IN THE GENERAL DIVISION OF
THE HIGH COURT OF THE REPUBLIC OF SINGAPORE

[2023] SGHC 99

Suit No 359 of 2013

Between

TOWA Corporation

… *Plaintiff*

And

(1) ASM Technology Singapore Pte Ltd
(2) ASM Pacific Technology Limited

… *Defendants*

JUDGMENT

[Damages — Assessment]
[Intellectual Property — Remedies — Damages]

TABLE OF CONTENTS

Towa Corp
v
ASM Technology Singapore Pte Ltd and another

[2023] SGHC 99

General Division of the High Court — Suit No 359 of 2013
Lee Seiu Kin J
15–17, 19 March 2021, 19–21, 25, 27–28 October 2022, 20 January 2023

14 April 2023 Judgment reserved.

Lee Seiu Kin J:

Introduction

1 In the previous tranche of this suit ("Suit 359"), I found the first defendant liable for infringement of a patent owned by the plaintiff. This judgment concerns the assessment of the damages to be awarded to the plaintiff for the infringement.

Facts

The parties

2 The plaintiff ("Towa") is a company incorporated in Japan which is in the business of providing semiconductor packaging solutions.[1] Towa is the registered proprietor of Singapore Patent No 49740 (the "Patent").[2] Towa is one of a number of companies within the Towa group of companies ("Towa Group").[3]

3 The first defendant ("ASMS") is a company incorporated in Singapore. ASMS is in the business of manufacturing and selling semiconductor equipment and materials[4] and has manufactured and sold moulding systems known as the IDEALmold machine.[5] ASMS is a wholly owned subsidiary of the second defendant ("ASM").[6]

Background to the dispute

4 Towa commenced Suit 359 on 19 April 2013[7] on the basis that the defendants' acts of manufacturing, keeping, offering for use, offering to dispose

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1 Statement of Claim (Amendment No. 1) dated 10 March 2014 ("SOC") at para 1; Defence and Counterclaim (Amendment No. 1) dated 26 March 2014 ("DCC") at para 1.

2 SOC at paras 4–5; DCC at para 3.

3 Supplemental Defence of ASMS dated 19 February 2020 ("SD") at para 1.

4 SOC at para 2; DCC at para 1.

5 DCC at para 4.

6 SOC at para 2; DCC at para 1.

7 Writ of Summons for S 359/2013 filed 19 April 2013.

of and disposing of the IDEALmold machine in Singapore constituted infringements of Towa's patent ("the Patent").[8]

5 I gave my decision on liability on 22 December 2016: see *Towa Corp v ASM Technology Singapore Pte Ltd and another* [2017] 3 SLR 771 at [2]–[3]. I accepted Towa's interpretation of the invention as the application of the concept of modularity to the moulding units of moulding machines (at [22]). I found that the Patent was valid (at [75]) and that the IDEALmold machine, having the feature of modularity of moulding units, fell squarely within the claims made *vis-à-vis* the Patent (at [77]).

6 I found that ASMS's acts of making, disposing of, offering to dispose of, keeping and offering for use the IDEALmold machine constituted acts of Patent infringement (at [98], [109] and [133]). As against ASMS, Towa was hence entitled to (at [165]–[166]):

(a) a declaration that the Patent has been infringed by ASMS;

(b) an inquiry as to damages or, alternatively, at Towa's option, an account of profits and an order for payment of all sums found due upon making such inquiry or account; and

(c) interest at 5.33% per annum.

7 ASMS appealed against my decision. The Court of Appeal dismissed the appeal and held that given the limitation period of six years under s 6 of the Limitation Act (Cap 163, 1996 Rev Ed), the damages or account of profits for infringement of the Patent would run from 20 April 2007 (six years before Towa

[8] Particulars of Infringement (Amendment No. 1) dated 10 March 2014 at paras 2–3.

filed its writ of summons on 19 April 2013) to 5 July 2014, the date just before the Patent expired on 6 July 2014 (*ASM Technology Singapore Pte Ltd v Towa Corp* [2018] 1 SLR 211 at [91]–[92]). I will hereafter refer to the period of 20 April 2007 to 5 July 2014 as the "Claim Period".

Election for damages

8 Towa elected for damages accrued during the Claim Period to be paid to it by ASMS.[9]

9 Towa avers that during the Claim Period, ASMS had manufactured at least 439 IDEALmold machines for sale, and the IDEALmold machines were direct substitutes for and in direct competition with Towa's YPS machine. Its position is that, but for ASMS's infringement of the Patent and manufacture for sale of the 439 IDEALmold machines, Towa would have sold (or had a substantial chance of selling) the same number of YPS machines, as well as press modules and moulds ("Additional Parts"), over the life expectancy of each YPS machine.[10]

10 Towa therefore claims for:

(a) profits lost by Towa arising from lost sales of 439 YPS machines and Additional Parts over the life expectancy of each machine;[11]

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9 Supplemental Statement of Claim dated 5 February 2020 ("SSOC") at paras 5–6.

10 SSOC at paras 7–11.

11 SSOC at paras 10–12.

(b) profits lost by Towa arising from the lost sales of aftersales products and services (including maintenance and support) on the YPS machines;[12] and

(c) profits lost by Towa for the Claim Period (during which Towa had sold at least 183 YPS machines), where it had been compelled to sell the YPS machines at lower prices to compete with ASMS.[13]

11 Towa also claims interest on the damages.[14]

12 ASMS acknowledges that 439 IDEALmold machines were manufactured or part-manufactured in Singapore during the Claim Period. However, ASMS also avers that only 410 of these machines were manufactured before or during the Claim Period and sold during the Claim Period. The remaining 29 machines did not cause Towa to lose any sales of YPS machines during the Claim Period because:

(a) Twenty-seven of the machines were sold after the Patent had expired. Specifically, nine machines were manufactured during the Claim Period and sold only after the Claim Period. For the other 18 machines, manufacturing commenced during the Claim Period and was completed after the Claim Period, and they were sold after the Claim Period; and

(b) Two of the machines were unsold.[15]

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12 SSOC at paras 13–15.

13 SSOC at paras 17–20.

14 SSOC at para 5(b).

15 SD at para 8.

13 Further, 200 of the IDEALmold machines were sold by ASMS to an associated or subsidiary company within the ASM group of companies. ASMS avers that Towa would not have sold a YPS machine to any of these companies during the Claim Period.[16]

14 Two hundred and twenty-four of the IDEALmold machines were sold to third-party customers outside Singapore and Japan, while another 13 machines were sold to third-party companies based in Singapore. ASMS denies that, but for its acts of infringement, Towa would have made a sale of a YPS machine in relation to any of these 237 sales.[17]

15 ASMS also denies that the YPS machine was in direct competition with or was a direct substitute for the IDEALmold machine during the Claim Period.[18] ASMS avers that while the YPS machines were marketed at a premium price because of their modularity, the IDEALmold machines had not been marketed as modular machines but as machines with fixed moulding presses and comprised other technologies and functional options. Hence, the feature of modularity would not have been relevant to the purchasing decisions of ASMS's customers.[19] Further and alternatively, ASMS avers that Towa had offered for sale other models embodying the Patent other than the YPS machine, and there were also other competitors to the IDEALmold machines on the market.[20]

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16 SD at para 19.

17 *Ibid*.

18 SD at para 10.

19 SD at paras 11–14.

20 SD at paras 15–16.

16 Moreover, ASMS avers that even if it was true that a buyer of the IDEALmold product could have purchased a YPS machine during the Claim Period, other entities in the Towa Group, aside from Towa, could have made the sale instead of Towa itself.[21] ASMS denies that customers of its IDEALmold machines would have purchased Additional Parts.[22] Even if the customers did so, they would have purchased them from one of the entities in the Towa Group, as opposed to Towa.[23] ASMS also denies that Towa would have provided aftersales and/or servicing on YPS machines which would have been supplied during the Claim Period. It was TOWATEC Co., Ltd ("TOWATEC") and not Towa which would have provided such aftersales and services.[24]

17 Lastly, ASMS puts Towa to strict proof regarding whether Towa had been caused by the competition posed by the infringing IDEALmold machines in the market to sell 183 YPS machines at a lower price. ASMS avers that any price reduction caused by the sale of the IDEALmold machines would either have happened before the Claim Period or be due to reasons other than the sale of the IDEALmold machines.[25]

Witnesses and procedural history

18 Towa initially intended to call the following factual witnesses:

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21 SD at para 21.

22 SD at para 23.

23 SD at para 24.

24 SD at paras 26–27.

25 SD at paras 29–34.

(a) Mr Hiroyuki Kanamaru ("Mr Kanamaru"), Deputy Manager of Towa's Product Planning Department;[26] and

(b) Mr Takashi Nishizuka ("Mr Nishizuka"), Senior Manager of Towa's Finance Department.[27]

19 ASMS called the following factual witnesses:

(a) Mr Hao Ming Yen ("Mr Hao"), a Marketing Director of the ASM Pacific (Holding) Limited, Taiwan Branch;[28]

(b) Mr Ng Wee Huat ("Mr Ng"), a Senior Technical Consultant of ASMS and an ex-employee of STMicroelectronics Sdn Bhd ("ST");[29]

(c) Mr Tee Teng Chuan ("Mr Tee"), a Corporate Key Account Director of ASMS. He was an employee of a semiconductor company, Infineon Melaka Sdn Bhd from 1997 to 2011;[30]

(d) Mr Yu Kan Fung, Jack ("Mr Yu"), a Senior Sales Manager of ASM Pacific (Hong Kong) Limited;[31] and

(e) Mr Yuen Chun On ("Mr Yuen"), the Senior Marketing Director of ASMS.[32]

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26 Hiroyuki Kanamaru's affidavit of evidence in chief ("AEIC") at para 1.

27 Takashi Nishizuka's AEIC at para 1.

28 Hao Ming Yen's AEIC at para 1.

29 Ng Wee Huat's AEIC at paras 1 and 3.

30 Tee Teng Chuan's AEIC at paras 1–4.

31 Yu Kan Fung Jack's AEIC at para 1.

32 Yuen Chun On's AEIC at para 1.

20 Towa called Mr Hiroaki Ishigaki ("Mr Ishigaki") as an expert witness.[33] ASMS called Mr Chan Kheng Tek ("Mr Chan") as an expert witness.[34]

21 The first tranche of the damages hearing was conducted between 15 March to 19 March 2021. Mr Nishizuka, Mr Hao, Mr Ng, Mr Tee and Mr Yu completed their evidence during the first tranche.

22 Towa encountered difficulties in procuring Mr Kanamaru to give evidence as Mr Kanamaru's health prevented him from travelling out of Japan during the Covid-19 pandemic.[35] I initially granted Towa leave to apply to take a deposition of Mr Kanamaru's evidence in a Japanese court.[36] Subsequently, Towa applied for leave to replace Mr Kanamaru with Mr Noboru Hayasaka ("Mr Hayasaka"),[37] the Executive Vice President and a Fellow of Towa.[38] This was because the deposition application was not yet granted by the Japanese authorities as of 31 May 2022 and it was uncertain whether Mr Kanamaru would be able to complete his deposition in time for the second tranche of the trial.[39]

23 I permitted Mr Hayasaka to be added as a factual witness but ordered that there be no departure from Mr Kanamaru's evidence. I directed Towa to redo Mr Hayasaka's affidavit evidence-in-chief ("AEIC") to ensure that it would not go beyond what Mr Kanamaru had stated. I also ordered that

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33 See ORC 1154/2021 filed 1 March 2021.

34 See ORC 1154/2021 filed 1 March 2021.

35 Hiroyuki Kanamaru's 6th affidavit at paras 6–10.

36 See SUM 898/2021; HC/ORC 3424/2021 filed 22 June 2021.

37 See SUM 2387/2022.

38 Noboru Hayasaka's AEIC at para 1.

39 Hiroyuki Kanamaru's 7th affidavit at paras 6–8.

Mr Kanamaru would not be admitted as a witness and that Towa was not to adduce further documentary evidence beyond what was already given in discovery in the trial.[40]

24 The second tranche of the hearing was conducted between 19 October 2022 to 28 October 2022. Mr Hayasaka, Mr Yuen and the two expert witnesses, Mr Ishigaki and Mr Chan, completed their evidence during the second tranche.

The expert reports

Towa's expert: Mr Ishigaki

25 Mr Ishigaki, the Managing Director of NERA Economic Consulting ("NERA"), provided two expert reports.[41] In his first calculation report dated 8 April 2019 ("First NERA Report"), he provided a quantification of the profits Towa would have received had it sold 439 YPS machines and the profits it lost on price reductions to the YPS machine.[42] In his second report dated 6 September 2019 ("Supplemental NERA Report"), he provided updated computations to the First NERA Report based on further supporting documents and information provided to him.[43] He also provided a response to Mr Chan's AEIC on 15 February 2021.[44]

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40 See SUM 2387/2022.

41 Hiroaki Ishigaki's 1st AEIC dated 21 January 2021 at para 1.

42 Hiroaki Ishigaki's 1st AEIC dated 21 January 2021 at para 15.

43 Hiroaki Ishigaki's 1st AEIC dated 21 January 2021 at paras 16–19.

44 Hiroaki Ishigaki's 2nd AEIC dated 15 February 2021 at para 4.

ASMS's expert: Mr Chan

26 Mr Chan, a partner at PricewaterhouseCoopers Advisory Services Pte Ltd ("PWC"), also prepared two reports.[45] First, on 23 April 2018, he prepared a report on specific sales and costs information ("First PWC Report") with respect to the infringing IDEALmold machines.[46] On 22 January 2021, he provided his alternative quantification of damages based on a licensing fees approach on the assumption that ASMS would have entered a licensing agreement with Towa to use the Patent for manufacturing and sale of the infringing IDEALmold Machines ("Second PWC Report").[47]

27 Mr Chan provides two computations of Towa's loss of profits. His first computation excludes 60-tonne ("60T") YPS machines when computing sales and the cost of sales parameters, while his second computation does not exclude 60T YPS machines.[48]

Expert computations

28 Mr Ishigaki has computed the estimated damages to be USD102,941,385 while Mr Chan has computed damages to stand at between JPY36,684,359 to JPY126,883,479 (*ie*, USD324,554 to 1,112,565).[49]

Issues

29 The issues in this suit are as follows:

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45 Chan Kheng Tek's AEIC at para 1.

46 Chan Kheng Tek's AEIC at CKT-2 p 18.

47 Second PWC Report dated 22 January 2021 at paras 5–8.

48 Second PWC Report dated 22 January 2021 at paras 54–56.

49 Joint Statement of Experts p 8–11 at S/N 5.

(a) Whether Towa would have sold (or had a substantial chance of selling) the 439 YPS machines during the Claim Period had the ASMS machines not been in the market.

(b) Whether Towa can establish its claim with respect to the provision of aftersales services on YPS machines during the Claim Period.

(c) Whether Towa can establish its claim with respect to Additional Sales over the life expectancy of each YPS machine during the Claim Period.

(d) Whether Towa can establish its claim with respect to its alleged lowering of prices of its YPS machines to compete with ASMS.

(e) Whether any cost items ought to be excluded from the calculation of damages.

(f) The appropriate methodology for the calculation of damages.

(g) The discount and interest to be applied to the damages, if any.

The law on damages

30 Damages are generally intended to be compensatory in nature, which would put the injured party in the same position it would have been in had the wrong not been committed (*Main-Line Corporate Holdings Ltd* v *United Overseas Bank Ltd and another* [2017] 3 SLR 901 ("*Main-Line*") at [63]; James Edelman, *McGregor on Damages* (Sweet & Maxwell, 21st Ed, 2021) at 2-003, citing *Livingstone v Rawyards Co* (1880) 5 App Cas 25 at 39). It is trite law that a plaintiff bears the burden of proving its loss and in order to do so, must provide

cogent evidence of the damages claimed. However, the court must adopt a flexible approach with respect to the proof of damage. The plaintiff is not required to prove with complete certainty the amount of damage it has suffered as different occasions may call for different evidence with regard to the certainty of proof, depending on the circumstances of the case and the nature of the damages claimed (*Kiri Industries Ltd and another v DyStar Global Holdings (Singapore) Pte Ltd and another appeal* [2021] 1 SLR 49 at [20]–[21]; *Robertson Quay Investment Pte Ltd v Steen Consultants Pte Ltd and another* [2008] 2 SLR(R) 623 ("*Robertson Quay*") at [27]–[30]; *Turf Club Auto Emporium Pte Ltd and others v Yeo Boong Hua and others and another appeal* [2019] 1 SLR 214 at [16]).

31 With respect to damages for patent infringements, a patentee can only claim the amount of profits attributable to the infringing use. In other words, causation would have to be proved (*Main-Line* at [59]). There are three "elemental principles" which have been applied to cases of patent infringement, although the application would naturally vary from case to case (*General Tire and Rubber Co v Firestone Tyre and Rubber Co Ltd* [1975] 1 WLR 819 ("*General Tire*") at 824–826):

> 1. Many patents of inventions belong to manufacturers, who exploit the invention to make articles or products which they sell at a profit. The benefit of the invention in such cases is realised through the sale of the article or product. In these cases, if the invention is infringed, the effect of the infringement will be to divert sales from the owner of the patent to the infringer. The measure of damages will then normally be the profit which would have been realised by the owner of the patent if the sales had been made by him …
>
> 2. Other patents of inventions are exploited through the granting of licences for royalty payments. In these cases, if an infringer uses the invention without a licence, the measure of the damages he must pay will be the sums which he would have paid by way of royalty if, instead of acting illegally, he had acted legally …

> 3. In some cases it is not possible to prove either (as in 1) that there is a normal rate of profit, or (as in 2) that there is a normal, or established, licence royalty. Yet clearly damages must be assessed. In such cases it is for the plaintiff to adduce evidence which will guide the court. This evidence may consist of the practice, as regards royalty, in the relevant trade or in analogous trades; perhaps of expert opinion expressed in publications or in the witness box; possibly of the profitability of the invention; and of any other factor on which the judge can decide the measure of loss. Since evidence of this kind is in its nature general and also probably hypothetical, it is unlikely to be of relevance, or if relevant of weight, in the face of the more concrete and direct type of evidence referred to under 2. But there is no rule of law which prevents the court, even when it has evidence of licensing practice, from taking these more general considerations into account. The ultimate process is one of judicial estimation of the available indications. …

32 The plaintiff has the burden of proving its loss. Although damages should be liberally assessed as the defendant has done wrong, the object is to compensate the plaintiff and not punish the defendant (*General Tire* at 824, affirmed in *Main-Line* at [63]).

Preliminary point on pleadings

33 Preliminarily, Towa contends that ASMS has failed to plead: (a) the comparative tonnages of the YPS and IDEALmold machines; and (b) the favourability of Towa as perceived by ASMS's customers as factors that would impact the number of sales which Towa would have been able to capture if not for ASMS's Patent infringement.[50] ASMS, in turn, relies on para 14 of its supplemental defence where it averred that the IDEALmold machine was a "highly complex machine, comprising a large variety of other technologies … and functional options", which would be "more important and relevant factors

[50] Plaintiff's Closing Submissions ("PCS") at para 99.

in the purchasing decision of [ASMS's] customers … than the modularity feature".[51]

34 It is true that ASMS's pleadings were somewhat scanty on these other factors that would influence the purchasing decisions of their consumers (see *V Nithia (co-administratrix of the estate of Ponnusamy Sivapakiam, deceased) v Buthmanaban s/o Vaithilingam and another* [2015] 5 SLR 1422 ("*V Nithia*") at [38]). Nevertheless, this point is pleaded, if rather widely and devoid of particulars. Towa is entitled to further and better particulars and had it applied to the court, this would have been granted.

35 Furthermore, this lack of particulars did not cause prejudice or injustice to Towa (*V Nithia* at [40]). Towa had ample opportunity to consider and cross-examine ASMS's witnesses on their evidence with respect to the tonnage of the YPS and IDEALmold machines, as well as customer perceptions of Towa. Towa was also given the opportunity to make submissions to refute these allegations. Moreover, since Towa is seeking to establish whether it would have been able to sell its machines in a hypothetical but-for counterfactual (*ie,* if there were no IDEALmold machines) (the "But-for Scenario"), this was not a case where it had been deprived of the chance to adduce contradictory evidence of the same customers choosing to purchase machines from Towa over ASMS. I therefore hold that ASMS is entitled to pursue these points as they have been pleaded in its defence.

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[51] SD at para 14.

Whether all 439 IDEALmold machines should be considered

Whether unsold IDEALmold machines and IDEALmold machines sold after the Claim Period should be excluded from consideration

36 The parties disagree on whether the two unsold IDEALmold machines and the 27 IDEALmold machines sold after the Claim Period (see above at [12]) should be taken into consideration for the assessment of damages.

37 Towa submits it is entitled at law to claim damages in respect of *every* infringing IDEALmold machine.[52] It relies on s 66(1)(*a*) of the Patents Act (Cap 221, 2005 Rev Ed) ("Patents Act") which states that a person who "makes" the product while the patent is in force would have infringed the patent. Towa submits that the reference to "makes" in the present tense contemplates that the act of infringement is committed at the commencement of the manufacturing process.[53] Accordingly, all 439 IDEALmold machines are infringing machines to which Towa is statutorily entitled to damages.[54]

38 Towa also submits that patentees are allowed to claim damages for the sales of an infringing product made after the expiration of a patent.[55] Towa submits that in the computation of lost profits, the law allows patentees to claim damages where the sale of the infringing product is made after the expiration of the patent, provided that the damages are foreseeable losses caused by infringing acts committed during the life of the patent. It relies on the case of *Gerber Garment Technology Inc v Lectra Systems Ltd and anr* [1995] RPC 383 ("*Gerber 1995*"), where the court awarded damages for the lost profits on

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52 PCS at para 42.

53 PCS at para 84.

54 PCS at para 85.

55 PCS at paras 36 and 86.

machine sales to the plaintiff for sales made by the defendant post-expiry of the patent.[56]

39 However, ASMS submits that only the total number of IDEALmold machines sold is relevant.[57] While ASMS initially contests only the two unsold machines and submits that the 437 IDEALmold machines sold are relevant to the claim,[58] ASMS subsequently responds to Towa's submissions on the 27 IDEALmold machines sold after the expiry of the Patent. In particular, ASMS submits that while Towa may claim for sales which occur after the expiry of the Patent, Towa is not entitled to claim a loss merely because a sale took place after the expiry or outside of the Claim Period and must point to an act of infringement during the period, which foreseeably caused the loss claimed.[59] In my view, what is pertinent when it comes to assessing damages is the quantum required to restore Towa to its original position if the losses sustained through the Patent infringement during the Claim Period had not been suffered. Towa has not shown how the mere *making* of the IDEALmold machine, while indeed an infringement of the Patent, has caused loss to itself during the Claim Period.

40 Hence, any possible damage to Towa would accrue from the sales of the IDEALmold machines and not the act of manufacturing these machines in isolation. Where no sale has been made, the infringement of making the IDEALmold machines has caused no damage to Towa. I hence find that the two IDEALmold machines which were not sold at all ought to be excluded from my consideration of the damages suffered.

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56 PCS at paras 36–37.

57 Defendants' Closing Submissions ("DCS") at paras 312–313.

58 DCS at para 315.

59 Defendants' Reply Submissions ("DRS") at para 74.

41 With regard to the 27 sales made after the expiry of the Patent, as parties do not seem to seriously dispute that in law, Towa may claim losses incurred by this sale should ASMS's infringements be found to have foreseeably caused any such losses. Indeed, in *Gerber 1995*, it was held that secondary losses for patent infringements can be recovered, provided that the secondary loss is a foreseeable consequence of the infringement (at 402). It was found that there was some advantage gained by the infringer with corresponding detriment to the wronged party, stemming from the infringer having become better enabled to compete post-expiry (at 418). Moreover, on appeal (see *Gerber Garment Technology Inc v Lectra Systems Ltd* and another [1997] RPC 443 ("*Gerber 1997*")), the English Court of Appeal observed (at 451–452) that there was no limitation against "springboard damages which relate to goods sold after the patent has expired" in ss 61(1) and 61(6) of the English Patents Act 1997. These provisions are similar in wording to s 67 of our Patents Act which provides for claims in civil proceedings for patent infringements. I further add that the decision in *Gerber 1997* has been considered to be based on the concepts of foreseeability and causation but was also made subject to the policy reason of balancing a fair scope for the right-owner against a general freedom of competitors to imitate what is not within the bounds of the right (see David Llewelyn & Tanya Aplin, *Intellectual Property: Patents, Copyright, Trade Marks and Allied Rights* (Sweet & Maxwell, 9th Ed, 2019) at 2-044). In my view, this approach allows for a fair consideration of the profits attributable to the infringing use, for the purpose of restoring the wronged party to the same position it would have been in had the patent not been infringed. In the circumstances of the present case, I find that any losses incurred by these sales would bear a sufficient causal connection to the infringing act of making these machines. Hence, these 27 machines remain part of my consideration.

Whether the 170T IDEALmold should be excluded

42 ASMS submits that the YPS machine has no competitive equivalent to the 170-tonne ("170T") models of the IDEALmold machines (the "170T IDEALmold") during the Claim Period, and the sales of the 170T IDEALmold would in all probability have gone to third party competitors in the But-for Scenario and should be excluded from the claim for lost profits.[60] It highlights that tonnage capacity is of great importance as tonnage specification refers to the maximum clamping pressure of a machine which would determine how large a lead frame a machine can produce.[61]

43 Towa submits that between different moulding machines, tonnage is not a determinative factor. Towa acknowledges that all things being equal, a higher tonnage can allow a moulding machine to mould larger lead frames and be more productive. However, according to Towa, the real question is whether there are other 170T machines in the market which are more productive than the YPS machines such that IDEALmold customers would choose them in the absence of IDEALmold. ASMS has not supplied evidence to establish this or to show that the 170T IDEALmold is more productive than YPS machines.[62] Rather, the maximum lead frame size that can be moulded by a 170T IDEALmold is only slightly smaller than a 120-tonnage ("120T") YPS machine, with at best a 6% difference in productivity.[63]

44 I am of the view that the 170T IDEALmold did not affect Towa's sales. While I accept that ASMS has not demonstrated the presence of other 170T

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60 DCS at paras 322–323.

61 DRS at para 105; DCS at paras 316–324.

62 PCS at paras 135–140.

63 Plaintiff's Reply Submissions ("PRS") at paras 55–56.

machines in the market that are more productive than the YPS machine, the burden is on Towa to prove that it had lost profits as a result of the 170T IDEALmold machines sold by ASMS.

45 It is not sufficient for Towa to say that the difference in tonnages is not a determinative factor. Towa has, quite fairly, acknowledged that a higher tonnage allows for the production of larger lead frames – and the production of such frames is central to the very function of an automould machine. Since Towa did not offer 170T YPS machines, I am unable to find that the 72 170T machines sold by ASMS[64] affected Towa's sales.

46 To summarise, out of the 439 infringing IDEALmold machines manufactured during the Claim Period, the following should be excluded:

(a) Two unsold machines; and

(b) 72 170T machines.

This leaves 365 IDEALmold machines which are relevant to my considerations below – in other words, there is a maximum of 365 sales which Towa could have possibly made but for ASMS's sale of the infringing IDEALmold machines (the "But-for Sales"). I turn now to consider how many of the But-for Sales would compromise the sale of Towa's YPS machines.

64 Yuen Chun On's AEIC at para 114.

Whether the YPS machine is a direct substitute for or competitor of the IDEALmold machine

Parties' submissions

47 Towa's position is that on a balance of probabilities, an IDEALmold customer would choose to buy a YPS machine if there was no IDEALmold machine.[65] ASMS takes the position that all automould machines are competitive substitutes for the IDEALmold machines.[66] This includes not just YPS machines, but also third-party automould machines,[67] machines sold by companies that benefit from a licence from TOWA in respect of the subject of the Patent (the "Licensee Companies"),[68] Towa's non-YPS automould machines (such as one model known as YPM, which was introduced in 2011 and intended to replace the YPS)[69] and ASMS's non-infringing automould machines.[70]

48 The parties crossed swords on several grounds. Firstly, the parties disagree on whether the inventive step of modularity was a casually determinative factor in a customer's purchasing decision.[71] Towa also submits that the YPS and IDEALmold are competitive equivalents due to their similar functions and specifications[72], while ASMS submits that all automould

65 PCS at para 119 and 122.

66 DCS at para 353.

67 DCS at paras 358–370.

68 DCS at paras 354–357.

69 DCS at paras 371 –391.

70 DCS at paras 392–396.

71 DCS at paras 325–345; PRS at paras 19–20; DRS at paras 24–27.

72 PCS at paras 123–130.

machines performed the same basic function of injecting molten thermos-setting plastics to seal and encapsulate electronic circuitry.[73]

49 Secondly, Towa disputes ASMS's contention that the Licensee Companies would produce competitive substitutes for the IDEALmold and YPS machines. Towa submits that the licences granted were either cross-licences issued due to cross-infringements of patents by both companies or comprised financial terms intended to deter infringement by these parties.[74] Further, there is no evidence to suggest that the alleged substitutes made by the Licensee Companies (if any) had incorporated the Patent and/or were actually sold to customers or posed competitive threats to the YPS machines.[75] Moreover, the Licensee Companies were too small to pose effective competition to Towa.[76]

50 Thirdly, Towa submits that the IDEALmold machines purchased by ASMS's associated or subsidiary companies were for onward sales to end-consumers and would still directly damage Towa.[77]

51 Fourthly, parties disagree on the relative appeal of ASMS and Towa to ASMS's customers. ASMS submits that its appeal is not derived from the IDEALmold itself but ASMS's unique "Total Solutions" offering, *ie*, where all machines in the production line could be provided by the ASM group of companies, such that a customer would have purchased a different moulding machine from ASMS in the absence of the IDEALmold.[78] ASMS also makes

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73 DCS at paras 74, 326–327 and 370.

74 PCS at paras 72–75; PRS at paras 43–47.

75 PCS at para 198.

76 PRS at para 65.

77 PCS at para 63.

78 DCS at paras 440–443; DRS at para 106.

submissions on the unfavourable view of Towa[79] and the expensive price of the YPS machine.[80] On the other hand, Towa submits that these considerations are irrelevant as the present inquiry involves a situation where there was no IDEALmold.[81] Moreover, ASMS has not adduced evidence to show how its technologies and appeal, customers' unfavourable view of Towa or the pricing of YPS machine would have affected an IDEALmold customer's decision to buy a YPS machine.[82]

52 Finally, the parties also disagree on whether IDEALmold customers in the US, Germany, Brazil, India, Morocco and the Czech Republic (where Towa had not sold any YPS machines from 2011 to 2018) would have bought YPS machines in the But-for Scenario. Towa submits that it is a global company which does not exclude any market from its sales.[83] ASMS submits that the But-for Scenario must be realistic and take into account historical facts when assessing whether there was a substantial chance for the YPS machines to be sold.[84]

My findings

53 The question at hand is how many of the 365 But-for Sales would have been captured by Towa had ASMS not breached the Patent. If Towa were the only other alternative in the market, Towa's submission that it would have captured the contract for all the But-for Sales would be a reasonable conclusion

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79 DRS at para 108.

80 DRS at para 107.

81 PRS at paras 99–100.

82 PCS at paras 149–151, 156–158, 164–170.

83 PCS at paras 174–176.

84 DRS at para 109.

(assuming that Towa had the ability to produce all those extra machines during the Claim period, a subject that I will turn to later). However, as Towa was not the only source of automould machines in the market, it does not stand to reason that it must necessarily capture all the sales.

54 Towa's argument is that the YPS machine is the nearest replacement to the IDEALmold. That may be the case on a feature-by-feature analysis. However, that does not mean that, for the unique requirements of any given purchaser and in the absence of IDEALmold in the market, that purchaser would have acquired Towa's YPS machine instead of the other machines available in the market. This is because many factors are involved in the decision to purchase from a particular manufacturer. Indeed, Mr Hayasaka has given evidence that there are multiple factors which are relevant in the context of a decision *vis-à-vis* the substitutability and competitiveness of an automould machine. At the end of the day, every customer has a range of parameters to consider in evaluating a purchase.[85] The most important concern is whether the machine does the job which the customer requires. If this concern is satisfied, the customer's evaluation then shifts to the question of which machine would do the job best in terms of profit and other factors, including price, efficiency, compatibility, aftersales service, reliability, *etc*.

55 I am of the view that these varied factors apply all the more to any decision to purchase an automould machine in the absence of the IDEALmold. Modularity is about the only common feature unique to the IDEALmold and the YPS machine, but even then, there is evidence that there are other manufacturers that offer some degree of modularity.

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85 Noboru Hayasaka's AEIC at para 33.

56 Furthermore, just because modularity is a common feature in both the YPS and IDEALmold machines, this does not mean that modularity is an all-important factor in the decision of the purchasers of the 365 IDEALmold machines. Indeed, there is no evidence that all the purchasers of IDEALmold machines bought them because modularity is the most important requirement. The evidence instead shows the interplay of multiple factors in influencing customers' purchase decisions. Mr Yu's evidence relating to the China and Hong Kong market, Mr Hao's evidence relating to the Taiwan market, Mr Ng's evidence relating to ST's machine purchases and Mr Tee's evidence relating to Infineon Melaka's machine purchases have identified companies such as Asahi, Dai-Ichi, Seiko, ASA and Fico as possible competitive suppliers in their respective markets.[86] Evidence has also been given that Towa's products were of a higher price and lacked strong service support which would affect their competitiveness. [87] As such, even if I accept Towa's evidence that the YPS machine is closest in terms of its features to the IDEALmold, there is no evidence from Towa that the 365 But-for Sales would, more likely than not, comprise sales of YPS machines only.

57 It appears to me that the best approach would be to consider the market share of Towa and the purported competitors. The market share best reflects the factors at play in the choice of machine as it is the real-world manifestation of the interplay of all factors that go into the selection process. It is telling that Mr Hayasaka, in disagreeing with ASMS's witnesses' evidence that customers would have purchased machines from other manufacturers,[88] relied on Towa's

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86 Yu Kan Fung Jack's AEIC at paras 24–27; Hao Ming Yen's AEIC at paras 14–16; Ng Wee Huat's AEIC at paras 24–32; Tee Teng Chuan's AEIC at paras 14–16.

87 DRS at para 107.

88 Noboru Hayasaka's AEIC at paras 48–65.

position as a "global leader in the moulding machine industry"[89] and the comparatively limited market share of the purported competitors.[90] It is most appropriate, in the circumstances of this case, to proceed on the basis that Towa would, in the But-for Scenario, capture the number of sales in proportion to its relative market share.

58 Therefore, on the evidence before me, I find that the most appropriate way to calculate the number of machine sales which Towa would have captured in the But-For Scenario would be to go by the number of IDEALmold machines sold per year in each country/regional market and derive the But-for Sales based on Towa's market share for that year, subject to any other factors which may affect market share.

59 To close off, I briefly address ASMS's contention that while Towa had identified the YPS machine as the model that the IDEALmold competed with, Towa had stopped actively marketing the YPS machine after 2011, promoted its new YPM line to new customers and only sold the YPS machine to existing users. I find this point to be a red herring. Towa has a range of products, and if the IDEALmold were not in the market during the Claim Period, it would mean that Towa had an opportunity to make a sale of its products to the customers who purchased an IDEALmold. As such, it is irrelevant whether it was the YPS machine or the YPM that Towa would have sold to them in the But-for Scenario. More importantly, the abovementioned calculation based on market share would take into account all relevant factors.

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89 Noboru Hayasaka's AEIC at para 61.

90 Noboru Hayasaka's AEIC at paras 63–66.

Whether Towa had the production capacity to manufacture and sell the additional machines

Parties' submissions

60 Towa submits that it had the capacity to manufacture its share of the But-For Sales as it was able to cater to fluctuating demand, had excess production capacity and would not require additional capital to do so.[91] Mr Hayasaka's evidence was that Towa's flexibly-structured production facilities and workforce allowed it to meet varied production demands, and that this was borne out from how its production could vary from 123 to 259 machines per year from the fiscal years of 2007/08 until 2014/15.[92]

61 ASMS contends that save for bald statements, Towa did not produce evidence to show that it could produce machines above its production capacity without incurring additional costs or investments during the Claim Period. ASMS submits that Towa had been operating at full capacity at all material times[93] and had lead time issues and production capacity constraints in the year 2007.[94]

My findings

62 In my view, Towa's claim of its flexible production capacities is evinced by its ability to accommodate fluctuating production levels from year to year. Moreover, Mr Hayasaka's evidence was that Towa's production capacity did not comprise only YPS machines. In fact, it had produced as many as 1,414

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91 PCS at paras 275–278.

92 Noboru Hayasaka's AEIC at para 40.

93 DCS at para 153; DRS at para 115(b).

94 DCS at para 149.

moulding machines (including the YPS machines and other moulding machines) during the Claim Period.[95] This evidence has not been shaken by ASMS; Mr Yuen, in fact, conceded that he did not have evidence to rebut this.[96] I hence find it more likely than not that Towa would be able to increase its production capacities to make and sell its share of the But-for Sales over the Claim Period.

Provision of aftersales services by Towa's subsidiaries

Parties' submissions

63 Towa submits that the loss of profits from aftersales services is a direct and foreseeable consequence of the Patent infringement as YPS customers – if not all, then at least 65% of them – would have bought aftersales services from Towa's wholly owned subsidiaries.[97] Towa relies on *Gerber 1997* to submit that a plaintiff is entitled to claim for damages suffered by its wholly owned subsidiary if that subsidiary shares consolidated accounts with the parent. Throughout the Claim Period, the financials of Towa's subsidiaries were consolidated with Towa.[98]

64 ASMS submits that Towa has failed to discharge its burden of proof on entitlement to aftersales profits.[99] The data of only seven customers from one of Towa's subsidiaries, TOWATEC, was given, and out of the seven, only the costs data of three customers was given. There is no basis to infer that this data

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95 Noboru Hayasaka's AEIC at para 39.

96 Transcript of 25 October 2022 p 107 ln 21 to p 108 ln 2.

97 PCS at paras 230–243.

98 PCS at paras 22–23, 245–246; PRS at paras 149–150.

99 DCS at paras 238–239.

is representative of any of the other YPS customers who could have received aftersales services from TOWATEC, let alone the other unidentified third-party affiliates and/or subsidiaries.[100] Further, ASMS submits that Towa has not led evidence sufficient to prove losses for aftersales services outside of Japan, which is why it was right for Mr Chan to consider in his calculations only the one IDEALmold machine sold in Japan during the Claim Period.[101]

My findings

65 The evidence furnished by Towa must achieve three things. First, it must establish that there are wholly owned subsidiaries of Towa which provide aftersales services on YPS machines in the various markets where YPS machines have been sold. Towa has managed to establish this. Both sides agree that in the Japanese market, aftersales services are provided by Towa's subsidiary, TOWATEC.[102] As for other markets, Towa relies on its annual reports to identify Towa's wholly owned subsidiaries.[103]

66 Secondly, it must establish that these subsidiaries would more likely than not provide aftersales services on the YPS machines which Towa would have sold but for ASMS's sale of the IDEALmold machines. In this respect, Towa's evidence, unfortunately, falls short.

67 For one, Towa has not been able to provide any evidence of aftersales services provided outside of Japan. Towa has not been able to provide the

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100 DCS at paras 276–277.

101 DCS at paras 301–302.

102 Transcript of 28 October 2022 p 22 ln 14 to ln 21.

103 Transcript of 28 October 2022 p 22 ln 22 to p 24 ln 4, p 27 ln 5 to ln 11.

accounts of its purported subsidiaries.[104] At their best, Mr Foo could only suggest that Towa had one invoice for a customer in Taiwan.[105] Towa hence sought to rely on its transfer pricing policy which states that Towa's subsidiaries (referred to as "sales company") would "[perform] services, [purchase] parts and [invoice] customers direct[ly] for compensation, and sales are attributable to the sales company".[106] This does not tell me the likelihood and/or frequency at which Towa's subsidiaries would perform aftersales services on YPS machines sold by Towa. It merely establishes that if a customer wishes to seek aftersales services from Towa after purchasing a product, Towa's subsidiaries would be able to provide such services.

68 Towa then sought to rely on the servicing records of TOWATEC's servicing records[107] to suggest that TOWATEC serviced machines outside of Japan – but this was a matter of inference upon inference. Towa's reasoning was essentially that only 15 YPS machines had been sold in Japan during the Claim Period, but the servicing records of TOWATEC indicated 42 instances of aftersales servicing.[108]

69 I also note that Mr Nishizuka sought to correct himself during cross-examination and say that TOWATEC provides worldwide coverage[109], despite saying earlier on the same day that it only handled the Japanese domestic market and that other dealer organisations overseas would provide aftersales goods and

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104 Transcript of 28 October 2022 p 25 ln 2 to ln 7.

105 Transcript of 28 October 2022 p 29 ln 13 to ln 15.

106 Transcript of 28 October 2022 p 26 ln 15 to ln 24; Agreed Bundle ("AB") Vol 3 p 218.

107 Approved Bundle Volume 8 ("AB") Vol 8 p 8–12.

108 Transcript of 28 October 2022 p 28 ln 1 to p 29 ln 12.

109 Transcript of 17 March 2021 p 61 ln 25 to p 62 ln 17.

services.[110] However, he agreed that he had only disclosed machines and documents relating to Japanese customers.[111] It was then suggested to him that he had "no evidence of [TOWATEC] performing services in relation to YPS machines outside of Japan", to which he said that "the provision of service is focused domestically but there are occasions when we go overseas".[112] The same problem remains – at the end of the day, there is no evidence of these occasions when TOWATEC is alleged to provide services outside of Japan. Therefore, I did not find the evidence sufficient to establish that any subsidiary of Towa had serviced machines outside of Japan, let alone that aftersales services would be provided by Towa and/or its subsidiaries on every YPS machine sold.

70 In its submissions, Towa had suggested that TOWATEC's profits on YPS machines aftersales should be used as a benchmark for the aftersales profits of its other subsidiaries.[113] In light of the dearth of evidence available on the aftersales done by its subsidiaries, there is no basis to infer the aftersales profits of Towa's subsidiaries in this manner.

71 Next, even for data on TOWATEC's servicing of customers *within* Japan, TOWA was only able to give aftersales data for only seven customers. This was because no distinction was made in TOWATEC's records between the servicing of a YPS machine and other TOWA machines, and these seven customers had been established to have purchased *only* a YPS machine.[114] Moreover, while the sales data of seven customers was used, Mr Ishigaki only

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110 Transcript of 17 March 2021 p 59 ln 14 to p 60 ln 7.

111 Transcript of 17 Mar 2021 p 62 ln 18 to p 63 ln 7.

112 Transcript of 17 Mar 2021 p 63 ln 8 to ln 12.

113 PCS at para 248.

114 Transcript of 28 Oct 2022 p 33 ln 2 to ln 20.

had the cost data of three of the customers, which he then projected on the remaining four customers.[115] In effect, this is a sample size of three customers. In my view, the available evidence is insufficient to suggest that a substantial majority of YPS customers bought aftersales services from TOWATEC. In light of the evidence available, I think it is correct that Mr Chan had considered only these seven customers who can be established to have sought aftersales servicing for YPS machines when determining the percentage of But-for Sales which could generate aftersales profits for TOWATEC.[116]

Additional Parts supplied by Towa

Parties' submissions

72 Towa submits that across a YPS machine's lifespan, YPS customers would buy Additional Parts from Towa, and not from third-party sellers.[117] Towa submits that, as held in *Gerber 1995* (at 402, 416–417), the law entitles it to seek damages for secondary losses of unpatented items which go with the patented item.[118]

73 ASMS's position is that there is no evidence from Towa as to what these Additional Parts are or any evidence from sales or marketing personnel. Moreover, Towa's evidence does not prove that the Additional Parts were necessarily purchased by customers with every YPS machine, even less as a result of the inventive modularity feature.[119] There were also third-party

115 Transcript of 28 Oct 2022 p 45 ln 25 to p 46 ln 22.

116 Second PWC Report dated 22 January 2021 at paras 223–225.

117 PCS at para 229.

118 PCS at para 35; PRS at paras 141–143.

119 DCS at paras 215–216.

suppliers which were in the business of making additional parts that targeted Towa's machines.[120]

74 ASMS also relies on *Gerber 1995* and *Gerber 1997* to say that the patented feature or inventive concept must form an integral part of the article sold and not just be an ancillary part or component. It hence follows that Towa is not entitled to a claim for the loss of profits on the entire article, or the loss of profits associated with spare parts and articles sold together with the main article in question.[121]

My findings

75 I find it helpful, to begin with a consideration of the facts of *Gerber 1995*, as well as *Gerber 1997*, which is the appeal against the former decision. The infringers, Lectra Systems Ltd, were found to have infringed patents for a machine or process for the automatic cutting of fabric (*Gerber 1997* at 448). What is pertinent to our present case are the items of damages which cover the patentee's loss of profit on spare parts and servicing, which they would have sold or supplied to customers who had bought the infringer's machines (*Gerber 1997* at 450). The judge below had awarded the patentees 55% of the profits which the patentees would have made in respect of spare parts and servicing for all the infringing machines (*Gerber 1995* at 416–417; *Gerber 1997* at 450). Lord Staughton found that the appeal, insofar as it sought to restrict the scope of recovery, should be dismissed (*Gerber 1997* at 456).

76 It can be gleaned from the two *Gerber* decisions that the guiding principle behind a patentee's losses (be they primary or secondary losses) is that

120 DCS at para 233.

121 DRS at paras 71–73.

they must be a foreseeable consequence of the infringement. This is unsurprising, and I consider it to be aligned with the compensatory principle, which governs the awarding of damages as well as the rule that a patentee can only claim the amount of profits attributable to the infringing use and must hence establish causation between profits claimed and the infringing use in question (see above at [30]–[31]).

77 ASMS relies on Lord Staughton's observation in *Gerber 1997* (at 456) that:

> It does not follow that, if customers were in the habit of purchasing a patented article at the patentee's supermarket, for example, he could claim against an infringer in respect of loss of profits on all the other items which the customers would buy in the supermarket but no longer bought. The limit there would be one of causation, or remoteness, or both. …

The relationship between the Additional Parts and the YPS machines, however, is nowhere as remote as the relationship between various disparate items stocked in a supermarket. With due respect, I would consider it a distortion of the principle behind damages for patent infringements if Towa is expected to prove that its customers was only buying Additional Parts as a direct result of the concept of modularity. Insofar as Towa has been deprived of sales of YPS machines that it would have made, but for ASMS's infringement, it would also have been deprived of parts which it could have sold to customers for use on these YPS machines. The "press modules and moulds over the life expectancy of the machine"[122] are not products to be used separately from the YPS machines but parts to be used *with* the YPS machines. The sale of these parts and the profits derived therein are hence part of the benefit that Towa should have received from its invention. In my view, the profits arising from the sales of

122 SSOC at para 11(b).

Additional Parts vis-à-vis the But-for Sales of the YPS machines should be awarded to Towa. The question, however, is how these profits should be calculated. I make two findings on the calculation of profits from these additional sales.

78 First, I find that, as Mr Chan has rightly noted, the significant decrease in the sales of Additional Parts after November 2011 should be taken into account in the computation of lost profits.[123]

79 Second, I note that the parties disagree on the life expectancy of the YPS machines. Towa submits that the life expectancy be estimated at 16.92 years;[124] ASMS submits that it should be ten years.[125] I am of the view that the estimated life expectancy of the YPS machine should be ten years and will say more on this below (see below at [95]).

Towa's alleged lowering of prices of its YPS machines to compete with ASMS

Parties' submissions

80 Towa submits that the infringing IDEALmold machines had caused Towa to reduce its prices. Towa relies on internal company records dated 2007, 2009 and 2010 where its sales representatives had submitted a written price reduction request in the face of competition from the IDEALmold.[126] Towa also

123 Second PWC Report dated 22 January 2021 at para 53.

124 PCS at para 268.

125 DCS at para 270.

126 PCS at paras 296 and 299.

highlights that the price reduction coincides in period and trend with evidence on the state of competition between the parties.[127]

81 On the other hand, ASMS submits that Towa has failed to prove any price reduction that was attributable directly and specifically to the infringement of the Patent by the sale or offer for sale of IDEALmold machines during the Claim Period.[128] It submits that the price reduction was caused by adverse economic events such as fluctuations in the JPY/USD exchange rate, third-party competitors and the global financial crisis in 2008.[129] ASMS also relies on other factors cited by Mr Chan which may affect the price comparisons made by Mr Ishigaki, such as the prices of modules of different tonnages, different prices in different geographical locations and the customisation of machines and modules.[130]

My findings

82 Two problems arise with respect to Towa's claim. First, although Towa relies on evidence of three internal price reduction requests in 2007, 2009 and 2010,[131] these requests suggest that Towa had to consider lowering prices to attract and retain customers from competitors *including,* ASMS, rather than ASMS alone. As such, these three instances, in fact, show that ASMS is only partly connected to the basis on which these price reduction requests were raised. It is unclear how much of these requests should hence be attributed to

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127 PCS at para 301.

128 DCS at para 483.

129 DCS at paras 70, 197 and 467; Second PWC Report dated 22 January 2021 at Appendix 1 A.57.

130 DCS at para 471; Second PWC Report dated 22 January 2021 at Appendix 1 A.60.

131 AB Vol 5 at p 7–19.

ASMS and how much of them should be attributed to other competitors in the market.

83 Secondly, TOWA's claim for price reduction is based on a trend of reduction that came about in May 2007. However, the IDEALmold machine was introduced in 1999.[132] This suggests the possibility that the price reduction may have arisen due to market factors unconnected with the presence of IDEALmold. I further note that the contributing factors raised by ASMS, *ie*, the recession between 2007 to 2009, currency fluctuations and the increased price of Japanese machines due to the appreciation of the JPY were factors which coincided in the timeframe with the price reductions.

84 For the foregoing reasons, I find that Towa has not been able to establish sufficient causation between the price reduction and ASMS's infringement of the Patent.

Expert Calculation Methodology

Whether the IDEALmold 60T should be excluded from calculations

85 Mr Ishigaki had assumed that the average sales and operating income per But-For Sale accorded to Towa would be identical to the average sales and operating income per machine for the YPS machines sold by Towa during the Claim Period. However, ASMS submits that the YPS 60T machines should be excluded from calculations as there is no IDEALmold 60T machine that can feature in the But-for Scenario and no evidence from Towa that it would sell a

132 DCS at para 481.

60T machine when a customer wishes to buy an 80T or 120T machine.[133] The 60T machines are more profitable than the 80T and 120T YPS machines.[134]

86 Towa, in turn, submits that there is no evidence to suggest that an IDEALmold customer would not buy a 60T YPS machine to replace an IDEALmold machine, despite the difference in tonnage, and a 60T YPS machine is capable of achieving the same productivity and moulding the same lead frames as the 80T and 120T IDEALmold.[135]

87 As I have found earlier (at [54]), it is indeed true that the tonnage of the machine would have some impact on the size of the lead frames constructed, but a consumer's decision to purchase a machine may be shaped by a multitude of factors and not tonnage alone. It is not possible to conclusively determine, on the face of the evidence available, whether a purchaser of an 80T IDEALmold would have decided to buy a 60T YPS in the But-for Scenario. This is because there is no IDEALmold machine of a lower tonnage, and it is entirely possible, for instance, that a customer may not have required an 80T machine for the frames that he intends to produce, and that a 60T machine would have sufficed for his needs. It is also possible that he may be happy to purchase a 60T machine for a variety of other factors that may shape his decision-making calculus.

88 This finding is different from my decision to exclude 170T IDEALmold machines from the computation of But-for Sales on the basis that Towa offered no YPS machine of an equivalent tonnage (see above at [45]). This is because the nearest Towa machine available is the 120T YPS machine. The 170T

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133 DCS at paras 198–205; DRS at para 117.

134 Second PWC Report dated 22 January 2021 at para 284.

135 PCS at paras 288 and 293–294; PRS at para 139.

IDEALmold represents a 42% increase in the size of the 120T YPS machine. This is a huge difference compared to the 20 tonne difference between the 60T Towa and 80T IDEALmold, and I am of the view that this factor puts the 170T IDEALmold in a different category altogether. I therefore find that there is no real basis to exclude 60T machines from the experts' calculations.

Use of multi-year averages or year-on-year basis when calculating Towa's profit margin

89 Mr Ishigaki has calculated Towa's profitability with respect to the YPS machines on an average basis and then multiplied the profit by the total number of YPS machine sales which Towa would have lost during the Claim Period (the "multi-year average" approach). Mr Chan has calculated Towa's profitability with respect to the YPS machines for each year in the Claim Period and then multiplied the profit by the respective number of YPS machine sales which Towa would have lost in each year (the "year-on-year" approach)[136]

90 ASMS submits that Mr Chan's use of the historical year-on-year average is correct.[137] Insofar as Towa seeks lost profits from the But-for Sales, it must accept that there are years of losses from the But-for Sales as well[138] – specifically, in FY2008/09 and FY2009/10.[139]

91 In contrast, Towa submits that the year-on-year approach would not allow the court to arrive at the best estimate of damages as it results in an illogical situation where for the years where Towa has made a loss on YPS

136 PCS at paras 332–333.

137 DCS at para 180.

138 DCS at para 192.

139 DCS at paras 186 and 190.

machine sales, it is now presumed to have made proportionately larger losses through capturing the sales made by the infringing IDEALmold. Towa submits that in the alternative if the year-on-year approach is adopted, any losses it should have made with more sales of YPS machines should be disregarded.[140]

92 I am of the view that a year-on-year approach would allow for a more accurate calculation of the profits that Towa could have made. I, however, agree that in the two loss-making years, it would not make sense to suggest that Towa's losses would be magnified should it have been able to sell a greater number of YPS machines. Therefore, even if Towa had captured some or all of the But-for Sales, no profit should be calculated for years which are loss-making.

Life expectancy of machine for calculation of aftersales services and the sale of additional parts

93 The parties disagree on the projected life expectancy of YPS machines. Towa submits that the lifespan of YPS machines should be pegged to the oldest YPS machine recorded in TOWATEC's maintenance records, *ie*, 16.92 years. While Towa acknowledges that it would be best to use an average lifespan, it was impossible to do so as there is no evidence of YPS machines which had stopped operation, and moulding machines which have been maintained may have very long lifespans exceeding ten years.[141]

94 ASMS stands by Mr Chan's calculation of an average of ten years, minus one year for free warranty. The sum of ten years was arrived at based on an average of the years of useful life, *ie*, the user's best estimate of how long

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140 PRS at paras 135–136.

141 PCS at paras 258–260; PRS at paras 155–158.

the machinery would provide economic benefit, found in the audited financial statements of Towa's key customers.[142]

95 While it is unfortunate that there is limited evidence on the lifespans of YPS machines such that a true average lifespan cannot be calculated, I do not think it reasonable for Towa to rely on the highest life expectancy on record. I am hence minded to find in favour of Mr Chan's best estimate of an average of ten years. However, I do not see any need to deduct a year to account for the warranty period. As Towa has rightly pointed out,[143] the evidence does not establish that the sales of Additional Parts and aftersales services would be provided for free when the warranty period was in effect.

The appropriate currency for the calculation of damages

96 Towa's expert calculations were done in USD. ASMS submits that the damages were clearly incurred in JPY and that the damages calculation, assessment and award should be in JPY.[144] Since it is undisputed that Towa's functional currency is JPY,[145] I find that the most accurate measure of compensation would be in JPY, which prevents calculations from being affected by currency fluctuations over the years of the Claim Period.

Whether any incremental cost items ought to be excluded from the calculation of damages

97 The cost items in contention are:

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142 DCS at paras 269, 271, 273 and 275.

143 PRS at paras 157–158.

144 DCS at para 102.

145 Joint Statement of Experts p 2 at S/N 1.

(a) sales, general and administrative expenses – comprising research and development ("R&D") costs, indirect sales commissions and depreciation and amortisation costs; and

(b) additional costs of sales – comprising unclassified development costs, unclassified disposal costs and unclassified valuation loss.[146]

98 ASMS seeks for these cost items to be allocated proportionately to the YPS machines, as Mr Chan had done in his calculations.[147] I will address each cost item in turn.

Indirect sales commissions

99 Towa contends that indirect sales commissions are paid to support a subsidiary's general operational costs and are hence a fixed cost item which does not change with the number of YPS machines sold.[148] ASMS, however, submits that there is no basis to exclude indirect sales commissions as they are related to sales generally.[149]

100 There is insufficient evidence to support Towa' submission. Counsel for Towa attempts to rely on Towa's transfer pricing policy, in which a "business outsourcing handling fee" is explained as being based on "estimated expenses such as collection of customer and market information, collection of new customer and technology information, and HQ sales activity support".[150] Towa's

146 PCS at para 348–376.

147 DCS at para 119.

148 PRS at paras 119–121; PCS at paras 359–360.

149 DCS at para 143.

150 AB Vol 3 at p 219.

position is that this business outsourcing handling fee refers to the indirect sales commission.[151] However, even if I, in the absence of any other evidence, were to assume that this business outsourcing handling fee and indirect sales commission are one and the same, Mr Chan has explained that the business outsourcing handling fees have been computed based on a percentage of the expenses related to sales activity, and his explanation was unshaken by Towa.[152] As such, these costs would increase should the sales of YPS machines increase.

Depreciation and amortisation costs

101 Towa submits that the depreciation and amortisation costs are not incremental costs as Towa could have manufactured and sold additional YPS machines using its existing production capacities.[153] Further, Mr Ishigaki had already accounted for other incremental costs (*eg*, labour costs) required to produce the additional YPS machines.[154] On the other hand, ASMS submits that given that TOWA did make significant capital investment during the first three years from the onset of the Claim Period and given TOWA's belief at all material times that it was operating at 100% efficiency, Mr Chan's approach of including depreciation was correct.[155]

102 Given my finding above that Towa's existing facilities during the Claim Period were sufficient to manufacture its share of the But-for Sales on top of its pre-existing production, I do not find there to be any basis on which depreciation and amortisation costs can be said to be incremental.

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151 Transcript of 27 Oct 2022 p 85 ln 14 to p 88 ln 8.

152 Transcript of 27 Oct 2022 p 90 ln 8 to ln 16.

153 PCS at para 355.

154 PRS at para 127.

155 DCS at paras 144–153.

Indirect R&D costs

103 Towa submits that there is no evidence to support the allegation that it conducted any research and development ("R&D") to the YPS machines in the Claim Period.[156] On the other hand, ASMS stands by Mr Chan's approach of proportionally allocated indirect R&D up till 2011, in which year TOWA ceased active marketing of the YPS machines, and it was assumed that no more R&D improvement was made to the YPS machines.[157]

104 On the evidence available, I did not think that ASMS was able to establish why Towa's R&D costs would have increased with the increased production of YPS machines, especially when it was already producing YPS machines during that time. Mr Chan's explanation for including R&D costs was that Towa had provided information that it had undertaken general R&D for their products, and Towa had not been able to identify whether this general R&D spending was for YPS machines or other Towa products.[158] I find this line of reasoning to be speculative and unpersuasive in suggesting that R&D costs should be attributed for the calculation of damages.

Additional costs of sales

105 As for the additional costs of sales, Mr Chan has rightly highlighted that some of the costs can be attributed to YPS machines, some to equipment other than YPS machines, and some cannot be linked to any specific category of equipment.[159] I am of the view that only the development cost, disposal cost and

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156 PRS at para 129.

157 DCS at paras 154–160.

158 DCS at para 157.

159 Second PWC Report dated 22 January 2021 at paras 176–182; Plaintiff's Core Bundle at p 123.

valuation cost that can be attributed to YPS machines are to be included. All remaining costs are to be excluded from the calculations.

Loan financing and interest for operating expenses

106 Towa's position is that since there is no evidence that it will need to incur additional capital expenses, loan financing and interest costs will not be incurred.[160] ASMS submits that financing costs and interest should be calculated and proportionately allocated and included as relevant expenses.[161]

107 I have found that Towa's operating capacity was sufficient to accommodate the production and sales of the increased number of YPS machines in the But-for Scenario. Moreover, the evidence merely establishes that Towa requires loan financing and pays interest for operating expenses[162], but does not show how these payments can be attributed to YPS machines. I did not see any basis on which financing costs and interest should be factored into the calculation of cost items.

Discount rate to be applied to additional sales and aftersales

108 The experts from both sides have agreed that it would be appropriate to apply a discount rate of 10% to additional sales and aftersales, and I see no reason to depart from this rate.

109 With respect to the date from which the discount should be computed, Towa submits that damages for its claim for additional sales and lost profits from aftersales can be discounted back to net present value at the date of

160 PRS at para 132.

161 DCS at paras 163–167.

162 DCS at para 165.

computation of 22 December 2016, to account for the accelerated receipt.[163] ASMS submits that the appropriate reference date is the date of judgment of the assessment.[164]

110 In my view, the appropriate date from which the discount rate should be applied would be the date of judgment of the assessment, at which point Towa will begin to enjoy the accelerated receipt which forms the basis for the application of the 10% discount.

Pre-judgment interest

111 Towa submits that given the approach of applying a discount, Towa ought to be entitled to pre-judgment interest of 10% from the midpoint of the Claim Period (*ie*, 26 November 2010) to 21 December 2016 (*ie*, the day before the preferred computation date).[165]

112 In reply, ASMS highlights that the damages were cumulative over the years and not entirely sustained in 2007 and that pre-judgment interest had not been pleaded by Towa. The proposed rate of 10% is also without basis, and the correct date for interest to run should be the date at which this court determines the quantum of damages. Lastly, ASMS submits that there has been a significant delay in Towa's prosecution of these proceedings and hence no interest should run for the period of delay.[166]

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163 PCS at para 394.

164 DCS at para 162.

165 PCS at paras 397–405; PRS at para 130.

166 DRS at para 124.

113 Section 12(1) of the Civil Law Act (Cap 43, 1999 Rev Ed) affords the court a wide discretion to grant interest for any part of the period between the date of the cause of action arose and the date of judgment (*Robertson Quay* at [98]). Where there has been an unjustifiable delay on the claimant's part in bringing his action to trial, the court may, however, choose to award interest from a date later than that which the claimant's loss accrued (*Robertson Quay* at [102]).

114 I am of the view that Towa should be awarded pre-judgment interest from the date of the writ till 22 December 2016. While it is true that this suit has been drawn out due to various difficulties, including the impact of the Covid-19 pandemic on Towa's ability to procure the attendance and evidence of Mr Kanamaru, I did not think there was an unjustifiable delay during that specific period of time which would warrant awarding no interest or less interest.

115 However, the rate of 10% is too high. Towa has not demonstrated any real basis on which such a rate should be applied. Insofar as the 10% discount rate is to serve a different purpose of accounting for accelerated receipt, I did not see any reason why the pre-judgment interest rate should have to mirror it. I hence order that the pre-judgment interest should run from the date of the writ till 22 December 2016 and be fixed at the default rate of 5.33%.

Conclusion

116 For the foregoing reasons, I make the following findings with respect to the damages to be awarded to Towa.

117 For Towa's claim for profits lost by Towa arising from lost sales of YPS machines:

(a) The two unsold IDEALmold machines and the 72 170T IDEALmold machines are to be excluded from calculations. This leaves a total of 365 But-for Sales.

(b) The correct way to calculate the number of machine sales that Towa would have captured in the But-For Scenario is to go by the number of IDEALmold machines sold per year in each country/regional market and derive the But-for Sales which Towa would have sold, based on Towa's market share for that year.

(c) A year-on-year approach should be applied to calculate the profits which Towa could have made in the But-for Scenario. However, no profit from But-for Sales should be calculated for years which are found to be loss-making.

118 For Towa's claim for lost profits arising from aftersales products and services and Additional Sales:

(a) The estimated life expectancy of the YPS machines is to be fixed at ten years, with no deduction of any warranty period.

(b) When determining TOWATEC's claim for aftersales profits, the calculations should consider only the seven customers who can be established to have sought aftersales servicing for YPS machines.

(c) The profits arising from the Additional Sales be awarded to Towa. The decrease in additional sales of press modules, moulds and other parts after November 2011 should be taken into account in the calculation of profits which Towa would earn from the additional sales.

119 For Towa's claim for lost profits arising from its price reduction on its YPS machines to compete with ASMS, I find that this claim has not been made out, and no profits are to be awarded.

120 I also find that:

(a) The currency to be applied is JPY and not USD.

(b) Indirect sales commissions and only the development cost, disposal cost and valuation cost that can be attributed to YPS machines are to be included as incremental costs. Depreciation and amortisation, financing costs, as well as indirect R&D costs, should be excluded.

(c) A discount rate of 10% should be applied to the additional sales and aftersales beginning from the date of judgment of the assessment.

(d) Pre-judgment interest of 5.33% should be applied from the date of writ until the date of judgment on 22 December 2016.

121 Based on the principles outlined in this judgment, parties are to provide an agreed re-computation of the damages to be awarded to Towa by

12 May 2023. If parties are unable to agree on the quantum of damages, they are to write in to court for a final determination.

122 I will hear parties on costs after the quantum has been settled.

Lee Seiu Kin
Judge of the High Court

Low Chai Chong, Foo Maw Jiun, Lee Ai Ming, Sherman Poon and Angie Ng (Dentons Rodyk & Davidson LLP) for the plaintiff;
Lim Ying Sin Daniel and Lakshmanan Anbarazan (Joyce A Tan & Partners LLC) for the first and second defendants.