

# XTPL S.A.



Fair value: PLN 196.10

Update

Rating: n.a.

Since our last update in February 2018, XTPL has done significant progress when it comes to commercialization of its technology. While we believe that it is currently finalizing negotiations with 3 Joint-Development/Joint-Venture industrial partners, in our view it is also in advanced talks regarding >10 contracts for laboratory printers and industrial printer heads. In June, a Chinese company, which has a market capitalization of c. USD 6bn, initiated discussions with XTPL regarding a commercial agreement, which relates to the use of XTPL's technology in the area of open-defect repair. Another important news was the appointment of Harold Hughes, ex CFO of Intel, and Amir Nayyerhabibi, ex Manager of Intel and Cisco, to the company's Advisory Board, who both have an extensive network of Silicon Valley contacts. Based on the newsflow since February, we have raised our FV for XTPL's shares from PLN 136.90 to PLN 196.10 as we now expect a backlog of c. USD 5m by year-end 2018E and thus higher sales from 2019E than we had previously forecast. Our new valuation is based on a lower WACC (15% vs. 17.5% before) and the assumption that in H2/18E XTPL will raise in total PLN 25.8m for financing of business development in North America (incl. the additional PLN 4.4m from German Universal Investment/ACATIS, which were announced on 3 September).

**H1/18 figures were in-line with our expectations.** Between January and June 2018, XTPL generated an EBIT and net income of PLN -2.6m. Free cash flow equaled PLN -3.7m and the cash position at the end of June PLN 2.5m. We estimate the current cash burn at c. PLN 1m/month, of which 40-50% is covered by EU grants.

**XTPL wants to raise additional capital by the end of 2018E in order to build operations in the US.** The company plans to establish an office in Silicon Valley and already hired experienced business development managers. Especially after the Display Week trade fair in May, where XTPL won an award for being one of the most innovative firms, the number of international companies, with which XTPL entered into negotiations regarding a co-operation, grew rapidly to 35 now.

in PLNm	2017	2018E	2019E	2020E	2021E	2022E
Net sales	0.00	1.09	14.50	38.21	68.65	106.90
EBITDA	-3.48	-4.53	3.13	13.41	31.23	54.08
EBIT	-3.95	-5.09	2.51	12.73	30.48	53.25
Net income	-3.96	-5.10	2.08	10.35	24.72	43.17
Diluted EPS	-2.34	-2.95	1.07	5.33	12.74	22.24
DPS	0.00	0.00	0.00	0.00	0.00	0.00
Dividend yield	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
RoE	-88.68%	-29.10%	7.18%	29.46%	46.94%	49.84%
Net gearing	-85.78%	-80.55%	-50.09%	-33.11%	-38.15%	-49.11%
EV/Sales	n.a	198.44x	14.91x	5.66x	3.15x	2.02x
EV/EBITDA	n.a	n.a	68.98x	16.12x	6.92x	4.00x
P/E	n.a	n.a	120.65x	24.19x	10.13x	5.80x

## Company profile

XTPL S.A. is developing a unique technology relating to ultra-fine printing of a wide spectrum of nano-materials. The technology allows printing lines that are 400 times narrower than standard lines that are used for digital printing or screen printing. Applications include e.g. consumer electronics and photovoltaics.

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Sector	Industrial Technology
Country	Poland
ISIN	PLXTPL000018
Reuters	XTPP.WA
Bloomberg	XTP PW

## Share information

Last price	129.00
No of shares (m)	1.70
Market cap. (PLNm)	218.68
Market cap. (EURm)	50.74
52-week range	PLN 183.50 / PLN 47
Average volume (3-months)	1,494

## Performance

4-weeks	-7.87%
13-weeks	55.42%
26-weeks	74.32%
52-weeks	n.a
YTD	104.44%

## Shareholder structure

Filip Granek (CEO)	17.87%
Sebastian Mlodzinski	17.70%
Leonarto Sp. Z.o.o	17.58%
TPL Sp. Z.o.o*	8.26%
Stefan Twardak	6.08%
Heidelberger Beteiligungsholding	6.02%
Universal Inv. on behalf of ACATIS Inv.	5.55%
Konrad Pankiewicz**	0.13%
Free float	20.81%

\* include shares for the employee' incentive scheme

\*\* Member of the Supervisory Board and MD of Leonarto Sp. Z.o.o

## Financial calendar

Q3/18 report	November 14, 2018
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## Analyst

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## H1 2018 results

### Revenues and Profitability

In H1/18, XTPL had revenues of PLN 1.3m, which stemmed from a research grant (in our model, we are showing it under "Other operating income"). EBIT and net income equaled PLN -2.6m.

in PLNm	H1/18
<b>EBITDA</b>	<b>-2.36</b>
<i>EBITDA margin</i>	<i>n.a</i>
<b>EBIT</b>	<b>-2.61</b>
<i>EBIT margin</i>	<i>n.a</i>
<b>Net income</b>	<b>-2.55</b>
<i>Net margin</i>	<i>n.a</i>

Source: Company information, East Value Research GmbH

### Balance sheet and Cash flow

As of 30 June 2018, XTPL had equity of PLN 4.7m, which corresponded to an equity ratio of 79.8%. Other larger balance sheet positions were cash of PLN 2.5m and intangibles (software, patents, licenses) of PLN 1.6m. Working capital amounted to PLN -471k. At the end of H1/18, XTPL had interest-bearing debt of PLN 38k.

Between January and June 2018, XTPL generated an operating cash flow of PLN -2.5m, which resulted from the net loss. Cash flow from investing equaled PLN -1.2m, while cash flow from financing reached PLN -14k.

We believe that currently the company's monthly cash burn amounts to c. PLN 1m and has increased over the last months mainly due to investments in the business development team. However, we would like to emphasize that 40%-50% of the cash burn is financed by research grants.

## Financial forecasts

### Revenues and Profitability

Since our last update in February 2018, XTPL has done significant progress when it comes to business development. The company has hired two experienced Silicon Valley executives as business development managers for North America and two for its Advisory Board. Especially, its presence at the world's largest trade fair for printed electronics, Display Week in Los Angeles in May, made XTPL more visible for global electronics manufacturers. We estimate that currently the company is in final talks regarding 3 JDA/JV agreements (partner co-finances R&D work on XTPL's technology for a specific application), 8 contracts for its laboratory printers and 7 for industrial printer heads. With a Chinese company, which has a market cap of c. USD 6bn and provides equipment for the manufacturing of displays, XTPL is negotiating a commercial agreement relating to the use of its technology in the area of repair of broken metallic paths in thin-film electronic circuits (open-defect repair with application in the production of TFT/LCD displays, silicon solar cells, integrated circuits and advanced PCBs). XTPL's management estimate the value of this segment at USD 4.5bn worldwide and the CAGR at c. 7.5%.

### Overview over discussions with potential commercial partners

Initial discussions	Proof-of-concept	Discussions about a commercial JDA/JV contract	Total
24	8	3	35

Source: East Value Research GmbH

We believe that first revenues from the likely contract with a Chinese manufacturer of machines for the production of displays will be booked in Q4/18E. In our view, a second commercial agreement with a US-based provider of equipment for manufacturers of semiconductors will also likely be signed in H2/18E. In total, we expect that by year-end 2018E XTPL will have a backlog worth c. USD 5m, which will be reflected in the company's revenues from 2019E. In general, due to the strong interest from the global Tech industry, which XTPL has been experiencing since Q2/18, we have increased our forecasts from 2019E. We are also increasingly confident that due to its innovative technology the company will attract interest from potential buyers from North America or Asia within the next 2-3 years.

Below is our revenue model of XTPL. While for 2018E our forecasts of PLN 1.1m for sales and PLN -5.1m for EBIT are unchanged, for 2019E we now estimate revenues at PLN 14.5m (previously: PLN 10.3m) and EBIT at PLN 2.5m (PLN -0.2m). However, we would like to emphasize that as XTPL has so far not informed the public, to whom it will outsource the production of its printers, our estimates are risky.

*Laboratory printers – sales:* In our model, we have assumed that while first sales to research facilities and R&D departments of large corporates will be booked in H2/18E, they will end in 2021E as XTPL will shift its focus towards commercial clients. We expect that the lab printers will be sold at an average price of PLN 200k and generate gross margins of 58.5%-62.5%. In our view, in full-year 2018E XTPL will sell 1 lab printer (previously: 5).

*Laboratory printers – rent:* XTPL also wants to rent some of the laboratory printers with the objective to gain valuable feedback in order to improve its device further and prepare it for commercial sales. We have assumed an average fee per device of PLN 4.2k per month and a target gross margin of 71.4%. For full-year 2018E, we now assume no sales of this segment (previously: PLN 76k). However, between 2019E and 2026E we expect them to increase from PLN 480k at a CAGR of 7.5%.

*Industrial printer heads:* Due to the progress, which the company has made since Q1/18, we now expect that XTPL will already gain an order for one industrial printer head as well as consulting and integration services in 2018E. In our model, we have assumed an average price per printer head of PLN 600k and a target gross margin of 75%. For full-year 2018E, we have forecast sales of PLN 600k and a gross margin of 65%. In our opinion, by 2026E revenues should grow at a CAGR of 78.7% (previously: 40.2%).

*Ink:* XTPL wants to produce the ink for its printers itself. Clients, who use the company's printers, will have to buy the ink regularly. In our model, we have assumed an average price of PLN 57.9k and a target gross margin of 62%. While small revenues should already be visible in 2018E, for full-year 2019E we have forecast sales of PLN 3.4m at a gross margin of 57%. In our view, revenues from the sale of ink should grow at a CAGR 19E-26E of 71.2% (77.5%).

	2018E	2019E	2020E	2021E	2022E
<b>Laboratory printers - sales</b>	<b>0.20</b>	<b>2.20</b>	<b>0.80</b>	<b>0.00</b>	<b>0.00</b>
(% of sales)	18.4%	15.2%	2.1%	0.0%	0.0%
Gross margin	58.5%	60.0%	62.5%	63.5%	62.5%
Units	1	11	4	0	0
Average price per unit	200,000	200,000	200,000	200,000	200,000
<b>Laboratory printers - rent</b>	<b>0.00</b>	<b>0.48</b>	<b>0.71</b>	<b>0.72</b>	<b>0.74</b>
(% of sales)	0.0%	3.3%	1.9%	1.1%	0.7%
Gross margin	65.0%	66.5%	68.0%	69.5%	71.4%
Units	0	10	14	14	15
Average price per unit per month	4,200	4,200	4,200	4,200	4,200
<b>Industrial printer heads</b>	<b>0.60</b>	<b>8.40</b>	<b>19.80</b>	<b>30.00</b>	<b>39.00</b>
(% of sales)	55.1%	57.9%	51.8%	43.7%	36.5%
Gross margin	65.0%	67.8%	70.5%	73.3%	75.0%
Units	1	14	33	50	65
Average price per unit	600,000	600,000	600,000	600,000	600,000
<b>Ink</b>	<b>0.29</b>	<b>3.42</b>	<b>16.91</b>	<b>37.92</b>	<b>67.16</b>
(% of sales)	26.6%	23.6%	44.2%	55.2%	62.8%
Gross margin	55.0%	57.0%	59.0%	61.0%	62.0%
Units	5	59	292	655	1,160
Average price per unit	57,900	57,900	57,900	57,900	57,900
<b>Total revenues</b>	<b>1.09</b>	<b>14.50</b>	<b>38.21</b>	<b>68.65</b>	<b>106.90</b>
(change y-o-y)	n.a	1230.5%	163.6%	79.6%	55.7%

Source: East Value Research GmbH

	2018E		2019E		2020E		2021E		2022E	
in PLNm	new	old	new	old	new	old	new	old	new	old
<b>Net sales</b>	<b>1.09</b>	<b>1.09</b>	<b>14.50</b>	<b>10.33</b>	<b>38.21</b>	<b>31.91</b>	<b>68.65</b>	<b>56.96</b>	<b>106.90</b>	<b>96.14</b>
<b>EBITDA</b>	<b>-4.53</b>	<b>-4.50</b>	<b>3.13</b>	<b>0.46</b>	<b>13.41</b>	<b>8.96</b>	<b>31.23</b>	<b>23.29</b>	<b>54.08</b>	<b>46.65</b>
<i>EBITDA margin</i>	-415.5%	-412.8%	21.6%	4.5%	35.1%	28.1%	45.5%	40.9%	50.6%	48.5%
<b>EBIT</b>	<b>-5.09</b>	<b>-5.12</b>	<b>2.51</b>	<b>-0.23</b>	<b>12.73</b>	<b>8.21</b>	<b>30.48</b>	<b>22.46</b>	<b>53.25</b>	<b>45.74</b>
<i>EBIT margin</i>	-467.3%	-469.7%	17.3%	-2.2%	33.3%	25.7%	44.4%	39.4%	49.8%	47.6%
<b>Net income</b>	<b>-5.10</b>	<b>-5.62</b>	<b>2.08</b>	<b>-0.83</b>	<b>10.35</b>	<b>6.01</b>	<b>24.72</b>	<b>17.56</b>	<b>43.17</b>	<b>35.74</b>
<i>Net margin</i>	-468.2%	-515.6%	14.3%	-8.0%	27.1%	18.8%	36.0%	30.8%	40.4%	37.2%

Source: East Value Research GmbH

### CAPEX and Working capital

In our model, we have assumed gross CAPEX of PLN 8.7m in 2018E-2020E, which in our opinion will mainly be related to the printers that XTPL is supposed to rent to labs and R&D facilities, and intangibles (software, licenses and patents). We would like to emphasize that XTPL does not plan to invest into an own production facility, which in our view reduces its business risk. For working capital, we have forecast that it will grow by PLN 19m in 2018E-2020E due to the ramp-up of production and will amount to 31.9% of total sales in the long run. XTPL's inventories will only reflect the printer heads and ink as these components are the only ones, which will be produced in-house.

## Valuation

Due to the company's early-stage character we have decided to value XTPL by using a DCF approach only. This results in a fair equity value of PLN 331.1m currently or PLN 196.10 per share in 12-months. Our new valuation is based on a lower WACC (15% vs. 17.5% before) due to, in our view, lower business risk as well as the issue of in total 245.7k shares at an average price of PLN 105 per share (total volume of PLN 25.8m) by the end of 2018E.

On 3 September 2018, XTPL announced that Universal Investment, which acts on behalf of German investment fund ACATIS Datini Valueflex Fonds, bought 47k new shares at PLN 94 per share (total volume of PLN 4.4m) in a private placement. According to an earlier press release from 10 August, the transaction price corresponds to the 3-months average volume-weighted market price, which was discounted by 10%. However, we expect that the remaining new shares will be sold at a higher price.

### DCF model

in PLNm	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E			
<b>Net sales</b>	<b>1.09</b>	<b>14.50</b>	<b>38.21</b>	<b>68.65</b>	<b>106.90</b>	<b>149.15</b>	<b>185.35</b>	<b>204.34</b>	<b>210.46</b>			
(y-o-y change)	n.a	1230.5%	163.6%	79.6%	55.7%	39.5%	24.3%	10.2%	3.0%			
<b>EBIT</b>	<b>-5.09</b>	<b>2.51</b>	<b>12.73</b>	<b>30.48</b>	<b>53.25</b>	<b>76.55</b>	<b>93.31</b>	<b>100.95</b>	<b>99.98</b>			
(operating margin)	-467.3%	17.3%	33.3%	44.4%	49.8%	51.3%	50.3%	49.4%	47.5%			
<b>NOPLAT</b>	<b>-5.15</b>	<b>2.04</b>	<b>10.31</b>	<b>24.69</b>	<b>43.13</b>	<b>62.01</b>	<b>75.58</b>	<b>81.77</b>	<b>80.98</b>			
+ Depreciation & amortisation	0.56	0.62	0.68	0.75	0.83	0.91	1.00	1.10	1.21			
= Net operating cash flow	-4.59	2.66	10.99	25.44	43.96	62.91	76.58	82.87	82.19			
- Total investments (Capex and WC)	-4.86	-10.15	-12.69	-14.01	-15.66	-15.01	-9.61	-1.62	0.19			
Capital expenditure	-4.05	-3.62	-1.03	-1.10	-1.18	-1.16	-1.25	-1.35	-1.46			
Working capital	-0.81	-6.53	-11.66	-12.91	-14.49	-13.85	-8.36	-0.27	1.65			
= Free cash flow (FCF)	-9.44	-7.49	-1.70	11.43	28.29	47.90	66.96	81.25	82.38			
<b>PV of FCF's</b>	<b>-9.06</b>	<b>-6.25</b>	<b>-1.23</b>	<b>7.21</b>	<b>15.53</b>	<b>22.88</b>	<b>27.82</b>	<b>29.37</b>	<b>25.90</b>			
PV of FCFs in explicit period	112.18											
PV of FCFs in terminal period	196.46											
<b>Enterprise value (EV)</b>	<b>308.63</b>											
+ Net cash / - net debt (31 December 2018E)	22.46											
+ investments / - minorities	0.00											
<b>Shareholder value</b>	<b>331.09</b>											
<b>Post-money shares outstanding (m)</b>	<b>1.94</b>											
<b>WACC</b>	<b>15.0%</b>											
Cost of equity	15.0%											
Pre-tax cost of debt	5.0%											
Normal tax rate	19.0%											
After-tax cost of debt	4.1%											
Share of equity	100.0%											
Share of debt	0.0%											
<b>Fair value per share in PLN (today)</b>	<b>170.58</b>											
<b>Fair value per share in PLN (in 12 months)</b>	<b>196.10</b>											
						<b>Terminal EBIT margin</b>						
						<b>44.5%</b>	<b>45.5%</b>	<b>46.5%</b>	<b>47.5%</b>	<b>48.5%</b>	<b>49.5%</b>	<b>50.5%</b>
						310.08	314.93	319.78	324.63	329.48	334.33	339.18
						269.95	274.00	278.05	282.10	286.15	290.20	294.25
						237.53	240.95	244.36	247.78	251.20	254.62	258.04
						210.86	213.77	216.68	219.59	222.51	225.42	228.33
						188.60	191.10	193.60	<b>196.10</b>	198.60	201.10	203.59
						169.79	171.95	174.11	176.27	178.43	180.58	182.74
						153.72	155.60	157.47	159.35	161.23	163.10	164.98

Source: East Value Research GmbH

## Peer Group

The following provides an overview over companies, which operate in the area of printed, organic and flexible electronics, and the technologies they use. Our list includes both privately-owned and listed peers.

- (1) *Nano Dimension Ltd.*: Nano Dimension, which is based in Ness Ziona/Israel, focuses on the research and development of advanced 3D electronics printing, including a printer for printing PCBs, and the development of nanotechnology-based ink products, which are complementary to 3D printers. Its DragonFly 2020 Pro 3D Printer is available to commercial clients for an estimated price of USD 150k/unit. In 2017, Nano Dimension generated sales of USD 3m and an EBIT of USD -60.1m. Currently, it has a market capitalization of USD 151.7m.
- (2) *PragmatIC Printing Ltd.*: PragmatIC, which is based in Cambridge/UK, is a leader in ultra-low cost flexible electronics. PragmatIC's technology platform delivers flexible integrated circuits thinner than a human hair that can be easily embedded in any surface. The circuits deliver intelligent electronics without the need for rigid, bulky and expensive silicon chips. PragmatIC is privately-owned.
- (3) *PolyIC GmbH & Co. KG*: PolyIC, which is based in Fürth/Germany, develops and markets products based on the platform technology for printed electronics. The technology enables the setup of flexible circuit structures as passive devices for a huge variety of further applications. The highlight is the possibility to combine decoration and function to achieve a maximum of design flexibility. PolyIC is 100%-owned by the Leonhard Kurz Foundation.
- (4) *FujiFilm Holdings Corp.*: FujiFilm, which is based in Minato-Ku/Japan, develops, sells and services Imaging, Information, and Document solutions. The company, which is listed in Tokyo, has a market cap of JPY 2tr. In 2017/18, it generated revenues of JPY 2.4tr and an EBIT of JPY 130.7bn.
- (5) *O-Film Tec Co. Ltd.*: O-Film Tec, which is based in Shenzhen/China, designs and manufactures high performing, cost effective electronic components for the consumer electronics and automotive markets. Its product portfolio includes e.g. touch panels, cover glass, camera modules, biometric sensors, haptic response technology and LCD modules. The company, which has market cap of CNY 37.1bn, generated revenues of CNY 33.8bn and an EBIT of CNY 1.7bn in 2017.
- (6) *Canatu Oyi*: Canatu, which is based in Helsinki/Finland, supplies Carbon NanoBud films and touch sensors to touch module vendors and OEMs in several industries, for example consumer electronics and automotive. Canatu's sales network covers Europe, Japan, Korea, China and the USA.

- (7) *Eikos Inc.*: Eikos, which is based in the Franklin/US, is a product developing firm, which leverages the unique properties of carbon nanotubes and specialty coatings in the area of electricity and optics.
- (8) *C3Nano Inc.*: C3Nano, which is based in Hayward/US, is a spinout from Professor Zhenan Bao's chemical engineering laboratory at Stanford University. The company is the developer of the solution-based, transparent conductive inks and films as direct replacements for indium tin oxide (ITO). Investors include among others Hitachi Chemical.
- (9) *Hereaus Holding GmbH*: Hereaus, which is based in Hanau/Germany, creates high-quality solutions by combining material expertise with technological know-how in areas such as Electronics, Photovoltaics or Electro-Nite. In 2017, the company, which is family-owned, generated revenues of EUR 2.2bn (excl. its precious metal business).
- (10) *Agfa-Gevaert NV*: Agfa-Gevaert, which is based in Mortsel/Belgium, develops, produces and distributes an extensive range of analog and digital imaging systems and IT solutions e.g. for the printing industry and the healthcare sector. The company, which is listed in Germany, has a market cap of EUR 642.7m. In 2017, it generated revenues of EUR 2.4bn and an EBIT of EUR 126m.
- (11) *Eastman Kodak Corp.*: Eastman Kodak, which is based in Rochester/US, provides hardware, software, consumables and services to customers from the areas graphic arts, commercial print, publishing, packaging, electronic displays, entertainment and commercial films and consumer products. The company, which is listed in the US, has a market cap of USD 123.8m. In 2017, it generated revenues of USD 1.5bn and an EBIT of USD 104m.
- (12) *Cambrios Advanced Materials*: Cambrios, which is based in Sunnyvale/US, develops electronic materials such as wet-processable transparent conductive films for the display industry.
- (13) *Seashell Technologies LLC*: Seashell, which is based in San Diego/US, is engaged in the development and production of specialty materials with micro- and nanoscale features. The company supplies nanoparticles and nanostructured materials for academic research, development projects and for industrial processes.
- (14) *ClearJet Ltd.*: ClearJet, which is based in Zichron Yaacov/Israel, develops a TCF technology based on silver nano-particles for application in digital printing.
- (15) *Scrona AG*: Scrona, which is based in Zurich/Switzerland, develops printer heads, which print nano-ink with high precision.

Company	EV/Sales			EV/EBITDA			P/E			P/BVPS	EBITDA margin	Net gearing
	2018E	2019E	2020E	2018E	2019E	2020E	2018E	2019E	2020E	Latest	2017	Latest
Nano Dimension Ltd. (USD)	7.73x	3.30x	2.32x	n.a	n.a	n.a	n.a	n.a	n.a	6.58x	neg	-50.35%
FujiFilm Holdings Corp. (JPY)	0.70x	0.65x	0.63x	5.36x	4.79x	4.71x	14.92x	12.46x	11.60x	0.95x	10.60%	-12.80%
O-Film Tec Co. Ltd. (CNY)	1.10x	0.86x	0.72x	10.67x	9.14x	7.71x	17.99x	12.78x	10.13x	3.80x	8.60%	111.69%
Agfa-Geveart NV (EUR)	0.31x	0.31x	n.a	3.74x	3.54x	n.a	9.58x	n.a	n.a	2.38x	7.00%	20.37%
<b>Median</b>	<b>0.90x</b>	<b>0.75x</b>	<b>0.72x</b>	<b>5.36x</b>	<b>4.79x</b>	<b>6.21x</b>	<b>14.92x</b>	<b>12.62x</b>	<b>10.86x</b>	<b>3.09x</b>	<b>8.60%</b>	<b>3.78%</b>
XTPL S.A. (PLN)	198.38x	14.91x	5.66x	n.a	68.96x	16.11x	n.a	120.65x	24.19x	46.84x	neg	-54.59%

Source: CapitalIQ, East Value Research GmbH

Technology	Description	Resistance <10 (OHM/m <sup>2</sup> )	Transparency >97 (%)	Flexibility	Companies, which are engaged
XTPL	A special ink that was formulated by XTPL's lab is precisely applied to the printing surface. Under the influence of an external electric field, the nanoparticles in the ink create conductive lines according to specified parameters e.g. thickness of the lines, their length and the distance between them	X	X	X	
ITO	Indium is a by-product created in zinc manufacturing. When converted into ITO, it turns into a transparent conductor by sputter coating a target material such as glass using a vapour deposition process in a vacuum chamber. The film is then laser-etched.				Current standard
Metal mesh	Various methods relating to imposing metal e.g. photolithography, direct printing, embossing	X		X	PolyIC, UniPixel, Rolith, FujiFilm, O-Film, CimaNanotech, ClearJet, 3M
Carbon nanotubes	Carbon nanotubes are allotropes of carbon with a cylindrical nanostructure.			X	Canatu, Eikos, C3Nano, CnTouch
Graphen	Graphene is a single-atomic layer of carbon atoms arranged in a hexagonal lattice		X	X	R&D phase
Leading polymers	Organic polymers that conduct electricity and are not thermoformable			X	Hereaus, Agfa-Gevaert, Kodak
Silver nanowires	Silver nanowires are strands of silver thinner than a human hair. They can be created by the silver polyol method (AG+/PVP) and then using a millifluidic reactor and a process called flow chemistry.		X	X	C3Nano, Cambrios, Seashell Technologies

Source: East Value Research GmbH

## Profit and loss statement

in PLNm	2017	2018E	2019E	2020E	2021E	2022E
<b>Revenues</b>	<b>0.00</b>	<b>1.09</b>	<b>14.50</b>	<b>38.21</b>	<b>68.65</b>	<b>106.90</b>
Cost of goods sold	-2.59	-0.42	-5.22	-13.30	-23.04	-35.48
<b>Gross profit</b>	<b>-2.59</b>	<b>0.67</b>	<b>9.28</b>	<b>24.92</b>	<b>45.61</b>	<b>71.42</b>
Other operating income	2.21	2.70	4.24	1.09	0.05	0.05
Personnel expenses	-2.68	-4.85	-6.40	-7.04	-7.74	-8.52
R&D expenses	0.00	-2.60	-3.50	-4.30	-5.20	-6.30
Other operating expenses	-0.41	-0.44	-0.48	-1.25	-1.49	-2.58
<b>EBITDA</b>	<b>-3.48</b>	<b>-4.53</b>	<b>3.13</b>	<b>13.41</b>	<b>31.23</b>	<b>54.08</b>
Depreciation & amortisation	-0.47	-0.56	-0.62	-0.68	-0.75	-0.83
<b>Operating income</b>	<b>-3.95</b>	<b>-5.09</b>	<b>2.51</b>	<b>12.73</b>	<b>30.48</b>	<b>53.25</b>
Net financial result	-0.01	0.05	0.05	0.05	0.04	0.04
<b>EBT</b>	<b>-3.96</b>	<b>-5.04</b>	<b>2.56</b>	<b>12.78</b>	<b>30.52</b>	<b>53.29</b>
Income taxes	0.00	-0.06	-0.49	-2.43	-5.80	-10.13
Minorities	0.00	0.00	0.00	0.00	0.00	0.00
<b>Net income / loss</b>	<b>-3.96</b>	<b>-5.10</b>	<b>2.08</b>	<b>10.35</b>	<b>24.72</b>	<b>43.17</b>
Diluted EPS	-2.34	-2.95	1.07	5.33	12.74	22.24
DPS	0.00	0.00	0.00	0.00	0.00	0.00
<b>Share in total sales</b>						
Revenues	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Cost of goods sold	n.a	-38.85 %	-36.00 %	-34.80 %	-33.56 %	-33.19 %
Gross profit	n.a	61.15 %	64.00 %	65.20 %	66.44 %	66.81 %
Other operating income	n.a	247.82 %	29.21 %	2.84 %	0.07 %	0.05 %
Personnel expenses	n.a	-445.16 %	-44.15 %	-18.42 %	-11.28 %	-7.97 %
R&D expenses	n.a	-238.64 %	-24.14 %	-11.25 %	-7.58 %	-5.89 %
Other operating expenses	n.a	-40.68 %	-3.30 %	-3.27 %	-2.17 %	-2.41 %
EBITDA	n.a	-415.51 %	21.62 %	35.10 %	45.49 %	50.58 %
Depreciation & amortisation	n.a	-51.75 %	-4.28 %	-1.79 %	-1.09 %	-0.77 %
Operating income	n.a	-467.26 %	17.34 %	33.31 %	44.40 %	49.81 %
Net financial result	n.a	4.59 %	0.33 %	0.12 %	0.06 %	0.04 %
EBT	n.a	-462.67 %	17.67 %	33.43 %	44.46 %	49.85 %
Income taxes	n.a	-5.51 %	-3.36 %	-6.35 %	-8.45 %	-9.47 %
Minorities	n.a	0.00 %	0.00 %	0.00 %	0.00 %	0.00 %
Net income / loss	n.a	-468.18 %	14.32 %	27.08 %	36.01 %	40.38 %

## Balance Sheet

in PLNm	2017	2018E	2019E	2020E	2021E	2022E
Cash and equivalents	6.21	22.46	15.01	13.34	24.81	53.13
Financial assets	0.00	0.00	0.00	0.00	0.00	0.00
Inventories	0.00	0.06	0.68	1.64	2.68	3.89
Trade accounts and notes receivables	0.01	0.63	7.94	19.58	32.72	47.15
Other current assets	0.70	0.77	0.85	0.94	1.03	1.13
<b>Current assets, total</b>	<b>6.92</b>	<b>23.92</b>	<b>24.48</b>	<b>35.50</b>	<b>61.24</b>	<b>105.31</b>
Property, plant and equipment	0.57	2.80	5.50	5.55	5.60	5.65
Other intangible assets	0.54	1.80	2.10	2.40	2.70	3.00
Goodwill	0.00	0.00	0.00	0.00	0.00	0.00
Other assets	0.01	0.01	0.01	0.01	0.01	0.01
Deferred tax assets	0.00	0.00	0.00	0.00	0.00	0.00
<b>Non-current assets, total</b>	<b>1.13</b>	<b>4.61</b>	<b>7.61</b>	<b>7.96</b>	<b>8.31</b>	<b>8.66</b>
<b>Total assets</b>	<b>8.05</b>	<b>28.53</b>	<b>32.09</b>	<b>43.46</b>	<b>69.56</b>	<b>113.97</b>
Trade payables	0.30	0.23	1.72	2.73	4.10	5.35
Other short-term liabilities	0.41	0.42	0.42	0.43	0.43	0.43
Short-term financial debt	0.03	0.00	0.00	0.00	0.00	0.00
Pension provisions	0.00	0.00	0.00	0.00	0.00	0.00
Provisions	0.11	0.00	0.00	0.00	0.00	0.00
<b>Current liabilities, total</b>	<b>0.84</b>	<b>0.65</b>	<b>2.14</b>	<b>3.16</b>	<b>4.53</b>	<b>5.78</b>
Long-term financial debt	0.03	0.00	0.00	0.00	0.00	0.00
Deferred tax liabilities	0.00	0.00	0.00	0.00	0.00	0.00
<b>Long-term liabilities, total</b>	<b>0.03</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Total liabilities</b>	<b>0.87</b>	<b>0.65</b>	<b>2.14</b>	<b>3.16</b>	<b>4.53</b>	<b>5.78</b>
<b>Shareholders equity, total</b>	<b>7.18</b>	<b>27.88</b>	<b>29.96</b>	<b>40.30</b>	<b>65.03</b>	<b>108.19</b>
Minority interests	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total liabilities and equity</b>	<b>8.05</b>	<b>28.53</b>	<b>32.09</b>	<b>43.46</b>	<b>69.56</b>	<b>113.97</b>

## Cash Flow Statement

in PLNm	2017	2018E	2019E	2020E	2021E	2022E
Net income / loss	-3.96	-5.10	2.08	10.35	24.72	43.17
Depreciation & amortisation	0.47	0.56	0.62	0.68	0.75	0.83
Change of working capital	-0.37	-0.81	-6.53	-11.66	-12.91	-14.49
Others	0.11	0.11	0.00	0.00	0.00	0.00
<b>Net operating cash flow</b>	<b>-3.75</b>	<b>-5.24</b>	<b>-3.83</b>	<b>-0.63</b>	<b>12.56</b>	<b>29.50</b>
<b>Cash flow from investing</b>	<b>-0.44</b>	<b>-4.05</b>	<b>-3.62</b>	<b>-1.03</b>	<b>-1.10</b>	<b>-1.18</b>
Free cash flow	-4.19	-9.28	-7.45	-1.66	11.46	28.33
<b>Cash flow from financing</b>	<b>8.96</b>	<b>25.53</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Change of cash	4.77	16.25	-7.45	-1.66	11.46	28.33
Cash at the beginning of the period	1.42	6.21	22.46	15.01	13.34	24.81
Cash at the end of the period	6.21	22.46	15.01	13.34	24.81	53.13

## Financial ratios

Fiscal year	2017	2018E	2019E	2020E	2021E	2022E
<b>Profitability and balance sheet quality</b>						
Gross margin	n.a	61.15%	64.00%	65.20%	66.44%	66.81%
EBITDA margin	n.a	-415.51%	21.62%	35.10%	45.49%	50.58%
EBIT margin	n.a	-467.26%	17.34%	33.31%	44.40%	49.81%
Net margin	n.a	-468.18%	14.32%	27.08%	36.01%	40.38%
Return on equity (ROE)	-88.68%	-29.10%	7.18%	29.46%	46.94%	49.84%
Return on assets (ROA)	-49.06%	-18.05%	6.32%	23.70%	35.48%	37.84%
Return on capital employed (ROCE)	-54.82%	-18.48%	6.80%	25.58%	37.96%	39.87%
Economic Value Added (in PLN)	-5.03	-9.32	-2.44	4.28	14.96	26.95
Net debt (in PLNm)	-6.16	-22.46	-15.01	-13.34	-24.81	-53.13
Net gearing	-85.78%	-80.55%	-50.09%	-33.11%	-38.15%	-49.11%
Equity ratio	89.19%	97.72%	93.34%	92.73%	93.48%	94.93%
Current ratio	8.19	36.80	11.45	11.24	13.51	18.21
Quick ratio	7.36	35.52	10.73	10.42	12.69	17.35
Net interest cover	-343.83	101.82	-52.37	-276.74	-692.64	-1267.85
Net debt/EBITDA	1.77	4.96	-4.79	-0.99	-0.79	-0.98
Tangible BVPS	4.24	16.14	15.43	20.77	33.50	55.74
CAPEX/Sales	n.a	371.60%	24.97%	2.70%	1.60%	1.10%
Working capital/Sales	n.a	74.28%	50.61%	49.71%	46.48%	43.40%
Cash Conversion Cycle (in days)	-42	60	128	157	152	146
<b>Trading multiples</b>						
EV/Sales	n.a	198.38	14.91	5.66	3.15	2.02
EV/EBITDA	-62.10	-47.74	68.96	16.11	6.92	4.00
EV/EBIT	-54.71	-42.46	85.97	16.98	7.09	4.06
P/Tangible BVPS	30.45	7.99	8.36	6.21	3.85	2.31
P/E	-55.19	-43.69	120.65	24.19	10.13	5.80
P/FCF	-52.14	-23.55	-29.35	-131.64	19.08	7.72

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