Exim & Manufacturing Holdings Pte Ltd v Fintex Industries Pte Ltd
[2007] SGHC 220

Case Number : Suit 57/2006

Decision Date : 12 December 2007

Tribunal/Court : High Court

Coram : Lee Seiu Kin J

Counsel Name(s) : Ranvir Kumar Singh and Low Eng Wan Eric (Unilegal LLC) for the plaintiff; Low Gary Leonard and Benedict Teo (Drew & Napier LLC) for the defendant

Parties : Exim & Manufacturing Holdings Pte Ltd — Fintex Industries Pte Ltd

Contract

12 December 2007 Judgment reserved.

Lee Seiu Kin J

1 The plaintiff carries on the business of, amongst other things, the trading of electronic hardware components including fasteners like screws. The defendant carries on the business of, amongst other things, providing electroplating, metal finishing, surface-coating and other related engineering services.

2 In this action the plaintiff claims against the defendant damages for breach of contract plus interest. In addition, the plaintiff seeks a declaration that it is entitled to be indemnified by the defendant against all claims that may be brought against the plaintiff by Cal-Comp Electronics (Thailand) Public Company Ltd ("Cal-Comp"), Venture Electronics (Shanghai) Company Ltd ("Venture Shanghai"), Hewlett Packard ("HP"), Technocomm Systems Sdn Bhd ("Technocomm") and TEC Singapore Electronics Pte Ltd ("TEC") for loss, damages and costs in respect of screws sent by the plaintiff to the defendant for the plating treatment.

3 On 26 June 2007, after the parties made their submissions on the evidence and the law, I dismissed the plaintiff's claims and gave judgment on the defendant's counterclaim in the sum of $20,260.78 with interest at the rate of 5.33% per annum from 2 March 2006. I also ordered the plaintiff to pay the defendant its costs in this action which is to be taxed if not agreed. The plaintiff has since filed an appeal against the dismissal of its claim and I now give my grounds of decision.

Background facts

4 The plaintiff had been sending its various types of screws, including tapping screws, to the defendant for stripping and re-plating treatment since about 1992, and also for baking treatment from 2003 onwards for its tapping screws. Tapping screws are a family of screws which are commonly used in the assembly of electronic equipment such as printers. This type of screw is different from another family of screws known as machine screws which are usually not as hard. Tapping screws are high strength fasteners able to "tap" their own internal thread when driven into pre-formed holes in metallic as well as non-metallic materials.

5 The plaintiff would require the defendant's electroplating services whenever its customers placed orders for screws with a different chromate coating from its original screws, usually from hexavalent chromium ("Cr6") to trivalent chromium ("Cr3"). The defendant's task, in essence, was to

acid-strip the Cr6 coating from the screws in the process of which the zinc-plating would also be stripped. The screws were then re-plated with zinc by way of chemical electroplating. After that, the re-plated screws would be baked in accordance with specified baking conditions before being chromated with Cr3 coating. The purpose of baking the screws was to reduce the risk of hydrogen embrittlement phenomenon in the screws as such heat treatment has the effect of driving out hydrogen molecules that enter the metal during the electroplating process. I shall refer to this service as the "conversion of Cr6 screws to Cr3 screws".

6 The reason for this conversion is due to the requirement of the plaintiff's customers for screws to comply with the regulations of the countries to which their finished products would be exported or in anticipation of such regulations coming into effect. An example of this is Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 ("the EU Directive"). This directs that with effect from 1 July 2006, new electrical and electronic equipment put on the market shall not contain, amongst other substances, Cr6. This restriction is referred to in the industry as "Restrictions on Hazardous Substances". As the deadline for the compliance with the EU Directive approached, more and more of the plaintiff's customers required Cr3 screws.

7 Against this background, the plaintiff had been sending various quantities of tapping screws to the defendant for its services in stripping, re-plating and baking them. The claim in this action concerns ten Purchase Orders ("PO") issued by the plaintiff to the defendant between January and May 2005 for the conversion of Cr6 screws to Cr3 screws. The details of these Pos are as follows:

S/No.	Purchase Order No.	Dates of Purchase Orders
1.	05040P	17 January 2005
2.	05086P	15 February 2005
3.	05108P	22 February 2005
4.	05144P	3 March 2005
5.	05231P	28 March 2005
6.	05255P	1 April 2005
7.	05256P	1 April 2005
8.	05254P	1 April 2005
9.	05339P	27 April 2005
10.	05415P	19 May 2005

Each of the ten POs expressly provided as follows:

"Remarks:

(1) To strip & plate to Blue (or Yellow, as the case may be) Trivalent

(2) Baking (190° ± 10°, 4 hrs)".

[emphasis in original]

8 The defendant carried out the necessary work on the screws and delivered to the plaintiff on a number of dates various quantities of the treated Cr3 screws. The plaintiff sold and delivered these screws to its customers. The customers to whom the plaintiff had sold the Cr3 screws included Cal-Comp, Venture Shanghai, HP, Technocomm and TEC. It should be noted that, except for TEC, these customers were contract manufacturers of Hewlett Packard Singapore Pte Ltd.

9 The plaintiff alleged that some of the Cr3 screws suffered breakage or fractured after they were affixed in the assembly of electronic equipment by the customers to whom the plaintiff had sold the screws. The plaintiff's customers have rejected the plaintiff's delivery of the screws which had been sold to them or have put the plaintiff on notice that they intended to claim compensation or have effected a set-off against the plaintiff (for sums owed to the plaintiff on other accounts) in respect of losses suffered by these customers.

10 The plaintiff pleaded that the defendant knew, or reasonably ought to have known, that the plating treatment to be carried out on the treated screws would also require the treated screws to be thermally baked in such a manner and for such duration as was necessary to neutralize or reduce the threat or risk of hydrogen embrittlement in the treated screws, which was essential to avoid failure of the treated screws due to hydrogen embrittlement.

11 The plaintiff further pleaded that it was a term of the contract "whether express or implied" that:

(a) the plating treatment would include the treated screws being thermally baked to neutralize them against or reduce the threat of hydrogen embrittlement; and

(b) the defendant would strip, re-plate with trivalent chromium and bake the stripped and re-plated screws at 190°C ± 10°C for four hours.

12 The plaintiff had also added alternative pleadings in paragraphs 6A, 6B, 7, 8 and 9 of its amended statement of claim as follows:

6A. Further or in the further alternative, as the defendant well knew or reasonably ought to have known, the purpose of the contract was to render the treated screws compliant with Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (the "EU Directive"). The EU Directive directs that with effect from 1 July 2006, new electrical and electronic equipment put on the market shall not contain, *inter alia*, hexavalent chromium. However, even before the said deadline, the Plaintiff had been sending the defendant various quantities and/or types of tapping screws for the plating treatment in anticipation of the compliance requirements of the EU Directive, as the defendant was well aware of or reasonably ought to have known.

6B In pursuance of the purpose of the contract as aforesaid, the defendant was required, *inter alia*, to thermally bake the treated screws in order to neutralize them against or reduce the threat or risk of hydrogen embrittlement, as the defendant well knew or reasonably ought to have

known.

7. Further or in the further alternative, at the time of the contract, the defendant well knew or reasonably ought to have known, or reasonably foresaw that the treated screws would be sold by the Plaintiff to various other parties for use in their business of, *inter alia*, the manufacture and/or assembly of electronic equipment.

8. By reason of the matters aforesaid, the defendant knew, or alternatively the Plaintiff by implication made known to the defendant, the particular purpose for which the treated screws were required, namely for use by the Plaintiff's buyers in the manufacture and/or assembly of electronic equipment, so that it was an express, or alternatively an implied, condition of the contract that the treated screws would be reasonably fit for such purpose.

9. Further or in the alternative, it was an implied term of the contract that the defendant would carry out the plating treatment with reasonable care and skill.

13 The plaintiff pleaded that the defendant had breached the contract constituted in the ten POs by delivering screws that had not been baked for four hours at a temperature of 190°C ± 10°C and/or were not reasonably fit for the said purpose, in that some of the treated screws suffered breakage or fracture of the bolt by reason of hydrogen embrittlement when they were used by the customers to whom the plaintiff had sold the treated screws.

14 In its Defence, the defendant pleaded that at no time did the plaintiff inform the defendant that services were required for the purpose of neutralising the threat of hydrogen embrittlement in the screws, or for any other purpose. Neither did the defendant warrant or otherwise represent that the services were fit for such and/or any other purposes. In plain terms, the defendant said that it had carried out the work contracted for, in particular, the screws had been baked in accordance with specific instructions set out in the POs.

15 The defendant also averred that, in any event, baking or heat treatment does not completely eliminate the risk of hydrogen embrittlement.

16 The defendant also pleaded that if the screws were unsuitable, it was because they were recycled screws of unknown origin procured by the plaintiff. There was no evidence that the screws were not already defective even before the defendant worked on them. In any event, the process of stripping and replating the screws exposed them to further risk of hydrogen embrittlement. Finally, the defendant put the plaintiff to strict proof that the screws rejected by its customers were the ones that were processed by the defendant.

17 In relation to the claim for an indemnity, the defendant pleaded that the plaintiff had failed to test the screws when it procured them from its suppliers nor did it test them after the defendant had processed them to ensure that the screws were fit for its customers' purposes.

18 Finally the defendant pleaded that it was an express or implied term of the contract that its liability for any loss or damage caused in connection with the services provided was limited to the amount paid for the services. Also, any defects or complaints would not be accepted unless the defendant was notified of it within 14 days of delivery of the goods.

Evidence of plaintiff's quality assurance manager

19 Lum Sau Yew was the plaintiff's quality assurance manager. He was the person in charge of the

procurements in question. He gave evidence that the plaintiff had, since 1992, been sending screws to the defendant to be plated. He said that not all screws sent for plating were required to be baked. Where baking was required the PO would state so. The defendant was not informed of the source of the parts supplied by the plaintiff for processing nor intended customers to whom the screws would be supplied. All that the plaintiff was required to do was expressly stipulated in the PO.

20 Lum also disclosed that the screws forming the subject matter of this suit was the first case of hydrogen embrittlement of screws involving the defendant. The plaintiff had previously encountered hydrogen embrittlement in parts supplied to their customers that had been replated by other platers. Lum admitted that the plaintiff was aware of the problem with hydrogen embrittlement in plated parts and the need to be careful about this. He also admitted that the plaintiff did not conduct strength tests on the screws procured from its suppliers. The plaintiff did not have facilities to conduct those tests. Lum also admitted that if the plaintiff had done such tests it could have discovered the hydrogen embrittlement in the screws before supplying them to its customers and the rejections which form the basis of the present suit would not have occurred.

21 Lum also testified that the requirement in the POs for baking for four hours at 190°C ± 10°C did not come from the plaintiff's customers but were decided by the plaintiff. He at first said that this was based on the recommendation in document number B633-98 published by the American Society for Testing and Materials ("ASTM"). However after it was pointed out to him that there was another document, ASTM B850-98 which recommended baking for 14 to 22 hours at the same temperature and that B633-98 actually recommended baking for three hours or more and not four hours, he withdrew that and said that it came from an industrial fastener handbook. The handbook was not produced in evidence, neither did he disclose its exact title.

22 Lum also disclosed that at the material time the plaintiff did not know what test there was for hydrogen embrittlement nor was the plaintiff aware of any yardstick to determine risk reduction of this problem. When the problem first surfaced with screws from certain suppliers, the plaintiff simply stopped buying screws from them and switched to other suppliers. Lum said that at that time it was cheaper to purchase Cr6 screws and replate them to convert them into Cr3 screws than to purchase Cr3 screws directly.

Whether the defendant had baked screws according to specification

23 In my view, Lum's evidence removed a large part of the plaintiff's claim against the defendant and reduced the action to the question of whether the defendant had complied with the requirement set out in the POs to bake the screws for four hours at 190°C ± 10°C. On its part, the defendant had produced baking records for the various batches of screws. Bimal Sarkar was the person who carried out the baking of the screws at the defendant's premises. He gave evidence as to how he went about the task. He turned on the oven and when the temperature gauge read 190°C, he placed the screws, which had been dried and spread out in shallow stainless steel mesh trays in batches of 15 to 18 kg, into the oven. He then closed the oven door and waited for the temperature gauge to show 190°C again, upon which he recorded the time on the record book. He then set the alarm on his mobile phone for the four hour interval. When this sounded, he turned off the oven, opened its door and left the screws there to cool overnight, unless there was another baking job to be done, in which case he would remove the trays of screws.

24 To ensure accuracy of baking temperature, Bimal tested the oven once a week with a 198°C temperature stick. This is a wax that melts at that temperature. He would set the temperature at 204°C to allow for a slight margin for error. When it reached that temperature according to the gauge, he would place in the oven a metal plate with a bit of the wax on it. About 20 minutes after

that he would check if the wax had melted. If it did, it would indicate that the oven had reached at least a temperature of 198°C with a deviation margin of ± 6°C. He would then report the result to one Ms Goh. He said that the wax melted in all the tests he did. The defendant's managing director, Alex Wong, gave evidence that the defendant also used a digital thermometer to verify the temperature gauge in the oven. This digital thermometer was calibrated by the Productivity and Standards Board in May 2002 and the results showed that the digital thermometer was accurate within 1°C for temperatures up to 500°C.

25 The plaintiff submitted that the baking process conducted by the defendant had failed to fulfill the requirement of the contract set out as: "Baking (190° ± 10 , 4 hrs)". The plaintiff alleged that the temperature gauge of the oven was not accurate. However the evidence of the defendant showed that it was checked periodically. The plaintiff next submitted that even if the gauge was accurate, the baking did not ensure that the screws themselves had attained the required temperature for the required time. This was because the gauge only showed the temperature of one spot of the oven which may not necessarily be the same as the location where the screws were placed. Further the screws would take some time to attain the required temperature. Since Bimal had placed them for exactly four hours, the time during which the screws were at 190°C would be reduced by the time it took the screws to attain that temperature. This time depended on the manner in which the screws were laid out in the basket. The plaintiff's expert, Dr Huang Xianya, conducted experiments with two batches of the screws to measure the time it took to attain the desired temperature. The experiments were not conducted in the defendant's oven; however it was done in a more powerful one. There was a 142 kg batch and a 15 kg batch. In the case of the 142kg batch, Dr Huang placed them in the oven in two baskets (each about 70kg). He found that it took about 23 minutes for the screws near the edge of the basket to attain the desired temperature but the ones near the middle took about 106 minutes to do so. When he conducted the experiment with a 15 kg batch, it took about nine minutes.

26 I found that Dr Huang's experiment did not quite approximate the conditions of baking as performed by the defendant's technician, Bimal. Firstly, although Dr Huang had pre-heated the oven to 190°C before loading the screws, he started the clock from the time he closed the oven door. Bimal had given evidence that he waited for the temperature gauge to attain 190°C again before he recorded the time. He said this took about 10 to 15 minutes. Secondly, although the batches of screws baked by the defendant were as large as 143kg, Bimal had placed them in 30kg capacity mesh trays but he only put 15kg to 18kg in each tray. This meant that the screws were well spread out, thus promoting a faster temperature gain. As Dr Huang's experiment has clearly shown, it took only 9 minutes for the 15kg batch to attain the required temperature. Although he had pointed out that he had used a more powerful oven, and also the 15kg batch he used was a much smaller quantity than the 143kg, I am not satisfied that the plaintiff had proven that the 10 to 15 minutes delay between the closing of the oven door and the temperature gauge reading 190°C again was insufficient to ensure that the screws, which had been well spread out, had also attained that temperature.

27 The plaintiff also relied on tests conducted by Dr Huang to show that the defendant had not properly baked the screws. Dr Huang had conducted experiments on similar samples of screws and concluded that had the baking been carried out as specified, the screws would not have been affected by hydrogen embrittlement. However, as pointed out by the defendant's expert, Mr Loh Peng Chun, there were many parameters affecting the results that Dr Huang had not taken into account. Further, the defendant pointed out the plaintiff had not proven the chain of custody in respect of the samples sent to Dr Huang for testing which I find is a relevant consideration. I do not therefore find it necessary to go into the rather complicated technical aspects of the evidence of the competing experts, save that I find that the plaintiff has not proven on a balance of probability that the defendant had not properly baked the screws on the basis of Dr Huang's evidence.

28 Indeed the plaintiff had not proven that, had the baking been done in the manner that it alleged it ought to, ie. ensuring that each screw attained the temperature of 190°C for four hours, the screws would not have failed and consequently rejected. Dr Huang's test involved subjecting the screws replated by the defendant to a further baking process. He did not conduct any test involving taking similar screws from the plaintiff's sources, putting them through a replating process similar to what the defendant did, and then baking them for four hours (I should add, and not a minute longer than that) at a metal temperature of 190°C. This would be an effective method of proving causation, but it was not done.

29 In any event, in my view, the exact obligations of the defendant in fulfilling a specification expressed under the "Remarks" box of the PO as "Baking (190° ± 10°, 4 hrs)" needs to be considered. This is not a situation where there are standards set for the baking procedure. Indeed the plaintiff had no idea as to the exact amount of time that would be required to effectively rid the screws of hydrogen so as to satisfactorily minimise the risk of hydrogen embrittlement. It is a case where the plaintiff plucked a number out of one ASTM standard, in a situation where the baking time would depend on the shape, size and metallurgical properties of the screw, in addition to the history of the screws (which the plaintiff had purchased from various sources without conducting any tests, before or after purchase and replating). In such circumstances, it is difficult for me to conclude that the plaintiff had, by specifying the requirement for baking in such cryptic terms, imposed obligations on the defendant to the degree of exactitude that it now says is the case which it never had any idea of at the outset. It is also necessary to consider this in the context of the price charged by the defendant for the services - $1.80 per kg for replating and $0.30 per kg for baking. For a 143kg batch, the baking cost would amount to $42.90. Seen in this context, I am satisfied that the defendant, in carrying out the baking process as evidenced by Bimal, had fulfilled its obligations under the contract.

Limitation term

30 The defendant also claimed that there was an express or implied term that the contracts were subjected to a clause limiting liability to the price of the services. The defendant had submitted a quotation on 25 April 2003 to the plaintiff quoting as follows:

Item	Part No	Plating type	Unit Price (S$)
1.	All parts	Baking 190°±10° (4Hrs) + Blue Zinc Plating	$1.80/kg,M/C $35
2.	All parts	Baking 190°±10° (4Hrs) + Black Zinc Plating	$2.50/kg,M/C $40
3.	All parts	Baking 190°±10° (4Hrs) + Yellow Zinc Plating	$1.80/kg,M/C $35
4.	All parts	Baking 190°±10° (4Hrs) + Nickel Plating	$3.20/kg, M/C $35

5.	All parts	Baking 190°±10° (4Hrs) + E/N Plating	$4.00/kg, M/C $40
6.	Standard Steel B/O		$7.00/kg

Terms & Conditions:

1. Validity of Quotation : 30 days

2. Payment Term : 30 Days Net

3. Prices subject to GST : 4%

4. FOB Singapore

Liability of Fintex Industries Pte Ltd for any direct, indirect, unforeseen or consequential loss or damage caused in connection with any service provided by Fintex Industries Pte Ltd shall be limited to the amount paid for the service.

[emphasis added]

31 Another quotation was sent dated 25 June 2004 which provided as follows:

Item	**Parts Description**	**Price (S$)**
1.	Screw/Washer (Trivalent Blue) (Min Charge of $15.00 for 1 lot)	$1.80/kg

Terms & Conditions:

1. Validity of Quotation : 30 days

2. Payment Term : 30 Days net

3. Prices subject to GST : 5%

4. FOB Singapore

Liability of Fintex Industries Pte Ltd for any direct, indirect, unforeseen or consequential loss or damage caused in connection with any service provided by Fintex Industries Pte Ltd shall be limited to the amount paid for the service.

32 The defendant also pointed out that there was another quotation issued after the last of the ten POs, on 9 June 2005, which included a separate rate for baking, in the following terms:

Item	Process type	Unit Price, $/kg	Min charge, $
1.	Strip Replate Trivalent Screw Yellow	1.60	15
2.	Strip Replate Trivalent Standoff Yellow	1.60	15
3.	Strip Replate Trivalent Washer Yellow	1.80	15
4.	Strip Replate Trivalent Blue Screw	1.60	15
5.	Strip Replate Trivalent Screw Clear	1.60	15
6.	Strip Replate Trivalent Screw Black	3.50	20
7.	Baking	0.30 (above 100kg)	30 (below 100kg)
8.	Strip Replate Trivalent Screw Yellow	3.80	20

Terms & Conditions:

1. Validity of Quotation : 30 days

2. Payment Term : 30 Days Net

3. Prices subject to GST : 5%

4. FOB Singapore

Liability of Fintex Industries Pte Ltd for any direct, indirect, unforeseen or consequential loss or damage caused in connection with any service provided by Fintex Industries Pte Ltd shall be limited to the amount paid for the service.

33 The plaintiff's quality assurance manager, Lum confirmed that it was the consistent and regular course of dealings between the parties that the defendant would issue quotations on request of the plaintiff. Such quotations were always accompanied by the limitation of liability clause. The plaintiff had never objected to the presence of this clause. Although the ten POs in question, which were issued in the period between January to May 2005, do not refer to these or any other quotations, the price at $1.80 per kg corresponds with that for blue and yellow trivalent in the first two quotations. A typical PO provides as follows:

Part No	Description	Quantity	UOM	Unit price	Amount
...	Screw Pan Head T-10	50,000	pcs	$1.80/kg	$54.00
	Steel Black Zn	Baking		$0.30/kg	$30/min.

Remarks: 1) To strip & plate to Blue Trivalent 30kg

2) Baking (190° ± 10°, four hrs)

Collect on [date]

[emphasis in original]

34 The plaintiff contended that the ten POs could not have been an acceptance of the offer contained in either of the first two quotations because those quotations had expired after 30 days of the respective dates, which would have been before the first PO was issued in January 2005. The plaintiff contended that each quotation was at most an invitation to treat. Whether it was an offer or invitation to treat depended on whether the quotation can be considered binding on the defendant the moment the plaintiff issued a PO confirming acceptance of the offer. However, I need not consider this question as the validity date had passed when the plaintiff issued the ten POs. What is germane is the nature of each PO. One of the terms in the PO, which is in the standard form of the plaintiff, provides as follows: "Please fax confirmation of acceptance of this offer within three working days". This clearly showed that this constituted an offer by the plaintiff, open for acceptance by the defendant within three working days. Although there was no document showing that the defendant had faxed its acceptance, the work was nevertheless carried out by delivery of the screws to the defendant and their return to the plaintiff after processing. If there were no documents, this would be a case of acceptance by performance.

35 The question remains whether the parties had contracted with the limitation term contained in quotations as an implied term. The plaintiff's argument that there was no such implied term would mean that a PO issued within the validity period of the quotation would contain the limitation term as an express term, but the POs in this case, issued outside of the validity period, would not. This is despite the fact that the prices are exactly the same, i.e. $1.80 per kg. In its quotation, the defendant had priced its services at that rate on the basis that its liability was limited to the price charged and the plaintiff had been contented to pay this price. Given the nature and course of dealings between the parties characterised by the informal nature of the transaction, as well as the cryptic nature of the PO, I agreed with the defendant that the limitation term was an implied term of the contract. Had the parties been asked at the time whether there was such a term, they would have answered "but of course".

Conclusion

36 For the reasons given above, I dismissed the plaintiff's claim against the defendant.

37 The defendant had counterclaimed against the plaintiff in the sum of $20,260.78 being payment for services rendered. Counsel for the plaintiff conceded that such sum was due and the plaintiff had

relied only on the defence of setoff against the sum claimed by it in this action. As I found for the defendant in the main action, the defence of setoff failed and I gave judgment in favour of the defendant against the plaintiff in the sum of $20,260.78.

38 I also ordered costs of the claim and counterclaim to be paid by the plaintiff to the defendant.