DANIELI MORGÅRDSHAMMAR	**JOB N°** **DPC68X01**	**Doc**.: 000-000-375-615 **Rev**: 00 **Page**: 1/91
	Customer: BARRAMANSA	

ROLLING MILL CALCULATIONS

FOR FLATS

Remarks:

- For rolling sequences see drawing 000-000-361-340
- Calculations consider an average temperature of 1050°C at first stand entry

Rev.	Date	Description	Compiled	Checked	Approved
00	07-04-2023	ISSUED	Trevisan M.	Paron L.	

DOCUMENT CONTENTS

Remark:

- R-factor = elongation

1 Gear ratios and motors summarizing table

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

STAND NO.	STAND TYPE	GEAR RATIO 1^	GEAR RATIO 2^	MOTOR TYPE	MOTOR POWER (kW)	MOTOR RPM (RPM)
1H	GCC7555	118.730		AC	450	0 /1000 /2000
2V	GCC7555	85.673		AC	450	0 /1000 /2000
3H	GCC7555	118.730		AC	450	0 /1000 /2000
4H/V	GCC6548	74.409		AC	450	0 /1000 /2000
5H	GUC8548	87.594		AC	800	0 /1000 /2000
6H/V	GCC6548	68.825		AC	450	0 /1000 /2000
7H	GUC8548	55.247	73.990	AC	800	0 /1000 /2000
8H/V	GUC8548	43.393	58.768	AC	800	0 /1000 /2000
9H	GUC8548	37.442	49.768	AC	800	0 /1000 /2000
10H/V	GUC8548	27.471	37.083	AC	800	0 /1000 /2000
11H	GCC6548	17.428	26.576	AC	800	0 /1000 /2000
12H/V	GUC8548	13.852	27.600	AC	800	0 /1000 /2000
13H	GUC8548	11.734	22.354	AC	800	0 /1000 /2000
14H/V	GCC6548	9.471	18.603	AC	800	0 /1000 /2000
15H	GUC8548	9.841	19.250	AC	800	0 /1000 /2000

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2 Roll pass design calculations

2.1 Flats from billet 180mm

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED	:	Flat 4"x1/4" Hot rolling
MATERIAL	:	Low-med. carbon steel
ROLLING SPEED	:	4.96 m/s
AXV	:	3272.11 mm²m/s
BILLET SIZE	:	182.3 mm SQUARE
BILLET WEIGHT	:	2970.0 kg
MAX HEATING CAPABILITY	:	80.0 t/h
ROLLING TIME	:	118.7 s
INTER BILLET	:	15.0 s
PRODUCTION	:	80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30 X	182.30	33147.4	
1H	750.0	20.00	BOX	124.00 X	206.79	24635.6	25.7
2V	750.0	18.00	BOX	136.50 X	144.56	18539.6	24.7
3H	750.0	17.00	R.BOX	93.00 X	162.38	13163.3	29.0
4V	660.0	15.00	ROUND	111.00 X	110.68	9671.8	26.5
5H	660.0	12.00	R.OVAL	67.60 X	132.54	6962.7	28.0
6V	660.0	12.00	ROUND	82.00 X	82.39	5292.0	24.0
7H	660.0	40.00	FLAT	40.00 X	106.11	4038.8	23.7
8V	660.0	8.00	EDGING	78.00 X	43.52	3366.0	16.7
9H	660.0	24.50	FLAT	24.50 X	95.19	2326.4	30.9
10H	660.0	15.50	FLAT	15.50 X	107.44	1659.1	28.7
11H	590.0	10.60	FLAT	10.60 X	115.38	1216.9	26.7
12V	590.0	20.00	EDGING	100.00 X	11.17	1112.3	8.6
13H	590.0	7.90	FLAT	7.90 X	105.56	831.2	25.3
14V	590.0	35.50	EDGING	100.50 X	8.01	802.3	3.5
15H	590.0	6.43	FLAT	6.43 X	102.90	660.2	17.7

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DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x1/4"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 4.96 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.18	639.8	5.3	85.673	451	1.329	110.2	1853.6	266.81	147	72.5
3H	0.25	685.9	6.9	118.730	822	1.408	64.1	2263.0	292.11	212	57.3
4V	0.34	587.6	11.0	74.409	818	1.361	72.4	1431.4	173.67	200	54.3
5H	0.47	619.5	14.5	87.594	1269	1.389	40.5	1654.8	168.36	255	31.9
6V	0.62	607.8	19.4	68.825	1337	1.316	52.2	1042.5	118.19	240	53.4
7H	0.81	660.0	23.4	55.247	1295	1.310	0.0	1376.9	142.92	351	43.9
8V	0.97	590.7	31.4	43.393	1364	1.200	69.3	419.7	35.35	116	14.5
9H	1.41	660.0	40.7	37.442	1524	1.447	0.0	1426.3	108.91	464	58.0
10H	1.97	660.0	57.1	27.471	1568	1.402	0.0	1398.2	73.69	440	55.1
11H	2.69	590.0	87.0	17.428	1517	1.363	0.0	1293.0	47.48	433	54.1
12V	2.94	510.4	110.1	13.852	1525	1.094	79.6	89.0	5.80	67	8.4
13H	3.94	590.0	127.4	11.734	1495	1.338	0.0	1175.0	34.97	467	58.3
14V	4.08	525.4	148.3	9.471	1404	1.036	64.6	35.6	1.42	22	2.8
15H	4.96	590.0	160.4	9.841	1579	1.215	0.0	848.6	17.70	297	37.2

TOTAL ROLLING POWER : 3847 kW

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DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x5/16"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 3.96 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30	X 182.30	33147.4	
1H	750.0	20.00	BOX	124.00	X 206.79	24635.6	25.7
2V	750.0	18.00	BOX	136.50	X 144.56	18539.6	24.7
3H	750.0	17.00	R.BOX	93.00	X 162.38	13163.3	29.0
4V	660.0	15.00	ROUND	111.00	X 110.68	9671.8	26.5
5H	660.0	12.00	R.OVAL	67.60	X 132.54	6962.7	28.0
6V	660.0	12.00	ROUND	82.00	X 82.39	5292.0	24.0
7H	660.0	40.00	FLAT	40.00	X 106.11	4038.8	23.7
8V	660.0	8.00	EDGING	78.00	X 43.52	3366.0	16.7
9H	660.0	24.50	FLAT	24.50	X 95.19	2326.4	30.9
10H	660.0	15.80	FLAT	15.80	X 106.89	1683.4	27.6
11H	590.0	11.20	FLAT	11.20	X 114.04	1272.6	24.4
12V	590.0	21.50	EDGING	101.50	X 11.67	1179.5	7.3
13H	590.0	9.00	FLAT	9.00	X 105.34	946.1	19.8
14V	590.0	11.10	EDGING	102.10	X 9.07	922.5	2.5
15H	590.0	8.04	FLAT	8.04	X 102.90	825.8	10.5

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DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x5/16"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 3.96 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.18	639.8	5.3	85.673	451	1.329	110.2	1853.6	266.81	147	72.5
3H	0.25	685.9	6.9	118.730	822	1.408	64.1	2263.0	292.11	212	57.3
4V	0.34	587.6	11.0	74.409	818	1.361	72.4	1431.4	173.67	200	54.3
5H	0.47	619.5	14.5	87.594	1269	1.389	40.5	1654.8	168.36	255	31.9
6V	0.62	607.8	19.4	68.825	1337	1.316	52.2	1042.5	118.19	240	53.4
7H	0.81	660.0	23.4	55.247	1295	1.310	0.0	1376.9	142.92	351	43.9
8V	0.97	590.7	31.4	43.393	1364	1.200	69.3	419.7	35.35	116	14.5
9H	1.41	660.0	40.7	37.442	1524	1.447	0.0	1426.3	108.91	464	58.0
10H	1.94	660.0	56.2	27.471	1545	1.382	0.0	1349.3	70.09	413	51.6
11H	2.57	590.0	83.2	17.428	1450	1.323	0.0	1185.5	42.44	370	46.2
12V	2.77	510.4	103.8	13.852	1438	1.079	79.6	82.9	4.95	54	6.7
13H	3.46	590.0	112.0	11.734	1314	1.247	0.0	948.0	25.84	303	37.9
14V	3.55	499.4	135.6	9.471	1285	1.026	90.6	31.3	1.01	14	1.8
15H	3.96	590.0	128.3	9.841	1262	1.117	0.0	544.1	9.38	126	15.7

TOTAL ROLLING POWER : 3401 kW

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DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x3/8"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 3.30 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30	X 182.30	33147.4	
1H	750.0	20.00	BOX	124.00	X 206.79	24635.6	25.7
2V	750.0	18.00	BOX	136.50	X 144.56	18539.6	24.7
3H	750.0	17.00	R.BOX	93.00	X 162.38	13163.3	29.0
4V	660.0	15.00	ROUND	111.00	X 110.68	9671.8	26.5
5H	660.0	12.00	R.OVAL	67.60	X 132.54	6962.7	28.0
6V	660.0	12.00	ROUND	82.00	X 82.39	5292.0	24.0
7H	660.0	40.00	FLAT	40.00	X 106.11	4038.8	23.7
8V	660.0	8.00	EDGING	78.00	X 43.52	3366.0	16.7
9H	660.0	25.50	FLAT	25.50	X 93.95	2390.6	29.0
10H	660.0	17.40	FLAT	17.40	X 104.14	1808.3	24.4
11H	590.0	13.00	FLAT	13.00	X 110.27	1430.7	20.9
12V	590.0	22.00	EDGING	102.00	X 13.33	1353.9	5.4
13H	590.0	10.70	FLAT	10.70	X 105.22	1123.8	17.0
14V	590.0	30.20	EDGING	102.20	X 10.78	1097.1	2.4
15H	590.0	9.65	FLAT	9.65	X 102.90	991.3	9.6

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x3/8"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 3.30 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.18	639.8	5.3	85.673	451	1.329	110.2	1853.6	266.81	147	72.5
3H	0.25	685.9	6.9	118.730	822	1.408	64.1	2263.0	292.11	212	57.3
4V	0.34	587.6	11.0	74.409	818	1.361	72.4	1431.4	173.67	200	54.3
5H	0.47	619.5	14.5	87.594	1269	1.389	40.5	1654.8	168.36	255	31.9
6V	0.62	607.8	19.4	68.825	1337	1.316	52.2	1042.5	118.19	240	53.4
7H	0.81	660.0	23.4	55.247	1295	1.310	0.0	1376.9	142.92	351	43.9
8V	0.97	590.7	31.4	43.393	1364	1.200	69.3	419.7	35.35	116	14.5
9H	1.37	660.0	39.6	37.442	1483	1.408	0.0	1346.6	100.52	417	52.1
10H	1.81	660.0	52.4	27.471	1438	1.322	0.0	1196.2	60.50	332	41.5
11H	2.29	590.0	74.0	17.428	1290	1.264	0.0	1016.1	36.01	279	34.9
12V	2.42	510.4	90.4	13.852	1253	1.057	79.6	74.6	3.71	35	4.4
13H	2.91	590.0	94.3	11.734	1106	1.205	0.0	846.1	23.16	229	28.6
14V	2.98	518.4	109.9	9.471	1041	1.024	71.6	37.0	1.18	14	1.7
15H	3.30	590.0	106.8	9.841	1052	1.107	0.0	519.4	9.45	106	13.2

TOTAL ROLLING POWER : 3068 kW

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DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 100x12
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 2.66 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30 X	182.30	33147.4	
1H	750.0	20.00	BOX	124.00 X	206.79	24635.6	25.7
2V	750.0	18.00	BOX	136.50 X	144.56	18539.6	24.7
3H	750.0	17.00	R.BOX	93.00 X	162.38	13163.3	29.0
4V	660.0	15.00	ROUND	111.00 X	110.68	9671.8	26.5
5H	660.0	15.00	R.OVAL	70.60 X	130.14	7276.6	24.8
6V	660.0	22.00	ROUND	92.00 X	81.49	6043.3	16.9
7H	660.0	40.00	FLAT	40.00 X	118.13	4509.6	25.4
8V	660.0	26.50	EDGING	96.50 X	41.92	4028.8	10.7
9H	660.0	25.50	FLAT	25.50 X	111.97	2850.4	29.2
10V	660.0	13.50	EDGING	98.50 X	26.64	2605.8	8.6
11H	590.0	17.50	FLAT	17.50 X	108.39	1890.6	27.4
12V	590.0	19.50	EDGING	99.50 X	17.96	1779.1	5.9
13H	590.0	13.70	FLAT	13.70 X	104.50	1429.0	19.7
14V	590.0	15.00	EDGING	100.00 X	13.86	1380.7	3.4
15H	590.0	12.16	FLAT	12.16 X	101.30	1229.7	10.9

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DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 100x12
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 2.66 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.18	639.8	5.3	85.673	451	1.329	110.2	1853.6	266.81	147	72.5
3H	0.25	685.9	6.9	118.730	822	1.408	64.1	2263.0	292.11	212	57.3
4V	0.34	587.6	11.0	74.409	818	1.361	72.4	1431.4	173.67	200	54.3
5H	0.45	619.1	13.9	87.594	1215	1.329	40.9	1501.0	148.84	216	27.0
6V	0.54	607.8	17.0	68.825	1171	1.204	52.2	863.6	89.88	160	35.6
7H	0.73	660.0	21.0	55.247	1160	1.340	0.0	1601.8	167.67	369	46.1
8V	0.81	590.4	26.3	43.393	1140	1.119	69.6	314.7	22.95	63	7.9
9H	1.15	660.0	33.2	37.442	1244	1.413	0.0	1604.7	115.25	401	50.1
10V	1.26	575.7	41.7	27.471	1144	1.094	84.3	196.1	13.03	57	7.1
11H	1.73	590.0	56.0	17.428	976	1.378	0.0	1341.8	67.96	399	51.0
12V	1.84	510.4	68.8	13.852	953	1.063	79.6	103.7	5.28	38	5.0
13H	2.29	590.0	74.1	11.734	870	1.245	0.0	992.8	34.64	269	38.6
14V	2.37	505.4	89.6	9.471	848	1.035	84.6	58.1	2.19	21	3.0
15H	2.66	590.0	86.1	9.841	848	1.123	0.0	588.0	13.21	119	17.6

TOTAL ROLLING POWER : 2805 kW

*** Subject to the confidentiality clause *** M

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DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x1/2"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 2.48 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30 X	182.30	33147.4	
1H	750.0	20.00	BOX	124.00 X	206.79	24635.6	25.7
2V	750.0	18.00	BOX	136.50 X	144.56	18539.6	24.7
3H	750.0	17.00	R.BOX	93.00 X	162.38	13163.3	29.0
4V	660.0	15.00	ROUND	111.00 X	110.68	9671.8	26.5
5H	660.0	15.00	R.OVAL	70.60 X	130.14	7276.6	24.8
6V	660.0	22.00	ROUND	92.00 X	81.49	6043.3	16.9
7H	660.0	40.00	FLAT	40.00 X	118.13	4509.6	25.4
8V	660.0	26.50	EDGING	96.50 X	41.92	4028.8	10.7
9H	660.0	25.50	FLAT	25.50 X	111.97	2850.4	29.2
10V	660.0	13.50	EDGING	98.50 X	26.64	2605.8	8.6
11H	590.0	17.50	FLAT	17.50 X	108.39	1890.6	27.4
12V	590.0	20.50	EDGING	100.50 X	17.89	1790.3	5.3
13H	590.0	13.70	FLAT	13.70 X	105.40	1441.3	19.5
14V	590.0	17.80	EDGING	102.80 X	13.78	1410.7	2.1
15H	590.0	12.87	FLAT	12.87 X	102.90	1322.0	6.3

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x1/2"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 2.48 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.18	639.8	5.3	85.673	451	1.329	110.2	1853.6	266.81	147	72.5
3H	0.25	685.9	6.9	118.730	822	1.408	64.1	2263.0	292.11	212	57.3
4V	0.34	587.6	11.0	74.409	818	1.361	72.4	1431.4	173.67	200	54.3
5H	0.45	619.1	13.9	87.594	1215	1.329	40.9	1501.0	148.84	216	27.0
6V	0.54	607.8	17.0	68.825	1171	1.204	52.2	863.6	89.88	160	35.6
7H	0.73	660.0	21.0	55.247	1160	1.340	0.0	1601.8	167.67	369	46.1
8V	0.81	590.4	26.3	43.393	1140	1.119	69.6	314.7	22.95	63	7.9
9H	1.15	660.0	33.2	37.442	1244	1.413	0.0	1604.7	115.25	401	50.1
10V	1.26	575.7	41.7	27.471	1144	1.094	84.3	196.1	13.03	57	7.1
11H	1.73	590.0	56.0	17.428	976	1.378	0.0	1341.8	67.96	399	51.0
12V	1.83	510.4	68.4	13.852	947	1.056	79.6	95.7	4.62	33	4.4
13H	2.27	590.0	73.5	11.734	862	1.242	0.0	993.4	34.40	265	38.4
14V	2.32	505.4	87.7	9.471	830	1.022	84.6	43.2	1.28	12	1.8
15H	2.48	590.0	80.1	9.841	788	1.067	0.0	371.6	6.19	52	8.2

TOTAL ROLLING POWER : 2720 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:05:54

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 100x16
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 2.00 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30 X	182.30	33147.4	
1H	750.0	20.00	BOX	124.00 X	206.79	24635.6	25.7
2V	750.0	18.00	BOX	136.50 X	144.56	18539.6	24.7
3H	750.0	17.00	R.BOX	93.00 X	162.38	13163.3	29.0
4V	660.0	15.00	ROUND	111.00 X	110.68	9671.8	26.5
5H	660.0	15.00	R.OVAL	70.60 X	130.14	7276.6	24.8
6V	660.0	22.00	ROUND	92.00 X	81.49	6043.3	16.9
7H	660.0	40.00	FLAT	40.00 X	118.13	4509.6	25.4
8V	660.0	26.50	EDGING	96.50 X	41.92	4028.8	10.7
9H	660.0	26.50	FLAT	26.50 X	110.67	2928.1	27.3
10V	660.0	15.50	EDGING	100.50 X	27.32	2724.8	6.9
11H	590.0	20.40	FLAT	20.40 X	106.69	2170.4	20.3
12V	590.0	20.80	EDGING	100.80 X	20.70	2078.6	4.2
13H	590.0	17.20	FLAT	17.20 X	103.87	1783.6	14.2
14V	590.0	21.10	EDGING	101.10 X	17.30	1742.4	2.3
15H	590.0	16.21	FLAT	16.21 X	101.30	1639.2	5.9

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 100x16
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 2.00 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.18	639.8	5.3	85.673	451	1.329	110.2	1853.6	266.81	147	72.5
3H	0.25	685.9	6.9	118.730	822	1.408	64.1	2263.0	292.11	212	57.3
4V	0.34	587.6	11.0	74.409	818	1.361	72.4	1431.4	173.67	200	54.3
5H	0.45	619.1	13.9	87.594	1215	1.329	40.9	1501.0	148.84	216	27.0
6V	0.54	607.8	17.0	68.825	1171	1.204	52.2	863.6	89.88	160	35.6
7H	0.73	660.0	21.0	55.247	1160	1.340	0.0	1601.8	167.67	369	46.1
8V	0.81	590.4	26.3	43.393	1140	1.119	69.6	314.7	22.95	63	7.9
9H	1.12	660.0	32.3	37.442	1211	1.376	0.0	1507.0	105.40	357	44.6
10V	1.20	575.8	39.8	27.471	1094	1.075	84.2	170.7	10.02	42	5.2
11H	1.51	590.0	48.8	17.428	851	1.255	0.0	1035.8	46.38	237	34.8
12V	1.57	510.4	58.9	13.852	816	1.044	79.6	93.0	3.94	24	3.7
13H	1.83	590.0	59.4	11.734	697	1.165	0.0	772.8	24.97	155	27.9
14V	1.88	510.4	70.3	9.471	665	1.024	79.6	56.7	1.74	13	2.4
15H	2.00	590.0	64.6	9.841	636	1.063	0.0	374.4	6.91	47	9.2

TOTAL ROLLING POWER : 2377 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:05:54

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x5/8"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.98 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30 X	182.30	33147.4	
1H	750.0	20.00	BOX	124.00 X	206.79	24635.6	25.7
2V	750.0	18.00	BOX	136.50 X	144.56	18539.6	24.7
3H	750.0	17.00	R.BOX	93.00 X	162.38	13163.3	29.0
4V	660.0	15.00	ROUND	111.00 X	110.68	9671.8	26.5
5H	660.0	15.00	R.OVAL	70.60 X	130.14	7276.6	24.8
6V	660.0	22.00	ROUND	92.00 X	81.49	6043.3	16.9
7H	660.0	40.00	FLAT	40.00 X	118.13	4509.6	25.4
8V	660.0	26.50	EDGING	96.50 X	41.92	4028.8	10.7
9H	660.0	26.50	FLAT	26.50 X	110.67	2928.1	27.3
10V	660.0	16.50	EDGING	101.50 X	27.22	2742.3	6.3
11H	590.0	20.40	FLAT	20.40 X	107.58	2188.7	20.2
12V	590.0	22.50	EDGING	102.50 X	20.65	2107.8	3.7
13H	590.0	17.20	FLAT	17.20 X	105.50	1811.6	14.1
14V	590.0	22.50	EDGING	102.50 X	17.31	1767.6	2.4
15H	590.0	16.08	FLAT	16.08 X	102.90	1651.8	6.6

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x5/8"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.98 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.18	639.8	5.3	85.673	451	1.329	110.2	1853.6	266.81	147	72.5
3H	0.25	685.9	6.9	118.730	822	1.408	64.1	2263.0	292.11	212	57.3
4V	0.34	587.6	11.0	74.409	818	1.361	72.4	1431.4	173.67	200	54.3
5H	0.45	619.1	13.9	87.594	1215	1.329	40.9	1501.0	148.84	216	27.0
6V	0.54	607.8	17.0	68.825	1171	1.204	52.2	863.6	89.88	160	35.6
7H	0.73	660.0	21.0	55.247	1160	1.340	0.0	1601.8	167.67	369	46.1
8V	0.81	590.4	26.3	43.393	1140	1.119	69.6	314.7	22.95	63	7.9
9H	1.12	660.0	32.3	37.442	1211	1.376	0.0	1507.0	105.40	357	44.6
10V	1.19	575.7	39.6	27.471	1087	1.068	84.3	159.7	8.96	37	4.6
11H	1.49	590.0	48.4	17.428	843	1.253	0.0	1037.0	46.14	234	34.7
12V	1.55	510.4	58.1	13.852	805	1.038	79.6	84.1	3.33	20	3.2
13H	1.81	590.0	58.5	11.734	686	1.163	0.0	778.7	24.97	153	27.9
14V	1.85	510.4	69.3	9.471	656	1.025	79.6	58.9	1.87	14	2.6
15H	1.98	590.0	64.1	9.841	631	1.070	0.0	414.1	8.09	54	10.8

TOTAL ROLLING POWER : 2371 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:05:54

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 100x19
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.68 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30 X	182.30	33147.4	
1H	750.0	20.00	BOX	124.00 X	206.79	24635.6	25.7
2V	750.0	18.00	BOX	136.50 X	144.56	18539.6	24.7
3H	750.0	17.00	R.BOX	93.00 X	162.38	13163.3	29.0
4V	660.0	15.00	ROUND	111.00 X	110.68	9671.8	26.5
5H	660.0	15.00	R.OVAL	70.60 X	130.14	7276.6	24.8
6V	660.0	22.00	ROUND	92.00 X	81.49	6043.3	16.9
7H	660.0	40.00	FLAT	40.00 X	118.13	4509.6	25.4
8V	660.0	25.00	EDGING	95.00 X	42.16	3988.3	11.6
9H	660.0	26.50	FLAT	26.50 X	109.34	2892.8	27.5
10V	660.0	12.50	EDGING	97.50 X	27.52	2660.5	8.0
11H	590.0	20.40	FLAT	20.40 X	103.87	2112.8	20.6
12V	590.0	21.10	EDGING	101.10 X	20.51	2065.5	2.2
13H	590.0	19.25	FLAT	19.25 X	101.30	1946.5	5.8

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 100x19
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.68 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.18	639.8	5.3	85.673	451	1.329	110.2	1853.6	266.81	147	72.5
3H	0.25	685.9	6.9	118.730	822	1.408	64.1	2263.0	292.11	212	57.3
4V	0.34	587.6	11.0	74.409	818	1.361	72.4	1431.4	173.67	200	54.3
5H	0.45	619.1	13.9	87.594	1215	1.329	40.9	1501.0	148.84	216	27.0
6V	0.54	607.8	17.0	68.825	1171	1.204	52.2	863.6	89.88	160	35.6
7H	0.73	660.0	21.0	55.247	1160	1.340	0.0	1601.8	167.67	369	46.1
8V	0.82	590.4	26.5	43.393	1152	1.131	69.6	334.7	25.37	71	8.8
9H	1.13	660.0	32.7	37.442	1226	1.379	0.0	1498.0	105.50	362	45.2
10V	1.23	575.8	40.8	27.471	1121	1.087	84.2	188.9	11.84	51	6.3
11H	1.55	590.0	50.1	17.428	874	1.259	0.0	1018.8	46.17	242	34.7
12V	1.58	510.4	59.3	13.852	821	1.023	79.6	59.3	1.78	11	1.7
13H	1.68	590.0	54.4	11.734	639	1.061	0.0	357.6	7.12	41	7.9

TOTAL ROLLING POWER : 2216 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:05:54

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x3/4"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.65 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30	X 182.30	33147.4	
1H	750.0	20.00	BOX	124.00	X 206.79	24635.6	25.7
2V	750.0	18.00	BOX	136.50	X 144.56	18539.6	24.7
3H	750.0	17.00	R.BOX	93.00	X 162.38	13163.3	29.0
4V	660.0	15.00	ROUND	111.00	X 110.68	9671.8	26.5
5H	660.0	15.00	R.OVAL	70.60	X 130.14	7276.6	24.8
6V	660.0	22.00	ROUND	92.00	X 81.49	6043.3	16.9
7H	660.0	40.00	FLAT	40.00	X 118.13	4509.6	25.4
8V	660.0	26.50	EDGING	96.50	X 41.92	4028.8	10.7
9H	660.0	26.50	FLAT	26.50	X 110.67	2928.1	27.3
10V	660.0	14.50	EDGING	99.50	X 27.43	2707.2	7.5
11H	590.0	20.40	FLAT	20.40	X 105.79	2152.1	20.5
12V	590.0	22.70	EDGING	102.70	X 20.53	2099.8	2.4
13H	590.0	19.30	FLAT	19.30	X 102.90	1982.4	5.6

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x3/4"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.65 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.18	639.8	5.3	85.673	451	1.329	110.2	1853.6	266.81	147	72.5
3H	0.25	685.9	6.9	118.730	822	1.408	64.1	2263.0	292.11	212	57.3
4V	0.34	587.6	11.0	74.409	818	1.361	72.4	1431.4	173.67	200	54.3
5H	0.45	619.1	13.9	87.594	1215	1.329	40.9	1501.0	148.84	216	27.0
6V	0.54	607.8	17.0	68.825	1171	1.204	52.2	863.6	89.88	160	35.6
7H	0.73	660.0	21.0	55.247	1160	1.340	0.0	1601.8	167.67	369	46.1
8V	0.81	590.4	26.3	43.393	1140	1.119	69.6	314.7	22.95	63	7.9
9H	1.12	660.0	32.3	37.442	1211	1.376	0.0	1507.0	105.40	357	44.6
10V	1.21	575.8	40.1	27.471	1101	1.082	84.2	181.4	11.09	47	5.8
11H	1.52	590.0	49.2	17.428	858	1.258	0.0	1034.3	46.62	240	35.0
12V	1.56	510.4	58.3	13.852	808	1.025	79.6	62.7	1.98	12	1.9
13H	1.65	590.0	53.4	11.734	627	1.059	0.0	357.4	7.03	39	7.8

TOTAL ROLLING POWER : 2197 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:05:54

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x7/8"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.42 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30 X	182.30	33147.4	
1H	750.0	20.00	BOX	124.00 X	206.79	24635.6	25.7
2V	750.0	18.00	BOX	136.50 X	144.56	18539.6	24.7
3H	750.0	17.00	R.BOX	93.00 X	162.38	13163.3	29.0
4V	660.0	15.00	ROUND	111.00 X	110.68	9671.8	26.5
5H	660.0	15.00	R.OVAL	70.60 X	130.14	7276.6	24.8
6V	660.0	22.00	ROUND	92.00 X	81.49	6043.3	16.9
7H	660.0	40.00	FLAT	40.00 X	118.13	4509.6	25.4
8V	660.0	26.50	EDGING	96.50 X	41.92	4028.8	10.7
9H	660.0	26.50	FLAT	26.50 X	110.67	2928.1	27.3
10V	660.0	18.60	EDGING	103.60 X	27.01	2779.2	5.1
11H	590.0	23.50	FLAT	23.50 X	105.31	2468.0	11.2
12V	590.0	23.00	EDGING	103.00 X	23.59	2420.7	1.9
13H	590.0	22.51	FLAT	22.51 X	102.90	2312.1	4.5

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x7/8"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.42 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.18	639.8	5.3	85.673	451	1.329	110.2	1853.6	266.81	147	72.5
3H	0.25	685.9	6.9	118.730	822	1.408	64.1	2263.0	292.11	212	57.3
4V	0.34	587.6	11.0	74.409	818	1.361	72.4	1431.4	173.67	200	54.3
5H	0.45	619.1	13.9	87.594	1215	1.329	40.9	1501.0	148.84	216	27.0
6V	0.54	607.8	17.0	68.825	1171	1.204	52.2	863.6	89.88	160	35.6
7H	0.73	660.0	21.0	55.247	1160	1.340	0.0	1601.8	167.67	369	46.1
8V	0.81	590.4	26.3	43.393	1140	1.119	69.6	314.7	22.95	63	7.9
9H	1.12	660.0	32.3	37.442	1211	1.376	0.0	1507.0	105.40	357	44.6
10V	1.18	575.7	39.1	27.471	1073	1.054	84.3	135.3	6.78	28	3.5
11H	1.33	590.0	42.9	17.428	748	1.126	0.0	612.7	20.04	90	15.1
12V	1.35	510.4	50.6	13.852	701	1.020	79.6	62.5	1.73	9	1.6
13H	1.42	590.0	45.8	11.734	538	1.047	0.0	313.3	5.83	28	6.5

TOTAL ROLLING POWER : 2014 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:05:54

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x1"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.24 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30 X	182.30	33147.4	
1H	750.0	20.00	BOX	124.00 X	206.79	24635.6	25.7
2V	750.0	18.00	BOX	136.50 X	144.56	18539.6	24.7
3H	750.0	17.00	R.BOX	93.00 X	162.38	13163.3	29.0
4V	660.0	15.00	ROUND	111.00 X	110.68	9671.8	26.5
5H	660.0	15.00	R.OVAL	70.60 X	130.14	7276.6	24.8
6V	660.0	25.00	ROUND	95.00 X	80.18	6214.2	14.6
7H	660.0	42.00	FLAT	42.00 X	119.27	4779.6	23.1
8V	660.0	33.00	EDGING	103.00 X	43.15	4421.5	7.5
9H	660.0	33.00	FLAT	33.00 X	110.49	3640.7	17.7
10V	660.0	35.70	EDGING	100.70 X	33.93	3393.4	6.8
11H	590.0	26.80	FLAT	26.80 X	105.71	2826.6	16.7
12V	590.0	38.00	EDGING	103.00 X	26.93	2763.3	2.2
13H	590.0	25.73	FLAT	25.73 X	102.90	2642.9	4.4

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x1"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.24 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.18	639.8	5.3	85.673	451	1.329	110.2	1853.6	266.81	147	72.5
3H	0.25	685.9	6.9	118.730	822	1.408	64.1	2263.0	292.11	212	57.3
4V	0.34	587.6	11.0	74.409	818	1.361	72.4	1431.4	173.67	200	54.3
5H	0.45	619.1	13.9	87.594	1215	1.329	40.9	1501.0	148.84	216	27.0
6V	0.53	607.5	16.6	68.825	1139	1.171	52.5	795.9	80.46	139	31.0
7H	0.68	660.0	19.8	55.247	1094	1.300	0.0	1541.0	157.01	326	40.7
8V	0.74	590.5	23.9	43.393	1039	1.081	69.5	247.3	15.34	38	4.8
9H	0.90	660.0	26.0	37.442	974	1.214	0.0	1076.9	62.78	171	21.9
10V	0.96	595.7	30.9	27.471	849	1.073	64.3	211.6	12.45	40	5.9
11H	1.16	590.0	37.5	17.428	653	1.200	0.0	929.4	43.06	169	32.3
12V	1.18	525.4	43.0	13.852	596	1.023	64.6	79.3	2.41	11	2.3
13H	1.24	590.0	40.1	11.734	470	1.046	0.0	322.2	6.35	27	7.1

TOTAL ROLLING POWER : 1831 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:05:54

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x1-1/4"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 0.99 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30 X	182.30	33147.4	
1H	750.0	20.00	BOX	124.00 X	206.79	24635.6	25.7
2V	750.0	18.00	BOX	136.50 X	144.56	18539.6	24.7
3H	750.0	17.00	R.BOX	93.00 X	162.38	13163.3	29.0
4V	660.0	15.00	ROUND	111.00 X	110.68	9671.8	26.5
5H	660.0	15.00	R.OVAL	70.60 X	130.14	7276.6	24.8
6V	660.0	25.00	ROUND	95.00 X	80.18	6214.2	14.6
7H	660.0	42.00	FLAT	42.00 X	119.27	4779.6	23.1
8V	660.0	37.00	EDGING	107.00 X	42.70	4549.5	4.8
9H	660.0	36.00	FLAT	36.00 X	110.96	3988.5	12.3
10V	660.0	40.00	EDGING	105.00 X	36.51	3808.1	4.5
11H	590.0	33.20	FLAT	33.20 X	105.75	3500.9	8.1
12V	590.0	33.10	EDGING	103.10 X	33.34	3424.2	2.2
13H	590.0	32.16	FLAT	32.16 X	102.90	3303.4	3.5

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x1-1/4"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 0.99 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.18	639.8	5.3	85.673	451	1.329	110.2	1853.6	266.81	147	72.5
3H	0.25	685.9	6.9	118.730	822	1.408	64.1	2263.0	292.11	212	57.3
4V	0.34	587.6	11.0	74.409	818	1.361	72.4	1431.4	173.67	200	54.3
5H	0.45	619.1	13.9	87.594	1215	1.329	40.9	1501.0	148.84	216	27.0
6V	0.53	607.5	16.6	68.825	1139	1.171	52.5	795.9	80.46	139	31.0
7H	0.68	660.0	19.8	55.247	1094	1.300	0.0	1541.0	157.01	326	40.7
8V	0.72	590.5	23.3	43.393	1009	1.051	69.5	183.4	10.05	24	3.1
9H	0.82	660.0	23.7	37.442	889	1.141	0.0	803.9	38.88	97	13.6
10V	0.86	595.7	27.5	27.471	757	1.047	64.3	167.9	7.95	23	3.8
11H	0.93	590.0	30.3	17.428	527	1.088	0.0	528.5	17.08	54	12.8
12V	0.96	520.4	35.1	13.852	486	1.022	69.6	95.5	2.84	10	2.7
13H	0.99	590.0	32.1	11.734	376	1.037	0.0	296.2	5.84	20	6.5

TOTAL ROLLING POWER : 1603 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:05:54

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 5"x1/4"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 3.96 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30 X	182.30	33147.4	
1H	750.0	20.00	BOX	124.00 X	206.79	24635.6	25.7
2V	750.0	18.00	BOX	136.50 X	144.56	18539.6	24.7
3H	750.0	17.00	R.BOX	93.00 X	162.38	13163.3	29.0
4V	660.0	15.00	ROUND	111.00 X	110.68	9671.8	26.5
5H	660.0	55.00	FLAT	55.00 X	139.04	7283.7	24.7
6V	660.0	28.00	EDGING	113.00 X	57.49	6392.4	12.2
7H	660.0	33.00	FLAT	33.00 X	131.04	4305.4	32.6
8V	660.0	8.00	EDGING	108.00 X	35.08	3769.4	12.4
9H	660.0	20.50	FLAT	20.50 X	124.09	2536.6	32.7
10H	660.0	13.50	FLAT	13.50 X	134.72	1810.8	28.6
11H	590.0	9.60	FLAT	9.60 X	141.42	1350.9	25.4
12V	590.0	22.00	EDGING	128.00 X	9.90	1262.8	6.5
13H	590.0	7.50	FLAT	7.50 X	131.94	987.7	21.8
14V	590.0	12.20	EDGING	127.20 X	7.57	959.4	2.9
15H	590.0	6.43	FLAT	6.43 X	128.70	826.2	13.9

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 5"x1/4"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 3.96 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.18	639.8	5.3	85.673	451	1.329	110.2	1853.6	266.81	147	72.5
3H	0.25	685.9	6.9	118.730	822	1.408	64.1	2263.0	292.11	212	57.3
4V	0.34	587.6	11.0	74.409	818	1.361	72.4	1431.4	173.67	200	54.3
5H	0.45	660.0	13.0	87.594	1139	1.328	0.0	1734.2	208.29	284	35.4
6V	0.51	576.8	16.9	68.825	1166	1.139	83.2	425.3	34.11	61	13.5
7H	0.76	660.0	22.0	55.247	1215	1.485	0.0	2046.4	178.03	410	51.3
8V	0.87	560.6	29.6	43.393	1283	1.142	99.4	320.8	26.43	82	10.2
9H	1.29	660.0	37.3	37.442	1398	1.486	0.0	1914.1	128.27	501	62.7
10H	1.81	660.0	52.3	27.471	1436	1.401	0.0	1796.2	83.45	457	57.1
11H	2.42	590.0	78.4	17.428	1366	1.340	0.0	1606.7	52.68	433	54.1
12V	2.59	484.4	102.2	13.852	1415	1.070	105.6	71.5	4.29	46	5.7
13H	3.31	590.0	107.2	11.734	1258	1.279	0.0	1384.9	35.51	399	49.9
14V	3.41	475.4	137.0	9.471	1298	1.029	114.6	31.7	1.19	17	2.1
15H	3.96	590.0	128.2	9.841	1262	1.161	0.0	941.3	16.79	225	28.2

TOTAL ROLLING POWER : 3608 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:05:54

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 6"x1/4"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 3.30 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30	X 182.30	33147.4	
1H	750.0	20.00	BOX	124.00	X 206.79	24635.6	25.7
2V	750.0	22.00	BOX	140.50	X 142.88	19039.5	22.7
3H	750.0	23.00	R.BOX	99.00	X 162.97	14155.8	25.7
4V	660.0	34.00	ROUND	130.00	X 109.89	11647.4	17.7
5H	660.0	55.00	FLAT	55.00	X 161.39	8494.4	27.1
6V	660.0	57.00	EDGING	142.00	X 56.17	7896.1	7.0
7H	660.0	33.00	FLAT	33.00	X 160.18	5266.8	33.3
8V	660.0	28.00	EDGING	128.00	X 35.41	4508.6	14.4
9H	660.0	20.50	FLAT	20.50	X 144.85	2960.5	34.3
10H	660.0	13.50	FLAT	13.50	X 155.62	2091.2	29.4
11H	590.0	9.50	FLAT	9.50	X 162.60	1536.6	26.5
12V	590.0	48.00	EDGING	154.00	X 9.62	1477.3	3.9
13H	590.0	7.50	FLAT	7.50	X 157.36	1178.6	20.2
14V	590.0	38.00	EDGING	153.00	X 7.54	1151.1	2.3
15H	590.0	6.43	FLAT	6.43	X 154.40	991.5	13.9

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 6"x1/4"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 3.30 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.17	638.7	5.1	85.673	440	1.294	111.3	1757.6	247.75	133	67.3
3H	0.23	686.1	6.4	118.730	764	1.345	63.9	2098.8	260.53	176	51.1
4V	0.28	588.0	9.1	74.409	679	1.215	72.0	1159.7	126.57	121	39.6
5H	0.39	660.0	11.1	87.594	976	1.371	0.0	2133.1	260.12	304	38.9
6V	0.41	576.4	13.7	68.825	945	1.076	83.6	304.1	21.08	30	7.1
7H	0.62	660.0	18.0	55.247	993	1.499	0.0	2572.0	219.20	413	51.9
8V	0.73	560.7	24.7	43.393	1073	1.168	99.3	389.6	37.50	97	12.1
9H	1.11	660.0	32.0	37.442	1198	1.523	0.0	2387.9	161.61	541	67.7
10H	1.56	660.0	45.3	27.471	1244	1.416	0.0	2200.9	102.26	485	60.6
11H	2.13	590.0	68.9	17.428	1201	1.361	0.0	2008.4	66.58	481	60.1
12V	2.21	484.4	87.3	13.852	1210	1.040	105.6	50.5	2.46	23	2.8
13H	2.78	590.0	89.9	11.734	1055	1.253	0.0	1638.8	39.68	373	46.7
14V	2.84	475.4	114.2	9.471	1082	1.024	114.6	31.0	1.14	14	1.7
15H	3.30	590.0	106.8	9.841	1051	1.161	0.0	1210.3	21.41	239	29.9

TOTAL ROLLING POWER : 3564 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:05:54

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 5"x5/16"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 3.17 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30	X 182.30	33147.4	
1H	750.0	20.00	BOX	124.00	X 206.79	24635.6	25.7
2V	750.0	18.00	BOX	136.50	X 144.56	18539.6	24.7
3H	750.0	17.00	R.BOX	93.00	X 162.38	13163.3	29.0
4V	660.0	15.00	ROUND	111.00	X 110.68	9671.8	26.5
5H	660.0	55.00	FLAT	55.00	X 139.04	7283.7	24.7
6V	660.0	28.00	EDGING	113.00	X 57.49	6392.4	12.2
7H	660.0	33.00	FLAT	33.00	X 131.04	4305.4	32.6
8V	660.0	8.00	EDGING	108.00	X 35.08	3769.4	12.4
9H	660.0	21.00	FLAT	21.00	X 123.33	2583.7	31.5
10H	660.0	14.50	FLAT	14.50	X 132.72	1919.2	25.7
11H	590.0	11.00	FLAT	11.00	X 138.12	1515.2	21.0
12V	590.0	8.50	EDGING	128.50	X 11.22	1437.7	5.1
13H	590.0	9.00	FLAT	9.00	X 131.52	1181.7	17.8
14V	590.0	7.90	EDGING	127.90	X 9.05	1154.4	2.3
15H	590.0	8.04	FLAT	8.04	X 128.70	1033.2	10.5

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 5"x5/16"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 3.17 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.18	639.8	5.3	85.673	451	1.329	110.2	1853.6	266.81	147	72.5
3H	0.25	685.9	6.9	118.730	822	1.408	64.1	2263.0	292.11	212	57.3
4V	0.34	587.6	11.0	74.409	818	1.361	72.4	1431.4	173.67	200	54.3
5H	0.45	660.0	13.0	87.594	1139	1.328	0.0	1734.2	208.29	284	35.4
6V	0.51	576.8	16.9	68.825	1166	1.139	83.2	425.3	34.11	61	13.5
7H	0.76	660.0	22.0	55.247	1215	1.485	0.0	2046.4	178.03	410	51.3
8V	0.87	560.6	29.6	43.393	1283	1.142	99.4	320.8	26.43	82	10.2
9H	1.27	660.0	36.6	37.442	1372	1.459	0.0	1844.1	121.77	467	58.4
10H	1.70	660.0	49.3	27.471	1355	1.346	0.0	1618.6	73.01	377	47.2
11H	2.16	590.0	69.9	17.428	1218	1.267	0.0	1336.1	42.07	308	38.5
12V	2.28	470.4	92.4	13.852	1280	1.054	119.6	66.7	3.43	33	4.1
13H	2.77	590.0	89.6	11.734	1052	1.217	0.0	1169.6	29.28	275	34.4
14V	2.83	470.4	115.1	9.471	1090	1.024	119.6	33.7	1.12	14	1.7
15H	3.17	590.0	102.5	9.841	1009	1.117	0.0	753.2	12.92	139	17.3

TOTAL ROLLING POWER : 3142 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:05:54

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 6"x5/16"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 2.64 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30	X 182.30	33147.4	
1H	750.0	20.00	BOX	124.00	X 206.79	24635.6	25.7
2V	750.0	22.00	BOX	140.50	X 142.88	19039.5	22.7
3H	750.0	23.00	R.BOX	99.00	X 162.97	14155.8	25.7
4V	660.0	34.00	ROUND	130.00	X 109.89	11647.4	17.7
5H	660.0	55.00	FLAT	55.00	X 161.39	8494.4	27.1
6V	660.0	57.00	EDGING	142.00	X 56.17	7896.1	7.0
7H	660.0	33.00	FLAT	33.00	X 160.18	5266.8	33.3
8V	660.0	32.00	EDGING	132.00	X 35.02	4603.6	12.6
9H	660.0	21.00	FLAT	21.00	X 147.75	3096.1	32.7
10H	660.0	14.50	FLAT	14.50	X 157.29	2274.9	26.5
11H	590.0	11.00	FLAT	11.00	X 162.74	1785.7	21.5
12V	590.0	34.50	EDGING	154.50	X 11.13	1715.8	3.9
13H	590.0	9.00	FLAT	9.00	X 157.37	1414.5	17.6
14V	590.0	33.50	EDGING	153.50	X 9.04	1384.5	2.1
15H	590.0	8.04	FLAT	8.04	X 154.40	1239.8	10.5

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 6"x5/16"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 2.64 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.17	638.7	5.1	85.673	440	1.294	111.3	1757.6	247.75	133	67.3
3H	0.23	686.1	6.4	118.730	764	1.345	63.9	2098.8	260.53	176	51.1
4V	0.28	588.0	9.1	74.409	679	1.215	72.0	1159.7	126.57	121	39.6
5H	0.39	660.0	11.1	87.594	976	1.371	0.0	2133.1	260.12	304	38.9
6V	0.41	576.4	13.7	68.825	945	1.076	83.6	304.1	21.08	30	7.1
7H	0.62	660.0	18.0	55.247	993	1.499	0.0	2572.0	219.20	413	51.9
8V	0.71	560.5	24.2	43.393	1051	1.144	99.5	356.0	32.37	82	10.3
9H	1.06	660.0	30.6	37.442	1145	1.487	0.0	2345.3	154.65	495	61.9
10H	1.44	660.0	41.6	27.471	1143	1.361	0.0	2048.5	92.42	403	50.4
11H	1.83	590.0	59.3	17.428	1034	1.274	0.0	1684.0	53.03	329	41.2
12V	1.91	470.4	77.4	13.852	1073	1.041	119.6	58.9	2.84	23	2.9
13H	2.31	590.0	74.9	11.734	879	1.213	0.0	1472.1	36.19	284	40.4
14V	2.36	470.4	96.0	9.471	909	1.022	119.6	35.6	1.23	12	1.7
15H	2.64	590.0	85.4	9.841	841	1.117	0.0	972.3	16.62	149	22.1

TOTAL ROLLING POWER : 3089 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:05:54

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 5"x3/8"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 2.64 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30 X	182.30	33147.4	
1H	750.0	20.00	BOX	124.00 X	206.79	24635.6	25.7
2V	750.0	18.00	BOX	136.50 X	144.56	18539.6	24.7
3H	750.0	17.00	R.BOX	93.00 X	162.38	13163.3	29.0
4V	660.0	15.00	ROUND	111.00 X	110.68	9671.8	26.5
5H	660.0	55.00	FLAT	55.00 X	139.04	7283.7	24.7
6V	660.0	28.00	EDGING	113.00 X	57.49	6392.4	12.2
7H	660.0	33.00	FLAT	33.00 X	131.04	4305.4	32.6
8V	660.0	8.00	EDGING	108.00 X	35.08	3769.4	12.4
9H	660.0	22.00	FLAT	22.00 X	121.82	2674.9	29.0
10H	660.0	15.80	FLAT	15.80 X	130.23	2053.8	23.2
11H	590.0	12.50	FLAT	12.50 X	134.81	1682.3	18.1
12V	590.0	15.00	EDGING	130.00 X	12.61	1631.0	3.0
13H	590.0	10.70	FLAT	10.70 X	131.56	1404.4	13.9
14V	590.0	7.80	EDGING	127.80 X	10.76	1371.4	2.4
15H	590.0	9.65	FLAT	9.65 X	128.70	1240.2	9.6

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 5"x3/8"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 2.64 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.18	639.8	5.3	85.673	451	1.329	110.2	1853.6	266.81	147	72.5
3H	0.25	685.9	6.9	118.730	822	1.408	64.1	2263.0	292.11	212	57.3
4V	0.34	587.6	11.0	74.409	818	1.361	72.4	1431.4	173.67	200	54.3
5H	0.45	660.0	13.0	87.594	1139	1.328	0.0	1734.2	208.29	284	35.4
6V	0.51	576.8	16.9	68.825	1166	1.139	83.2	425.3	34.11	61	13.5
7H	0.76	660.0	22.0	55.247	1215	1.485	0.0	2046.4	178.03	410	51.3
8V	0.87	560.6	29.6	43.393	1283	1.142	99.4	320.8	26.43	82	10.2
9H	1.22	660.0	35.4	37.442	1325	1.409	0.0	1709.1	109.35	405	50.7
10H	1.59	660.0	46.1	27.471	1266	1.302	0.0	1466.1	65.08	314	39.3
11H	1.95	590.0	63.0	17.428	1097	1.221	0.0	1154.7	35.71	235	29.4
12V	2.01	475.7	80.6	13.852	1116	1.031	114.3	50.6	1.97	17	2.1
13H	2.33	590.0	75.4	11.734	885	1.161	0.0	951.4	22.34	176	24.9
14V	2.39	470.4	96.9	9.471	917	1.024	119.6	40.7	1.37	14	1.9
15H	2.64	590.0	85.4	9.841	840	1.106	0.0	717.4	13.02	116	17.3

TOTAL ROLLING POWER : 2808 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:05:54

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 6"x3/8"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 2.20 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30	X 182.30	33147.4	
1H	750.0	20.00	BOX	124.00	X 206.79	24635.6	25.7
2V	750.0	22.00	BOX	140.50	X 142.88	19039.5	22.7
3H	750.0	23.00	R.BOX	99.00	X 162.97	14155.8	25.7
4V	660.0	34.00	ROUND	130.00	X 109.89	11647.4	17.7
5H	660.0	55.00	FLAT	55.00	X 161.39	8494.4	27.1
6V	660.0	57.00	EDGING	142.00	X 56.17	7896.1	7.0
7H	660.0	33.00	FLAT	33.00	X 160.18	5266.8	33.3
8V	660.0	35.00	EDGING	135.00	X 34.73	4672.8	11.3
9H	660.0	22.00	FLAT	22.00	X 148.94	3271.5	30.0
10H	660.0	15.80	FLAT	15.80	X 157.51	2484.6	24.1
11H	590.0	12.50	FLAT	12.50	X 162.14	2023.7	18.5
12V	590.0	41.00	EDGING	156.00	X 12.61	1958.8	3.2
13H	590.0	10.70	FLAT	10.70	X 157.60	1683.0	14.1
14V	590.0	33.60	EDGING	153.60	X 10.75	1647.0	2.1
15H	590.0	9.65	FLAT	9.65	X 154.40	1488.3	9.6

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 6"x3/8"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 2.20 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.17	638.7	5.1	85.673	440	1.294	111.3	1757.6	247.75	133	67.3
3H	0.23	686.1	6.4	118.730	764	1.345	63.9	2098.8	260.53	176	51.1
4V	0.28	588.0	9.1	74.409	679	1.215	72.0	1159.7	126.57	121	39.6
5H	0.39	660.0	11.1	87.594	976	1.371	0.0	2133.1	260.12	304	38.9
6V	0.41	576.4	13.7	68.825	945	1.076	83.6	304.1	21.08	30	7.1
7H	0.62	660.0	18.0	55.247	993	1.499	0.0	2572.0	219.20	413	51.9
8V	0.70	560.5	23.9	43.393	1035	1.127	99.5	330.0	28.58	71	8.9
9H	1.00	660.0	28.9	37.442	1084	1.428	0.0	2199.2	139.18	422	52.7
10H	1.32	660.0	38.1	27.471	1047	1.317	0.0	1901.5	84.43	337	42.1
11H	1.62	590.0	52.3	17.428	912	1.228	0.0	1493.1	46.17	253	34.7
12V	1.67	475.7	67.1	13.852	929	1.033	114.3	58.0	2.53	18	2.4
13H	1.94	590.0	62.9	11.734	738	1.164	0.0	1231.4	28.96	191	32.3
14V	1.99	470.4	80.7	9.471	764	1.022	119.6	42.9	1.49	13	2.1
15H	2.20	590.0	71.2	9.841	700	1.107	0.0	927.8	16.78	125	22.3

TOTAL ROLLING POWER : 2741 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:05:54

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 130x12
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 2.05 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30 X	182.30	33147.4	
1H	750.0	20.00	BOX	124.00 X	206.79	24635.6	25.7
2V	750.0	18.00	BOX	136.50 X	144.56	18539.6	24.7
3H	750.0	17.00	R.BOX	93.00 X	162.38	13163.3	29.0
4V	660.0	15.00	ROUND	111.00 X	110.68	9671.8	26.5
5H	660.0	55.00	FLAT	55.00 X	139.04	7283.7	24.7
6V	660.0	36.00	EDGING	121.00 X	56.32	6733.0	7.6
7H	660.0	34.00	FLAT	34.00 X	137.50	4656.9	30.8
8V	660.0	17.00	EDGING	117.00 X	35.69	4148.3	10.9
9H	660.0	24.00	FLAT	24.00 X	128.63	3082.5	25.7
10H	660.0	18.50	FLAT	18.50 X	135.21	2498.2	19.0
11H	590.0	15.20	FLAT	15.20 X	139.15	2112.7	15.4
12V	590.0	18.20	EDGING	133.20 X	15.37	2036.3	3.6
13H	590.0	13.20	FLAT	13.20 X	134.73	1774.8	12.8
14V	590.0	13.20	EDGING	131.20 X	13.27	1735.4	2.2
15H	590.0	12.16	FLAT	12.16 X	131.70	1599.5	7.8

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 130x12
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 2.05 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.18	639.8	5.3	85.673	451	1.329	110.2	1853.6	266.81	147	72.5
3H	0.25	685.9	6.9	118.730	822	1.408	64.1	2263.0	292.11	212	57.3
4V	0.34	587.6	11.0	74.409	818	1.361	72.4	1431.4	173.67	200	54.3
5H	0.45	660.0	13.0	87.594	1139	1.328	0.0	1734.2	208.29	284	35.4
6V	0.49	576.5	16.1	68.825	1108	1.082	83.5	297.5	19.84	33	7.4
7H	0.70	660.0	20.3	55.247	1123	1.446	0.0	2053.6	172.17	367	45.8
8V	0.79	560.8	26.9	43.393	1166	1.123	99.2	303.4	23.80	67	8.4
9H	1.06	660.0	30.7	37.442	1150	1.346	0.0	1647.0	100.31	323	40.3
10H	1.31	660.0	37.9	27.471	1041	1.234	0.0	1314.6	55.81	222	27.7
11H	1.55	590.0	50.1	17.428	874	1.182	0.0	1078.6	33.83	178	25.4
12V	1.61	475.7	64.5	13.852	894	1.038	114.3	71.4	3.07	21	2.9
13H	1.84	590.0	59.7	11.734	700	1.147	0.0	948.2	23.98	150	26.7
14V	1.89	472.4	76.2	9.471	722	1.023	117.6	49.5	1.63	13	2.2
15H	2.05	590.0	66.2	9.841	652	1.085	0.0	642.5	11.82	82	15.7

TOTAL ROLLING POWER : 2432 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:05:54

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 5"x1/2"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.98 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30 X	182.30	33147.4	
1H	750.0	20.00	BOX	124.00 X	206.79	24635.6	25.7
2V	750.0	18.00	BOX	136.50 X	144.56	18539.6	24.7
3H	750.0	17.00	R.BOX	93.00 X	162.38	13163.3	29.0
4V	660.0	15.00	ROUND	111.00 X	110.68	9671.8	26.5
5H	660.0	55.00	FLAT	55.00 X	139.04	7283.7	24.7
6V	660.0	36.00	EDGING	121.00 X	56.32	6733.0	7.6
7H	660.0	34.00	FLAT	34.00 X	137.50	4656.9	30.8
8V	660.0	16.00	EDGING	116.00 X	35.81	4123.8	11.4
9H	660.0	24.00	FLAT	24.00 X	127.72	3060.5	25.8
10H	660.0	18.50	FLAT	18.50 X	134.30	2481.2	18.9
11H	590.0	15.50	FLAT	15.50 X	137.73	2132.4	14.1
12V	590.0	15.60	EDGING	130.60 X	15.72	2042.3	4.2
13H	590.0	13.80	FLAT	13.80 X	131.66	1812.9	11.2
14V	590.0	10.30	EDGING	128.30 X	13.87	1773.8	2.2
15H	590.0	12.87	FLAT	12.87 X	128.70	1654.0	6.8

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 5"x1/2"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.98 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.18	639.8	5.3	85.673	451	1.329	110.2	1853.6	266.81	147	72.5
3H	0.25	685.9	6.9	118.730	822	1.408	64.1	2263.0	292.11	212	57.3
4V	0.34	587.6	11.0	74.409	818	1.361	72.4	1431.4	173.67	200	54.3
5H	0.45	660.0	13.0	87.594	1139	1.328	0.0	1734.2	208.29	284	35.4
6V	0.49	576.5	16.1	68.825	1108	1.082	83.5	297.5	19.84	33	7.4
7H	0.70	660.0	20.3	55.247	1123	1.446	0.0	2053.6	172.17	367	45.8
8V	0.79	560.8	27.0	43.393	1173	1.129	99.2	313.4	25.12	71	8.9
9H	1.07	660.0	30.9	37.442	1158	1.347	0.0	1640.3	100.28	325	40.6
10H	1.32	660.0	38.2	27.471	1048	1.234	0.0	1303.3	55.33	221	27.6
11H	1.53	590.0	49.7	17.428	866	1.164	0.0	985.6	29.62	154	22.2
12V	1.60	475.7	64.3	13.852	891	1.044	114.3	81.7	3.80	26	3.6
13H	1.80	590.0	58.4	11.734	686	1.127	0.0	824.1	19.70	121	22.0
14V	1.84	472.4	74.6	9.471	706	1.022	117.6	50.3	1.61	13	2.2
15H	1.98	590.0	64.0	9.841	630	1.072	0.0	559.1	9.80	66	13.0

TOTAL ROLLING POWER : 2373 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:05:54

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 6"x1/2"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.65 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30 X	182.30	33147.4	
1H	750.0	20.00	BOX	124.00 X	206.79	24635.6	25.7
2V	750.0	22.00	BOX	140.50 X	142.88	19039.5	22.7
3H	750.0	23.00	R.BOX	99.00 X	162.97	14155.8	25.7
4V	660.0	34.00	ROUND	130.00 X	109.89	11647.4	17.7
5H	660.0	55.00	FLAT	55.00 X	161.39	8494.4	27.1
6V	660.0	57.00	EDGING	142.00 X	56.17	7896.1	7.0
7H	660.0	34.00	FLAT	34.00 X	159.01	5387.8	31.8
8V	660.0	40.00	EDGING	140.00 X	35.22	4910.2	8.9
9H	660.0	24.00	FLAT	24.00 X	151.49	3631.1	26.0
10H	660.0	18.50	FLAT	18.50 X	158.17	2922.8	19.5
11H	590.0	15.50	FLAT	15.50 X	161.65	2503.1	14.4
12V	590.0	41.50	EDGING	156.50 X	15.61	2432.0	2.8
13H	590.0	13.80	FLAT	13.80 X	157.43	2168.6	10.8
14V	590.0	36.10	EDGING	154.10 X	13.85	2128.7	1.8
15H	590.0	12.87	FLAT	12.87 X	154.40	1984.8	6.8

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 6"x1/2"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.65 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.17	638.7	5.1	85.673	440	1.294	111.3	1757.6	247.75	133	67.3
3H	0.23	686.1	6.4	118.730	764	1.345	63.9	2098.8	260.53	176	51.1
4V	0.28	588.0	9.1	74.409	679	1.215	72.0	1159.7	126.57	121	39.6
5H	0.39	660.0	11.1	87.594	976	1.371	0.0	2133.1	260.12	304	38.9
6V	0.41	576.4	13.7	68.825	945	1.076	83.6	304.1	21.08	30	7.1
7H	0.61	660.0	17.6	55.247	971	1.466	0.0	2461.8	205.97	379	48.8
8V	0.67	560.6	22.7	43.393	985	1.097	99.4	282.9	21.62	51	6.5
9H	0.90	660.0	26.1	37.442	976	1.352	0.0	2000.1	119.87	327	41.9
10H	1.12	660.0	32.4	27.471	890	1.242	0.0	1625.1	69.00	234	32.9
11H	1.31	590.0	42.3	17.428	737	1.168	0.0	1228.0	36.91	164	27.7
12V	1.35	475.7	54.0	13.852	748	1.029	114.3	66.2	2.70	15	2.5
13H	1.51	590.0	48.8	11.734	573	1.121	0.0	1013.1	23.59	121	26.3
14V	1.54	472.4	62.1	9.471	589	1.019	117.6	51.1	1.64	11	2.3
15H	1.65	590.0	53.4	9.841	525	1.072	0.0	715.3	12.45	70	16.6

TOTAL ROLLING POWER : 2270 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:05:54

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 130x16
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.53 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30 X	182.30	33147.4	
1H	750.0	20.00	BOX	124.00 X	206.79	24635.6	25.7
2V	750.0	22.00	BOX	140.50 X	142.88	19039.5	22.7
3H	750.0	23.00	R.BOX	99.00 X	162.97	14155.8	25.7
4V	660.0	34.00	ROUND	130.00 X	109.89	11647.4	17.7
5H	660.0	60.00	FLAT	60.00 X	157.03	8978.1	22.9
6V	660.0	31.00	EDGING	131.00 X	61.94	8089.1	9.9
7H	660.0	39.00	FLAT	39.00 X	148.26	5776.5	28.6
8V	660.0	20.00	EDGING	130.00 X	40.48	5234.8	9.4
9H	660.0	27.00	FLAT	27.00 X	142.40	3836.9	26.7
10V	660.0	21.00	EDGING	131.00 X	27.64	3601.0	6.1
11H	590.0	20.50	FLAT	20.50 X	137.73	2818.2	21.7
12V	590.0	26.50	EDGING	131.50 X	20.73	2711.7	3.8
13H	590.0	17.20	FLAT	17.20 X	134.28	2304.9	15.0
14V	590.0	13.50	EDGING	131.50 X	17.26	2263.0	1.8
15H	590.0	16.21	FLAT	16.21 X	131.70	2131.9	5.8

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 130x16
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.53 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.17	638.7	5.1	85.673	440	1.294	111.3	1757.6	247.75	133	67.3
3H	0.23	686.1	6.4	118.730	764	1.345	63.9	2098.8	260.53	176	51.1
4V	0.28	588.0	9.1	74.409	679	1.215	72.0	1159.7	126.57	121	39.6
5H	0.36	660.0	10.5	87.594	924	1.297	0.0	1890.6	222.49	246	33.2
6V	0.40	560.4	13.8	68.825	949	1.110	99.6	419.3	32.14	46	10.9
7H	0.57	660.0	16.4	55.247	906	1.400	0.0	2178.2	187.12	321	44.3
8V	0.63	550.7	21.7	43.393	941	1.103	109.3	325.1	24.51	56	7.4
9H	0.85	660.0	24.7	37.442	924	1.364	0.0	1964.8	129.23	334	45.2
10V	0.91	550.7	31.5	27.471	866	1.066	109.3	182.1	11.11	37	5.3
11H	1.16	590.0	37.6	17.428	655	1.278	0.0	1505.0	68.67	270	51.6
12V	1.21	485.7	47.5	13.852	657	1.039	104.3	97.9	4.31	21	4.1
13H	1.42	590.0	46.0	11.734	539	1.177	0.0	1122.6	36.35	175	40.5
14V	1.45	472.4	58.5	9.471	554	1.019	117.6	56.4	1.66	10	2.3
15H	1.53	590.0	49.7	9.841	489	1.061	0.0	528.8	9.63	50	12.8

TOTAL ROLLING POWER : 2131 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:05:54

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 5"x5/8"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.58 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30 X	182.30	33147.4	
1H	750.0	20.00	BOX	124.00 X	206.79	24635.6	25.7
2V	750.0	22.00	BOX	140.50 X	142.88	19039.5	22.7
3H	750.0	23.00	R.BOX	99.00 X	162.97	14155.8	25.7
4V	660.0	34.00	ROUND	130.00 X	109.89	11647.4	17.7
5H	660.0	60.00	FLAT	60.00 X	157.03	8978.1	22.9
6V	660.0	31.00	EDGING	131.00 X	61.94	8089.1	9.9
7H	660.0	39.00	FLAT	39.00 X	148.26	5776.5	28.6
8V	660.0	19.00	EDGING	129.00 X	40.59	5207.7	9.8
9H	660.0	27.00	FLAT	27.00 X	141.49	3812.3	26.8
10V	660.0	18.00	EDGING	128.00 X	27.80	3539.7	7.2
11H	590.0	20.50	FLAT	20.50 X	134.92	2760.5	22.0
12V	590.0	23.50	EDGING	128.50 X	20.75	2651.8	3.9
13H	590.0	17.20	FLAT	17.20 X	131.30	2253.5	15.0
14V	590.0	10.40	EDGING	128.40 X	17.27	2210.2	1.9
15H	590.0	16.08	FLAT	16.08 X	128.70	2066.6	6.5

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 5"x5/8"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.58 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.17	638.7	5.1	85.673	440	1.294	111.3	1757.6	247.75	133	67.3
3H	0.23	686.1	6.4	118.730	764	1.345	63.9	2098.8	260.53	176	51.1
4V	0.28	588.0	9.1	74.409	679	1.215	72.0	1159.7	126.57	121	39.6
5H	0.36	660.0	10.5	87.594	924	1.297	0.0	1890.6	222.49	246	33.2
6V	0.40	560.4	13.8	68.825	949	1.110	99.6	419.3	32.14	46	10.9
7H	0.57	660.0	16.4	55.247	906	1.400	0.0	2178.2	187.12	321	44.3
8V	0.63	550.7	21.8	43.393	946	1.109	109.3	336.5	25.96	59	7.8
9H	0.86	660.0	24.8	37.442	930	1.366	0.0	1958.1	129.24	336	45.2
10V	0.92	550.7	32.1	27.471	881	1.077	109.3	203.3	13.35	45	6.4
11H	1.19	590.0	38.4	17.428	669	1.282	0.0	1488.9	68.68	276	51.6
12V	1.23	485.7	48.5	13.852	672	1.041	104.3	100.1	4.46	23	4.2
13H	1.45	590.0	47.0	11.734	552	1.177	0.0	1094.2	35.50	175	39.6
14V	1.48	472.4	59.9	9.471	567	1.020	117.6	57.6	1.72	11	2.4
15H	1.58	590.0	51.3	9.841	504	1.069	0.0	558.5	10.78	58	14.3

TOTAL ROLLING POWER : 2160 kW

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TERMINATED AT 14:05:54

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 6"x5/8"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.32 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30 X	182.30	33147.4	
1H	750.0	20.00	BOX	124.00 X	206.79	24635.6	25.7
2V	750.0	22.00	BOX	140.50 X	142.88	19039.5	22.7
3H	750.0	23.00	R.BOX	99.00 X	162.97	14155.8	25.7
4V	660.0	34.00	ROUND	130.00 X	109.89	11647.4	17.7
5H	660.0	60.00	FLAT	60.00 X	157.03	8978.1	22.9
6V	660.0	48.00	EDGING	148.00 X	60.28	8896.4	0.9
7H	660.0	39.00	FLAT	39.00 X	164.41	6406.7	28.0
8V	660.0	41.00	EDGING	151.00 X	39.84	5988.7	6.5
9H	660.0	27.00	FLAT	27.00 X	163.02	4394.0	26.6
10V	660.0	44.00	EDGING	154.00 X	27.37	4196.1	4.5
11H	590.0	20.50	FLAT	20.50 X	160.54	3285.8	21.7
12V	590.0	49.00	EDGING	154.00 X	20.69	3171.9	3.5
13H	590.0	17.20	FLAT	17.20 X	156.79	2691.9	15.1
14V	590.0	36.10	EDGING	154.10 X	17.24	2650.5	1.5
15H	590.0	16.08	FLAT	16.08 X	154.40	2479.9	6.4

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 6"x5/8"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.32 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.17	638.7	5.1	85.673	440	1.294	111.3	1757.6	247.75	133	67.3
3H	0.23	686.1	6.4	118.730	764	1.345	63.9	2098.8	260.53	176	51.1
4V	0.28	588.0	9.1	74.409	679	1.215	72.0	1159.7	126.57	121	39.6
5H	0.36	660.0	10.5	87.594	924	1.297	0.0	1890.6	222.49	246	33.2
6V	0.37	560.4	12.5	68.825	863	1.009	99.6	146.4	6.95	9	2.4
7H	0.51	660.0	14.8	55.247	817	1.389	0.0	2361.2	196.12	304	46.5
8V	0.55	550.7	18.9	43.393	822	1.070	109.3	261.4	17.33	34	5.2
9H	0.74	660.0	21.5	37.442	807	1.363	0.0	2260.1	145.42	328	50.8
10V	0.78	550.7	27.0	27.471	743	1.047	109.3	153.1	8.49	24	4.0
11H	1.00	590.0	32.2	17.428	562	1.277	0.0	1788.7	80.25	271	60.3
12V	1.03	485.7	40.6	13.852	562	1.036	104.3	98.7	4.47	19	4.2
13H	1.22	590.0	39.3	11.734	462	1.178	0.0	1369.9	44.17	182	49.3
14V	1.23	472.4	49.9	9.471	473	1.016	117.6	55.9	1.63	9	2.3
15H	1.32	590.0	42.7	9.841	420	1.069	0.0	704.5	13.51	60	18.0

TOTAL ROLLING POWER : 2051 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:05:54

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 130x19
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.29 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30	X 182.30	33147.4	
1H	750.0	20.00	BOX	124.00	X 206.79	24635.6	25.7
2V	750.0	22.00	BOX	140.50	X 142.88	19039.5	22.7
3H	750.0	23.00	R.BOX	99.00	X 162.97	14155.8	25.7
4V	660.0	34.00	ROUND	130.00	X 109.89	11647.4	17.7
5H	660.0	60.00	FLAT	60.00	X 157.03	8978.1	22.9
6V	660.0	30.00	EDGING	130.00	X 62.08	8045.5	10.4
7H	660.0	39.00	FLAT	39.00	X 147.33	5740.5	28.7
8V	660.0	18.00	EDGING	128.00	X 40.61	5170.0	9.9
9H	660.0	26.50	FLAT	26.50	X 141.18	3733.2	27.8
10V	660.0	18.00	EDGING	128.00	X 27.27	3471.6	7.0
11H	590.0	20.30	FLAT	20.30	X 134.57	2726.6	21.5
12V	590.0	27.00	EDGING	132.00	X 20.37	2675.5	1.9
13H	590.0	19.25	FLAT	19.25	X 131.70	2529.7	5.5

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 130x19
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.29 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.17	638.7	5.1	85.673	440	1.294	111.3	1757.6	247.75	133	67.3
3H	0.23	686.1	6.4	118.730	764	1.345	63.9	2098.8	260.53	176	51.1
4V	0.28	588.0	9.1	74.409	679	1.215	72.0	1159.7	126.57	121	39.6
5H	0.36	660.0	10.5	87.594	924	1.297	0.0	1890.6	222.49	246	33.2
6V	0.41	560.4	13.9	68.825	954	1.116	99.6	434.9	34.10	49	11.5
7H	0.57	660.0	16.5	55.247	911	1.402	0.0	2169.4	186.88	323	44.3
8V	0.63	550.7	21.9	43.393	952	1.110	109.3	337.8	26.09	60	7.9
9H	0.88	660.0	25.4	37.442	950	1.385	0.0	2010.7	134.90	358	47.2
10V	0.94	550.7	32.7	27.471	898	1.075	109.3	196.5	12.77	44	6.1
11H	1.20	590.0	38.8	17.428	677	1.273	0.0	1446.9	65.26	266	49.0
12V	1.22	485.7	48.1	13.852	666	1.019	104.3	61.2	1.85	9	1.8
13H	1.29	590.0	41.9	11.734	491	1.058	0.0	480.6	8.99	39	10.0

TOTAL ROLLING POWER : 1959 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:05:54

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 5"x3/4"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.32 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30 X	182.30	33147.4	
1H	750.0	20.00	BOX	124.00 X	206.79	24635.6	25.7
2V	750.0	22.00	BOX	140.50 X	142.88	19039.5	22.7
3H	750.0	23.00	R.BOX	99.00 X	162.97	14155.8	25.7
4V	660.0	34.00	ROUND	130.00 X	109.89	11647.4	17.7
5H	660.0	60.00	FLAT	60.00 X	157.03	8978.1	22.9
6V	660.0	28.00	EDGING	128.00 X	62.37	7958.4	11.4
7H	660.0	39.00	FLAT	39.00 X	145.49	5668.4	28.8
8V	660.0	15.00	EDGING	125.00 X	40.77	5067.2	10.6
9H	660.0	26.50	FLAT	26.50 X	138.28	3656.3	27.8
10V	660.0	15.40	EDGING	125.40 X	27.27	3400.8	7.0
11H	590.0	20.30	FLAT	20.30 X	131.95	2673.5	21.4
12V	590.0	24.00	EDGING	129.00 X	20.39	2616.6	2.1
13H	590.0	19.30	FLAT	19.30 X	128.70	2478.3	5.3

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 5"x3/4"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.32 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.17	638.7	5.1	85.673	440	1.294	111.3	1757.6	247.75	133	67.3
3H	0.23	686.1	6.4	118.730	764	1.345	63.9	2098.8	260.53	176	51.1
4V	0.28	588.0	9.1	74.409	679	1.215	72.0	1159.7	126.57	121	39.6
5H	0.36	660.0	10.5	87.594	924	1.297	0.0	1890.6	222.49	246	33.2
6V	0.41	560.4	14.0	68.825	964	1.128	99.6	465.0	38.01	56	12.9
7H	0.58	660.0	16.7	55.247	923	1.404	0.0	2151.8	186.40	326	44.2
8V	0.65	550.7	22.4	43.393	972	1.119	109.3	351.6	27.82	65	8.4
9H	0.89	660.0	25.9	37.442	970	1.386	0.0	1971.3	132.91	360	46.5
10V	0.96	550.7	33.4	27.471	917	1.075	109.3	194.2	12.48	44	5.9
11H	1.22	590.0	39.6	17.428	690	1.272	0.0	1411.1	63.65	264	47.8
12V	1.25	485.7	49.2	13.852	681	1.022	104.3	65.2	2.09	11	2.0
13H	1.32	590.0	42.7	11.734	501	1.056	0.0	457.1	8.41	38	9.4

TOTAL ROLLING POWER : 1974 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:05:54

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 6"x3/4"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.10 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30 X	182.30	33147.4	
1H	750.0	20.00	BOX	124.00 X	206.79	24635.6	25.7
2V	750.0	22.00	BOX	140.50 X	142.88	19039.5	22.7
3H	750.0	23.00	R.BOX	99.00 X	162.97	14155.8	25.7
4V	660.0	34.00	ROUND	130.00 X	109.89	11647.4	17.7
5H	660.0	60.00	FLAT	60.00 X	157.03	8978.1	22.9
6V	660.0	44.50	EDGING	144.50 X	60.51	8718.5	2.9
7H	660.0	39.00	FLAT	39.00 X	161.01	6274.2	28.0
8V	660.0	37.00	EDGING	147.00 X	39.92	5841.1	6.9
9H	660.0	26.50	FLAT	26.50 X	159.76	4225.8	27.7
10V	660.0	41.00	EDGING	151.00 X	26.86	4037.4	4.5
11H	590.0	20.30	FLAT	20.30 X	157.19	3185.9	21.1
12V	590.0	49.80	EDGING	154.80 X	20.35	3136.6	1.5
13H	590.0	19.30	FLAT	19.30 X	154.40	2974.3	5.2

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 6"x3/4"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.10 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.17	638.7	5.1	85.673	440	1.294	111.3	1757.6	247.75	133	67.3
3H	0.23	686.1	6.4	118.730	764	1.345	63.9	2098.8	260.53	176	51.1
4V	0.28	588.0	9.1	74.409	679	1.215	72.0	1159.7	126.57	121	39.6
5H	0.36	660.0	10.5	87.594	924	1.297	0.0	1890.6	222.49	246	33.2
6V	0.38	560.4	12.8	68.825	880	1.030	99.6	189.6	10.38	14	3.5
7H	0.52	660.0	15.1	55.247	834	1.390	0.0	2316.3	193.32	306	45.8
8V	0.56	550.7	19.4	43.393	843	1.074	109.3	269.8	18.22	37	5.5
9H	0.77	660.0	22.4	37.442	839	1.382	0.0	2279.1	149.49	351	52.3
10V	0.81	550.7	28.1	27.471	772	1.047	109.3	147.7	8.08	24	3.8
11H	1.03	590.0	33.2	17.428	579	1.267	0.0	1697.0	74.48	259	55.9
12V	1.04	485.7	41.0	13.852	568	1.016	104.3	59.2	1.76	8	1.7
13H	1.10	590.0	35.6	11.734	418	1.055	0.0	565.5	10.29	38	11.5

TOTAL ROLLING POWER : 1847 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:05:54

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 5"x7/8"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.13 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30 X	182.30	33147.4	
1H	750.0	20.00	BOX	124.00 X	206.79	24635.6	25.7
2V	750.0	22.00	BOX	140.50 X	142.88	19039.5	22.7
3H	750.0	23.00	R.BOX	99.00 X	162.97	14155.8	25.7
4V	660.0	34.00	ROUND	130.00 X	109.89	11647.4	17.7
5H	660.0	60.00	FLAT	60.00 X	157.03	8978.1	22.9
6V	660.0	28.00	EDGING	128.00 X	62.37	7958.4	11.4
7H	660.0	40.00	FLAT	40.00 X	144.45	5772.5	27.5
8V	660.0	17.00	EDGING	127.00 X	41.48	5229.8	9.4
9H	660.0	29.00	FLAT	29.00 X	137.62	3982.8	23.8
10V	660.0	17.00	EDGING	127.00 X	29.64	3743.0	6.0
11H	590.0	23.50	FLAT	23.50 X	131.77	3089.8	17.5
12V	590.0	21.80	EDGING	128.80 X	23.59	3028.9	2.0
13H	590.0	22.51	FLAT	22.51 X	128.70	2892.8	4.5

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 5"x7/8"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.13 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.17	638.7	5.1	85.673	440	1.294	111.3	1757.6	247.75	133	67.3
3H	0.23	686.1	6.4	118.730	764	1.345	63.9	2098.8	260.53	176	51.1
4V	0.28	588.0	9.1	74.409	679	1.215	72.0	1159.7	126.57	121	39.6
5H	0.36	660.0	10.5	87.594	924	1.297	0.0	1890.6	222.49	246	33.2
6V	0.41	560.4	14.0	68.825	964	1.128	99.6	465.0	38.01	56	12.9
7H	0.57	660.0	16.4	55.247	906	1.379	0.0	2064.9	175.65	302	41.6
8V	0.63	550.9	21.7	43.393	941	1.104	109.1	326.1	24.06	55	7.3
9H	0.82	660.0	23.8	37.442	890	1.313	0.0	1739.0	110.51	275	38.6
10V	0.87	550.7	30.3	27.471	833	1.064	109.3	188.0	11.08	35	5.3
11H	1.06	590.0	34.3	17.428	597	1.211	0.0	1211.2	51.84	186	38.9
12V	1.08	483.4	42.7	13.852	591	1.020	106.6	72.0	2.20	10	2.1
13H	1.13	590.0	36.6	11.734	430	1.047	0.0	427.2	7.99	31	8.9

TOTAL ROLLING POWER : 1759 kW

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TERMINATED AT 14:05:54

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 6"x7/8"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 0.94 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30 X	182.30	33147.4	
1H	750.0	20.00	BOX	124.00 X	206.79	24635.6	25.7
2V	750.0	22.00	BOX	140.50 X	142.88	19039.5	22.7
3H	750.0	23.00	R.BOX	99.00 X	162.97	14155.8	25.7
4V	660.0	34.00	ROUND	130.00 X	109.89	11647.4	17.7
5H	660.0	60.00	FLAT	60.00 X	157.03	8978.1	22.9
6V	660.0	45.00	EDGING	145.00 X	60.47	8743.5	2.6
7H	660.0	40.00	FLAT	40.00 X	160.43	6411.7	26.7
8V	660.0	38.50	EDGING	148.50 X	40.75	6022.6	6.1
9H	660.0	29.00	FLAT	29.00 X	158.72	4594.9	23.7
10V	660.0	42.50	EDGING	152.50 X	29.25	4440.5	3.4
11H	590.0	23.50	FLAT	23.50 X	156.95	3681.8	17.1
12V	590.0	47.50	EDGING	154.50 X	23.55	3629.2	1.4
13H	590.0	22.51	FLAT	22.51 X	154.40	3471.3	4.4

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DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 6"x7/8"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 0.94 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.17	638.7	5.1	85.673	440	1.294	111.3	1757.6	247.75	133	67.3
3H	0.23	686.1	6.4	118.730	764	1.345	63.9	2098.8	260.53	176	51.1
4V	0.28	588.0	9.1	74.409	679	1.215	72.0	1159.7	126.57	121	39.6
5H	0.36	660.0	10.5	87.594	924	1.297	0.0	1890.6	222.49	246	33.2
6V	0.37	560.4	12.8	68.825	878	1.027	99.6	183.8	9.88	13	3.3
7H	0.51	660.0	14.8	55.247	816	1.364	0.0	2221.9	181.63	281	43.0
8V	0.54	550.7	18.8	43.393	818	1.065	109.3	249.8	15.71	31	4.7
9H	0.71	660.0	20.6	37.442	772	1.311	0.0	2005.9	124.36	268	43.5
10V	0.74	550.7	25.6	27.471	702	1.035	109.3	129.5	6.08	16	2.9
11H	0.89	590.0	28.8	17.428	501	1.206	0.0	1444.2	60.06	181	45.1
12V	0.90	483.4	35.6	13.852	493	1.014	106.6	65.3	1.85	7	1.7
13H	0.94	590.0	30.5	11.734	358	1.045	0.0	526.0	9.72	31	10.8

TOTAL ROLLING POWER : 1639 kW

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DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 5"x1"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 0.99 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30 X	182.30	33147.4	
1H	750.0	20.00	BOX	124.00 X	206.79	24635.6	25.7
2V	750.0	22.00	BOX	140.50 X	142.88	19039.5	22.7
3H	750.0	23.00	R.BOX	99.00 X	162.97	14155.8	25.7
4V	660.0	34.00	ROUND	130.00 X	109.89	11647.4	17.7
5H	660.0	60.00	FLAT	60.00 X	157.03	8978.1	22.9
6V	660.0	28.00	EDGING	128.00 X	62.37	7958.4	11.4
7H	660.0	40.00	FLAT	40.00 X	144.45	5772.5	27.5
8V	660.0	18.00	EDGING	128.00 X	41.36	5258.6	8.9
9H	660.0	31.00	FLAT	31.00 X	136.00	4207.5	20.0
10V	660.0	28.00	EDGING	128.00 X	31.45	4013.0	4.6
11H	590.0	26.70	FLAT	26.70 X	131.19	3498.5	12.8
12V	590.0	22.80	EDGING	128.80 X	26.78	3438.4	1.7
13H	590.0	25.73	FLAT	25.73 X	128.70	3306.7	3.8

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DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 5"x1"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 0.99 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.17	638.7	5.1	85.673	440	1.294	111.3	1757.6	247.75	133	67.3
3H	0.23	686.1	6.4	118.730	764	1.345	63.9	2098.8	260.53	176	51.1
4V	0.28	588.0	9.1	74.409	679	1.215	72.0	1159.7	126.57	121	39.6
5H	0.36	660.0	10.5	87.594	924	1.297	0.0	1890.6	222.49	246	33.2
6V	0.41	560.4	14.0	68.825	964	1.128	99.6	465.0	38.01	56	12.9
7H	0.57	660.0	16.4	55.247	906	1.379	0.0	2064.9	175.65	302	41.6
8V	0.62	550.9	21.6	43.393	936	1.098	109.1	313.8	22.57	51	6.8
9H	0.78	660.0	22.5	37.442	843	1.250	0.0	1490.5	87.25	206	30.5
10V	0.82	560.4	27.8	27.471	763	1.048	99.6	165.4	8.55	25	4.1
11H	0.94	590.0	30.3	17.428	528	1.147	0.0	953.0	36.64	116	27.5
12V	0.95	484.4	37.5	13.852	520	1.017	105.6	75.6	2.15	8	2.0
13H	0.99	590.0	32.0	11.734	376	1.040	0.0	399.1	7.41	25	8.3

TOTAL ROLLING POWER : 1599 kW

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DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 6"x1"
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 0.82 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	182.30 X	182.30	33147.4	
1H	750.0	20.00	BOX	124.00 X	206.79	24635.6	25.7
2V	750.0	22.00	BOX	140.50 X	142.88	19039.5	22.7
3H	750.0	23.00	R.BOX	99.00 X	162.97	14155.8	25.7
4V	660.0	34.00	ROUND	130.00 X	109.89	11647.4	17.7
5H	660.0	60.00	FLAT	60.00 X	157.03	8978.1	22.9
6V	660.0	45.00	EDGING	145.00 X	60.47	8743.5	2.6
7H	660.0	40.00	FLAT	40.00 X	160.43	6411.7	26.7
8V	660.0	40.00	EDGING	150.00 X	40.63	6065.8	5.4
9H	660.0	31.00	FLAT	31.00 X	157.53	4875.0	19.6
10V	660.0	54.00	EDGING	154.00 X	31.11	4778.6	2.0
11H	590.0	26.70	FLAT	26.70 X	156.93	4185.7	12.4
12V	590.0	48.50	EDGING	154.50 X	26.76	4123.6	1.5
13H	590.0	25.73	FLAT	25.73 X	154.40	3968.0	3.8

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DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

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Hot rolling
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ROLLING SPEED : 0.82 m/s
AXV : 3272.11 mm²m/s
BILLET SIZE : 182.3 mm SQUARE
BILLET WEIGHT : 2970.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 118.7 s
INTER BILLET : 15.0 s
PRODUCTION : 80.0 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.13	650.9	3.9	118.730	463	1.346	99.1	2400.7	330.53	135	64.8
2V	0.17	638.7	5.1	85.673	440	1.294	111.3	1757.6	247.75	133	67.3
3H	0.23	686.1	6.4	118.730	764	1.345	63.9	2098.8	260.53	176	51.1
4V	0.28	588.0	9.1	74.409	679	1.215	72.0	1159.7	126.57	121	39.6
5H	0.36	660.0	10.5	87.594	924	1.297	0.0	1890.6	222.49	246	33.2
6V	0.37	560.4	12.8	68.825	878	1.027	99.6	183.8	9.88	13	3.3
7H	0.51	660.0	14.8	55.247	816	1.364	0.0	2221.9	181.63	281	43.0
8V	0.54	550.7	18.7	43.393	812	1.057	109.3	229.0	13.58	27	4.1
9H	0.67	660.0	19.4	37.442	727	1.244	0.0	1706.3	96.84	197	33.9
10V	0.68	560.4	23.3	27.471	641	1.020	99.6	100.6	3.61	9	1.7
11H	0.78	590.0	25.3	17.428	441	1.142	0.0	1129.8	42.02	111	31.6
12V	0.79	484.4	31.3	13.852	433	1.015	105.6	75.9	2.19	7	2.1
13H	0.82	590.0	26.7	11.734	313	1.039	0.0	495.6	9.17	26	10.2

TOTAL ROLLING POWER : 1481 kW

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2.2 Flats from billet 150mm

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x1/4" blt150
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 4.95 m/s
AXV : 3269.59 mm²m/s
BILLET SIZE : 152.0 mm SQUARE
BILLET WEIGHT : 2065.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 82.6 s
INTER BILLET : 15.0 s
PRODUCTION : 76.2 t/h

STAND NO.	ROLL DIA (mm)	GAP (mm)	GROOVE TYPE	STOCK HEIGHT (mm)	STOCK WIDTH (mm)	AREA (mm²)	REDUCTION (%)
			SQUARE	151.95	X 151.95	23003.0	
1H	750.0	24.00	BOX	128.00	X 160.30	20518.4	10.8
2V	750.0	18.00	BOX	136.50	X 136.23	18063.7	12.0
3H	750.0	17.00	R.BOX	93.00	X 161.05	13111.5	27.4
4V	660.0	15.00	ROUND	111.00	X 110.52	9668.5	26.3
5H	660.0	12.00	R.OVAL	67.60	X 132.53	6962.5	28.0
6V	660.0	12.00	ROUND	82.00	X 82.39	5292.0	24.0
7H	660.0	40.00	FLAT	40.00	X 106.11	4038.8	23.7
8V	660.0	8.00	EDGING	78.00	X 43.52	3366.0	16.7
9H	660.0	24.50	FLAT	24.50	X 95.19	2326.4	30.9
10H	660.0	15.50	FLAT	15.50	X 107.44	1659.1	28.7
11H	590.0	10.60	FLAT	10.60	X 115.38	1216.9	26.7
12V	590.0	20.00	EDGING	100.00	X 11.17	1112.3	8.6
13H	590.0	7.90	FLAT	7.90	X 105.56	831.2	25.3
14V	590.0	35.50	EDGING	100.50	X 8.01	802.3	3.5
15H	590.0	6.43	FLAT	6.43	X 102.90	660.2	17.7

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DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x1/4" blt150
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 4.95 m/s
AXV : 3269.59 mm²m/s
BILLET SIZE : 152.0 mm SQUARE
BILLET WEIGHT : 2065.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 82.6 s
INTER BILLET : 15.0 s
PRODUCTION : 76.2 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.16	646.0	4.7	118.730	559	1.121	104.0	1167.2	112.48	55	22.0
2V	0.18	635.4	5.4	85.673	466	1.136	114.6	1133.6	113.64	65	30.9
3H	0.25	685.6	6.9	118.730	825	1.378	64.4	2178.6	273.30	199	53.6
4V	0.34	587.5	11.0	74.409	818	1.356	72.5	1430.7	172.81	199	54.0
5H	0.47	619.5	14.5	87.594	1268	1.389	40.5	1664.5	169.28	257	32.1
6V	0.62	607.8	19.4	68.825	1336	1.316	52.2	1048.8	118.90	242	53.7
7H	0.81	660.0	23.4	55.247	1294	1.310	0.0	1384.6	143.72	353	44.1
8V	0.97	590.7	31.4	43.393	1363	1.200	69.3	421.9	35.53	117	14.6
9H	1.41	660.0	40.7	37.442	1523	1.447	0.0	1433.2	109.43	466	58.3
10H	1.97	660.0	57.0	27.471	1567	1.402	0.0	1404.2	74.01	442	55.2
11H	2.69	590.0	87.0	17.428	1516	1.363	0.0	1297.9	47.66	434	54.3
12V	2.94	510.4	110.0	13.852	1524	1.094	79.6	89.4	5.83	67	8.4
13H	3.93	590.0	127.3	11.734	1494	1.338	0.0	1178.7	35.09	468	58.5
14V	4.08	525.4	148.1	9.471	1403	1.036	64.6	35.7	1.43	22	2.8
15H	4.95	590.0	160.3	9.841	1578	1.215	0.0	851.0	17.75	298	37.2

TOTAL ROLLING POWER : 3683 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:06:57

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x5/16" blt150
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 3.96 m/s
AXV : 3269.59 mm²m/s
BILLET SIZE : 152.0 mm SQUARE
BILLET WEIGHT : 2065.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 82.6 s
INTER BILLET : 15.0 s
PRODUCTION : 76.2 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	151.95	X 151.95	23003.0	
1H	750.0	24.00	BOX	128.00	X 160.30	20518.4	10.8
2V	750.0	18.00	BOX	136.50	X 136.23	18063.7	12.0
3H	750.0	17.00	R.BOX	93.00	X 161.05	13111.5	27.4
4V	660.0	15.00	ROUND	111.00	X 110.52	9668.5	26.3
5H	660.0	12.00	R.OVAL	67.60	X 132.53	6962.5	28.0
6V	660.0	12.00	ROUND	82.00	X 82.39	5292.0	24.0
7H	660.0	40.00	FLAT	40.00	X 106.11	4038.8	23.7
8V	660.0	8.00	EDGING	78.00	X 43.52	3366.0	16.7
9H	660.0	24.50	FLAT	24.50	X 95.19	2326.4	30.9
10H	660.0	15.80	FLAT	15.80	X 106.89	1683.4	27.6
11H	590.0	11.20	FLAT	11.20	X 114.04	1272.6	24.4
12V	590.0	21.50	EDGING	101.50	X 11.67	1179.5	7.3
13H	590.0	9.00	FLAT	9.00	X 105.34	946.1	19.8
14V	590.0	11.10	EDGING	102.10	X 9.07	922.5	2.5
15H	590.0	8.04	FLAT	8.04	X 102.90	825.8	10.5

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x5/16" blt150
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 3.96 m/s
AXV : 3269.59 mm²m/s
BILLET SIZE : 152.0 mm SQUARE
BILLET WEIGHT : 2065.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 82.6 s
INTER BILLET : 15.0 s
PRODUCTION : 76.2 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.16	646.0	4.7	118.730	559	1.121	104.0	1167.2	112.48	55	22.0
2V	0.18	635.4	5.4	85.673	466	1.136	114.6	1133.6	113.64	65	30.9
3H	0.25	685.6	6.9	118.730	825	1.378	64.4	2178.6	273.30	199	53.6
4V	0.34	587.5	11.0	74.409	818	1.356	72.5	1430.7	172.81	199	54.0
5H	0.47	619.5	14.5	87.594	1268	1.389	40.5	1664.5	169.28	257	32.1
6V	0.62	607.8	19.4	68.825	1336	1.316	52.2	1048.8	118.90	242	53.7
7H	0.81	660.0	23.4	55.247	1294	1.310	0.0	1384.6	143.72	353	44.1
8V	0.97	590.7	31.4	43.393	1363	1.200	69.3	421.9	35.53	117	14.6
9H	1.41	660.0	40.7	37.442	1523	1.447	0.0	1433.2	109.43	466	58.3
10H	1.94	660.0	56.2	27.471	1544	1.382	0.0	1355.1	70.39	414	51.8
11H	2.57	590.0	83.2	17.428	1449	1.323	0.0	1190.0	42.60	371	46.4
12V	2.77	510.4	103.7	13.852	1437	1.079	79.6	83.2	4.97	54	6.7
13H	3.46	590.0	111.9	11.734	1313	1.247	0.0	951.2	25.92	304	38.0
14V	3.54	499.4	135.5	9.471	1284	1.026	90.6	31.4	1.01	14	1.8
15H	3.96	590.0	128.2	9.841	1261	1.117	0.0	545.7	9.41	126	15.8

TOTAL ROLLING POWER : 3235 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:06:57

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x3/8" blt150
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 3.30 m/s
AXV : 3269.59 mm²m/s
BILLET SIZE : 152.0 mm SQUARE
BILLET WEIGHT : 2065.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 82.6 s
INTER BILLET : 15.0 s
PRODUCTION : 76.2 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	151.95	X 151.95	23003.0	
1H	750.0	24.00	BOX	128.00	X 160.30	20518.4	10.8
2V	750.0	18.00	BOX	136.50	X 136.23	18063.7	12.0
3H	750.0	17.00	R.BOX	93.00	X 161.05	13111.5	27.4
4V	660.0	15.00	ROUND	111.00	X 110.52	9668.5	26.3
5H	660.0	12.00	R.OVAL	67.60	X 132.53	6962.5	28.0
6V	660.0	12.00	ROUND	82.00	X 82.39	5292.0	24.0
7H	660.0	40.00	FLAT	40.00	X 106.11	4038.8	23.7
8V	660.0	8.00	EDGING	78.00	X 43.52	3366.0	16.7
9H	660.0	25.50	FLAT	25.50	X 93.95	2390.6	29.0
10H	660.0	17.40	FLAT	17.40	X 104.14	1808.3	24.4
11H	590.0	13.00	FLAT	13.00	X 110.27	1430.7	20.9
12V	590.0	22.00	EDGING	102.00	X 13.33	1353.9	5.4
13H	590.0	10.70	FLAT	10.70	X 105.22	1123.8	17.0
14V	590.0	30.20	EDGING	102.20	X 10.78	1097.1	2.4
15H	590.0	9.65	FLAT	9.65	X 102.90	991.3	9.6

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x3/8" blt150
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 3.30 m/s
AXV : 3269.59 mm²m/s
BILLET SIZE : 152.0 mm SQUARE
BILLET WEIGHT : 2065.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 82.6 s
INTER BILLET : 15.0 s
PRODUCTION : 76.2 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.16	646.0	4.7	118.730	559	1.121	104.0	1167.2	112.48	55	22.0
2V	0.18	635.4	5.4	85.673	466	1.136	114.6	1133.6	113.64	65	30.9
3H	0.25	685.6	6.9	118.730	825	1.378	64.4	2178.6	273.30	199	53.6
4V	0.34	587.5	11.0	74.409	818	1.356	72.5	1430.7	172.81	199	54.0
5H	0.47	619.5	14.5	87.594	1268	1.389	40.5	1664.5	169.28	257	32.1
6V	0.62	607.8	19.4	68.825	1336	1.316	52.2	1048.8	118.90	242	53.7
7H	0.81	660.0	23.4	55.247	1294	1.310	0.0	1384.6	143.72	353	44.1
8V	0.97	590.7	31.4	43.393	1363	1.200	69.3	421.9	35.53	117	14.6
9H	1.37	660.0	39.6	37.442	1482	1.408	0.0	1353.2	101.01	419	52.3
10H	1.81	660.0	52.3	27.471	1437	1.322	0.0	1201.4	60.76	333	41.6
11H	2.29	590.0	74.0	17.428	1289	1.264	0.0	1020.1	36.15	280	35.0
12V	2.41	510.4	90.4	13.852	1252	1.057	79.6	74.9	3.73	35	4.4
13H	2.91	590.0	94.2	11.734	1105	1.205	0.0	849.0	23.24	229	28.7
14V	2.98	518.4	109.8	9.471	1040	1.024	71.6	37.1	1.19	14	1.7
15H	3.30	590.0	106.8	9.841	1051	1.107	0.0	521.0	9.48	106	13.3

TOTAL ROLLING POWER : 2902 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:06:57

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x1/2" blt150
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 2.47 m/s
AXV : 3269.59 mm²m/s
BILLET SIZE : 152.0 mm SQUARE
BILLET WEIGHT : 2065.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 82.6 s
INTER BILLET : 15.0 s
PRODUCTION : 76.2 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	151.95	X 151.95	23003.0	
1H	750.0	24.00	BOX	128.00	X 160.30	20518.4	10.8
2V	750.0	18.00	BOX	136.50	X 136.23	18063.7	12.0
3H	750.0	17.00	R.BOX	93.00	X 161.05	13111.5	27.4
4V	660.0	15.00	ROUND	111.00	X 110.52	9668.5	26.3
5H	660.0	15.00	R.OVAL	70.60	X 130.13	7276.2	24.7
6V	660.0	22.00	ROUND	92.00	X 81.48	6043.2	16.9
7H	660.0	40.00	FLAT	40.00	X 118.13	4509.6	25.4
8V	660.0	26.50	EDGING	96.50	X 41.92	4028.8	10.7
9H	660.0	25.50	FLAT	25.50	X 111.97	2850.4	29.2
10V	660.0	13.50	EDGING	98.50	X 26.64	2605.8	8.6
11H	590.0	17.50	FLAT	17.50	X 108.39	1890.6	27.4
12V	590.0	20.50	EDGING	100.50	X 17.89	1790.3	5.3
13H	590.0	13.70	FLAT	13.70	X 105.40	1441.3	19.5
14V	590.0	17.80	EDGING	102.80	X 13.78	1410.7	2.1
15H	590.0	12.87	FLAT	12.87	X 102.90	1322.0	6.3

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x1/2" blt150
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 2.47 m/s
AXV : 3269.59 mm²m/s
BILLET SIZE : 152.0 mm SQUARE
BILLET WEIGHT : 2065.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 82.6 s
INTER BILLET : 15.0 s
PRODUCTION : 76.2 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.16	646.0	4.7	118.730	559	1.121	104.0	1167.2	112.48	55	22.0
2V	0.18	635.4	5.4	85.673	466	1.136	114.6	1133.6	113.64	65	30.9
3H	0.25	685.6	6.9	118.730	825	1.378	64.4	2178.6	273.30	199	53.6
4V	0.34	587.5	11.0	74.409	818	1.356	72.5	1430.7	172.81	199	54.0
5H	0.45	619.1	13.9	87.594	1214	1.329	40.9	1509.8	149.64	217	27.2
6V	0.54	607.8	17.0	68.825	1170	1.204	52.2	868.8	90.42	161	35.8
7H	0.73	660.0	21.0	55.247	1159	1.340	0.0	1610.8	168.62	370	46.3
8V	0.81	590.4	26.3	43.393	1139	1.119	69.6	316.4	23.08	63	7.9
9H	1.15	660.0	33.2	37.442	1243	1.413	0.0	1612.6	115.82	403	50.3
10V	1.25	575.7	41.6	27.471	1144	1.094	84.3	197.0	13.09	57	7.1
11H	1.73	590.0	56.0	17.428	976	1.378	0.0	1347.6	68.25	400	51.3
12V	1.83	510.4	68.3	13.852	947	1.056	79.6	96.1	4.64	33	4.4
13H	2.27	590.0	73.4	11.734	862	1.242	0.0	997.1	34.53	266	38.5
14V	2.32	505.4	87.6	9.471	829	1.022	84.6	43.3	1.28	12	1.8
15H	2.47	590.0	80.1	9.841	788	1.067	0.0	372.9	6.21	52	8.3

TOTAL ROLLING POWER : 2552 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:06:57

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x5/8" blt150
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.98 m/s
AXV : 3269.59 mm²m/s
BILLET SIZE : 152.0 mm SQUARE
BILLET WEIGHT : 2065.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 82.6 s
INTER BILLET : 15.0 s
PRODUCTION : 76.2 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	151.95	X 151.95	23003.0	
1H	750.0	24.00	BOX	128.00	X 160.30	20518.4	10.8
2V	750.0	18.00	BOX	136.50	X 136.23	18063.7	12.0
3H	750.0	17.00	R.BOX	93.00	X 161.05	13111.5	27.4
4V	660.0	15.00	ROUND	111.00	X 110.52	9668.5	26.3
5H	660.0	15.00	R.OVAL	70.60	X 130.13	7276.2	24.7
6V	660.0	22.00	ROUND	92.00	X 81.48	6043.2	16.9
7H	660.0	40.00	FLAT	40.00	X 118.13	4509.6	25.4
8V	660.0	26.50	EDGING	96.50	X 41.92	4028.8	10.7
9H	660.0	26.50	FLAT	26.50	X 110.67	2928.1	27.3
10V	660.0	16.50	EDGING	101.50	X 27.22	2742.3	6.3
11H	590.0	20.40	FLAT	20.40	X 107.58	2188.7	20.2
12V	590.0	22.50	EDGING	102.50	X 20.65	2107.8	3.7
13H	590.0	17.20	FLAT	17.20	X 105.50	1811.6	14.1
14V	590.0	22.50	EDGING	102.50	X 17.31	1767.6	2.4
15H	590.0	16.08	FLAT	16.08	X 102.90	1651.8	6.6

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x5/8" blt150
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.98 m/s
AXV : 3269.59 mm²m/s
BILLET SIZE : 152.0 mm SQUARE
BILLET WEIGHT : 2065.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 82.6 s
INTER BILLET : 15.0 s
PRODUCTION : 76.2 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.16	646.0	4.7	118.730	559	1.121	104.0	1167.2	112.48	55	22.0
2V	0.18	635.4	5.4	85.673	466	1.136	114.6	1133.6	113.64	65	30.9
3H	0.25	685.6	6.9	118.730	825	1.378	64.4	2178.6	273.30	199	53.6
4V	0.34	587.5	11.0	74.409	818	1.356	72.5	1430.7	172.81	199	54.0
5H	0.45	619.1	13.9	87.594	1214	1.329	40.9	1509.8	149.64	217	27.2
6V	0.54	607.8	17.0	68.825	1170	1.204	52.2	868.8	90.42	161	35.8
7H	0.73	660.0	21.0	55.247	1159	1.340	0.0	1610.8	168.62	370	46.3
8V	0.81	590.4	26.3	43.393	1139	1.119	69.6	316.4	23.08	63	7.9
9H	1.12	660.0	32.3	37.442	1210	1.376	0.0	1514.5	105.92	358	44.8
10V	1.19	575.7	39.6	27.471	1086	1.068	84.3	160.5	9.00	37	4.7
11H	1.49	590.0	48.4	17.428	843	1.253	0.0	1041.6	46.34	235	34.8
12V	1.55	510.4	58.0	13.852	804	1.038	79.6	84.5	3.35	20	3.2
13H	1.80	590.0	58.4	11.734	686	1.163	0.0	781.7	25.07	153	28.0
14V	1.85	510.4	69.2	9.471	656	1.025	79.6	59.2	1.88	14	2.6
15H	1.98	590.0	64.1	9.841	631	1.070	0.0	415.6	8.12	55	10.8

TOTAL ROLLING POWER : 2202 kW

*** Subject to the confidentiality clause *** M

TERMINATED AT 14:06:57

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x3/4" blt150
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.65 m/s
AXV : 3269.59 mm²m/s
BILLET SIZE : 152.0 mm SQUARE
BILLET WEIGHT : 2065.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 82.6 s
INTER BILLET : 15.0 s
PRODUCTION : 76.2 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	151.95	X 151.95	23003.0	
1H	750.0	24.00	BOX	128.00	X 160.30	20518.4	10.8
2V	750.0	18.00	BOX	136.50	X 136.23	18063.7	12.0
3H	750.0	17.00	R.BOX	93.00	X 161.05	13111.5	27.4
4V	660.0	15.00	ROUND	111.00	X 110.52	9668.5	26.3
5H	660.0	15.00	R.OVAL	70.60	X 130.13	7276.2	24.7
6V	660.0	22.00	ROUND	92.00	X 81.48	6043.2	16.9
7H	660.0	40.00	FLAT	40.00	X 118.13	4509.6	25.4
8V	660.0	26.50	EDGING	96.50	X 41.92	4028.8	10.7
9H	660.0	26.50	FLAT	26.50	X 110.67	2928.1	27.3
10V	660.0	14.50	EDGING	99.50	X 27.43	2707.2	7.5
11H	590.0	20.40	FLAT	20.40	X 105.79	2152.1	20.5
12V	590.0	22.70	EDGING	102.70	X 20.53	2099.8	2.4
13H	590.0	19.30	FLAT	19.30	X 102.90	1982.4	5.6

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DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x3/4" blt150
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.65 m/s
AXV : 3269.59 mm²m/s
BILLET SIZE : 152.0 mm SQUARE
BILLET WEIGHT : 2065.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 82.6 s
INTER BILLET : 15.0 s
PRODUCTION : 76.2 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.16	646.0	4.7	118.730	559	1.121	104.0	1167.2	112.48	55	22.0
2V	0.18	635.4	5.4	85.673	466	1.136	114.6	1133.6	113.64	65	30.9
3H	0.25	685.6	6.9	118.730	825	1.378	64.4	2178.6	273.30	199	53.6
4V	0.34	587.5	11.0	74.409	818	1.356	72.5	1430.7	172.81	199	54.0
5H	0.45	619.1	13.9	87.594	1214	1.329	40.9	1509.8	149.64	217	27.2
6V	0.54	607.8	17.0	68.825	1170	1.204	52.2	868.8	90.42	161	35.8
7H	0.73	660.0	21.0	55.247	1159	1.340	0.0	1610.8	168.62	370	46.3
8V	0.81	590.4	26.3	43.393	1139	1.119	69.6	316.4	23.08	63	7.9
9H	1.12	660.0	32.3	37.442	1210	1.376	0.0	1514.5	105.92	358	44.8
10V	1.21	575.8	40.1	27.471	1100	1.082	84.2	182.3	11.15	47	5.8
11H	1.52	590.0	49.2	17.428	857	1.258	0.0	1038.9	46.83	241	35.2
12V	1.56	510.4	58.3	13.852	807	1.025	79.6	63.0	1.99	12	1.9
13H	1.65	590.0	53.4	11.734	626	1.059	0.0	358.8	7.05	39	7.9

TOTAL ROLLING POWER : 2028 kW

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DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x7/8" blt150
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.41 m/s
AXV : 3269.59 mm²m/s
BILLET SIZE : 152.0 mm SQUARE
BILLET WEIGHT : 2065.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 82.6 s
INTER BILLET : 15.0 s
PRODUCTION : 76.2 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	151.95	X 151.95	23003.0	
1H	750.0	24.00	BOX	128.00	X 160.30	20518.4	10.8
2V	750.0	18.00	BOX	136.50	X 136.23	18063.7	12.0
3H	750.0	17.00	R.BOX	93.00	X 161.05	13111.5	27.4
4V	660.0	15.00	ROUND	111.00	X 110.52	9668.5	26.3
5H	660.0	15.00	R.OVAL	70.60	X 130.13	7276.2	24.7
6V	660.0	22.00	ROUND	92.00	X 81.48	6043.2	16.9
7H	660.0	40.00	FLAT	40.00	X 118.13	4509.6	25.4
8V	660.0	26.50	EDGING	96.50	X 41.92	4028.8	10.7
9H	660.0	26.50	FLAT	26.50	X 110.67	2928.1	27.3
10V	660.0	18.60	EDGING	103.60	X 27.01	2779.2	5.1
11H	590.0	23.50	FLAT	23.50	X 105.31	2468.0	11.2
12V	590.0	23.00	EDGING	103.00	X 23.59	2420.7	1.9
13H	590.0	22.51	FLAT	22.51	X 102.90	2312.1	4.5

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x7/8" blt150
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.41 m/s
AXV : 3269.59 mm²m/s
BILLET SIZE : 152.0 mm SQUARE
BILLET WEIGHT : 2065.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 82.6 s
INTER BILLET : 15.0 s
PRODUCTION : 76.2 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.16	646.0	4.7	118.730	559	1.121	104.0	1167.2	112.48	55	22.0
2V	0.18	635.4	5.4	85.673	466	1.136	114.6	1133.6	113.64	65	30.9
3H	0.25	685.6	6.9	118.730	825	1.378	64.4	2178.6	273.30	199	53.6
4V	0.34	587.5	11.0	74.409	818	1.356	72.5	1430.7	172.81	199	54.0
5H	0.45	619.1	13.9	87.594	1214	1.329	40.9	1509.8	149.64	217	27.2
6V	0.54	607.8	17.0	68.825	1170	1.204	52.2	868.8	90.42	161	35.8
7H	0.73	660.0	21.0	55.247	1159	1.340	0.0	1610.8	168.62	370	46.3
8V	0.81	590.4	26.3	43.393	1139	1.119	69.6	316.4	23.08	63	7.9
9H	1.12	660.0	32.3	37.442	1210	1.376	0.0	1514.5	105.92	358	44.8
10V	1.18	575.7	39.0	27.471	1072	1.054	84.3	136.0	6.81	28	3.5
11H	1.32	590.0	42.9	17.428	747	1.126	0.0	615.5	20.13	90	15.1
12V	1.35	510.4	50.5	13.852	700	1.020	79.6	62.8	1.74	9	1.6
13H	1.41	590.0	45.8	11.734	537	1.047	0.0	314.7	5.85	28	6.5

TOTAL ROLLING POWER : 1844 kW

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DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x1" blt150
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.24 m/s
AXV : 3269.59 mm²m/s
BILLET SIZE : 152.0 mm SQUARE
BILLET WEIGHT : 2065.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 82.6 s
INTER BILLET : 15.0 s
PRODUCTION : 76.2 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	151.95	X 151.95	23003.0	
1H	750.0	24.00	BOX	128.00	X 160.30	20518.4	10.8
2V	750.0	18.00	BOX	136.50	X 136.23	18063.7	12.0
3H	750.0	17.00	R.BOX	93.00	X 161.05	13111.5	27.4
4V	660.0	15.00	ROUND	111.00	X 110.52	9668.5	26.3
5H	660.0	15.00	R.OVAL	70.60	X 130.13	7276.2	24.7
6V	660.0	25.00	ROUND	95.00	X 80.18	6214.1	14.6
7H	660.0	42.00	FLAT	42.00	X 119.27	4779.5	23.1
8V	660.0	33.00	EDGING	103.00	X 43.15	4421.4	7.5
9H	660.0	33.00	FLAT	33.00	X 110.49	3640.7	17.7
10V	660.0	35.70	EDGING	100.70	X 33.93	3393.4	6.8
11H	590.0	26.80	FLAT	26.80	X 105.71	2826.6	16.7
12V	590.0	38.00	EDGING	103.00	X 26.93	2763.3	2.2
13H	590.0	25.73	FLAT	25.73	X 102.90	2642.9	4.4

*** Subject to the confidentiality clause *** M

DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x1" blt150
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 1.24 m/s
AXV : 3269.59 mm²m/s
BILLET SIZE : 152.0 mm SQUARE
BILLET WEIGHT : 2065.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 82.6 s
INTER BILLET : 15.0 s
PRODUCTION : 76.2 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.16	646.0	4.7	118.730	559	1.121	104.0	1167.2	112.48	55	22.0
2V	0.18	635.4	5.4	85.673	466	1.136	114.6	1133.6	113.64	65	30.9
3H	0.25	685.6	6.9	118.730	825	1.378	64.4	2178.6	273.30	199	53.6
4V	0.34	587.5	11.0	74.409	818	1.356	72.5	1430.7	172.81	199	54.0
5H	0.45	619.1	13.9	87.594	1214	1.329	40.9	1509.8	149.64	217	27.2
6V	0.53	607.5	16.5	68.825	1138	1.171	52.5	800.8	80.94	140	31.2
7H	0.68	660.0	19.8	55.247	1094	1.300	0.0	1549.8	157.90	327	40.9
8V	0.74	590.5	23.9	43.393	1038	1.081	69.5	248.7	15.42	39	4.8
9H	0.90	660.0	26.0	37.442	973	1.214	0.0	1082.4	63.11	172	22.1
10V	0.96	595.7	30.9	27.471	849	1.073	64.3	212.6	12.52	40	6.0
11H	1.16	590.0	37.4	17.428	653	1.200	0.0	933.7	43.26	170	32.5
12V	1.18	525.4	43.0	13.852	596	1.023	64.6	79.7	2.43	11	2.3
13H	1.24	590.0	40.0	11.734	470	1.046	0.0	323.6	6.38	27	7.1

TOTAL ROLLING POWER : 1661 kW

*** Subject to the confidentiality clause *** M

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DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x1-1/4" blt150
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 0.99 m/s
AXV : 3269.59 mm²m/s
BILLET SIZE : 152.0 mm SQUARE
BILLET WEIGHT : 2065.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 82.6 s
INTER BILLET : 15.0 s
PRODUCTION : 76.2 t/h

STAND NO.	ROLL DIA	GAP	GROOVE TYPE	STOCK HEIGHT	STOCK WIDTH	AREA	REDUCTION
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm²)	(%)
			SQUARE	151.95	X 151.95	23003.0	
1H	750.0	24.00	BOX	128.00	X 160.30	20518.4	10.8
2V	750.0	18.00	BOX	136.50	X 136.23	18063.7	12.0
3H	750.0	17.00	R.BOX	93.00	X 161.05	13111.5	27.4
4V	660.0	15.00	ROUND	111.00	X 110.52	9668.5	26.3
5H	660.0	15.00	R.OVAL	70.60	X 130.13	7276.2	24.7
6V	660.0	25.00	ROUND	95.00	X 80.18	6214.1	14.6
7H	660.0	42.00	FLAT	42.00	X 119.27	4779.5	23.1
8V	660.0	37.00	EDGING	107.00	X 42.70	4549.5	4.8
9H	660.0	36.00	FLAT	36.00	X 110.96	3988.5	12.3
10V	660.0	40.00	EDGING	105.00	X 36.51	3808.1	4.5
11H	590.0	33.20	FLAT	33.20	X 105.75	3500.9	8.1
12V	590.0	33.10	EDGING	103.10	X 33.34	3424.2	2.2
13H	590.0	32.16	FLAT	32.16	X 102.90	3303.4	3.5

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DANIELI-MORGARDSHAMMAR PASS DESIGN DEPT.
SPEED CALCULATION FOR HOT ROLLING MILL 07/04/23

JOB NO. : DPC68X01 LAYOUT NO. : 000-000-361-340

SECTION ROLLED : Flat 4"x1-1/4" blt150
Hot rolling
MATERIAL : Low-med. carbon steel
ROLLING SPEED : 0.99 m/s
AXV : 3269.59 mm²m/s
BILLET SIZE : 152.0 mm SQUARE
BILLET WEIGHT : 2065.0 kg
MAX HEATING CAPABILITY : 80.0 t/h
ROLLING TIME : 82.6 s
INTER BILLET : 15.0 s
PRODUCTION : 76.2 t/h

STAND NO.	SPEED	WORK DIA	ROLL RPM	GEAR RATIO	MOTOR RPM	R FACTOR	GROOVE FACTOR	R O L L I N G LOAD	TORQUE	POWER	UTIL
	(m/s)	(mm)	(RPM)		(RPM)		(mm)	(kN)	(kNm)	(kW)	(%)
	1.20										
1H	0.16	646.0	4.7	118.730	559	1.121	104.0	1167.2	112.48	55	22.0
2V	0.18	635.4	5.4	85.673	466	1.136	114.6	1133.6	113.64	65	30.9
3H	0.25	685.6	6.9	118.730	825	1.378	64.4	2178.6	273.30	199	53.6
4V	0.34	587.5	11.0	74.409	818	1.356	72.5	1430.7	172.81	199	54.0
5H	0.45	619.1	13.9	87.594	1214	1.329	40.9	1509.8	149.64	217	27.2
6V	0.53	607.5	16.5	68.825	1138	1.171	52.5	800.8	80.94	140	31.2
7H	0.68	660.0	19.8	55.247	1094	1.300	0.0	1549.8	157.90	327	40.9
8V	0.72	590.5	23.2	43.393	1009	1.051	69.5	184.5	10.11	25	3.1
9H	0.82	660.0	23.7	37.442	888	1.141	0.0	808.1	39.08	97	13.7
10V	0.86	595.7	27.5	27.471	756	1.047	64.3	168.7	7.99	23	3.8
11H	0.93	590.0	30.2	17.428	527	1.088	0.0	531.0	17.16	54	12.9
12V	0.95	520.4	35.0	13.852	485	1.022	69.6	96.0	2.85	10	2.7
13H	0.99	590.0	32.0	11.734	376	1.037	0.0	297.5	5.86	20	6.5

TOTAL ROLLING POWER : 1432 kW

*** Subject to the confidentiality clause *** M

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3 Motor utilization diagrams