

SuperPress P/L – Information from interview with Supply Chain Manager

SuperPress P/L source metal sheet blanks from Thailand, and produce pressed parts for Mega Autos (MA).

There are four different parts (panels) produced for MA, and one press line on which the parts are manufactured. The parts are for “bonnet” and “boot” panels, and have inner and outer components. The blanks for the parts are different sizes (thickness, width, length) and so are not interchangeable between parts. That is, Parts P1 to P4 use respective blanks B1 to B4.

The sheet blanks are transported in specialised pallets, which are stacked in temperature-controlled shipping containers. The number of pallets per container depends on the size of the blanks and therefore on the intended part, but 7-8 pallets per container is normal.

There are around 250 pallets in circulation at any time. Pallets cycle between Australia and Thailand.

Blanks are ordered once monthly, and are received at the SuperPress plant about 35 days after ordering. This lead time exhibits some variability (of a few days).

The plant operates 5 days per week, excepting public holidays and shutdown periods.

SuperPress hold some inventory of completed parts. The size of this inventory is a decision SuperPress is free to make.

Tool-change durations on the press line mean that SuperPress avoids small lot sizes, and will instead tend to produce more than a day's demand for parts in one lot. In turn, this means that not all parts are produced on all working days.

The blanks should be used promptly, as aging effects reduce the material's suitability in manufacture. Blanks that have been in storage for more than around six weeks can be of concern.

The number of blanks required for manufacturing a given quantity of a certain part can vary, presumably due to some pressings being non-conforming (varies from 0% to 5%).

MA place orders on SuperPress approximately 24 hours in advance.

Demand from MA varies from day to day, and is not accurately predictable.

The ratio of demand for one part to another varies, because the range of parts relates to more than one model of vehicle.

Pallet return to Thailand involves a journey of around the same duration as the order lead time

From the fact that transit time is about 35 days, then we assume that typically the order decision is made, and the order is placed, before the arrival of the previous month's order at the plant. Thus there are two orders in transit during part of the month.

SuperPress want to understand:

- Is 250 pallets enough for the supply chain?
- How many blanks of each type to order each month (this can be a dynamic decision)
- How to avoid wastage of blanks and excessive holding costs for finished goods
- What is the potential value of twice-monthly ordering?

Data from SuperPress follows

PARAMETERS

PALLETS IN SUPPLY CHAIN	250
WORKING DAYS / WEEK	5

PARTS AND BLANKS

Part	Uses Blank
P1	B1
P2	B2
P3	B3
P4	B4

CAR MODELS AND PARTS

	Model	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
	Name	<i>Navigator</i>	<i>Orion</i>	<i>Prince</i>	<i>Quest</i>	<i>Regal</i>	<i>Sports</i>	<i>Trail-X</i>
USES P1		1	1	0	0	1	1	0
USES P2		1	1	0	0	1	1	0
USES P3		0	1	1	1	1	0	1
USES P4		0	1	1	1	0	1	1

BLANKS PER PALLET

Blank	B1	B2	B3	B4
Number per Pallet	160	175	175	190

BLANK USABILITY (based on surface condition, determined in-line prior to pressing by non-destructive optical testing)

AGE OF BLANK (WEEKS)	PROBABILITY OF BEING UNUSABLE
<6	0
7	0.05
8	0.12
9	0.34
10	0.71
11	0.94
12	1

Percent of pressed parts non-conforming (rejected)	Frequency			
	PART P1	PART P2	PART P3	PART P4
0.00%	16	28	18	0
0.20%	16	27	13	0
0.40%	17	22	17	0
0.60%	18	22	11	4
0.80%	18	21	11	10
1.00%	18	19	15	12
1.20%	18	17	9	13
1.40%	16	14	9	16
1.60%	13	12	10	16
1.80%	14	10	13	16
2.00%	13	8	14	16
2.20%	11	7	11	15
2.40%	9	6	12	15
2.60%	7	5	8	14
2.80%	6	2	6	13
3.00%	6	1	4	11
3.20%	4	0	9	11
3.40%	2	0	4	10
3.60%	2	0	4	9
3.80%	0	0	3	6
4.00%	0	0	2	5
4.20%	0	0	8	4
4.40%	0	0	7	4
4.60%	0	0	1	2
4.80%	0	0	2	2
5.00%	0	0	1	0

MONTH				MONTHLY CAR PRODUCTION						
				Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Month #	Month starting	Month Ending	Working Days	Navigator	Orion	Prince	Quest	Regal	Sports	Trail-X
1	1/03/2009	31/03/2009	19	1453	505	1150	521	483	0	209
2	1/04/2009	30/04/2009	22	1586	543	1253	518	518	0	237
3	1/05/2009	31/05/2009	21	1706	564	1349	547	565	0	249
4	1/06/2009	30/06/2009	21	1513	500	1211	510	467	0	190
5	1/07/2009	31/07/2009	23	1451	488	1156	489	484	0	215
6	1/08/2009	31/08/2009	21	1453	492	1113	470	452	0	192
7	1/09/2009	30/09/2009	21	1529	493	1185	522	479	0	229
8	1/10/2009	31/10/2009	22	1475	475	1159	502	472	0	203
9	1/11/2009	30/11/2009	19	1378	424	1038	482	448	0	194
10	1/12/2009	31/12/2009	14	934	288	755	354	310	0	164
11	1/01/2010	31/01/2010	14	1008	316	766	348	331	0	141
12	1/02/2010	28/02/2010	20	1416	440	1105	507	461	0	210
13	1/03/2010	31/03/2010	22	1392	460	1107	0	465	517	168
14	1/04/2010	30/04/2010	20	1339	399	1025	0	465	491	146
15	1/05/2010	31/05/2010	15	1022	319	802	0	353	368	117
16	1/06/2010	30/06/2010	21	1412	446	1100	0	479	493	195
17	1/07/2010	31/07/2010	22	1450	460	1152	0	462	500	174
18	1/08/2010	31/08/2010	22	1527	456	1237	0	526	527	224
19	1/09/2010	30/09/2010	22	1385	433	1040	0	418	451	159
20	1/10/2010	31/10/2010	21	1549	510	1262	0	474	582	181
21	1/11/2010	30/11/2010	21	1535	501	1210	0	490	545	223
22	1/12/2010	31/12/2010	13	984	325	781	0	318	332	149
23	1/01/2011	31/01/2011	10	647	214	496	0	203	217	86
24	1/02/2011	28/02/2011	20	1343	447	1057	0	449	475	0
25	1/03/2011	31/03/2011	22	1596	498	1183	0	528	566	0
26	1/04/2011	30/04/2011	21	1419	457	1098	0	477	525	0
27	1/05/2011	31/05/2011	22	1577	522	1169	0	490	579	0
28	1/06/2011	30/06/2011	21	1404	459	1109	0	480	497	0
29	1/07/2011	31/07/2011	21	1416	479	1047	0	440	518	0
30	1/08/2011	31/08/2011	23	1785	583	1281	0	562	640	0
31	1/09/2011	30/09/2011	17	1046	353	807	0	352	392	0
32	1/10/2011	31/10/2011	21	1577	513	1193	0	519	593	0
33	1/11/2011	30/11/2011	21	1486	481	1090	0	504	551	0
34	1/12/2011	31/12/2011	17	1162	393	843	0	382	416	0
35	1/01/2012	31/01/2012	14	981	315	735	0	316	375	0
36	1/02/2012	29/02/2012	21	1517	498	1104	0	464	578	0
37	1/03/2012	31/03/2012	21	1491	515	1050	0	478	560	0

Order Date	Receipt at Port	Pallets of B1	Pallets of B2	Pallets of B3	Pallets of B4
Monday, 2 March 2009	Sunday, 5 April 2009	16	15	17	13
Friday, 3 April 2009	Saturday, 9 May 2009	17	16	18	14
Monday, 4 May 2009	Thursday, 4 June 2009	19	17	20	15
Monday, 1 June 2009	Wednesday, 8 July 2009	16	15	17	14
Friday, 3 July 2009	Friday, 7 August 2009	16	15	17	13
Monday, 3 August 2009	Monday, 7 September 2009	16	15	16	13
Monday, 7 September 2009	Wednesday, 14 October 2009	17	15	18	14
Monday, 5 October 2009	Sunday, 8 November 2009	16	15	17	13
Monday, 2 November 2009	Friday, 4 December 2009	15	14	16	12
Monday, 7 December 2009	Friday, 8 January 2010	10	9	11	9
Monday, 4 January 2010	Saturday, 6 February 2010	11	10	12	9
Monday, 8 February 2010	Tuesday, 16 March 2010	15	14	16	13
Tuesday, 2 March 2010	Tuesday, 6 April 2010	19	17	13	13
Wednesday, 31 March 2010	Thursday, 6 May 2010	18	16	12	12
Monday, 3 May 2010	Saturday, 5 June 2010	14	13	10	9
Monday, 7 June 2010	Saturday, 10 July 2010	19	17	13	13
Monday, 5 July 2010	Monday, 9 August 2010	19	9	4	3
Tuesday, 3 August 2010	Sunday, 5 September 2010	20	18	15	14
Monday, 6 September 2010	Wednesday, 13 October 2010	18	16	13	12
Tuesday, 5 October 2010	Thursday, 16 December 2010	20	19	15	14
Tuesday, 16 November 2010	Friday, 17 December 2010	no data	no data	no data	no data
Wednesday, 8 December 2010	Wednesday, 12 January 2011	no data	no data	no data	no data
Wednesday, 5 January 2011	Saturday, 5 February 2011	9	8	6	6
Friday, 4 February 2011	Wednesday, 9 March 2011	18	16	12	11
Tuesday, 1 March 2011	Wednesday, 6 April 2011	21	19	13	13
Monday, 4 April 2011	Saturday, 7 May 2011	19	17	12	12
Monday, 2 May 2011	Thursday, 9 June 2011	21	19	13	13
Monday, 6 June 2011	Saturday, 9 July 2011	19	17	12	12
Monday, 4 July 2011	Monday, 5 September 2011	19	17	12	12
Friday, 5 August 2011	Monday, 8 August 2011	23	21	15	14
Monday, 5 September 2011	Tuesday, 11 October 2011	14	13	9	9
Monday, 3 October 2011	Thursday, 3 November 2011	21	19	14	13
Monday, 7 November 2011	Thursday, 8 December 2011	20	18	13	12
Monday, 5 December 2011	Sunday, 8 January 2012	16	14	10	9
Monday, 2 January 2012	Monday, 6 February 2012	13	12	9	8
Monday, 6 February 2012	Friday, 9 March 2012	20	18	13	12