A3 Application Functions
Mill Setup References

Table of Contents

1. General

Besides the dynamic calculation and adaption of the pass schedule for the Finishing Mill, static reference tables are used to get the setpoints for Primary Edger, Rouhing Mill and Runout Cooling.

Handling of these static tables is called

Mill Setup References

Tasks:

- ❒ User Interface to Setup Reference Tables
- ❒ Assign Setup Data to Materials
- ❒ Prepare Setup Data for Level 1
- ❒ Send Setup Data to Level 1

Areas:

- ❒ Primary Edger
- ❒ Roughing Mill
- ❒ Runout Cooling

2. Setup Reference Tables

To build the slab specific setpoints, which are finally sent to the level 1 system, static setpoint tables are used. These tables are called ***Setup Reference Tables (SRT)***.

SRT's are identified by predefined *Rolling Recipe Numbers* and exist for *Roughing Mill* and *Runout Cooling Section*. For the *Primary Edger* setup no specific SRT's are used.

Contents and maintenance of these tables is in the full responsibility of the technological staff.

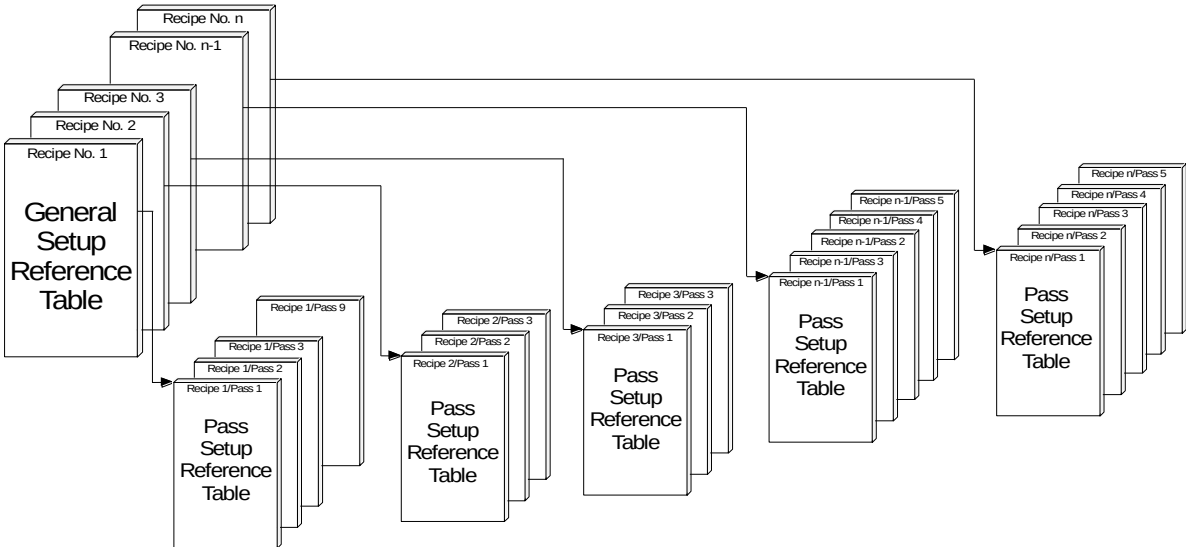
2.1 Recipe Number

Each reference table has for identification an arbitrary, unique, 4 digit number in the range from 0001 to 9999 assigned - called *Recipe Number*. Recipe number zero is not allowed (reserved for internal use).

2.2 Roughing Mill SRT

Each SRT for the Roughing Mill consists of a general entry and the corresponding setup data for each pass. These pass data entries may vary in the total number of passes and are limited to a maximum of 9 passes per recipe. The total structure of Roughing Mill SRT is shown in figure 1.

Figure 1: Structure of SRT for Roughing Mill



2.2.1 SRT Structure

2.2.2 General Setup Reference Table RM

Max.Number of Records: 30

Key: - RM recipe number

Data:
- reference slab width (cold value)
- number of passes
- date and time of last modification
- Primary Edger offset
- descaling speed

2.2.3 Pass Setup Reference Table RM

Max.Number of Records: 270

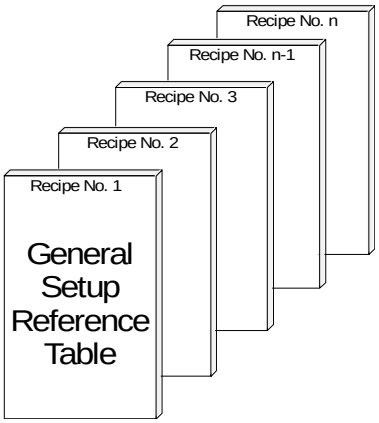
Key:
- RM recipe number
- Pass Number

Data:
- active / blind pass indicator
- offset side guide RM entry table
- offset side guide RM deliv.table
- mill entry speed
- mill run speed
- edger entry speed
- edger run speed
- rougher screw down (noload gap)
- offset RMedger
- descale settings
- reference load gap
- reference force

2.3 Cooling SRT

SRT's for the Runout Cooling Section consist of a general entry without further cross references (shown in figure 2).

Figure 2: Structure of SRT for Runout Cooling



2.3.1 SRT Structure: Strip Cooling Reference Table

Max.Number of Records: 200

Keys: - Cooling recipe number

Data:
- date and time of last modification
- duration from F2 to start of cooling
- duration from F2 to end of cooling
- cooling pattern:
  top cooling section 1 to 10
  bottom cooling section 1 to 4

3. Setup Assignment to Slab

Assignment of a SRT to a certain slab is done with the help of two cross reference tables:

- Steel Grade Reference Table

- SRT class tables for RM and Cooling

In the *Steel Grade Reference Table* the RM and Cooling SRT class for a particular steel grade is specified. This allows to use same SRT's for a group of steel grades.

In the *SRT class tables* a SRT recipe number is assigned to a certain width and thickness range:

- RM ranges are slab width and slab thickness
- Cooling ranges are target strip width and strip thickness

The relation of all tables together is shown in figure 3 on the next page.

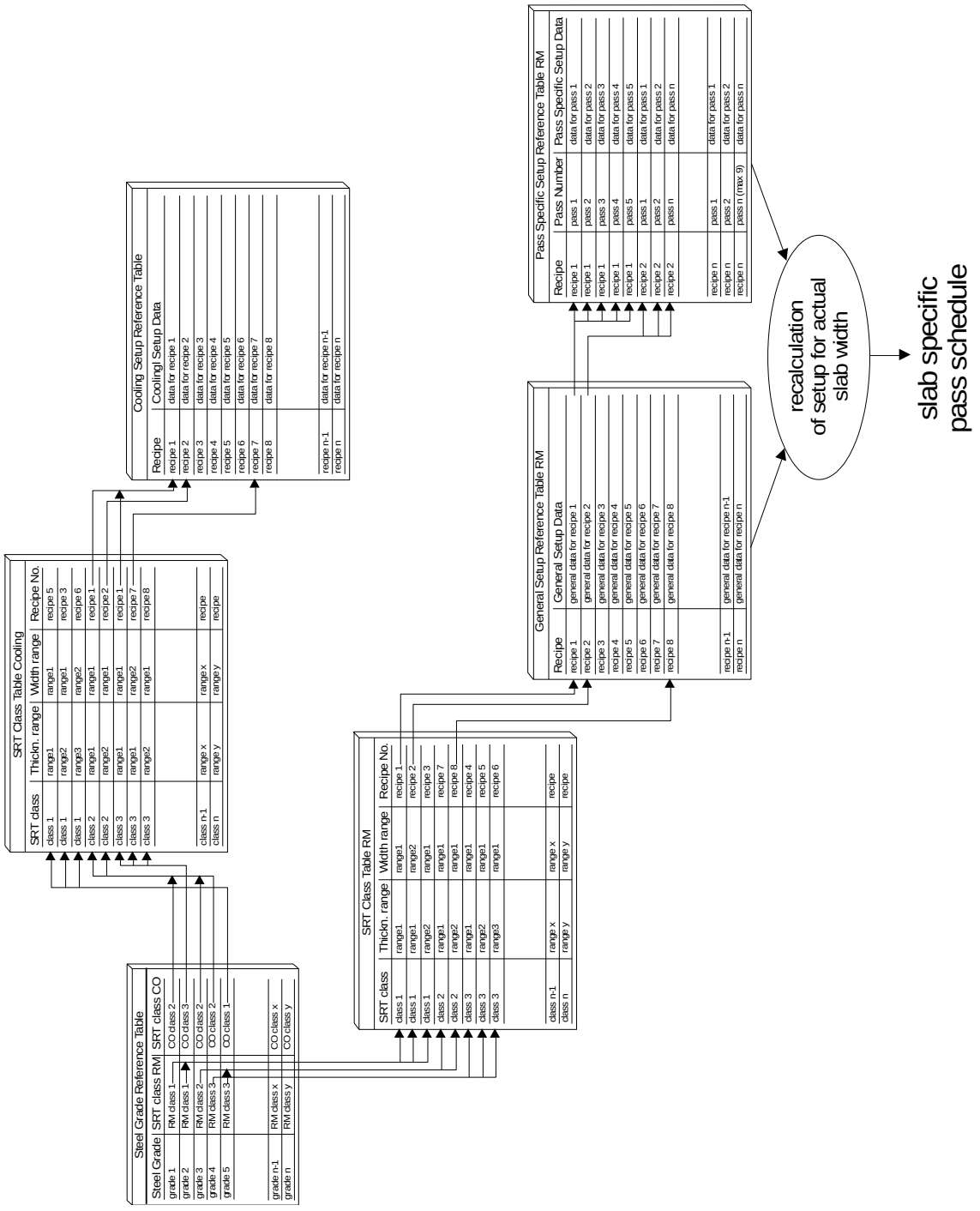
RM setup is made at following events:
- Furnace charging and discharging (for actual slab)
- Last pass RM finished (for next slab in furnace)
- Push button *Get Pass Schedule* in MMI (for selected slab)

RM setup is sent to Level 1 at:
- Furnace discharging (for actual slab)
- Last pass RM finished (for next slab in furnace)
- Push button *Send Pass Schedule* in MMI (for selected slab)

Cooling setup is made at:
- Furnace charging and discharging
- Push button *Send Cooling Setup* in MMI

Cooling setup is sent to Level 1 at:
- Furnace discharging
- Push button *Send Cooling Setup* in MMI

Figure 3: Setup Assignment to Slab



3.1 Edger Setup

Setup for Primary Edger and RM Edger is done in following way (all values are related to hot material if not mentioned different):

1) If difference of slab width to strip width is from 0" to 1.5":

Primary edger adjustment:	strip width minus 0.5 inch
Roughing edger adjustment 1. pass:	strip width
Roughing edger adjustment 3. pass:	strip width
all other roughing passes no edging	

Example:

Slab width cold	38"
Slab width hot	38.7"
Strip width cold	37"
Strip width hot	37.7"
Width difference hot	38.7 - 37.7 = 1" < 1.5"
Setup PE	37.7 - 0.5 = 37.2"
Setup 1.RE pass	37.7"
Setup 3.RE pass	37.7"

2) If difference of slab width to strip width is from 1.5" to 2":

Primary edger adjustment:	strip width minus 0.25 inch
Roughing edger adjustment 1. pass:	strip width
Roughing edger adjustment 3. pass:	strip width
all other roughing passes no edging	

Example:

Slab width cold	44.75"
Slab width hot	45.6"
Strip width cold	43"
Strip width hot	43.8"
Width difference hot	45.6 - 43.8 = 1.8" > 1.5"
Setup PE	43.8 - 0.25 = 43.55"
Setup 1.RE pass	43.8"
Setup 3.RE pass	43.8"

3) If difference of slab width to strip width is higher than 2":
The final strip width is adapted to slab width minus 2" and
the procedure of item 2) is applied
Remark: the change of strip width is shown to the operator by a message box, which must be confirmed by him and the primary data are overwritten in order to make the change permanent and visible to the operator.

Example:

Slab width cold	49.25"
Slab width hot	50.1"
Strip width cold	47"
Strip width hot	47.8"
Width difference hot	50.1 - 47.8 = 2.3" > 2"
Strip width adjusted hot	50.1 - 2 = 48.1"
Strip width adjusted cold	47.25"
Adjusted width differ. hot	50.1 - 48.1 = 2"
Setup PE	48.1 - 0.25 = 47.85"
Setup 1.RE pass	48.1"
Setup 3.RE pass	48.1"

4) If cold width of strip would become more than 49.5" the edgers are set-up in order to keep this width regardless of the edging drafts and the resulting edger overload. Related to the width difference (slab - strip) the related edging strategy (1 or 2) is selected. Amongst the edging strategies the strategy no 4 has the highest priority:

Exampe:

Slab width cold	50.75"
Slab width hot	51.7"
Strip width cold	49.75" > 49.5"
Strip width hot	50.6"
Strip width adjusted hot	49.5 x 1.018 = 50.4
Adjusted width differ.hot	51.7 - 50.4 = 1.3" (case 1)
Setup PE	50.4 - 0.5 = 49.9"
Setup 1.RE pass	50.4"
Setup 3.RE pass	50.4"

3.2 RM Setup

This setup is calculated linear for the actual slab width from the reference slab width in the pass specific Setup Reference Table.

```
stretch  = (referenceLoadGap[pass]
         -  0.25
         -  referenceScrewDown[pass])
         * slabWidthCold
         / referenceSlabWidthCold;

screwDown[pass] =
         referenceLoadGap[pass]
         - 0.25
         - stretch;
```

Value 0.25 was evaluated during startup to cover the mechanical behaviour of the Roughing Mill.

3.3 Cooling Setup

This setup is taken directly from the Cooling Setup Reference Table and sent to the level 1 system without further modifications.

4. Data Tables Contents

On following pages the contents of all used tables is shown (dump was taken at 03/06/96 12:20 p.m.):

4.1 Steel Grade Reference Table for RM

Steel grade	SRT class RM
1005	1100
1005A	1100
1005B	1100
1005C	1100
1005P	1100
1006	1100
1006A	1100
1006B	1100
1006C	1100
1006D	1100
1006H	1100
1010A	1100
1015A	1200
1015B	1200
1016A	1200
1018A	1300
1018B	1300
1018C	1300
1018D	1300
1019P	1300
1020A	1300
1020P	1300
1021A	1300
1021B	1300
1022	1300
1022A	1300
1022P	1300
1026B	1300
1026C	1300
1026H	1300
1030A	1300

Steel grade	SRT class RM
1038A	1400
1038B	1400
1038H	1400
1038P	1400
1042A	1400
1045A	1400
1045B	1400
1050A	1400
1050B	1400
1055A	1400
40915	1500
40916	1500
40921	1421
41010	1400
41014	1400
4130A	1400
43020	1400
945A	1400
946A	1400
950A	1400
951A	1400

4.2 SRT Class for RM

index	thick min	thick max	width min	width max	recipe no
1100	3.50	4.50	25.00	50.90	5410
1100	4.50	5.50	25.00	50.90	5510
1200	3.50	4.50	25.00	50.90	5420
1200	4.50	5.50	25.00	50.90	5520
1300	3.50	4.50	25.00	50.90	5430
1300	4.50	5.50	25.00	50.90	5530
1400	3.50	4.50	25.00	50.90	5440
1400	4.50	5.50	25.00	50.90	5540
1421	3.50	4.50	25.00	50.90	5441
1421	4.50	5.50	25.00	40.00	5540
1421	4.50	5.50	40.00	50.90	5540
1450	4.50	5.50	40.00	50.90	5550
1500	3.50	4.50	25.00	50.90	5450
1500	4.50	5.50	25.00	40.00	5550
1500	4.50	5.50	40.00	50.90	5550
1700	3.50	4.50	25.00	50.90	7450
[-]	[in]				[-]

4.3 General Setup Reference Table RM

recipe number	reference slab width (cold)	no. of passes	Last Modification Date/Time					offset PE	desc. speed
			year	month	day	hour	minute		
5410	25.0	5	1996	01	01	17	41	-0.400	650
5420	25.0	5	1995	11	13	05	50	-0.450	650
5430	25.0	5	1995	12	29	11	16	-0.350	650
5440	25.0	5	1995	12	23	08	07	-0.250	650
5441	25.0	5	1995	09	16	21	06	-0.800	550
5450	25.0	5	1995	10	18	11	43	0.000	400
5510	25.0	5	1996	03	04	17	53	-0.150	650
5520	25.0	5	1996	02	23	11	50	-0.250	600
5530	25.0	5	1996	02	23	13	13	-0.450	600
5540	25.0	5	1996	02	22	18	55	-0.350	600
5550	25.0	5	1996	02	06	21	34	-0.350	650
7450	25.0	7	1995	08	04	12	57	0.000	650
7510	25.0	7	1995	10	17	00	36	-0.250	650
7520	25.0	7	1995	10	17	00	49	0.000	650
7530	25.0	7	1995	10	24	17	35	0.000	650
7550	40.0	7	1995	10	13	18	05	-0.250	400
[-]	**[in]**	**[-]**	**yy**	**mm**	**dd**	**hh**	**mm**	**[in]**	**[fpm]**

4.4 Pass Setup Reference Table RM

recipe no.	pas no.	a/b	side guide offset		speed mill		speed edger		screw down	offset RM edger	prim. desc.		RM descaler entry		RM descaler delivery		ref. load gap	ref. force
			RMET	RMDT	entry	run	entry	run			S	N	Top	Bot	Top	Bot		
5410	1	1	0.100	0.100	650	800	650	800	3.012	0.100	0	0	1	1	0	0	3.100	642
5410	2	1	0.100	0.100	800	800	800	800	2.115	0.100	0	0	0	0	1	1	2.310	668
5410	3	1	0.100	0.100	800	800	800	800	1.540	0.100	0	0	0	0	0	0	1.680	681
5410	4	1	0.100	0.100	800	800	800	800	0.900	0.100	0	0	0	0	0	0	1.150	788
5410	5	0	0.100	0.100	800	800	800	800	1.650	0.100	0	0	0	0	0	0	1.350	0
5420	1	1	0.100	0.100	650	800	650	800	2.910	0.100	0	1	0	0	0	0	3.100	701
5420	2	1	0.100	0.100	800	800	800	800	2.110	0.100	0	0	0	0	1	1	2.310	729
5420	3	1	0.100	0.100	800	800	800	800	1.480	0.100	0	0	0	0	0	0	1.680	742
5420	4	1	0.100	0.100	800	800	800	800	0.910	0.100	0	0	0	0	0	0	1.150	859
5420	5	0	0.100	0.100	800	800	800	800	1.350	0.100	0	0	0	0	0	0	1.350	0
5430	1	1	0.100	0.100	650	800	650	800	2.950	0.100	0	0	1	1	0	0	3.150	718
5430	2	1	0.100	0.100	800	800	800	800	2.120	0.100	0	0	0	0	1	1	2.360	771
5430	3	1	0.100	0.100	800	800	800	800	1.450	0.100	0	0	0	0	0	0	1.680	842
5430	4	1	0.100	0.100	800	800	800	800	0.840	0.100	0	0	0	0	0	0	1.150	909
5430	5	0	0.100	0.100	800	800	800	800	1.750	0.100	0	0	0	0	0	0	1.350	0
5440	1	1	0.250	0.250	650	800	650	800	2.965	0.250	0	0	1	1	0	0	3.150	847
5440	2	1	0.250	0.250	800	800	800	800	2.150	0.250	0	0	0	0	1	1	2.360	909
5440	3	1	0.250	0.250	800	800	800	800	1.450	0.250	0	0	0	0	0	0	1.680	990
5440	4	1	0.250	0.250	800	800	800	800	0.900	0.250	0	0	0	0	0	0	1.150	1066
5440	5	0	0.250	0.250	800	800	800	800	1.350	0.250	0	0	0	0	0	0	1.350	0
5441	1	1	0.350	0.350	800	550	550	550	2.782	0.350	0	0	1	1	0	0	3.150	847
5441	2	1	0.350	0.350	700	700	700	700	1.986	0.350	0	0	0	0	1	1	2.360	909
5441	3	1	0.350	0.350	700	700	700	700	1.472	0.350	0	0	0	0	0	0	1.680	990
5441	4	1	0.350	0.350	700	700	700	700	0.888	0.350	0	0	0	0	0	0	1.150	1066
5441	5	0	0.350	0.350	800	800	800	800	1.350	0.350	0	0	0	0	0	0	1.350	0
5450	1	1	0.000	0.000	800	400	400	400	3.270	0.000	0	0	1	1	0	0	3.100	751
5450	2	1	0.000	0.000	700	700	700	700	2.100	0.000	0	0	0	0	1	1	2.310	775
5450	3	1	0.000	0.000	700	700	700	700	1.480	0.000	0	0	1	1	0	0	1.680	782
5450	4	1	0.000	0.000	700	700	700	700	0.840	0.000	0	0	0	0	0	0	1.150	893
5450	5	0	0.000	0.000	750	750	750	750	1.350	0.000	0	0	0	0	0	0	1.350	0
5510	1	1	0.250	0.250	800	800	800	800	4.020	0.250	0	1	1	1	0	0	4.111	582
5510	2	1	0.250	0.250	800	800	800	800	2.760	0.250	0	0	0	0	1	1	3.000	763
5510	3	1	0.250	0.250	800	800	800	800	1.738	0.250	0	0	0	0	0	0	2.034	872
5510	4	1	0.250	0.250	800	800	800	800	0.955	0.250	0	0	0	0	0	0	1.250	1009
5510	5	0	0.250	0.250	800	800	800	800	1.787	0.250	0	0	0	0	0	0	1.350	0
5520	1	1	0.250	0.250	600	600	600	600	3.905	0.250	0	0	1	1	0	0	3.983	698
5520	2	1	0.250	0.250	800	800	800	800	2.516	0.250	0	0	0	0	1	1	2.823	892
5520	3	1	0.250	0.250	800	800	800	800	1.598	0.250	0	0	0	0	0	0	1.909	940
5520	4	1	0.250	0.250	800	800	800	800	0.937	0.250	0	0	0	0	0	0	1.250	970
5520	5	0	0.250	0.250	800	800	800	800	1.350	0.250	0	0	0	0	0	0	1.350	0
5530	1	1	-0.050	-0.050	600	600	600	600	3.975	-0.050	0	0	1	1	0	0	3.963	749
5530	2	1	-0.050	-0.050	800	800	800	800	2.585	-0.050	0	0	0	0	1	1	2.783	938
5530	3	1	-0.050	-0.050	800	800	800	800	1.621	-0.050	0	0	0	0	0	0	1.909	983
5530	4	1	-0.050	-0.050	800	800	800	800	1.035	-0.050	0	0	0	0	0	0	1.350	1015
5530	5	0	-0.050	-0.050	800	800	800	800	2.000	-0.050	0	0	0	0	0	0	1.350	0
5540	1	1	0.000	0.000	600	500	500	500	3.600	0.000	0	0	1	1	0	0	3.645	975
5540	2	1	0.000	0.000	700	700	700	700	2.390	0.000	0	0	0	0	1	1	2.627	908
5540	3	1	0.000	0.000	700	700	700	700	1.594	0.000	0	0	0	0	0	0	1.903	914

5540	4	1	0.000	0.000	700	700	700	700	0.975	0.000	0	0	0	0	0	0	1.395	1207
5540	5	0	0.000	0.000	800	800	800	800	1.950	0.000	0	0	0	0	0	0	1.350	0
[-]	**[-]**	**[-]**	**[in]**		**[fpm]**				**[in]**		**0 = OFF**			**1 = ON**			**[in]**	**[tons]**

recipe no.	pas no.	a/b	side guide offset		speed mill		speed edger		screw down	offset RM edger	prim . desc.		RM descaler entry		RM descaler delivery		ref. load gap	ref. force
			RMET	RMDT	entry	run	entry	run			S	N	Top	Bot	Top	Bot		
5550	1	1	-0.200	-0.200	650	800	650	800	3.245	-0.200	0	0	1	1	0	0	3.100	642
5550	2	1	-0.200	-0.200	800	800	800	800	2.117	-0.200	0	0	0	0	1	1	2.310	668
5550	3	1	-0.200	-0.200	800	800	800	800	1.540	-0.200	0	0	1	1	0	0	1.680	681
5550	4	1	-0.200	-0.200	800	800	800	800	0.850	-0.200	0	0	0	0	0	0	1.150	788
5550	5	0	-0.200	-0.200	800	800	800	800	1.650	-0.200	0	0	0	0	0	0	1.350	0
7450	1	1	0.000	0.000	620	650	620	620	3.610	0.000	0	0	1	1	0	0	3.850	751
7450	2	1	0.000	0.000	800	800	800	800	2.800	0.000	0	0	0	0	0	0	3.100	775
7450	3	1	0.000	0.000	800	800	800	800	2.130	0.000	0	0	1	1	0	0	2.430	782
7450	4	1	0.000	0.000	800	800	800	800	1.750	0.000	0	0	0	0	0	0	2.050	893
7450	5	1	0.000	0.000	800	800	800	800	1.520	0.000	0	0	1	1	0	0	1.820	700
7450	6	1	0.000	0.000	800	800	800	800	1.100	0.000	0	0	0	0	0	0	1.400	650
7450	7	1	0.000	0.000	800	800	800	800	0.790	0.000	0	0	0	0	0	0	1.150	600
7510	1	1	0.150	0.150	650	800	650	800	3.926	0.150	1	0	0	0	0	0	4.212	553
7510	2	1	0.150	0.150	800	800	800	800	3.210	0.150	0	0	0	0	1	1	3.492	503
7510	3	1	0.150	0.150	800	800	800	800	2.486	0.150	0	0	0	0	0	0	2.773	575
7510	4	1	0.150	0.150	800	800	800	800	1.978	0.150	0	0	0	0	1	1	2.260	501
7510	5	1	0.150	0.150	800	800	800	800	1.350	0.150	0	0	0	0	0	0	1.750	605
7510	6	1	0.150	0.150	800	800	800	800	0.950	0.150	0	0	0	0	0	0	1.250	769
7510	7	0	0.150	0.150	800	800	800	800	1.350	0.150	0	0	0	0	0	0	1.350	0
7520	1	1	0.000	0.000	650	800	650	800	4.099	0.000	1	1	1	1	0	0	4.383	531
7520	2	1	0.000	0.000	800	800	800	800	3.408	0.000	0	0	0	0	1	1	3.693	535
7520	3	1	0.000	0.000	800	800	800	800	2.637	0.000	0	0	0	0	0	0	2.929	640
7520	4	1	0.000	0.000	800	800	800	800	2.015	0.000	0	0	0	0	0	0	2.306	636
7520	5	1	0.000	0.000	800	800	800	800	1.350	0.000	0	0	0	0	0	0	1.730	732
7520	6	1	0.000	0.000	800	800	800	800	0.943	0.000	0	0	0	0	0	0	1.250	880
7520	7	0	0.000	0.000	800	800	800	800	1.350	0.000	0	0	0	0	0	0	1.350	0
7530	1	1	0.000	0.000	800	800	800	800	4.151	0.000	1	1	1	1	0	0	4.438	574
7530	2	1	0.000	0.000	800	800	800	800	3.358	0.000	0	0	0	0	1	1	3.649	638
7530	3	1	0.000	0.000	800	800	800	800	2.618	0.000	0	0	0	0	0	0	2.912	677
7530	4	1	0.000	0.000	800	800	800	800	2.000	0.000	0	0	0	0	0	0	2.294	689
7530	5	1	0.000	0.000	800	800	800	800	1.350	0.000	0	0	0	0	0	0	1.742	758
7530	6	1	0.000	0.000	800	800	800	800	0.943	0.000	0	0	0	0	0	0	1.250	879
7530	7	0	0.000	0.000	800	800	800	800	1.350	0.000	0	0	0	0	0	0	1.350	0
7550	1	1	0.000	0.000	800	400	400	700	3.861	0.000	0	0	1	1	0	0	4.181	1084
7550	2	1	0.000	0.000	700	700	700	700	3.115	0.000	0	0	0	0	1	1	3.433	1058
7550	3	1	0.000	0.000	700	700	700	700	2.504	0.000	0	0	1	1	0	0	2.820	1017
7550	4	1	0.000	0.000	700	700	700	700	1.885	0.000	0	0	0	0	0	0	2.212	1192
7550	5	1	0.000	0.000	700	700	700	700	1.350	0.000	0	0	0	0	0	0	1.735	1159
7550	6	1	0.000	0.000	700	700	700	700	0.903	0.000	0	0	0	0	0	0	1.250	1506
7550	7	0	0.000	0.000	750	750	750	750	1.350	0.000	0	0	0	0	0	0	1.350	0
[-]	[-]	[-]	[in]		[fpm]				[in]		0 = OFF		1 = ON				[in]	[tons]

4.5 Steel Grade Reference Table for Cooling

Steel grade	SRT class CO
1005	3530
1005A	3250
1005B	3250
1005C	3530
1005P	3530
1006	3530
1006A	3530
1006B	3530
1006C	3530
1006D	3530
1006H	3530
1010A	3530
1015A	3530
1015B	3530
1016A	3530
1018A	3530
1018B	3530
1018C	3530
1018D	3530
1019P	3530
1020A	3530
1020P	3530
1021A	3250
1021B	3250
1022	3250
1022A	3250
1022P	3250
1026B	3530
1026C	3530
1026H	3530
1030A	3530
1038A	3530
1038B	3530
1038H	3530
1038P	3530
1042A	3530
1045A	3530
1045B	3530
1050A	3530
1050B	3530
1055A	3530
40915	3530
40916	3530
40921	3530
41010	3530
41014	3530
4130A	3530
43020	3530
945A	3530
946A	3530

950A	3530
951A	3530

4.6 SRT Class for Cooling

index	thick min	thick max	width min	width max	recipe no
3001	0.070	1.000	25.00	50.00	322
3050	0.000	0.100	0.00	52.00	1050
3050	0.100	0.125	0.00	52.00	2050
3050	0.125	0.150	0.00	52.00	3050
3050	0.150	0.175	0.00	52.00	4050
3050	0.175	0.200	0.00	52.00	5050
3050	0.200	0.240	0.00	52.00	6050
3050	0.240	0.300	0.00	52.00	7050
3050	0.300	0.400	0.00	52.00	8050
3050	0.400	1.100	0.00	52.00	9050
3152	0.000	0.100	0.00	52.00	1152
3152	0.100	0.125	0.00	52.00	2152
3152	0.125	0.150	0.00	52.00	3152
3152	0.150	0.175	0.00	52.00	4152
3152	0.175	0.200	0.00	52.00	5152
3152	0.200	0.240	0.00	52.00	6152
3152	0.240	0.300	0.00	52.00	7152
3152	0.300	0.400	0.00	52.00	8152
3152	0.400	1.100	0.00	52.00	9152
3200	0.000	0.100	0.00	52.00	1200
3200	0.100	0.125	0.00	52.00	2200
3200	0.125	0.150	0.00	52.00	3200
3200	0.150	0.175	0.00	52.00	4200
3200	0.175	0.200	0.00	52.00	5200
3200	0.200	0.240	0.00	52.00	6200
3200	0.240	0.300	0.00	52.00	7200
3200	0.300	0.400	0.00	52.00	8200
3200	0.400	1.100	0.00	52.00	9200
3230	0.000	0.100	0.00	52.00	1230
3230	0.100	0.125	0.00	52.00	2230
3230	0.125	0.150	0.00	52.00	3230
3230	0.150	0.175	0.00	52.00	4230
3230	0.175	0.200	0.00	52.00	5230
3230	0.200	0.240	0.00	52.00	6230
3230	0.240	0.300	0.00	52.00	7230
3230	0.300	0.400	0.00	52.00	8230
3230	0.400	1.100	0.00	52.00	9230
3250	0.000	0.100	0.00	52.00	1250
3250	0.100	0.125	0.00	52.00	2250
3250	0.125	0.150	0.00	52.00	3250
3250	0.150	0.175	0.00	52.00	4250
3250	0.175	0.200	0.00	52.00	5250
3250	0.200	0.240	0.00	52.00	6250
3250	0.240	0.300	0.00	52.00	7250
3250	0.300	0.400	0.00	52.00	8250
3250	0.400	1.100	0.00	52.00	9250
[-]	[in]				[-]

index	thick min	thick max	width min	width max	recipe no
3321	0.000	0.100	0.00	52.00	1321
3321	0.100	0.125	0.00	52.00	2321
3321	0.125	0.150	0.00	52.00	3321
3321	0.150	0.175	0.00	52.00	4321
3321	0.175	0.200	0.00	52.00	5321
3321	0.200	0.240	0.00	52.00	6321
3321	0.240	0.300	0.00	52.00	7321
3321	0.300	0.400	0.00	52.00	8321
3321	0.400	1.100	0.00	52.00	9321
3330	0.000	0.100	0.00	52.00	1330
3330	0.100	0.125	0.00	52.00	2330
3330	0.125	0.150	0.00	52.00	3330
3330	0.150	0.175	0.00	52.00	4330
3330	0.175	0.200	0.00	52.00	5330
3330	0.200	0.240	0.00	52.00	6330
3330	0.240	0.300	0.00	52.00	7330
3330	0.300	0.400	0.00	52.00	8330
3330	0.400	1.100	0.00	52.00	9330
3331	0.000	0.100	0.00	52.00	1331
3331	0.100	0.125	0.00	52.00	2331
3331	0.125	0.150	0.00	52.00	3331
3331	0.150	0.175	0.00	52.00	4331
3331	0.175	0.200	0.00	52.00	5331
3331	0.200	0.240	0.00	52.00	6331
3331	0.240	0.300	0.00	52.00	7331
3331	0.300	0.400	0.00	52.00	8331
3331	0.400	1.100	0.00	52.00	9331
3450	0.000	0.100	0.00	52.00	1450
3450	0.100	0.125	0.00	52.00	2450
3450	0.125	0.150	0.00	52.00	3450
3450	0.150	0.175	0.00	52.00	4450
3450	0.175	0.200	0.00	52.00	5450
3450	0.200	0.240	0.00	52.00	6450
3450	0.240	0.300	0.00	52.00	7450
3450	0.300	0.400	0.00	52.00	8450
3450	0.400	1.100	0.00	52.00	9450
3451	0.000	0.100	0.00	52.00	1451
3451	0.100	0.125	0.00	52.00	2451
3451	0.125	0.150	0.00	52.00	3451
3451	0.150	0.175	0.00	52.00	4451
3451	0.175	0.200	0.00	52.00	5451
3451	0.200	0.240	0.00	52.00	6451
3451	0.240	0.300	0.00	52.00	7451
3451	0.300	0.400	0.00	52.00	8451
3451	0.400	1.100	0.00	52.00	9451
3530	0.000	1.100	0.00	52.00	9000
[-]	[in]				[-]

4.7 Setup Reference Table for Cooling

recipe number	top cooling section										bottom cooling section				F2 duration cooling	
	1	2	3	4	5	6	7	8	9	10	1	2	3	4	start	end
1050	0	1	1	1	0	0	1	0	0	0	0	1	0	0	2	35
2050	0	1	1	1	0	0	1	0	0	0	0	1	0	0	3	35
3050	0	0	1	1	1	0	1	0	0	1	0	1	0	0	2	35
4050	0	1	1	0	0	0	1	0	0	0	0	1	0	0	2	35
5050	0	1	1	1	0	0	1	0	0	0	0	1	0	0	2	35
6050	0	1	1	1	0	0	1	0	0	0	0	1	0	0	0	35
7050	0	1	1	1	0	0	0	0	0	0	0	1	0	0	2	35
8050	0	1	0	0	1	0	0	0	0	0	0	1	0	0	2	35
9050	0	1	0	0	1	0	0	0	0	0	0	1	0	0	2	35
1152	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	35
2152	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	35
3152	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	35
4152	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	35
5152	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	35
6152	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	35
7152	0	1	1	0	1	0	0	0	0	0	0	1	0	0	0	35
8152	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	35
9152	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	35
1200	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	35
2200	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	35
3200	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	35
4200	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	35
5200	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	35
6200	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	35
7200	0	1	1	0	1	0	0	0	0	0	0	1	0	0	0	35
8200	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	35
9200	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	35
1230	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	35
2230	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	35
3230	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	35
4230	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	35
5230	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	35
6230	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	35
7230	0	1	1	0	1	0	0	0	0	0	0	1	0	0	0	35
8230	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	35
9230	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	35
1250	0	1	1	0	0	0	0	0	0	0	0	1	0	0	2	35
2250	0	1	1	1	0	0	0	0	0	0	0	1	0	0	2	35
3250	0	1	1	0	0	0	0	0	0	0	0	1	0	0	2	35
4250	0	1	1	0	0	0	0	0	0	0	0	1	0	0	2	35
5250	0	1	1	0	0	0	0	0	0	0	0	1	0	0	2	35
6250	0	0	1	1	0	0	0	0	0	0	0	1	0	0	2	35
7250	0	1	1	0	0	0	0	0	0	0	0	1	0	0	2	35
8250	0	1	0	0	1	0	0	0	0	0	0	1	0	0	2	35
9250	0	1	0	0	1	0	0	0	0	0	0	1	0	0	2	35
[-]	0 = OFF 1 = ON														[sec]	

recipe number	top cooling section 1	2	3	4	5	6	7	8	9	10	bottom cooling section 1	2	3	4	F2 duration cooling start	end
1321	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	35
2321	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	35
3321	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	35
4321	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	35
5321	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	35
6321	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	35
7321	0	1	1	0	1	0	0	0	0	0	0	1	0	0	0	35
8321	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	35
9321	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	35
1330	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	35
2330	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	35
3330	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	35
4330	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	35
5330	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	35
6330	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	35
7330	0	1	1	0	1	0	0	0	0	0	0	1	0	0	0	35
8330	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	35
9330	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	35
1331	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	35
2331	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	35
3331	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	35
4331	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	35
5331	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	35
6331	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	35
7331	0	1	1	0	1	0	0	0	0	0	0	1	0	0	0	35
8331	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	35
9331	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	35
1450	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	35
2450	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	35
3450	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	35
4450	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	35
5450	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	35
6450	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	35
7450	0	1	1	0	1	0	0	0	0	0	0	1	0	0	0	35
8450	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	35
9450	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	35
1451	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	35
2451	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	35
3451	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	35
4451	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	35
5451	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	35
6451	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	35
7451	0	1	1	0	1	0	0	0	0	0	0	1	0	0	0	35
8451	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	35
9451	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	35
9000	0	1	1	1	0	0	1	0	0	0	0	1	0	0	2	35
[-]	0 = OFF 1 = ON														[sec]	

5. Revision and Document Distribution List

REVISION LIST

Date	Version	Author	Description
94-Feb-28	V1.0	F.Dvo	in progress
94-Apr-25	V1.1	F.Dvo	revised
94-May-20	V2.0	F.Dvo	revised
94-Jul-22	V3.0	F.Dvo	for approval
28-Feb-96	as buit	F.Dvo	as built

DISTRIBUTION LIST

Version	Receiver
V1.0	ARMCO
V1.1	ARMCO
V2.0	ARMCO
V3.0	ARMCO
as built	ARMCO