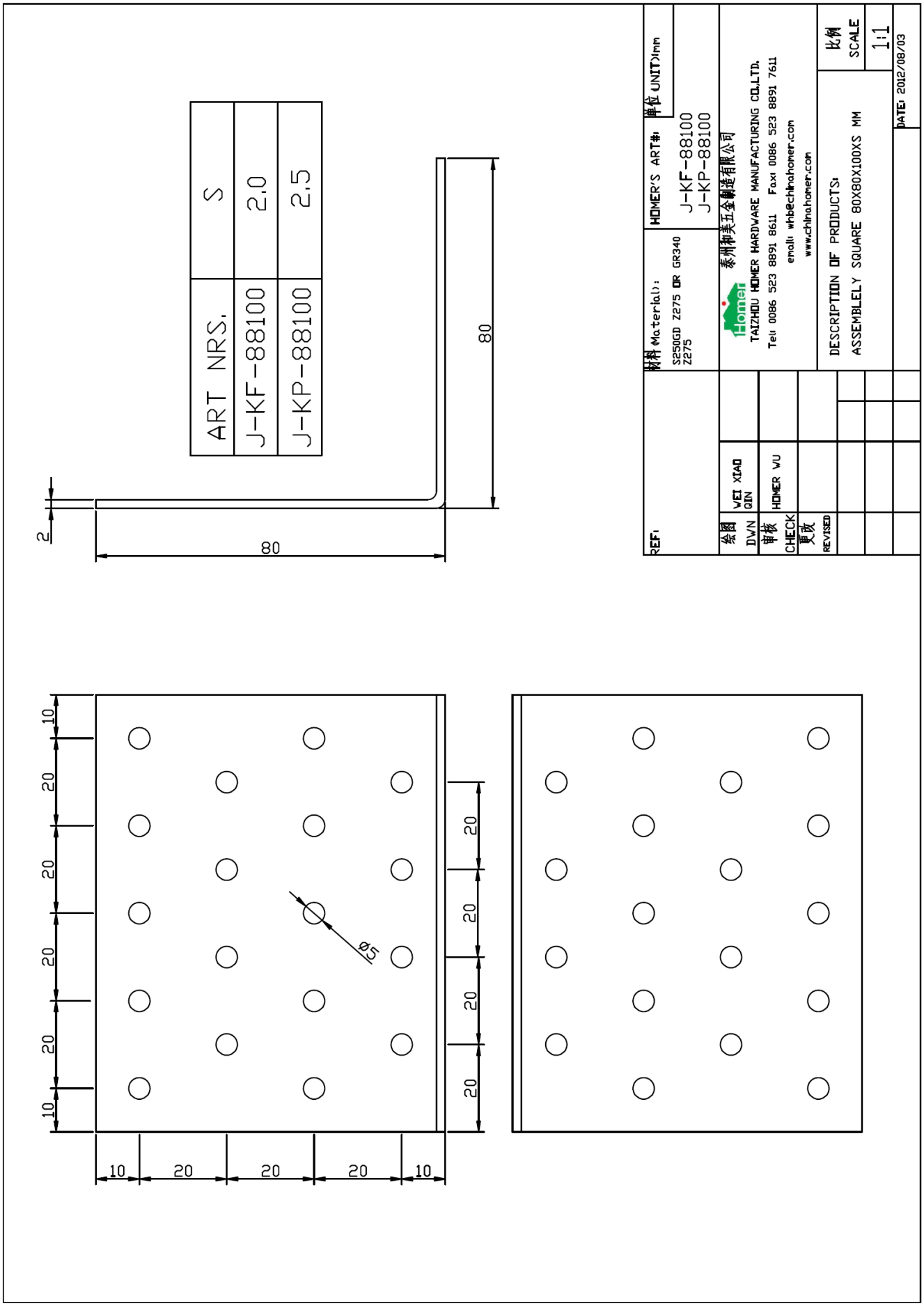
20
20
20
Φ5
HOMER'S ART#
J-KF-8880
J-KP-8880
单位 UNIT:mm
材料 Material:
S250GD Z275 OR GR340 Z275
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ASSEMBLELY SQUARE 80X80X80XS MM
比例 SCALE
1:1
DATE: 2012/08/03
REF:
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED


ART NRS.
S
J-KF-88100
2.0
J-KP-88100
2.5
80
2
80
10
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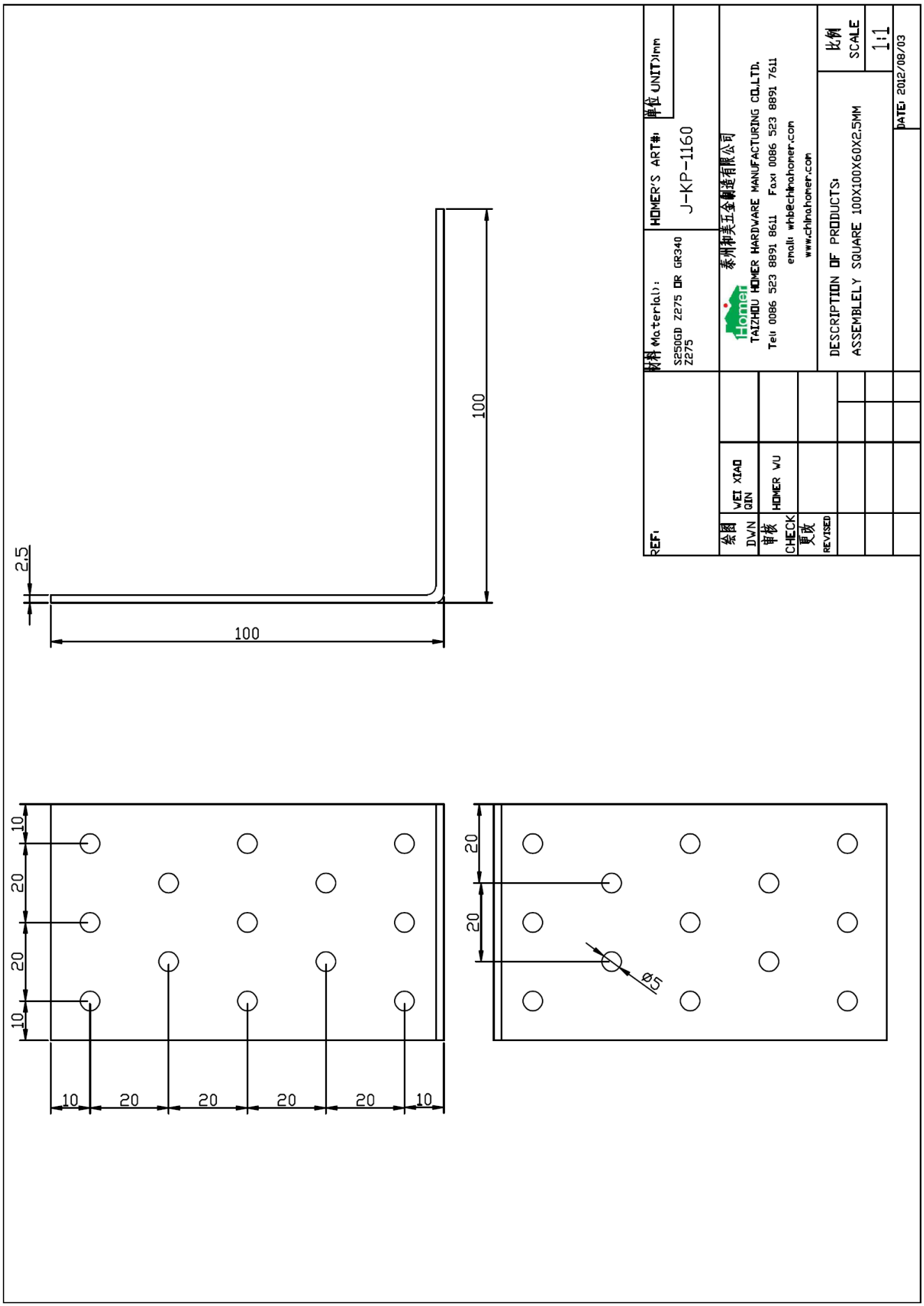
Ø5
REF:
材料 Material:
S250GD Z275 OR GR340
Z275
HOMER'S ART#:
J-KF-88100
J-KP-88100
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ASSEMBLELY SQUARE 80X80X100XS MM
比例
SCALE
1:1
DATE: 2012/08/03
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED


2.5
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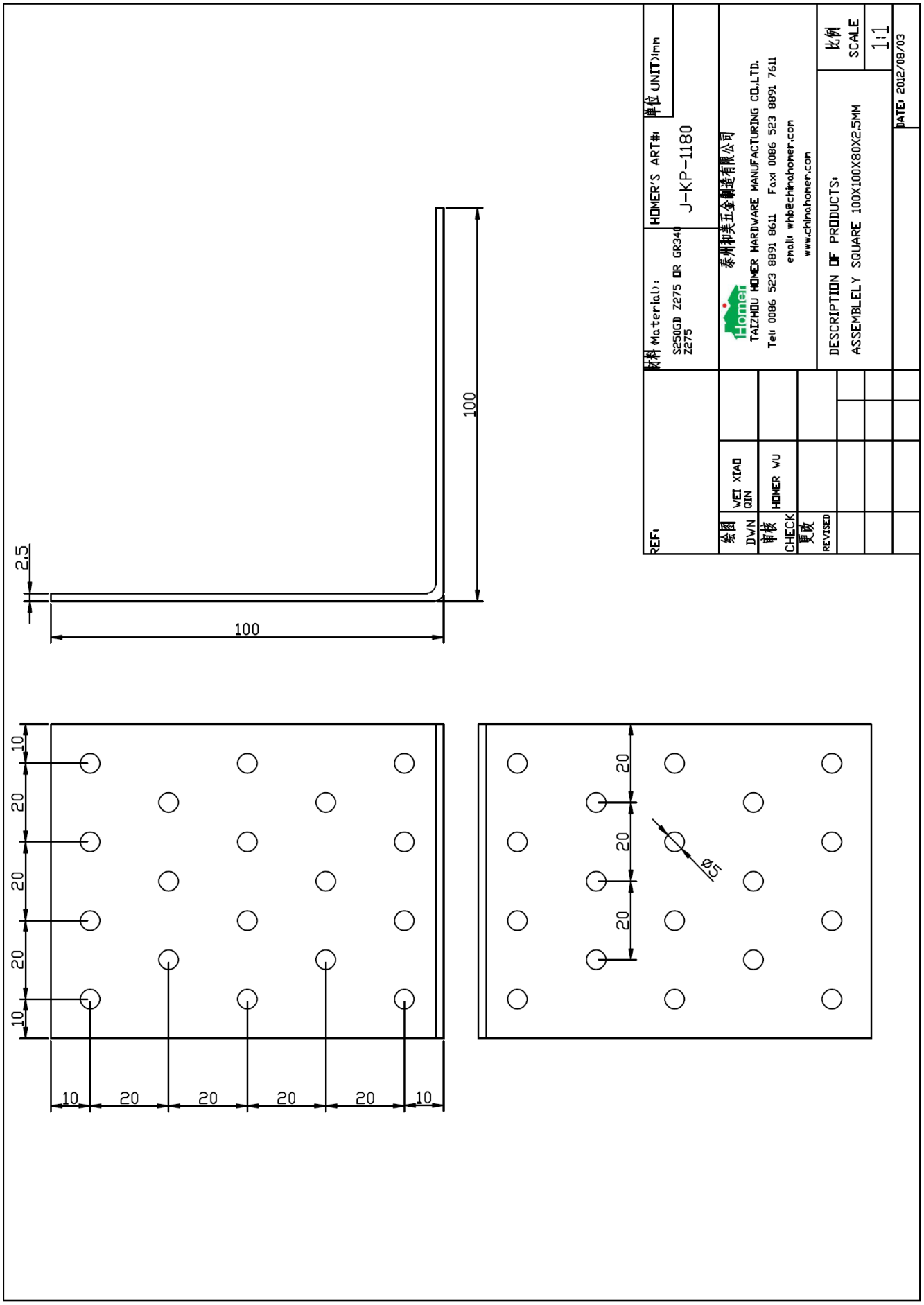
Ø5
REF:
材料 Material:
S250GD Z275 OR GR340 Z275
HOMER'S ART#:
J-KP-1160
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ASSEMBLELY SQUARE 100X100X60X2.5MM
比例 SCALE
1:1
DATE: 2012/08/03
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED


2.5
100
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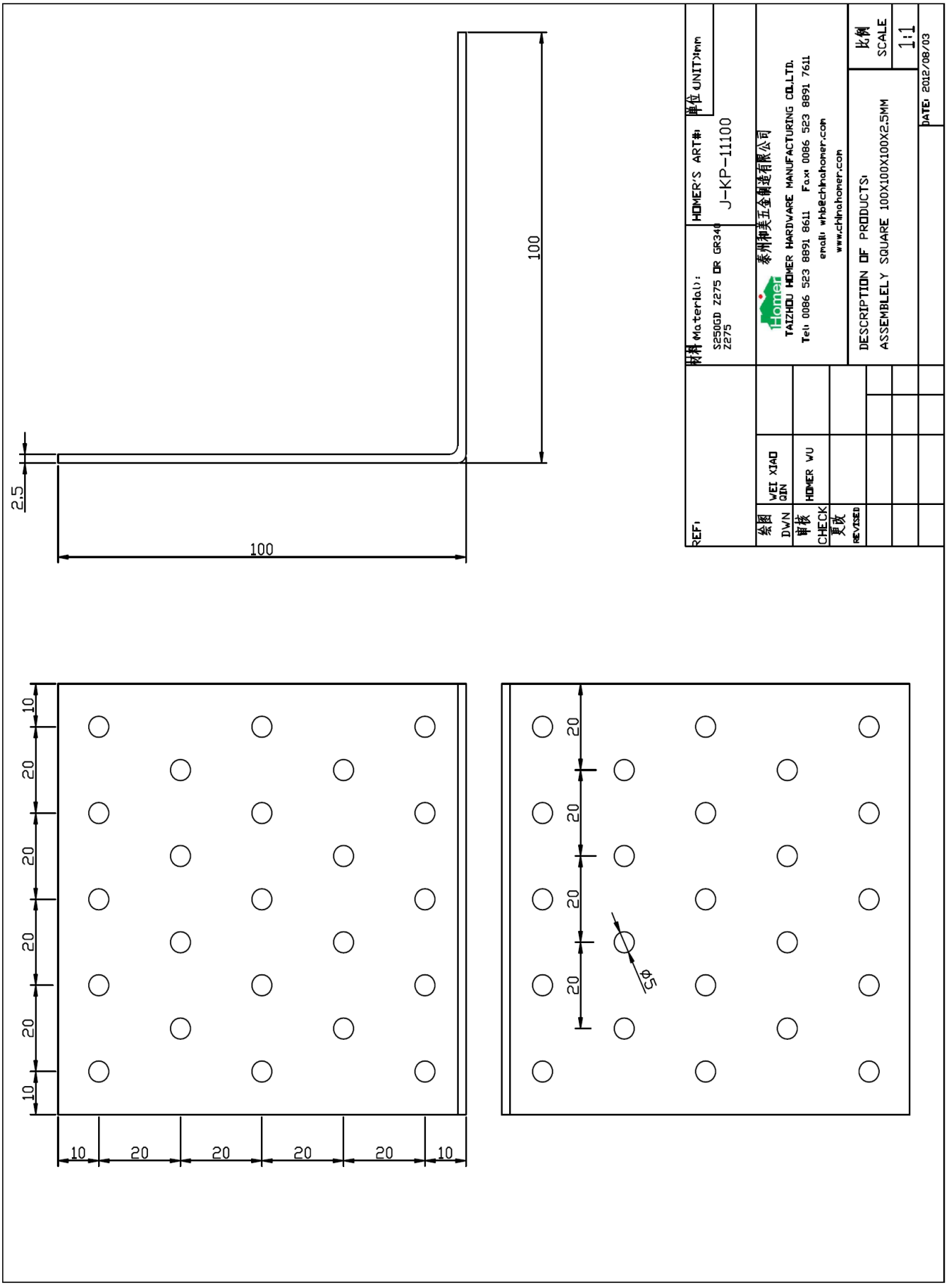
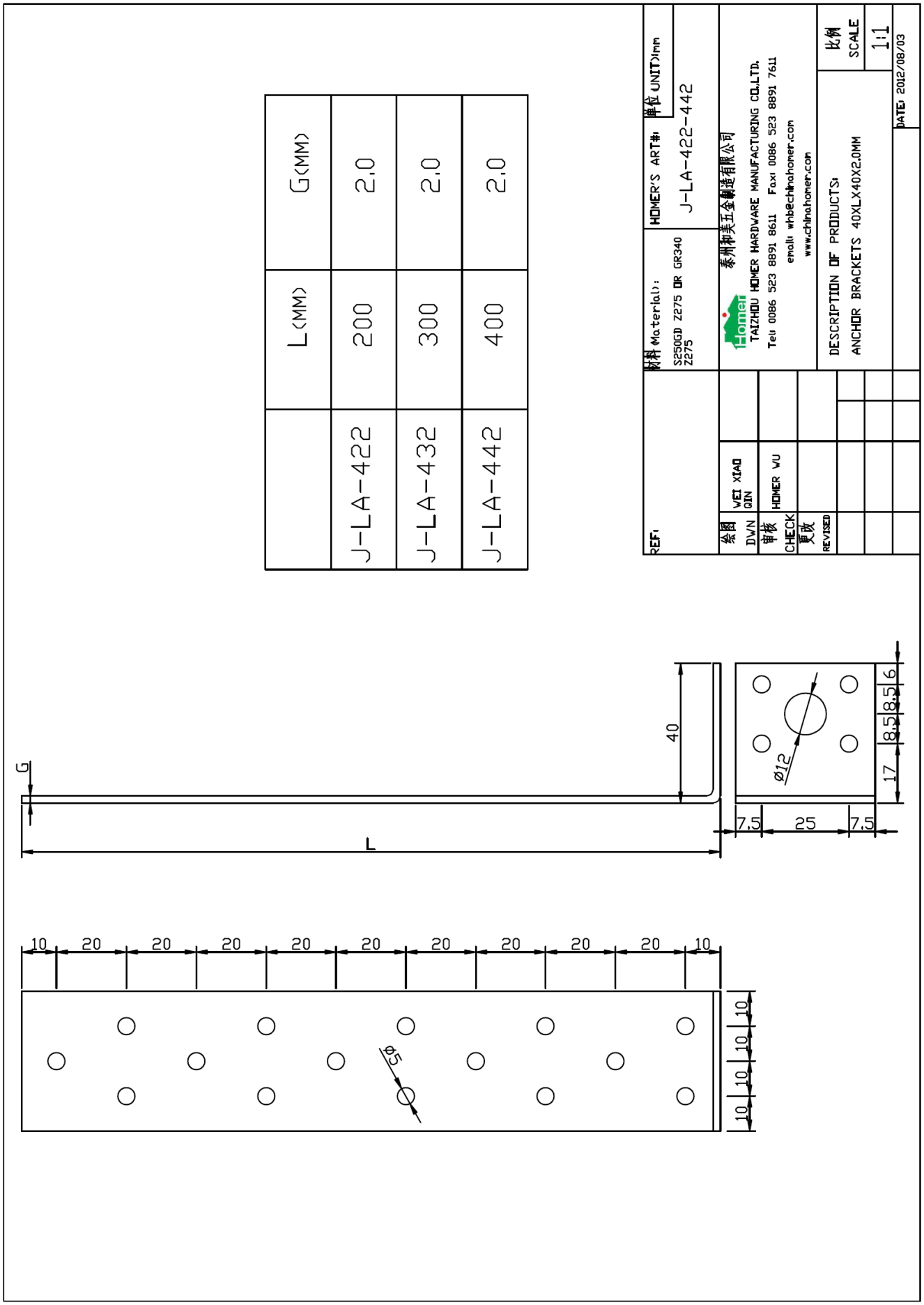
REF:
材料 Materials:
S250GD Z275 OR GR340 Z275
HOMER'S ART#:
J-KP-1180
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ASSEMBLELY SQUARE 100X100X80X2.5MM
比例 SCALE
1:1
DATE: 2012/08/03
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED

ANNEX 1: Product details and definitions




L(MM)
G(MM)
J-LA-422
200
2.0
J-LA-432
300
2.0
J-LA-442
400
2.0
HOMER'S ART#: J-LA-422-442
单位 UNIT:mm
材料 Material: S250GD Z275 OR GR340 Z275
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ANCHOR BRACKETS 40XLX40X2.0MM
比例 SCALE 1:1
DATE: 2012/08/03
REF:
绘图 DWN WEI XIAO QIN
审核 CHECK HOMER WU
更改 REVISED
G
L
40
Ø12
Ø5
7.5
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7.5
17
8.5
8.5
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10 20 20 20 20 20 20 20 20 20 10
10
10
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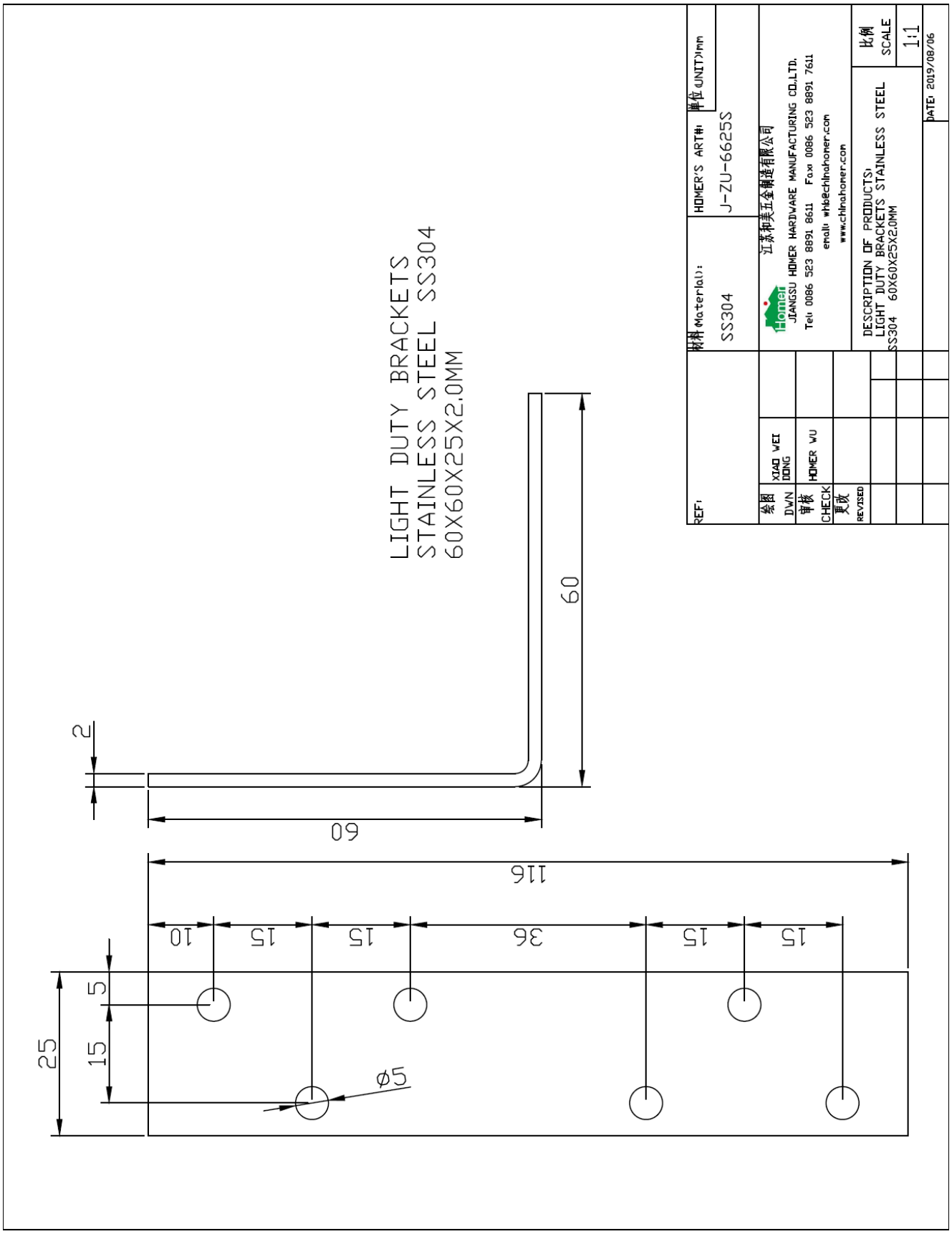
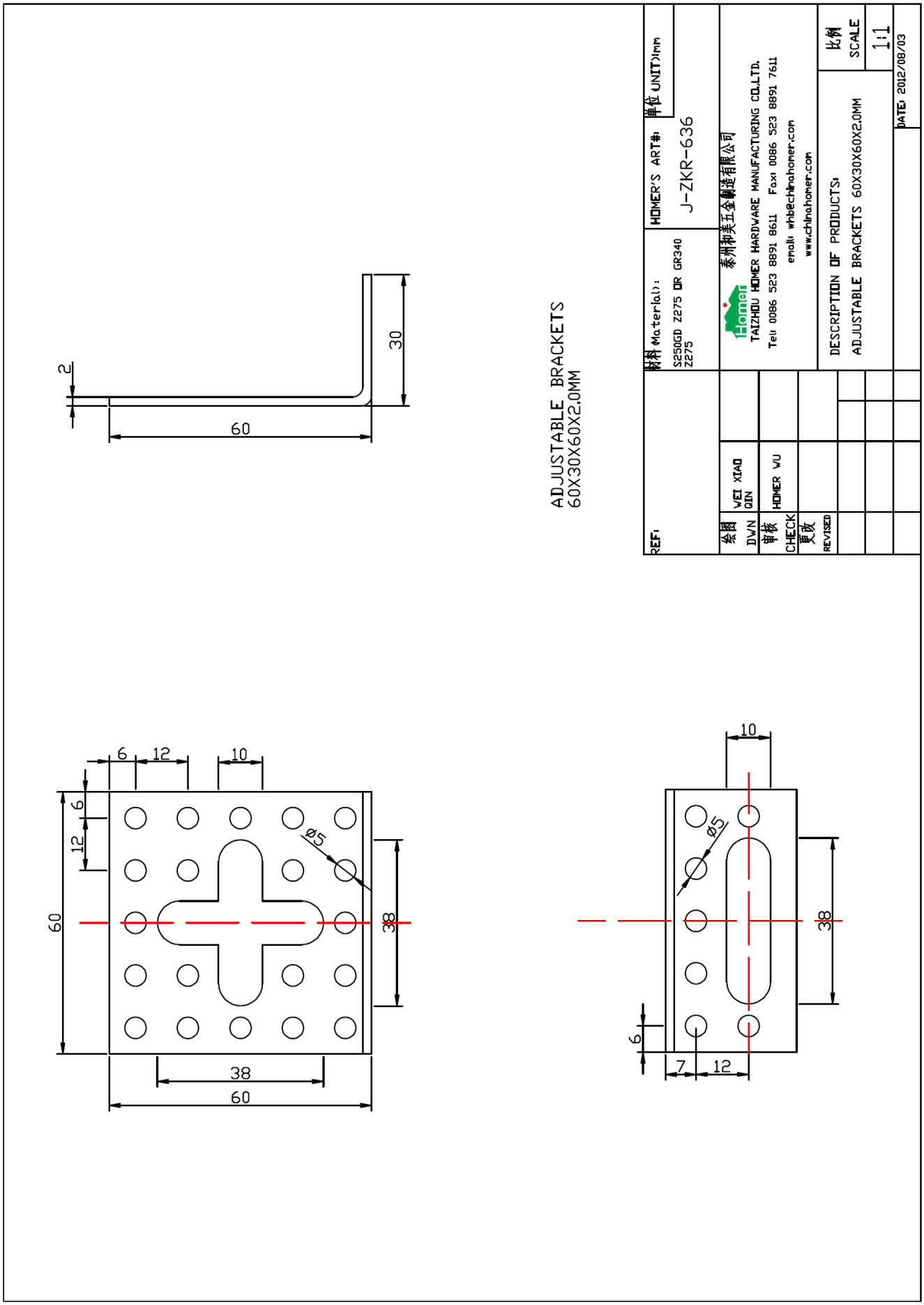
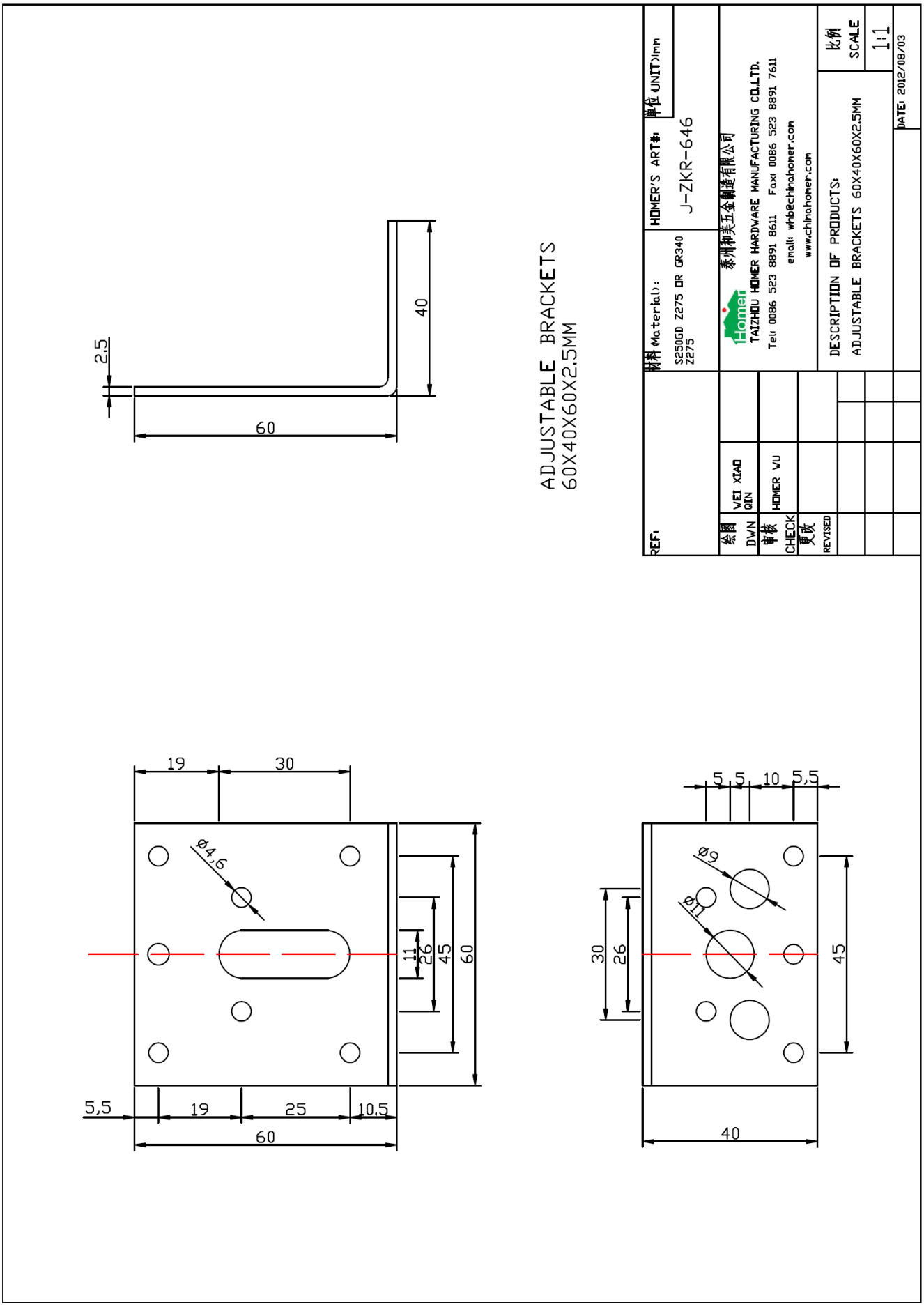
10

ANNEX 1: Product details and definitions




ADJUSTABLE BRACKETS
60X30X60X2.0MM
2
30
60
6
12
10
6
12
60
38
60
Ø5
38
10
Ø5
38
6
7
12
REF:
材料 Material:
S250GD Z275 OR GR340
Z275
HOMER'S ART#:
J-ZKR-636
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ADJUSTABLE BRACKETS 60X30X60X2.0MM
比例 SCALE
1:1
DATE: 2012/08/03
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED


ADJUSTABLE BRACKETS
60X40X60X2.5MM
材料 Material:
S250GD Z275 OR GR340 Z275
HOMER'S ART#:
J-ZKR-646
单位 UNIT:mm
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ADJUSTABLE BRACKETS 60X40X60X2.5MM
比例 SCALE
1:1
DATE: 2012/08/03
REF:
绘图 DWN
VEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED
2.5
40
60
19
30
Φ4.6
11
26
45
60
5.5
19
25
10.5
60
5.5
5.5
10
5.5
Φ9
Φ11
30
26
45
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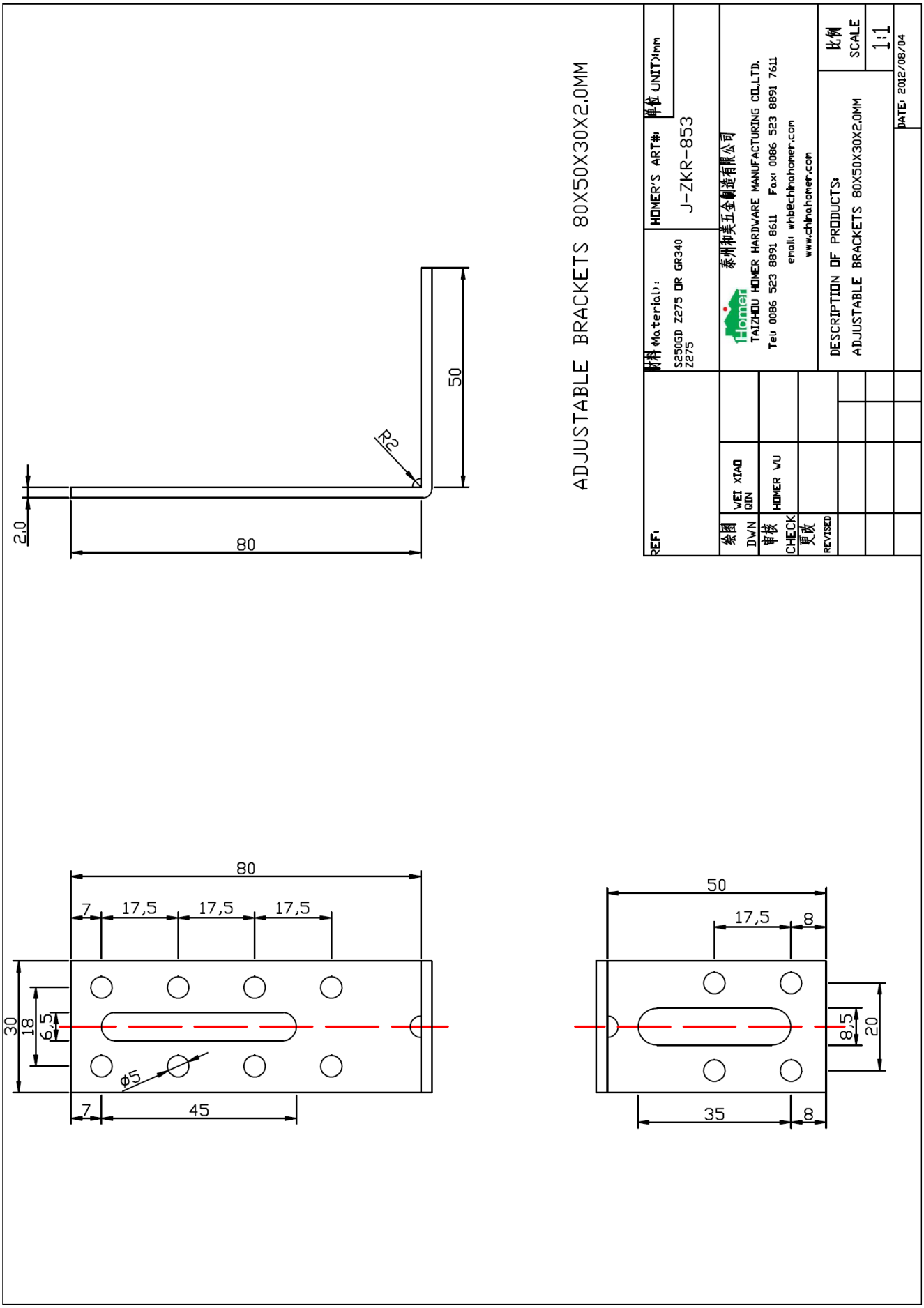
ADJUSTABLE BRACKETS 80X50X30X2.0MM
HOMER'S ART#: J-ZKR-853
单位 UNIT:mm
材料 Material:
S250GD Z275 OR GR340
Z275
泰州和美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ADJUSTABLE BRACKETS 80X50X30X2.0MM
比例 SCALE 1:1
DATE: 2012/08/04
REF:
绘图 DWN WEI XIAO QIN
审核 CHECK HOMER WU
更改 REVISED
2.0
80
50
R2
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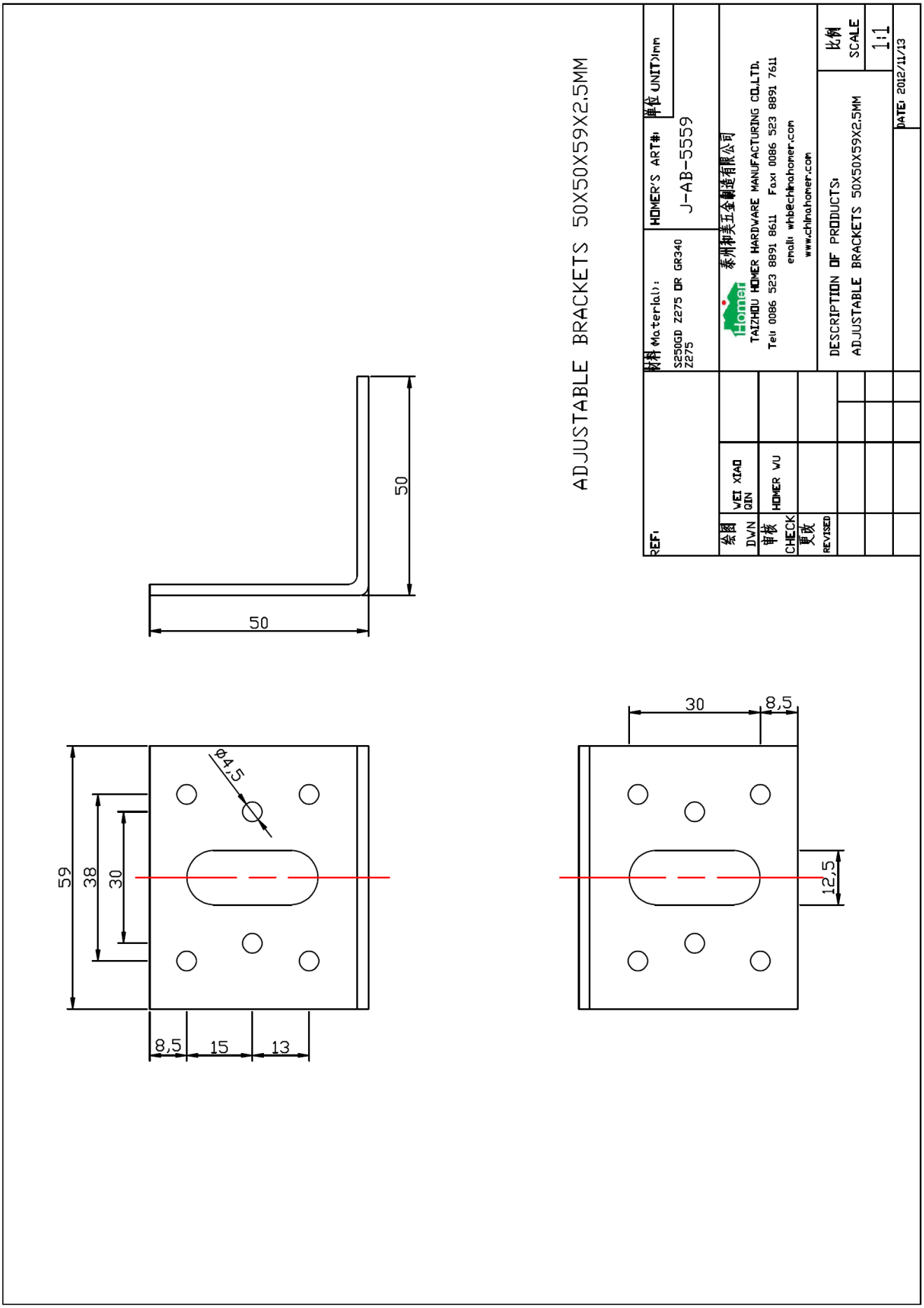
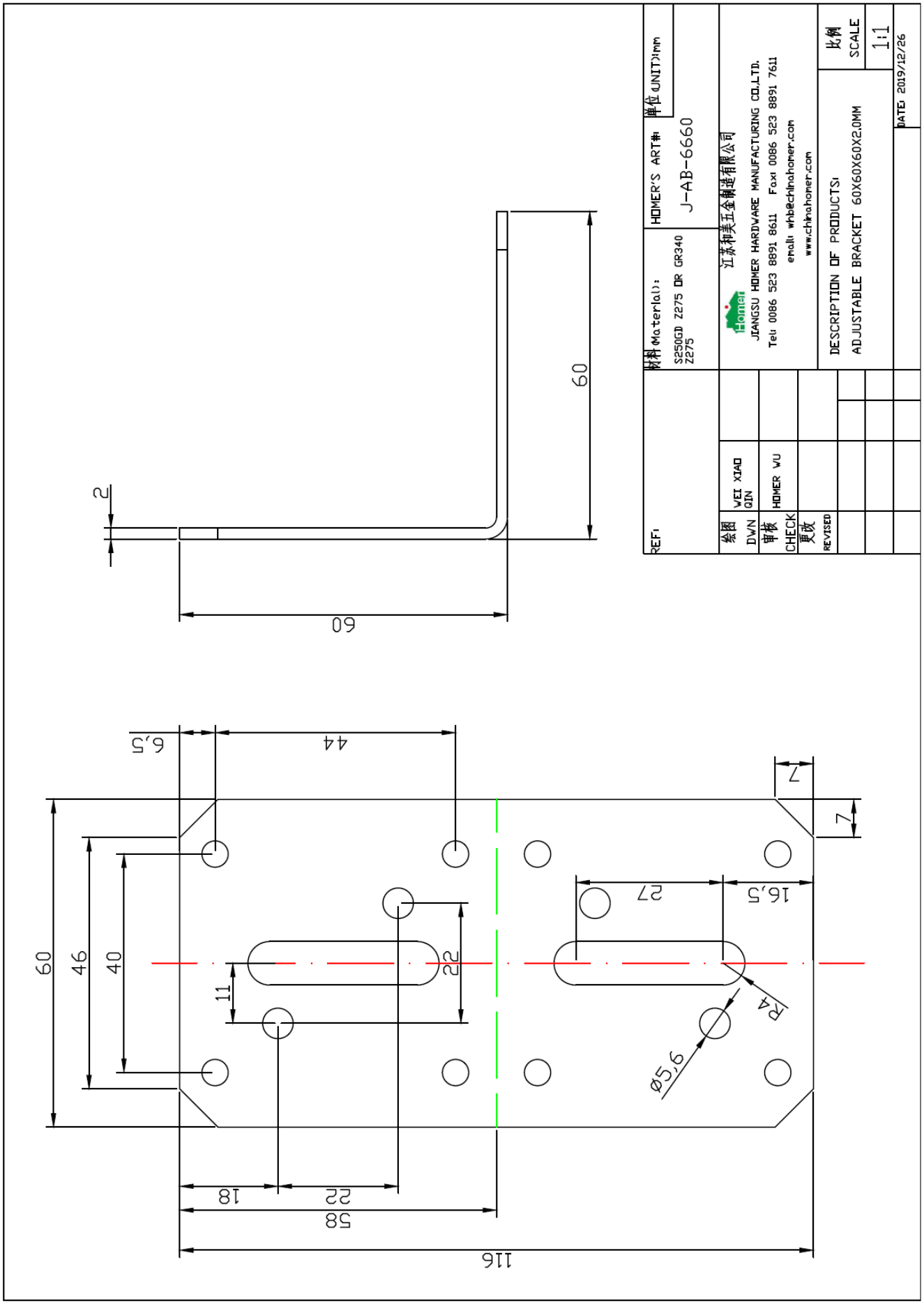
7
17,5
17,5
17,5
30
18
6,5
ϕ5
7
45
50
17,5
8
8,5
20
35
8


ADJUSTABLE BRACKETS 50X50X59X2.5MM
50
50
Φ4.5
59
38
30
8.5
15
13
30
8.5
12.5
REF:
材料 Material:
S250GD Z275 OR GR340
Z275
HOMER'S ART#:
J-AB-5559
单位 UNIT:mm
泰州神美五金制造有限公司
TAIZHOU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ADJUSTABLE BRACKETS 50X50X59X2.5MM
比例 SCALE
1:1
DATE: 2012/11/13
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED


材料 Material:
S250GD Z275 OR GR340 Z275
HOMER'S ART#
J-AB-6660
单位 UNIT:mm
江苏和美五金制造有限公司
JIANGSU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
ADJUSTABLE BRACKET 60X60X60X2.0MM
比例 SCALE
1:1
DATE: 2019/12/26
REF:
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED
2
60
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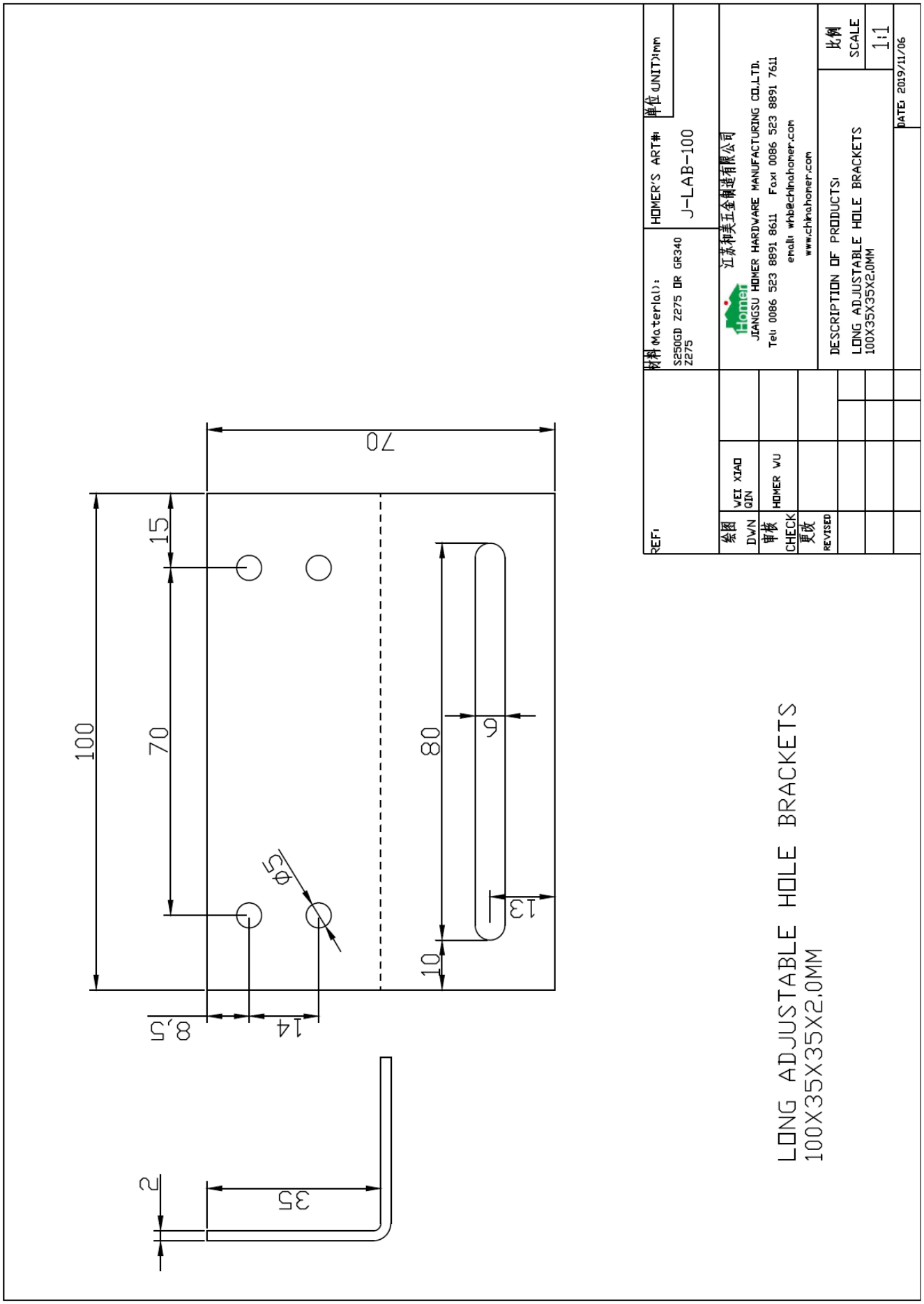
58
116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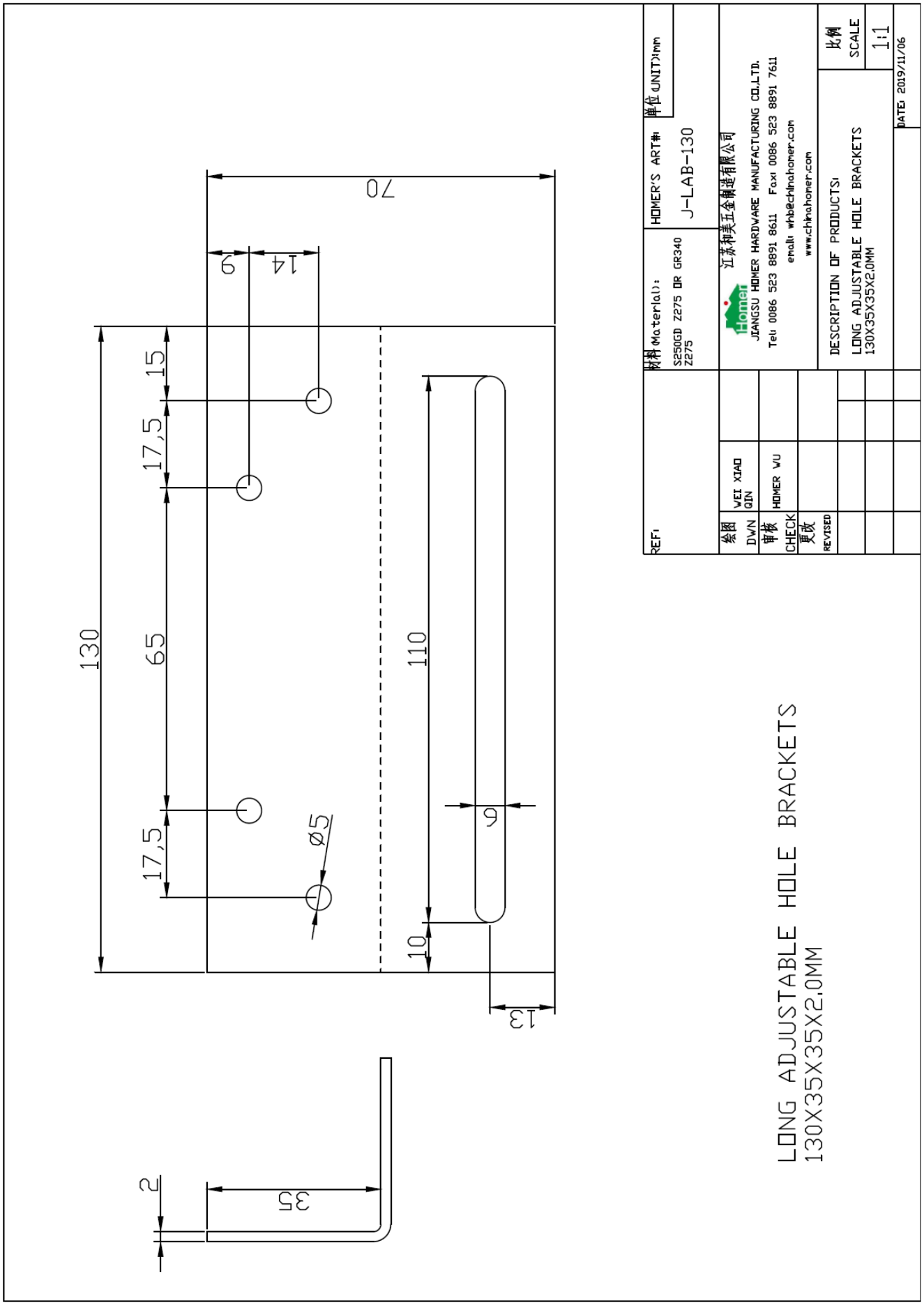
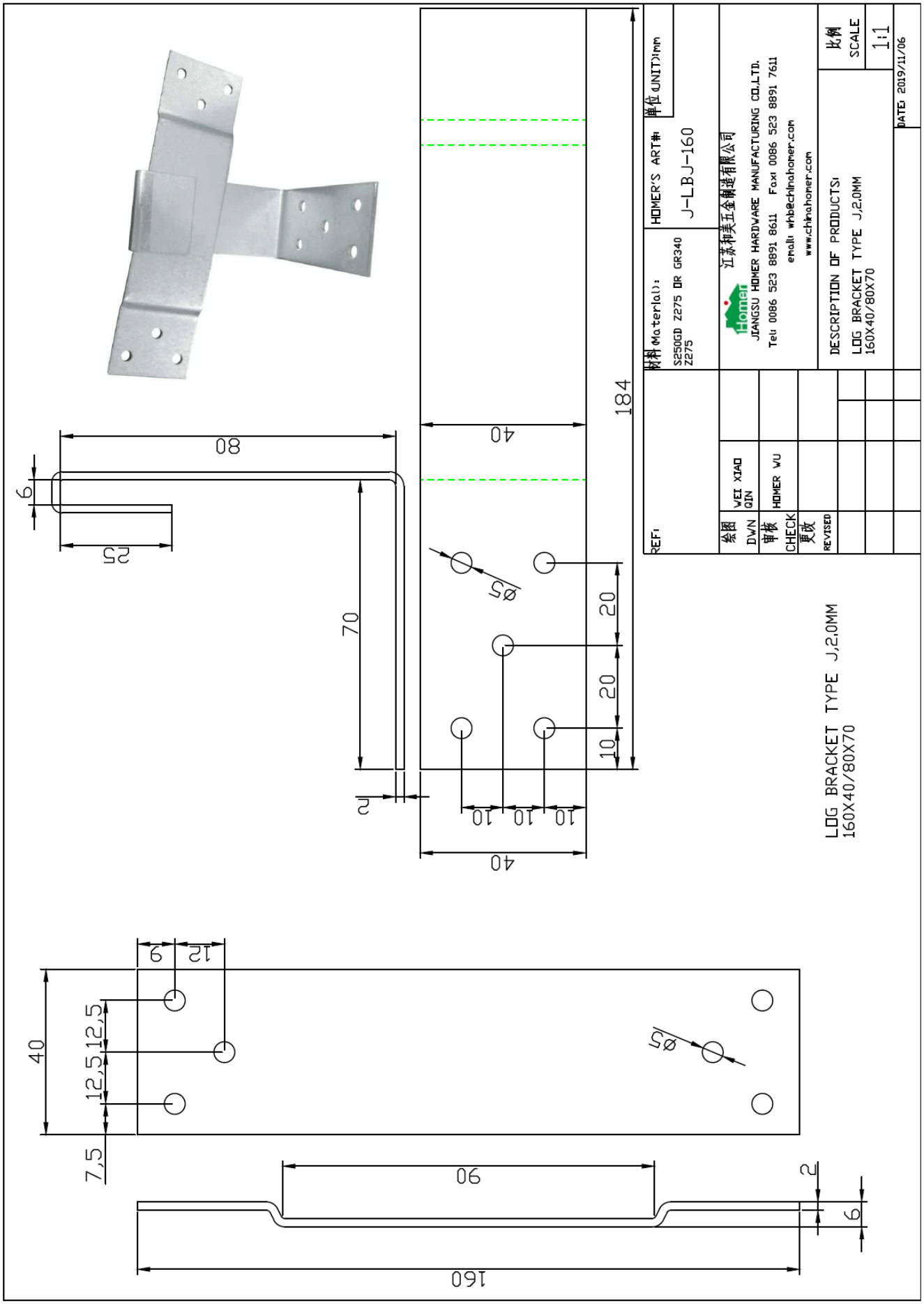
材料 Material:
S250GD Z275 OR GR340 Z275
HOMER'S ART#:
J-LAB-100
单位 UNIT:mm
江苏和美五金制造有限公司
JIANGSU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
绘图 DWN
WEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED
DESCRIPTION OF PRODUCTS:
LONG ADJUSTABLE HOLE BRACKETS
100X35X35X2.0MM
比例 SCALE
1:1
DATE: 2019/11/06
LONG ADJUSTABLE HOLE BRACKETS
100X35X35X2,0MM
70
15
100
70
80
6
13
10
Φ5
8,5
14
2
35


70
9
14
15
17,5
65
17,5
130
Ø5
110
9
10
13
2
35
LONG ADJUSTABLE HOLE BRACKETS
130X35X35X2,0MM
材料 Material:
S250GD Z275 OR GR340 Z275
HOMER'S ART#:
J-LAB-130
单位 UNIT:mm
江苏和美五金制造有限公司
JIANGSU HOMER HARDWARE MANUFACTURING CO.,LTD.
Tel: 0086 523 8891 8611 Fax: 0086 523 8891 7611
email: whb@chinahomer.com
www.chinahomer.com
DESCRIPTION OF PRODUCTS:
LONG ADJUSTABLE HOLE BRACKETS
130X35X35X2.0MM
比例 SCALE
1:1
DATE: 2019/11/06
REF:
绘图 DWN
VEI XIAO QIN
审核 CHECK
HOMER WU
更改 REVISED

ANNEX 1: Product details and definitions



ANNEX 2. CHARACTERISTIC LOAD-CARRYING CAPACITIES

Characteristic resistances for Taizhou Homer Angle Brackets - calculation method

Load carrying capacity of non-sliding Angle Bracket connections

The design resistance R_d of the angle bracket connection is

$$R_d = k_{\text{mod}} \frac{R_k}{\gamma_M} \quad (1)$$

where k_{mod} is the modification factor according to EN 1995-1-1 taking into account the effect of the duration of the load and moisture content for timber, γ_M is the partial factor for the resistance of connections according to the relevant National annex of EN 1995-1-1 and R_k is the characteristic resistance of the angle bracket connection.

When the connection made by the angle bracket is loaded by a shear force at the plane of flange A in the middle of the flange, it shall be checked that the conditions according to equations (2) to (4) are fulfilled

$$F_d \leq R_{A,d} \quad (2)$$

$$F_{x,d} \leq R_{B,x,d} \quad (3)$$

$$F_{z,d} \leq \begin{cases} R_{B,z,t,d} & \text{when the connection is in tension} \\ R_{B,z,c,d} & \text{when the connection is in compression} \end{cases} \quad (4)$$

where $F_{x,d}$ is the component in the direction of the bent edge of the angle bracket from the connection force F_d and $F_{z,d}$ is the component perpendicular to $F_{x,d}$ from the connection force F_d.

In addition, when the connection is stressed in tension, the following interaction equation shall be fulfilled:

$$\left(\frac{F_{z,d}}{R_{B,z,t,d}}\right)^2 + \left(\frac{F_{x,d}}{R_{B,x,d}}\right)^2 \leq 1 \quad (5)$$

Characteristic resistance

$$R_{A,k} = n_A F_{A,v,Rk} \quad (6)$$

where n_A is number of fasteners at flange A. $F_{A,v,Rk}$ is the characteristic lateral load-carrying capacity of the fastener in the timber part against flange A according to EN 1995-1-1, equation (7) for steel plate thickness t less than or equal to $d/2$ and (8) for thicker steel plates of thickness greater than or equal to d:

$$F_{v,Rk} = \min \begin{cases} 0{,}4\, f_{h,k} t_1 d & \text{(a)} \\ 1{,}15\sqrt{2M_{y,Rk} f_{h,k} d} + \frac{F_{ax,Rk}}{4} & \text{(b)} \end{cases} \quad (7)$$

$$F_{v,Rk} = \min \begin{cases} f_{h,k} t_1 d & \text{(a)} \\ f_{h,k} t_1 d \left[\sqrt{2 + \dfrac{4 M_{y,Rk}}{f_{h,k} d\, t_1^2}} - 1 \right] + \dfrac{F_{ax,Rk}}{4} & \text{(b)} \\ 2{,}3 \sqrt{M_{y,Rk}\, f_{h,k} d} + \dfrac{F_{ax,Rk}}{4} & \text{(c)} \end{cases} \qquad (8)$$

where $t_1 = L - t$ when L is the length of the fastener, t is the thickness of steel plate, $M_{y,k}$ is according to standards EN 14592 and EN 409 experimentally determined characteristic value of the yield moment of the fastener, $F_{ax,Rk}$ is the withdrawal resistance of the fastener according to Eq. (10) limited at maximum to $^1/_3$ with nails and ½ with screws from the load-carrying capacity $F_{v,Rk}$ and the characteristic value of the embedding strength

$$f_{h,k} = 0{,}082 \rho_k d^{-0{,}3} \qquad \text{N/mm}^2 \qquad (9)$$

The characteristic withdrawal resistance of the nail

$$F_{ax,Rk} = f_{ax,k} d\, t_{pen} \le f_{tens,k} \qquad (10a)$$

and for the screw

$$F_{ax,Rk} = n^{-0{,}1} f_{ax,k} d\, l_{ef} \left(\frac{\rho_k}{\rho_a} \right)^{0{,}8} \le n^{-0{,}1} f_{tens,k} \qquad (10b)$$

where $f_{ax,k}$ is the withdrawal parameter determined by testing according to standards EN 14592 and EN 1382 for the actual timber material with density ρ_a, $f_{tens,k}$ is the experimentally determined tensile resistance of the fastener together with a steel plate, t_{pen} is the penetration depth of the profiled part of the nail in timber, n is the number of the screws in the flange of connector, l_{ef} is the length of threaded part of the screw and ρ_k is the characteristic density of timber in the actual connection. If the penetration depth for an anchor nail is less than $t_{pen} \le 8d = 32$ mm, the resistance according to Eq. (10a) is reduced by (t_{pen}/8mm - 3).

Eq. (8) may be used for angular ring shank nails, if the length of the conical part is at least 4 mm and the diameter of the cone at the head of the nail is at least 5,2 mm. Otherwise linear interpolation of equations (7) and (8) is used for steel plate thicknesses between 2 and 4 mm.

Characteristic resistance

$$R_{B,x,k} = k_m F_{B,v,Rk} \qquad (11)$$

where $F_{B,v,Rk}$ is the characteristic lateral load-carrying capacity of the fastener in the timber part against flange B, according to EN 1995-1-1, and the factor k_m depends on the placement of the fasteners. Values of k_m are given in Table A2.1 for cases, where fasteners are used in all holes of the angle bracket with diameter from 4 to 5 mm.

Characteristic tension resistance for angle brackets without stiffeners

$$R_{B,z,t,k} = \min \begin{cases} F_{n,1} + F_{n,2} - 3 \cdot \dfrac{F_{n,1} \cdot d_1 + F_{n,2} \cdot d_2 - \dfrac{B \cdot t_d{}^2}{4} \cdot f_y}{2L_B + d_2} & \text{(a)} \\ \dfrac{t_d{}^2 f_y}{4 d_1} \cdot \left(B + B_{net,1}\right) & \text{(b)} \\ \dfrac{t_d{}^2 f_y}{4 d_2} \cdot \left(B + B_{net,2}\right) + \dfrac{F_{n,1}\left(d_2 - d_1\right)}{d_2} & \text{(c)} \\ F_{n,1} + F_{n,2} & \text{(d)} \end{cases} \quad (12)$$

where

d_1 distance between the bent edge and the hole row nearest to it in flange B (i = 1)

d_2 distance between the bent edge and the hole row second nearest to it in flange B (i = 2)

B the width of the angle bracket

t_d is the thickness of the connector to be used in calculations (= the minimum thickness minus the thickness of the zinc coating)

f_y yield strength of the steel of the angle bracket

L_B the length of flange B from the middle of the bent edge

$B_{net,i}$ the net width of the angle bracket at hole row i and

$$F_{n,i} = n_i F_{ax,Rk} \quad (13)$$

when n_i is the number of fasteners at row i and $F_{ax,Rk}$ is the characteristic resistance against withdrawal in the timber member against flange B according to EN 1995-1-1.

If there are fasteners only in one or two rows at flange B, equation (12.a) is inserted by $F_{n,2} = 0$ and $d_2 = d_1$ and equation (12.c) needs not to be checked.

Characteristic tension resistance for angle brackets with stiffener

$$R_{B,z,t,k} = \min \begin{cases} \Sigma F_{a,j} + F_{n,1} - 3 \cdot \dfrac{F_{n,1} \cdot d_1 - \dfrac{B \cdot t_d{}^2}{4} \cdot f_y}{2L_B - 2a + d_2} & \text{(a)} \\ \dfrac{t_d{}^2 f_y}{4(a + d_1)} \cdot \left(B + B_{net,1}\right) + \dfrac{\Sigma\left(F_{a,j}\left(a + d_1 - a_j\right)\right)}{a + d_1} & \text{(b)} \\ \sum F_{a,j} + F_{n,1} & \text{(c)} \end{cases} \quad (14)$$

where

d_1 distance between the end of the stiffener ridge and the hole row nearest to it in flange B (i = 1)

a is the length of the stiffener ridge in flange B

B the width of the angle bracket at the end of the stiffener ridge

t_d is the thickness of the connector to be used in calculations (= the minimum thickness minus the thickness of the zinc coating)

f_y yield strength of the steel of the connector

L_B the length of flange B from the middle of the bent edge

$B_{net,i}$ the net width of the angle bracket at hole row i

$F_{n,1}$ is calculated from equation (13) where n_1 is the number of fasteners in the row nearest to the end of the stiffener ridge (i) and

$F_{a,j} = n_j F_{ax,Rk}$ (15)

when n_j is the number of fasteners at row j in the part of flange B with the stiffener ridge and $F_{ax,Rk}$ is the characteristic resistance against withdrawal in the timber member against flange B according to EN 1995-1-1.

If the flange B of the connector only has one row of fasteners on the part without stiffener ridge, in equation (14) is inserted $F_{n,1} = 0$.

Characteristic compression resistance for the angle brackets without stiffeners

$$R_{B,z,ck} = t_d \cdot \sqrt{3 \cdot B \cdot B_{net} \cdot f_y \cdot f_{c,90,k}} \quad (16)$$

where t_d, B, ja f_y are defined as for equation (12) and B_{net} is the smallest net width of the flange B and $f_{c,90,k}$ is the characteristic compression strength perpendicular to the timber member against flange B.

Characteristic compression resistance for the angle brackets with stiffeners

$$R_{z,c,B,k} = 3 \cdot a \cdot B_{ef} \cdot f_{c,90} + t_d \cdot \sqrt{3 \cdot B \cdot B_{net} \cdot f_y \cdot f_{c,90,k}} \quad (17)$$

where a is the length of the stiffener ridge from the bent edge of the angle bracket, B_{ef} is the width of the connector minus the width of the stiffener ridge and the other symbols as for equation (16).

Table A2.1. Article numbers of non-sliding Taizhou Homer Angle Brackets, nominal dimensions, number of fasteners in flange B n_B, eccentricity of the fastener group e, sum of the moment arms for the fastener group Σr_i and values for factor k_m when the fasteners are placed in every hole.

Art. No.	Size (mm)	n_B	e (mm)	Σr_i (mm)	k_m
J-ZK-7755WZ	70x70x55x2.5	6	35,8	143,5	2,54
J-ZK-7755WZS	70x70x55x2.5	6	35,8	143,5	2,54
J-ZK-9960WZA	90x90x60x2.0	9	48,6	296,2	3,77
J-ZK-9965WZ	90x90x65x2.5	10	47,3	281,2	3,86
J-ZK-9965WZS/2	90x90x65x2.0	10	47,5	202,0	2,98
J-ZK-9965WZS	90x90x65x2.5	10	47,3	202,0	3,00
J-ZK-1190WZ	105x105x90x3.0	12	61,8	410,5	4,48
J-ZK-1190WZS/2,5	105x105x90x2.5	12	62,1	419,8	4,53
J-ZK-8640WZ	83x62x40x2.0	5	33,0	89,4	1,80
J-ZK-9660WZ	90x60x60x2.5	4	34,8	97,7	1,85
J-ZK-9455WZ	90x45x55x2.5	8	23,3	150,1	4,05
J-DRB-9960	90x90x60x2.5	5	52,2	136,0	1,75
J-DRB-15090	150x90x59x2.0	8	48,5	245,0	3,21
J-DRB-12546	125x125x46x2.5	5	77,8	133,3	1,28
J-DRB-12555	125x125x55x2.5	8	75,3	242,1	2,32
J-DRB-151560	150x150x60x2.5	10	86,6	412,0	3,28
J-ZK-5535	50x50x35x2.5	4	28,8	72,1	1,60
J-ZK-5535S/2	50x50x35x2.0	4	28,0	72,1	1,63
J-ZK-5535S	50x50x35x2.5	4	27,8	72,1	1,64
J-ZK-6645	60x60x45x3.0	6	32,5	124,4	2,46
J-ZK-7755	70x70x55x2.5	6	33,3	143,5	2,65
J-ZK-9940S	90x90x40x3.0	8	48,0	186,0	2,64
J-ZK-9965	90x90x65x2.5	10	47,3	284,8	3,89
J-ZK-1190	105x105x90x3.0	12	61,8	410,5	4,48

J-ZK-9940	90x90x40x3.0	8	48,0	186,0	2,64
J-ZK-9340	90x35x40x3.0	4	17,3	61,0	2,12
J-KF-4420	40x40x20x2.0	2	21,0	22,4	0,71
J-KF-4420S	40x40x20x2.0	2	19,5	22,4	0,75
J-KF-4440	40x40x40x2.0	3	22,3	37,4	1,07
J-KF-4440A	40x40x40x2.0	4	21,0	57,7	1,69
J-KF-4440S	40x40x40x2.0	3	22,3	37,4	1,07
J-KF-4460	40x40x60x2.0	5	21,0	82,3	2,33
J-KF-4460S	40x40x60x2.0	5	21,0	82,3	2,33
J-KF-4480	40x40x80x2.0	7	20,4	146,2	3,54
J-KF-44100	40x40x100x2.0	9	20,1	228,5	5,37
J-KF-44200	40x40x200x2.0	19	19,5	936,2	13,61
J-KF-5540	50x50x40x2.0	6	22,3	77,4	2,20
J-KF-6640	60x60x40x2.0	5	31,0	89,4	1,88
J-KF-6640S	60x60x40x2.0	5	31,0	89,4	1,88
J-KF-6650	60x60x50x2.0	6	29,0	110,2	2,36
J-KF-6660	60x60x60x2.0	8	31,0	173,1	3,29
J-KF-6680	60x60x80x2.0	11	29,0	273,7	5,22
J-KF-66100	60x60x100x2.0	14	29,0	412,0	7,05
J-KF-8840	80x80x40x2.0	6	42,3	130,3	2,03
J-KF-8860	80x80x60x2.0	10	41,0	248,1	3,77
J-KF-8880	80x80x80x2.0	14	40,4	396,0	5,76
J-KF-88100	80x80x100x2.0	18	40,1	578,9	8,01
J-KP-4460	40x40x60x2.5	5	20,8	82,3	2,35
J-KP-6640	60x60x40x2.5	5	31,3	89,4	1,87
J-KF-6640S	60x60x40x2.0	5	31,0	89,4	1,88
J-KP-6660	60x60x60x2.5	8	31,3	173,1	3,27
J-KP-6680	60x60x80x2.5	11	28,8	273,7	5,24
J-KP-66100	60x60x100x2.5	14	28,8	412,0	7,08
J-KP-8860	80x80x60x2.5	10	40,8	248,1	3,78
J-KP-8880	80x80x80x2.5	14	40,2	396,0	5,78
J-KP-88100	80x80x100x2.5	18	39,9	578,9	8,04
J-KP-1160	100x100x60x2.5	13	48,8	388,3	4,94
J-KP-1180	100x100x80x2.5	18	48,8	598,1	7,30
J-KP-1110	100x100x100x2.5	23	48,8	838,8	9,84
J-LA-422	40x200x40x2.0	4	24,5	60,5	1,71
J-LA-432	40x300x40x2.0	4	24,5	60,5	1,71
J-LA-442	40x400x40x2.0	4	24,5	60,5	1,71
J-ZU-6625S	60x60x25x2.0	3	34,0	41,6	0,88
J-ZKR-636	60x30x60x2.0	7	9,4	127,9	4,62
J-ZKR-646	60x40x60x2.5	5	25,3	91,1	2,28
J-ZKR-853	80x50x30x2.0	4	34,3	53,2	1,20
J-AB-5559	50x50x59x2.5	6	25,9	124,4	2,99
J-AB-6660	60x60x60x2.0	6	30,3	150,0	2,91

Table A2.2. Characteristic compression resistance $R_{B,z,c,k}$ for Taizhou Homer Angle Brackets without stiffeners with timber of strength class C24. Values for other strength classes are found by multiplying by $\sqrt{f_{c,90,k} / 2{,}5}$, where $f_{c,90,k}$ is the characteristic compression strength of timber perpendicular to the grain in N/mm^2.

Art. No.	Size (mm)	t_d (mm)	B (mm)	B_{net} (mm)	M_p (Nmm)	b_1 (mm)	$R_{B,z,c,k}$ (kN)
J-ZK-5535	50X50X35X2.5	2,30	35	24,5	8100	11,1	2,92
J-ZK-5535S/2	50x50x35x2.0	1,90	35	24,5	5086	8,8	2,31
J-ZK-5535S	50x50x35x2.5	2,38	35	24,5	7980	11,0	2,89
J-ZK-6645	60X60X45X3.0	2,78	45	34,5	16664	14,1	4,74
J-ZK-7755	70X70X55X2.5	2,30	55	45,0	14878	12,0	4,95
J-ZK-9940S	90x90x40x3.0	2,86	40	29,5	13875	13,6	4,08
J-ZK-9965	90X90X65X2.5	2,30	65	55,0	18184	12,2	5,95
J-ZK-1190	105X105X90X3.0	2,78	90	68,0	32846	14,0	9,42
J-ZK-9940	90X90X40X3.0	2,78	40	29,5	14249	13,8	4,14
J-ZK-9340	90X35X40X3.0	2,78	40	30,0	14491	13,9	4,17
J-KF-4420	40X40X20X2.0	1,82	20	15,0	3105	9,1	1,37
J-KF-4420S	40x40x20x2.0	1,90	20	15,0	3114	9,1	1,37
J-KF-4440	40X40X40X2.0	1,82	40	30,0	6211	9,1	2,73
J-KF-4440A	40x40x40x2.0	1,82	40	30,4	6294	9,2	2,75
J-KF-4440S	40x40x40x2.0	1,90	40	30,0	6227	9,1	2,73
J-KF-4460	40X40X60X2.0	1,82	60	45,0	9316	9,1	4,10
J-KF-4460S	40x40x60x2.0	1,90	60	45,0	9341	9,1	4,10
J-KF-4480	40X40X80X2.0	1,82	80	60,0	12422	9,1	5,46
J-KF-44100	40X40X100X2.0	1,82	100	75,0	15527	9,1	6,83
J-KF-44200	40X40X200X2.0	1,82	200	150,0	31054	9,1	13,65
J-KF-5540	50X50X40X2.0	1,82	40	30,0	6211	9,1	2,73
J-KF-6640	60X60X40X2.0	1,82	40	30,0	6211	9,1	2,73
J-KF-6640S	60x60x40x2.0	1,90	40	30,0	6227	9,1	2,73
J-KP-6640S	60x60x40x2.5	2,38	40	30,0	9771	11,4	3,42
J-KF-6650	60X60X50X2.0	1,82	50	40,0	8281	9,4	3,52
J-KF-6660	60X60X60X2.0	1,82	60	45,0	9316	9,1	4,10
J-KF-6680	60X60X80X2.0	1,82	80	60,0	12422	9,1	5,46
J-KF-66100	60X60100X2.0	1,82	100	75,0	15527	9,1	6,83
J-KF-8840	80X80X40X2.0	1,82	40	30,0	6211	9,1	2,73
J-KF-8860	80X80X60X2.0	1,82	60	45,0	9316	9,1	4,10
J-KF-8880	80X80X80X2.0	1,82	80	60,0	12422	9,1	5,46
J-KF-88100	80X80X100X2.0	1,82	100	75,0	15527	9,1	6,83
J-KP-4460	40X40X60X2.5	2,30	60	45,0	14878	11,5	5,18
J-KP-6640	60X60X40X2.5	2,30	40	30,0	9919	11,5	3,45
J-KP-6660	60X60X60X2.5	2,30	60	45,0	14878	11,5	5,18
J-KP-6680	60X60X80X2.5	2,30	80	60,0	19838	11,5	6,90
J-KP-66100	60X60X100X2.5	2,30	100	75,0	24797	11,5	8,63
J-KP-8860	80X80X60X2.5	2,30	60	45,0	14878	11,5	5,18
J-KP-8880	80X80X80X2.5	2,30	80	60,0	19838	11,5	6,90
J-KP-88100	80X80X100X2.5	2,30	100	75,0	24797	11,5	8,63
J-KP-1160	100X100X60X2.5	2,30	60	45,0	14878	11,5	5,18
J-KP-1180	100X100X80X2.5	2,30	80	60,0	19838	11,5	6,90
J-KP-1110	100X100X100X2.5	2,30	100	75,0	24797	11,5	8,63
J-LA-422	40X200X40X2.0	1,82	40	28,0	5797	8,8	2,64
J-LA-432	40X300X40X2.0	1,82	40	28,0	5797	8,8	2,64
J-LA-442	40X400X40X2.0	1,82	40	28,0	5797	8,8	2,64
J-ZU-6625S	60x60x25x2.0	1,90	25	20,0	4152	9,4	1,76
J-ZKR-636	60X30X60X2.0	1,82	60	12,0	2484	4,7	2,11
J-ZKR-646	60X40X60X2.5	2,30	60	35,0	11572	10,1	4,56
J-ZKR-853	80X50X30X2.0	1,82	30	11,5	2381	6,5	1,46
J-AB-5559	50X50X59X2.5	2,30	59	37,5	12398	10,6	4,68
J-AB-6660	60x60x60x2.0	1,82	60	46,4	9606	9,2	4,16

Table A2.3. Characteristic compression resistance $R_{B,z,c,k}$ for Taizhou Homer Angle Brackets with stiffeners with timber of strength class C24. Values for other strength classes are found by multiplying by $\sqrt{f_{c,90,k} / 2{,}5}$, where $f_{c,90,k}$ is the characteristic compression strength of timber perpendicular to the grain in N/mm².

Art. No.	Size (mm)	t_d (mm)	B (mm)	a (mm)	B_{ef} (mm)	B_{net} (mm)	M_p (Nmm)	b_1 (mm)	$R_{B,z,c,k}$ (kN)
J-ZK-7755WZ	70x70x55x2.5	2,30	55	36,25	30	45	14878	12,0	13,1
J-ZK-7755WZS	70x70x55x2.5	2,38	55	31,25	30	45,0	31,25	11,9	11,9
J-ZK-9960WZA	90x90x60x2.0	1,82	60	29,00	44	42,4	29,00	8,8	13,5
J-ZK-9965WZ	90x90x65x2.5	2,30	65	37,75	37	55	18184	12,2	16,4
J-ZK-9965WZS/2	90x90x65x2.0	1,90	65	46,00	40	45,0	46,00	8,8	18,1
J-ZK-9965WZS	90x90x65x2.5	2,38	65	46,25	40	45,0	46,25	11,0	19,2
J-ZK-1190WZ	105x105x90x3.0	2,78	90	66,50	57	70	33812	14,2	38,0
J-ZK-1190WZS/2,5	105x105x90x2,5	2,38	90	61,25	60	60,0	61,25	10,8	34,8
J-ZK-8640WZ	83x62x40x2.0	1,82	40	23,00	22	35	7246	9,8	6,74
J-ZK-9660WZ	90x60x60x2.5	2,30	60	12,25	40	40	13225	10,8	8,55
J-ZK-9455WZ	90x45x55x2.5	2,30	55	11,25	45	34	11241	10,4	8,10
J-DRB-9960	90x90x60x2.5	2,30	60	40,25	42	40	13225	10,8	17,6
J-DRB-15090	150x90x59x2.0	1,82	59	28,00	47	39	8157	8,6	13,7
J-DRB-12546	125x125x46x2.5	2,30	40	78,25	24	32	10580	11,9	17,6
J-DRB-12555	125x125x55x2.5	2,30	52	76,25	38	42	13886	11,9	26,4
J-DRB-151560	150x150x60x2.5	2,30	60	59,25	46	51	16862	12,2	26,0

Load carrying capacity of Long Adjustable Brackets J-LAB-100 and J-LAB-130

In design of Long Adjustable Hole Brackets following condition shall be fulfilled

$$\left(\frac{F_{z,t,d}}{R_{B,z,t,d}}\right)^2 + \left(\frac{F_{y,t,d}}{R_{A,y,t,d}}\right)^2 \leq 1 \qquad (18)$$

where $F_{z,t,d}$ is the design tension load perpendicular to flange B and $F_{y,t,d}$ is the desing tension load perpendicular to the sliding flange A.

The design capacities are as follows

$$R_{B,z,t,d} = \min\begin{cases} \frac{k_{mod}}{\gamma_M} \cdot R_{t,z,k} \\ \frac{k_{mod}}{\gamma_M} \cdot R_{v,z,k} \\ \frac{R_{b,z,k}}{\gamma_{M,1}} \end{cases} \qquad (19)$$

$$R_{A,y,t,d} = \min\begin{cases} \frac{k_{mod}}{\gamma_M} \cdot R_{t,y,k} \\ \frac{k_{mod}}{\gamma_M} \cdot R_{v,y,k} \\ \frac{R_{f,y,k}}{\gamma_{M,1}} \end{cases} \quad (20)$$

where $\gamma_{M,1}$ is the partial safety factor in accordance with the relevant national annex of standard EN 1993-1-3, k_{mod} is the modification factor for load duration and moisture content according to EN 1995-1-1 and γ_M is the partial safety factor of connection in accordance with the relevant national annex of standard EN 1995-1-1.

The characteristic lateral load capacities of the fastener connections are as follows

$$R_{v,z,k} = F_{v,A,Rk} \quad (21)$$

$$R_{v,y,k} = 2F_{v,B,Rk} \quad (22)$$

where $F_{v,A,Rk}$ is the lateral load-carrying capacity per fastener in the sliding part and $F_{v,B,Rk}$ is similarly the load-carrying capacity per fastener in nailing plate side, see equations (7) and (8).

The characteristic capacities for J-LAB-100 connector are as follows:

$$R_{t,z,k} = \min\begin{cases} 1{,}053F_{ax,B,Rk} + 242\,\text{N} \\ 4F_{ax,B,Rk} \end{cases} \quad (23)$$

$$R_{b,z,k} = 715\ \text{N} \quad (24)$$

$$R_{t,y,k} = \min\begin{cases} 0{,}2737F_{ax,A,Rk} + 218\,\text{N} \\ F_{ax,A,Rk} \end{cases} \quad (25)$$

$$R_{f,y,k} = 1080\ \text{N} \quad (26)$$

where $F_{ax,A,Rk}$ is the withdrawal capacity of the sliding fastener and $F_{ax,B,Rk}$ is the withdrawal capacity of nailing plate side fastener, see equations (10a) and (10b).

The characteristic capacities for J-LAB-130 are respectively:

$$R_{t,z,k} = \min\begin{cases} 1{,}082F_{ax,B,Rk} + 317\text{N} \\ 4F_{ax,B,Rk} \end{cases} \quad (27)$$

$$R_{b,z,k} = 515\ \text{N} \quad (28)$$

$$R_{t,y,k} = \min\begin{cases} 0{,}2737F_{ax,A,Rk} + 283\,\text{N} \\ F_{ax,A,Rk} \end{cases} \quad (29)$$

$$R_{f,y,k} = 1350\ \text{N} \quad (30)$$

Load carrying capacity of Log Bracket J-LBJ-160

The design tensile capacity of the log bracket connector joint

$$R_{B,y,t,d} = \min\begin{cases} \dfrac{F_{b,Rk}}{\gamma_{M,1}} \\ \dfrac{k_{\mathrm{mod}}}{\gamma_M} \cdot R_{t,k} \end{cases} \quad (31)$$

where $\gamma_{M,1}$ is the partial safety factor in accordance with the relevant national annex of standard EN 1993-1-3, $F_{b,Rk}$ characteristic buckling bending capacity of the sliding part, k_{mod} is the modification factor for load duration and moisture content according to EN 1995-1-1, γ_M is the partial safety factor of connection in accordance with the relevant national annex of standard EN 1995-1-1 and $R_{t,k}$ is the characteristic tension capacity of the angle bracket part.

Characteristic capacities are as follows

$$F_{b,Rk} = 1425 \text{ N} \quad (32)$$

$$R_{t,k} = \min\begin{cases} 1{,}227 F_{ax,B,Rk} + 51 \text{ N} \\ 690 \text{ N} \\ 5 F_{ax,B,Rk} \\ 4{,}05 F_{v,A,Rk} \end{cases} \quad (33)$$

where $F_{ax,B,Rk}$ is the characteristic axial withdrawal capacity per fastener in the angular part to timber connection, see equations (10a) and (10b) and $F_{v,A,Rk}$ is the lateral load-carrying capacity of the fastener in the sliding timber part, see equations (7) and (8).

Structural requirements

Connections with the angle brackets shall fulfil the minimum spacing and edge and end distance requirements specified in EN 1995-1-1. The minimum distances a_1 and a_2 in table 8.2 of EN 1995-1-1 can be multiplied by a factor of 0,7 (nailed steel-to-timber connections).

If angle brackets are placed on both sides of the timber, the point of the fastener shall be at most 4d from the surface of the opposing side, where d is the nominal diameter of the fastener.

It is not possible to fill all holes by fasteners in all configurations and loading combinations of the angle brackets. In partial fixing the fasteners shall always be placed in the row nearest to the end of the flange and as near as possible to the bent edge of the angle bracket. Additionally, the fasteners should be positioned symmetrically.

The Long Adjustable Brackets and Log Brackets are always fixed from all the holes.

All fasteners in same flange shall be identical. The opposing flanges may have different fasteners.

Table A2.4. Characteristic tension resistance $R_{B,z,t,k}$ for Taizhou Homer Angle Brackets without stiffeners when anchor nails 4x50, $f_{ax,k}$ = 6 N/mm² and t_{pen} = 34 mm, are used in all holes.

Art. No.	Size (mm)	L_B (mm)	M_0 (Nmm)	d_1 (mm)	n_1	$B_{net,1}$ (mm)	$F_{n,1}$ (N)	d_2 (mm)	n_2	$B_{net,2}$ (mm)	$F_{n,2}$ (N)	$F_{z,t,k}$ (a) (N)	$F_{z,t,k}$ (b) (N)	$F_{z,t,k}$ (c) (N)	$F_{z,t,k}$ (d) (N)	$R_{B,z,t,k}$ (kN)
J-ZK-5535	50X50X35X2.5	48,75	11572	13,75	2	25	1632	13,75	2	25	0	1339	1443		1632	**1,34**
J-ZK-5535S/2	50x50x35x2.0	49,00	7265	13,00	2	25	1632	13,00	2	25	0	1255	958		1632	**0,96**
J-ZK-5535S	50x50x35x2.5	48,75	11400	12,75	2	25	1632	12,75	2	25	0	1376	1533		1632	**1,38**
J-ZK-6645	60X60X45X3.0	68,50	21736	12,50	2	35	1632	25,50	1	40	816	2089	3091	2442	2448	**2,09**
J-ZK-7755	70X70X55X2.5	68,75	18184	13,25	2	45	1632	33,25	2	45	1632	2250	2495	1976	3264	**1,98**
J-ZK-9965	90X90X65X2.5	88,75	21491	13,75	2	55	1632	31,25	2	55	1632	2517	2885	2184	3264	**2,18**
J-ZK-1190	105X105X90X3.0	103,50	43472	31,00	2	80	1632	41,00	2	80	1632	2368	2649	2401	3264	**2,37**
J-ZK-9940	90X90X40X3.0	88,50	19321	15,50	2	30	1632	40,50	2	30	1632	2270	2181	1842	3264	**1,84**
J-ZK-9940S	90x90x40x3.0	88,50	18813	15,50	2	30	1632	40,50	2	30	1632	2263	2124	1820	3264	**1,82**
J-ZK-9340	90X35X40X3.0	33,50	19321	8,50	2	30	1632	8,50	2	30	0	1849	3978		1632	**1,85**
J-KF-4420	40X40X20X2.0	41,00	4141	11,00	1	15	816	11,00	1	15	0	660	659		816	**0,66**
J-KF-4420S	40x40x20x2.0	39,00	4152	9,50	1	15	816	9,50	1	15	0	693	765		816	**0,69**
J-KF-4440	40X40X40X2.0	39,00	8281	9,00	1	35	816	9,00	2	30	0	848	1725		816	**0,85**
J-KF-4440A	40x40x40x2.0	39,00	8281	11,00	1	30,4	1632	11,00	2	30,4	0	1306	1325		1632	**1,31**
J-KF-4440S	40x40x40x2.0	39,00	8281	9,00	1	35	816	9,00	2	30	0	848	1725		816	**0,85**
J-KF-4460	40X40X60X2.0	39,00	12422	9,00	2	50	1632	9,00	3	45	0	1554	2530		1632	**1,55**
J-KF-4460S	40x40x60x2.0	39,00	12455	9,00	2	50	1632	9,00	3	45	0	1555	2537		1632	**1,55**
J-KF-4480	40X40X80X2.0	39,00	16562	9,00	3	65	2448	9,00	4	60	0	2259	3335		2448	**2,26**
J-KF-44100	40X40X100X2.0	39,00	20703	9,00	4	80	3264	9,00	5	75	0	2965	4141		3264	**2,96**
J-KF-44200	40X40X200X2.0	39,00	41405	9,00	9	155	7344	9,00	10	150	0	6493	8166		7344	**6,49**
J-KF-5540	50X50X40X2.0	51,00	8281	11,00	2	30	1632	21,00	1	35	816	1794	1317	1517	2448	**1,32**
J-KF-6640	60X60X40X2.0	61,00	8281	11,00	2	30	1632	31,00	1	35	816	1762	1317	1554	2448	**1,32**
J-KF-6640S	60x60x40x2.0	59,00	8303	9,00	2	30	1632	29,00	1	35	816	1835	1614	1662	2448	**1,61**
J-KP-6640S	60x60x40x2.5	58,75	13028	8,75	2	30	1632	28,75	1	35	816	1941	2606	1985	2448	**1,94**
J-KF-6650	60X60X50X2.0	59,00	10351	9,00	2	40	1632	29,00	2	40	1632	2210	2070	1768	3264	**1,77**
J-KF-6660	60X60X60X2.0	61,00	12422	11,00	3	45	2448	31,00	2	50	1632	2804	1976	2314	4080	**1,98**
J-KF-6680	60X60X80X2.0	59,00	16562	9,00	4	60	3264	29,00	3	65	2448	4002	3220	3286	5712	**3,22**
J-KF-66100	60X60100X2.0	59,00	20703	9,00	5	75	4080	29,00	4	80	3264	5085	4025	4099	7344	**4,03**
J-KF-8840	80X80X40X2.0	79,00	8281	9,00	1	35	816	29,00	2	30	1632	1704	1725	1062	2448	**1,06**
J-KF-8860	80X80X60X2.0	79,00	12422	9,00	2	50	1632	29,00	3	45	2448	2905	2530	1875	4080	**1,88**
J-KF-8880	80X80X80X2.0	81,00	16562	11,00	3	65	2448	31,00	4	60	3264	3978	2729	2514	5712	**2,51**
J-KF-88100	80X80X100X2.0	79,00	20703	9,00	4	80	3264	29,00	5	75	4080	5307	4141	3500	7344	**3,50**
J-KP-4460	40X40X60X2.5	38,75	19838	8,75	2	50	1632	8,75	3	45	0	1825	4156		1632	**1,83**
J-KP-6640	60X60X40X2.5	60,75	13225	10,75	2	30	1632	30,75	1	35	816	1868	2153	1868	2448	**1,87**
J-KP-6660	60X60X60X2.5	60,75	19838	10,75	3	45	2448	30,75	2	50	1632	2963	3229	2775	4080	**2,77**
J-KP-6680	60X60X80X2.5	58,25	26450	8,75	4	60	3264	28,75	3	65	2448	4215	5290	3938	5712	**3,94**
J-KP-66100	60X60X100X2.5	58,75	33063	8,75	5	75	4080	28,75	4	80	3264	5365	6613	4908	7344	**4,91**
J-KP-8860	80X80X60X2.5	78,75	19838	8,75	2	50	1632	28,75	3	45	2448	3036	4156	2343	4080	**2,34**
J-KP-8880	80X80X80X2.5	80,75	26450	10,75	3	65	2448	30,75	4	60	3264	4148	4460	3097	5712	**3,10**
J-KP-88100	80X80X100X2.5	78,75	33063	8,75	4	80	3264	28,75	5	75	4080	5527	6801	4283	7344	**4,28**
J-KP-1160	100X100X60X2.5	98,75	19838	8,75	3	45	2448	28,75	2	50	1632	3437	3968	2968	4080	**2,97**
J-KP-1180	100X100X80X2.5	98,75	26450	8,75	4	60	3264	28,75	3	65	2448	4751	5290	3938	5712	**3,94**
J-KP-1110	100X100X100X2.5	98,75	33063	8,75	5	75	4080	28,75	4	80	3264	6065	6613	4908	7344	**4,91**
J-LA-4L2	40XL00X40X2.0	39,00	8281	16,00	2	30	1632	16,00	2	30	0	1063	906		1632	**0,91**
J-LA-432	40X300X40X2.0	39,00	8281	16,00	2	30	1632	16,00	2	30	1632	1862	906	906	3264	**0,91**
J-LA-442	40X400X40X2.0	39,00	8281	16,00	2	30	1632	16,00	2	30	1632	1862	906	906	3264	**0,91**
J-ZU-6625S	60x60x25x2.0	59,00	5189	19,00	1	20	816	34,00	1	20	816	881	492	635	1632	**0,49**
J-ZKR-636	60X30X60X2.0	29,00	12422	6,00	5	35	4080	6,00	2	12	0	3515	3278		4080	**3,28**
J-ZKR-646	60X40X60X2.5	38,75	19838	13,25	2	50	1632	13,25	3	46	0	1573	2745		1632	**1,57**
J-ZKR-853	80X50X30X2.0	51,00	5176	27,50	2	11	1632	27,50	2	20	0	712	309		1632	**0,31**
J-AB-5559	50X50X59X2.5	48,75	19507	12,25	2	50	1632	25,25	2	37	1632	2245	2942	2097	3264	**2,10**
J-AB-6660	60x60x60x2.0	59,00	12422	8,50	2	48,8	1632	19,00	1	46,4	816	2077	2650	2061	2448	**2,06**

Table A2.5. Characteristic tension resistance $R_{B,z,t,k}$ for Taizhou Homer Angle Brackets with stiffeners when anchor nails 4x50, $f_{ax,k}$ = 6 N/mm² and t_{pen} = 34 mm, are used in all holes.

Art. No.	Size (mm)	B (mm)	L_B (mm)	a (mm)	M_0 (Nmm)	a_1 (mm)	n_{a1}	$F_{a,1}$ (N)	a_2 (mm)	n_{a2}	$F_{a,2}$ (N)	d_1 (mm)	n_1	$B_{net,1}$ (mm)	$F_{n,1}$ (N)	$F_{z,t,k}$ (a) (N)	$F_{z,t,k}$ (b) (N)	$F_{z,t,k}$ (c) (N)	$R_{B,z,t,k}$ (kN)
J-ZK-7755WZ	70x70x55X2.5	55	68,75	36,25	18184	13,25	2	1632	33,25	2	1632	24,5	2	35	0	3874	2505	3264	**2,50**
J-ZK-7755WZS	70x70x55x2.5	55	68,75	31,25	17914	13,25	2	1632	33,25	2	1632	27,5	2	35	0	3788	2471	3264	**2,47**
J-ZK-9960WZA	90x90x60x2.0	60	89,00	29,00	12422	9,00	2	1632	29,00	1	816	5,0	1	55,2	816	3464	2021	3264	**2,02**
J-ZK-9965WZ	90x90x65X2.5	65	88,75	37,75	21491	13,75	2	1632	31,25	2	1632	11,0	2	55	1632	4990	2571	4896	**2,57**
J-ZK-9965WZS/2	90x90x65x2.0	65	89,00	46,00	13492	14,00	2	1632	31,50	2	1632	3,0	2	55	1632	5186	2257	4896	**2,26**
J-ZK-9965WZS	90x90x65x2.5	65	88,75	46,25	21171	13,75	2	1632	31,25	2	1632	3,5	2	55	1632	5420	2573	4896	**2,57**
J-ZK-1190WZ	105x105x90X3.0	90	103,50	66,50	43472	31,00	2	1632	54,33	6	4896	14,5	2	70	1632	8831	3574	8160	**3,57**
J-ZK-1190WZS/2,5	105x105x90x2,5	90	103,75	61,25	29313	36,25	4	3264	61,25	4	3264	20,0	2	70	1632	8065	3253	8160	**3,25**
J-ZK-8640WZ	83x62x40X2.0	40	63,00	23,00	8281	13,00	2	1632			0	10,0	1	35	816	2452	1460	2448	**1,46**
J-ZK-9660WZ	90X60X60X2.5	60	58,75	12,25	19838			0			0	8,5	2	40	1632	1808	1593	1632	**1,59**
J-ZK-9455WZ	90X45X55X2.5	55	46,25	11,25	18184	1,00	2	1632			0	7,0	2	45	1632	3527	3354	3264	**3,26**
J-DRB-9960	90x90x60X2.5	60	88,75	40,25	19838	12,75	1	816			0	6,5	1	49	816	2053	1364	1632	**1,36**
J-DRB-15090	150X90X59X2.0	59	89,00	28,00	12214	11,00	2	1632			0	18,0	2	50	1632	2896	1732	3264	**1,73**
J-DRB-12546	125X125X46X2.5	40	123,75	78,25	13225	33,75	1	816	63,75	1	816	10,5	2	32	1632	3148	1004	3264	**1,00**
J-DRB-12555	125X125X55X2.5	52	126,25	76,25	17193	33,75	2	1632	63,75	2	1632	12,5	2	42	1632	4810	1821	4896	**1,82**
J-DRB-151560	150X150X60X2.5	60	148,75	59,25	19838	29,75	2	1632			0	0,5	2	51	1632	3582	1434	3264	**1,43**