



D5 - Report Description

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1. Model Strip Report

1.1 Purpose of Model Strip Report

The model strip report is a tool to trace the model's pass schedule calculation. It contains a number of relevant data which are the basic of the pass schedule calculation as well as a number of relevant recalculated values, averages of readings over different numbers of single readings which are either the basis for adaptation or for information only.

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1.2 Layout of Report

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=====
CAL Calculation Slab A16638 Stands 1-6                      Version 2.24 from 31/01/96                      5-FEB-1996 09:52:22
=====
Valid 3                                                     FM in L2
=====
Slab Trb FMexit Longterm Ada off, used shortterm Ada
Th 5.295 1.150 0.208 [in] "1005P" sFrc6 20.00[Ton/in] Slope 0.000070[Ton/in2] AdaTemp 1.001 [-] CorThick +0
Wd 43.5 0.0 42.5 [in] MatLaw 5 Prop 1 RolStr 6-Load AdaTim -7.619 [s] OfsSpeed -2
Ln 45.320 0 0 [ft] Cool 111 LoopTa 6 AdaThi +0.0103 [in] Limits off
Te 2350.0 2000.0 1620.0 [oF] Descale 2: North 1 16[s] South 1 150[s] AdaWidt +0.5000 [in] Correct Speed
MatLaw 5: kFO 5186 m1:0.003340 m2:0.0290 Fo:0.950|0.938|0.828|1.055|0.816|0.798 To:0.906|0.919|0.879|0.996|0.815|0.803
Ada 5: kFO 5186 m1:0.003340 m2:0.0290 Fo:0.952|0.940|0.828|1.059|0.817|0.798 To:0.909|0.922|0.880|1.001|0.815|0.803 g=10
=====
Roughing Mill Area
=====
RM Pas Act Screw ThIn ThOut Edg WdIn WdOu Force Speed TeIn TeOu dur dTmP TeHead TeTail Roll Dia Crown
42.2
1 1 3.998 5.295 4.257 43.2 42.17 43.23 953 618 2127 2042 Zo1: 0.11 0.6 2109.7 2109.7 Up NA05357 38.035 50.0
2 1 2.674 4.257 2.952 47.2 43.23 43.41 1226 573 2091 2056 Zo2: 4.99 20.3 2109.0 2026.1 Lo NA05356 37.973 0.0
3 1 1.698 2.952 1.970 43.2 43.18 43.47 1152 585 2146 2103 Zo3: 0.48 2.4 2088.8 1810.8 [in] [mil]
4 1 0.898 1.970 1.179 47.2 43.47 43.54 1274 613 2097 2063 Zo4: 1.89 15.4 2086.4 1793.9 FMinHeadTemp 1933 [oF]
5 0 1.780 1.178 1.178 42.1 38.79 38.79 0 428 2018 1994 Zo5: 7.56 35.3 2070.9 1777.9 FMinTailTemp 1748 [oF]
[in] [in] [in] [in] [in] [in] [in] [T] [fpm] [s] [oF] [oF] [oF]
=====
Finishing Mill Area
=====
St ThIn ThOu Gap ThOA ThOMF MsTo TeIn Tail TeIP TeOu FrcC Tail FrcP FrcA TorqCa TrqPo TorqA PowC PowA vIn vOut vRol vAct
1 1179 716 704 701 684.7 131 2036 1757 1932 2004 983 1679 1244 1260 285462 406057 415022 2243 3298 156 256 240 238
2 716 535 522 519 513.7 79 1971 1731 1884 1936 637 1029 727 741 139911 162140 164996 1597 1896 256 343 330 326
3 535 409 396 393 398.3 69 1906 1691 1829 1871 545 840 602 596 95184 117279 118323 1468 1811 343 449 426 422
4 409 308 295 293 303.1 101 1842 1651 1772 1816 771 1140 827 858 127207 125617 130168 2677 2695 449 595 558 552
5 308 254 242 241 249.5 62 1793 1627 1728 1759 479 679 540 537 50532 67020 66435 1255 1622 595 723 688 681
6 254 211 199 198 209.9 67 1739 1589 1677 1706 522 714 558 552 68765 77000 73542 1960 2032 723 872 816 811
[in/1000] [in/1000] [in/1000] [oF] [oF] [oF] [oF] [T] [T] [T] [T] [lbFt] [lbFt] [lbFt] [hp] [hp] [fpm] [fpm]
St dur durA ovlHd-Tl ovlA bite epsS epsO eps epsA red redA rMF widIn widOu leng slipB slipF vRolAv ThiAv Lp Tens CL Ov iG
1 78.7 78.7 75 132 110 11.71 30.70 39.40 39.22 40.24 463 472 488 43.54 43.42 336 33.86 8.82 239.4 0.704 13 1200 0 0 0
2 79.1 78.6 53 83 63 7.49 21.81 25.43 25.32 25.90 182 182 171 43.42 43.20 452 20.93 5.88 328.9 0.521 13 1400 0 0 0
3 79.6 78.6 49 72 60 6.32 15.89 23.67 23.56 24.26 127 126 115 43.20 42.94 595 19.28 5.60 425.0 0.395 13 1600 0 0 0
4 80.0 78.7 89 128 90 5.65 13.05 24.69 24.57 25.42 101 100 95 42.94 42.72 793 20.05 6.00 556.5 0.295 10 1900 0 0 0
5 80.5 78.5 42 57 54 4.06 10.28 17.82 17.74 17.80 55 53 54 42.72 42.41 971 14.16 4.35 685.8 0.243 8 2150 0 0 0
6 80.5 78.6 65 81 68 3.47 6.69 17.11 17.03 18.08 44 44 40 42.41 42.42 1170 13.52 4.23 814.6 0.200 0 0 0 0 0
[s] [s] [%] [%] [%] [deg] [%] [%] [%] [%] [in/1000] [in] [in] [ft] [%] [%] [fpm] [in] [o] [psi] [sec]
St WRTop Dia WRBot Dia teRol Wear Crown gapCo vCorP vCorA Force Force Grad GradA Grd1A Grd2A
on WR BR Min Ave Max Head Midd Tail on
1 HP23716 21.791 HP23717 21.791 68.3 0.50 8.0 0.0 -11.3 +1.75 +1.87 972-1321-1602 1072-1264-1484 7.07 5.26 4.93 5.58
2 HP21937 20.645 HP21938 20.643 68.2 0.47 8.0 5.0 -12.8 +1.78 +1.75 637- 764- 974 683- 742- 883 3.96 2.55 1.50 3.58
3 CO71452 20.038 CO71453 20.040 68.2 0.57 6.0 10.0 -12.8 +0.31 +0.24 514- 615- 904 564- 582- 761 2.96 2.51 0.47 4.52
4 WH24075 19.400 WH24215 19.400 68.3 0.89 5.0 10.0 -12.0 -0.62 -0.64 696- 877-1041 796- 861- 964 3.70 2.14 1.66 2.61
5 NA67091 20.292 NA67092 20.294 68.3 0.82 5.0 10.0 -11.2 -0.80 -0.83 441- 547- 686 540- 538- 628 1.99 1.12 -0.04 2.27
6 WH33123 21.339 WH33124 21.339 68.4 0.82 4.0 10.0 -10.3 -2.39 -2.39 464- 587- 783 586- 571- 738 1.90 1.94 -0.39 4.23
[-] [in] [-] [in] [oF] [mil] [mil] [mil] [mil] [%] [%] [T] [T] [T] [T] [T] [T] [T/s] [T/s] [T/s] [T/s]
thickDev 0.0000[in] tempDev +46.17[oF] specForceF6 20.00[Ton/in] slope 0.000070[Ton/in2]
Measuring past F6: Averages Seg 25-225
Thick 0.2076[in] ThiAgc 0.2077[in] Width 42.44[in] Temp 1635.1[oF] Profile -0.260[mil] Wedge -0.26[mil] EdgDrop 0.34[mil] Head
Thick 0.2078[in] ThiAgc 0.2078[in] Width 42.45[in] Temp 1630.7[oF] Profile 0.000[mil] Wedge 0.67[mil] EdgDrop 0.62[mil] Strip
Adaptor Thick: 0 Val. pure -0.0200> 0.0103< 0.0400 old 0.0103 new 0.0107 on Tgt: 198- 208- 216 Act: 204- 208- 214[mil]
Adaptor Temp : 175 Val. pure 0.7200> 1.0136< 1.2900 old 1.0013 new 1.0050 on Tgt: 1570-1620-1660 Act: 1590-1631-1660[oF]
Adaptor Time : -15.00> -7.62< 15.00 Width: Tgt: 4206-4250-4306 Act: 4225-4245-4262[in/100]
=====
printed at 5-FEB-1996 09:52:22
=====
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1.3 Types of Values

1.3.1 Values of both Pass Schedule Calculation and Adaptation

PD Piece data

Slab data and target values from the level 3 system, transmitted to the level 2 system by the furnace computer.

TD Lookup Table Data

Data coming from a lookup table supplied by the level 2 system administrator and eventually changed by the operators.

SW Switches

Strategic switches set either by the operator or by the level 2 system administrator.

SP Setpoints

Setpoints transmitted to the level 1 system

OP Operator inputs

Inputs in the operator mask "setup data finishing mill"

PA Parameters

Model parameters and constants

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1.3.2 Values of Pass Schedule Precalculation and Calculation

CA Calculated Values

Calculated values from the pass schedule calculation

DC Adapters used by the calculation

Adapter set that is used to create the present pass schedule

AR Actual values of roughing mill and upstreams

Setpoints transmitted to the level 1 system

1.3.3 Values of Adaptation

AF Actual values of finishing mill area and downstreams

Actual readings from the strip in the finishing mill or downstreams, either the linear average over the entire strip, or the linear average over a given part of the strip as described.

PO Post calculated of finishing mill area and downstreams

Recalculated values for strip segments based on the actual readings for this segment. The adaptation uses the same algorithms as the pass schedule calculations, but input data from the readings during rolling. These values are averages over a certain number of strip segments.

DA Adapters created by the adaptation

Adapters that are results of the adaptation.

SI Signals occurred during rolling

From Level 1 transmitted signal stated during rolling.

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1.4 Values Description

1.4.1 Header Values

Th	PD	target thickness of slab (cold), transfer bar and strip (cold)
Wd	PD	target width of slab (cold), transfer bar and strip (cold)
Ln	PD	target length of slab (cold), transfer bar and strip (cold)
Te	PD	target discharge temperature, target roughing mill exit temperature and target strip temperature leaving F6
"1005A"	PD	steel grade
sFrc6	TD	preset specific rollforce on F6 (only relevant in "force" strategy)
Slope	TD	preset specific rollforce slope (only relevant in "force" strategy)
MatLaw	TD	used material law, see steelgrade reference table
Lube	TD	roll lubrication settings for the first 4 stand (see also LubPres) 0 set to "off" L setting "low" M set to "medium" H set to "high"
RolStr	TD	used rolling strategy lookup table, see steelgrade reference table
	SW	operator-switch state rolling strategy ("force" or "load")
Op-Corr	SW	operator correction mode for load strategy "abs" absolute draft corrections (in [mil]) "rel" relative draft corrections (in % correction to the present relative draft)

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Cool	TD	roll cooling pattern
LoopTa	TD	used looper strategy lookup table, see steelgrade reference table
Descale	TD	used descaling table, see steelgrade reference table
North	SW	north spray header "1"=on, "0"=off
	TD	time north spray header is on
South	SW	south spray header "1"=on, "0"=off
	TD	time south spray header is on
Longterm Ada	SW	operator-switch state ("on" or "off") for long term speed adaption at the time of calculation (obsolete)
AdaTemp	DC	temperature adapter at time af pass schedule creation
AdaTim	DC	transfer bar delivery time adapter at time af pass schedule creation
AdaThi	DC	thickness adapter at time af pass schedule creation
Offs_SG	OP	sideguides adjustment offset by operator input
CorThick	OP	thickness offset by operator input
OfsSpeed	OP	F6 speed variation by operator input
BelowMax	CA	the mill's speed reserve until maximum possible speed for the present pass schedule, referenced to F1 stand
Limits	SW	operator-switch limit check ("on" or "off")
Correct	SW	system administrator switch state for gap error correction ("Speed" or "Gap")
MatLaw	TD	Number of material law
kF0	DC	general rollforce coefficient
m1	DC	temperature coefficient
m2	DC	speed coefficient
Fo	DC	rollforce stand coefficients F1 to F6

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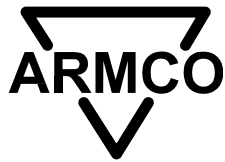


To	DC	rolltorque stand coefficients F1 to F6
ADA	TD	Number of material law
kF0	DA	general rollforce coefficient
m1	DA	temperature coefficient
m2	DA	speed coefficient
Fo	DA	rollforce stand coefficients F1 to F6
To	DA	rolltorque stand coefficients F1 to F6
g	PA	rollforce and rolltorque learning rate %

1.4.2 Roughing Mill Values

Pas	TD	pass number used by precalculation
	AR	pass number used by calculation
Act	TD	flag loadpass (1=load pass, 0=unload pass) precalculation
	AR	flag loadpass (1=load pass, 0=unload pass) calculation
ThIn	CA	entry thickness by precalculation
	PO	entry thickness by calculation
ThOut	CA	exit thickness by precalculation
	PO	exit thickness by calculation
Edg	TD	edger screwdown used by precalculation
	AR	edger screwdown used by calculation
WdIn	CA	entry width by precalculation
	PO	entry width by calculation
WdOut	CA	exit width by precalculation
	PO	exit width by calculation

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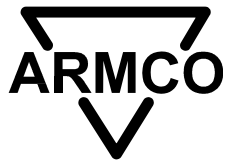


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Force	CA	rollforce roughing mill by precalculation
	AR	rollforce roughing mill for calculation
Speed	TD	rolling speed roughing mill for precalculation
	AR	rolling speed roughing mill for calculation
TeIn	AR	temperature pyrometer RM entry side, average over the entire bar
TeOut	AR	temperature pyrometer RM exit side, average over the entire bar
Zo1	PA	distance RM gap to start table cover for precalculation
		distance pyrometer on RM exit side to start table cover for calculation
Zo2	PA	distance table cover start to table cover end
Zo3	PA	distance table cover end to descaler start
Zo4	PA	distance descaler start to descaler end
Zo5	PA	distance descaler end to F1 gap
dur	CA	duration of the strip head in each zone
dTmp	CA	temperature drop for headend each zone
TeHead	CA	entry temperature headend each zone for precalculation
	PO	entry temperature headend each zone for calculation
TeTail	CA	entry temperature tailend each zone for precalculation
	PO	entry temperature tailend each zone for calculation
Roll Te	PA	average work roll temperature roughing mill
Up	PA	roll ID, diameter and ground crown of upper roughing mill roll
Lo	PA	roll ID, diameter and ground crown of lower roughing mill roll
To	PA	tons on roll for roughing mill roll set

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Up	PA	roll ID, diameter and ground crown of upper roughing mill roll
FMinHead	AR	temperature at FM entry pyrometer, average over first 10 readings
FMinTail	AR	temperature at FM entry pyrometer, average over last 10 readings

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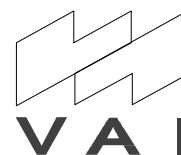
1.4.3 Finishing Mill Area

St	PA	stand number
ThIn	CA	entry thickness
ThOu	CA	exit thickness
Gap	SP	transmitted loadgap
ThOA	AF	loadgaps, average over the entire strip
ThOMF	PO	exit thickness recalculated from massflow
MsTo	CA	millstretch calculated, only for display (effective calculation is done in level1 using the same algorithm).
TeIn	CA	entry temperature for headend
Tail	CA	entry temperature for tailend
TeIP	PO	entry temperature over the defined strip part
TeOu	CA	exit temperature for headend
FrcC	SP	rollforce for headend
Tail	CA	entry temperature for tailend
FrcP	PO	rollforce for the defined strip part
FrcA	AF	rollforce for the defined strip part
TorqCa	CA	rolltorque for headend
TrqPo	PO	rolltorque for the defined strip part
TorqA	AF	rolltorque for the defined strip part
PowC	CA	rollpower for headend
PowA	AF	rollpower for the defined strip part
vIn	CA	entry speed, without adaptive correction
vOut	CA	exit speed, without adaptive correction
vRol	SP	rollspeed, including adaptive correction

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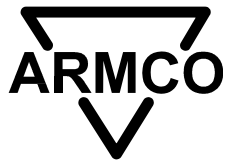


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vAct	AF	rollspeed, average over the entire strip
dur	CA	rolling time
durA	AF	rolling time
ovIA	AF	motor utility for the defined strip part
bite	CA	bite angle
epsS	TD	original preset relative reduction
epsO	TD	operator corrected preset of relative reduction
Cor	OP	operator draft correction in "relative" mode
eps	CA	relative reduction, fitted to transferbar- and strip thickness
epsMF	PO	relative reduction recalculated from massflow
red	CA	absolute reduction
rMF	PO	absolute reduction recalculated from massflow for the defined strip part
widOu	CA	exit width
leng	CA	exit length
LubPres Top	TD	lubricant pressure for top roll set
Bot	TD	lubricant pressure for bottom roll set
yldStr	CA	specific yield stress ("strip module")
slipF	CA	forward slip
slipB	CA	backward slip
Lp	TD	looper angle total (includes operator correction)
Of	OP	operator correction to looper angle
Tens	TD	specific strip tension total (including operator correction)
Of	OP	operator correction to tension
CL	SI	indication current limit reached

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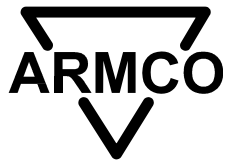


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Ov	SI	indication AGC in overload protection; time when it occurred
iG	SI	indication of manual gap intervention
WRTop	PA	upper workroll identification
Dia	PA	upper workroll diameter
WRBot	PA	lower workroll identification
Dia	PA	lower workroll diameter
teRol	PA	workroll surface temperature before threading
Wear	PO	roll wear total
Crown	PA	grinded ovrkroll crown, average upper+lower/2
gapCo	CA	stand gap correction (last active stand equals thickness adapter)
vCorP	DC	stand speed correction
vCorA	DA	stand speed correction
Force Min	AF	minimum reading for rollforce over the entire strip
Force Ave	AF	average reading for rollforce over the entire strip
Force Max	AF	maximum reading rollforce oer the entire strip
Force Head	AF	average over first 10 force readings
Force Midd	AF	average over 10 force readings in the strip middle
Force Tail	AF	average over last 10 force readings
Grad	SP	rollforce gradient - rollforce increase over rolling time
on/off	SW	switch "gradient on" or "gradient off"
GradA	PO	rollforce gradient postcalculated
Grd1A	PO	rollforce gradient postcalculated for front strip part
Grd2A	PO	rollforce gradient postcalculated for rear strip part
thickDev	CA	calculated thickness deviation

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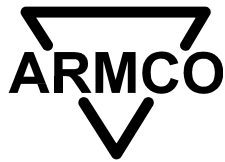
tempDev		CA	calculated FM exit temperature deviation
specForceF6	CA		specific rollforce on F6 (force strategy only)
slope		CA	specific rollforce slope (force strategy only)
Averages Seg	PA		preset range of segments for adaptation and protocol
Narrow	PO		range from first width reading under target minimum width to last width reading under target width minimum, average amount of width limit violation (only if a width reading is below target width minimum)

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1.4.4 Measured Values Past F6

Thick	AF	ABB telegram x-ray readings for the defined strip part
ThiAGC	AF	Intel telegram x-ray readings for the defined strip part
Width	AF	width readings, average for the defined strip part
Temp	AF	temperature readings for the defined strip part
Profile	AF	profile readings for the defined strip part
Wedge	AF	wedge readings for the defined strip part
EdgDrop	AF	edge drop readings for the defined strip part
Thick	AF	ABB telegram x-ray readings for entire strip
ThiAGC	AF	Intel telegram x-ray readings for entire strip
Width	AF	width readings, average for entire strip
Temp	AF	temperature readings for entire strip
Profile	AF	profile readings for entire strip
Wedge	AF	wedge readings for entire strip
EdgDrop	AF	edge drop readings for entire strip
Adaptor Thick		
Val	PA	number of readings for adaptation (obsolete)
pure	PA	lower limit
	PO	pure deviation (obsolete)
	PA	upper limit
old	DC	old thickness adapter
new	DA	new thickness adapter
on/off	SW	switch "thickness adaptation on"
Tgt	PD	exit thickness, lower limit, target, and upper limit

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Act	AF	exit thickness minimum, average and maximum reading over the entire strip
Adaptor Temp		
Val	PA	number of readings for adaptation
pure	PA	lower limit
	PO	pure deviation
	PA	upper limit
old	DC	old temperature adapter
new	DA	new temperature adapter
Tgt	PD	exit temperature F6, lower limit, target, and upper limit
Act	AF	exit temperature F6 minimum, average and maximum reading over the entire strip
Adapter Time		Transferbar transport time adapter
	PA	lower limit
	PO	deviation
	PA	upper limit

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2. Revision and Document Distribution List

<u>REVISION LIST</u>			
Date	Version	Author	Description
95-Dec-05	V1.0	W.Bal.	first draft
96-Feb-28	as built	W.Bal.	as built
96-Aug-01	V1.1	W.Bal	updated

<u>DISTRIBUTION LIST</u>	
Version	Receiver
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