

ALUMINUM EXTRUSION FACTORY SOFTWARE GENERAL CATALOG

Constant
speed
extrusion
(RcdWin)
Isothermal
extrusion
(RcdWin)



Extrusion
management
(EM)
Extrusion
data analysis
(EDA)



Extrusion
Plant
automation
(EP)

RC Digital,Inc.

<http://www.rcdigital.co.jp>

2019/10/28

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FIVE PROGRAMS THAT IMPROVE THE PRODUCTIVITY OF ALUMINUM EXTRUSION AND HELP WITH MAINTENANCE AND DATA ANALYSIS

Constant speed extrusion (RcdWin)

- This is a constant speed extrusion controller that automatically suppresses overshoot and speeds up startup for each die.
- It automatically adjusts the ram and torque relational expression, rise coefficient and constant velocity parameters.

Extrusion management (EM)

- Register and search extrusion parameters such as extrusion speed in the database for each die.
- Extrusion can be performed according to the schedule for each die.
- The billet length schedule is calculated taking into account the length of the long billet and set on the machine.
- AI detects defects in extruded profiles.

Extrusion data analysis (EDA)

- IT can be used in the extrusion process for each die.
- Extrusion data can be analyzed with extrusion forms and graphs for each die.
- You can calculate the yield per die.

Isothermal extrusion (RcdWin)

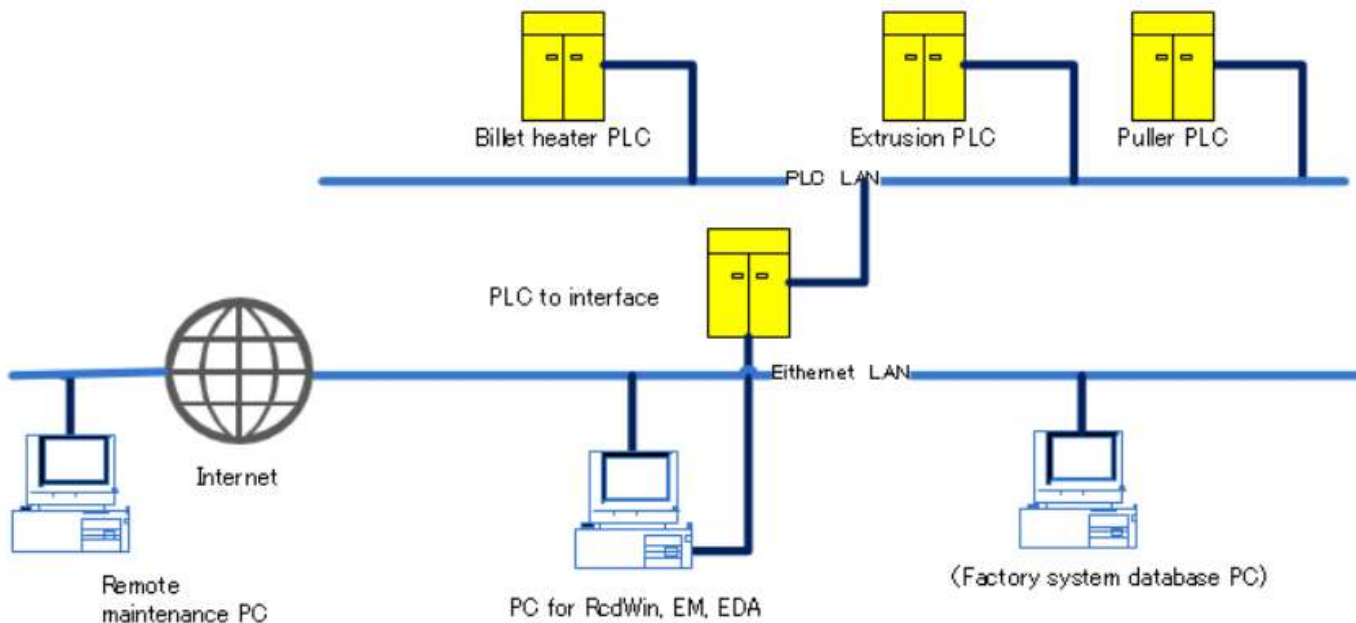
- Controls the rise of temperature. A controller that performs isothermal extrusion with $\pm 1^{\circ}$ C error by adjusting parameters.

Extrusion Plant automation (EP)

- Real-time monitoring from long billets to cutting billets, cutting billets to extruded shapes, and extruded shapes to products.
- The parameters are retrieved from the database by die number or lot and set in the machine.

SYSTEM CONFIGURATION

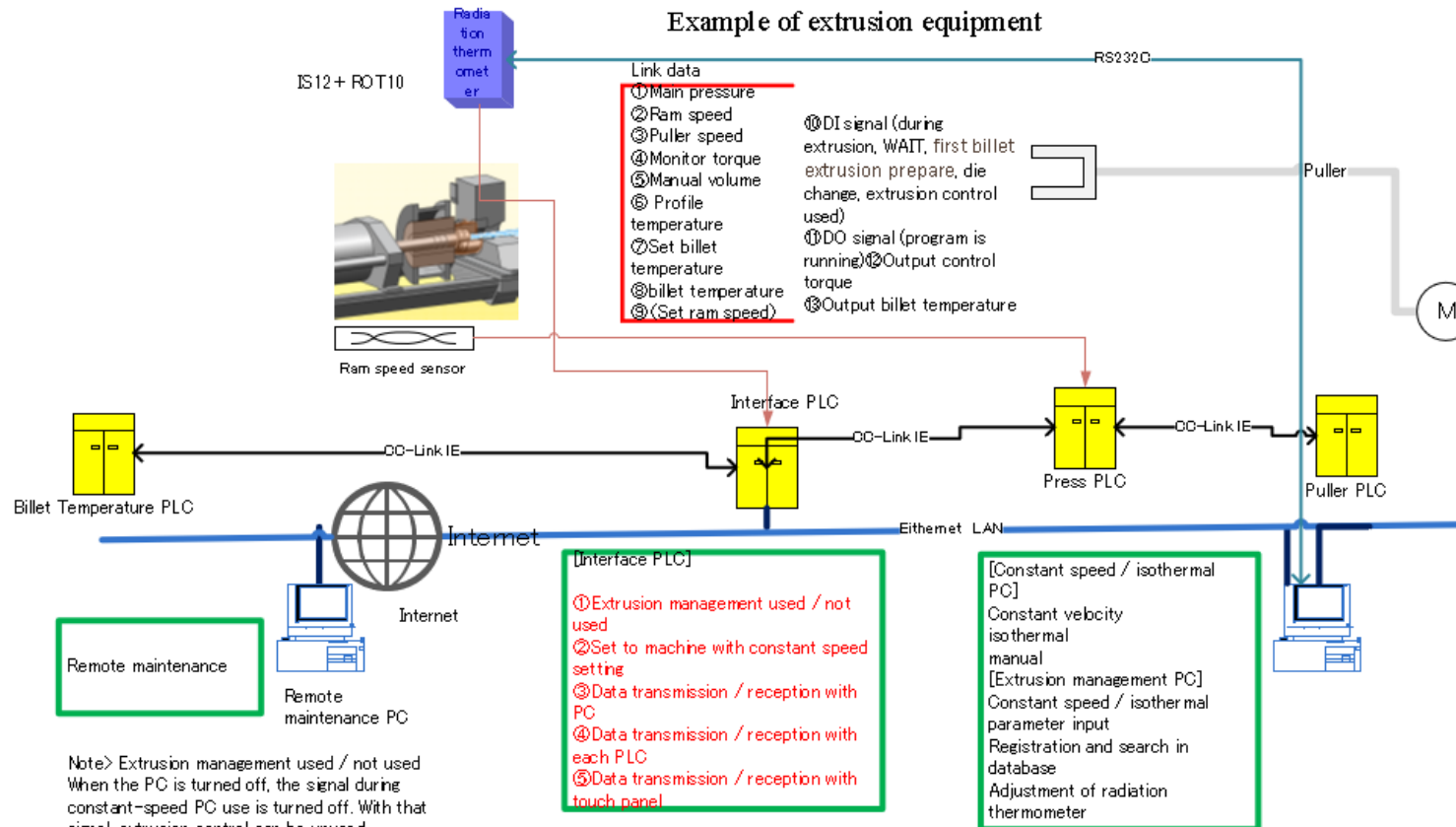
1. This is an interface PLC that is connected to a personal computer via LAN.
 1. Three programs run on one computer.
 2. The PLC is for exchanging signal data with the equipment.
 3. There are two LAN ports for the PC, one for the PLC and the second for the Internet.
2. The PLC is for exchanging signal data with the equipment.
 1. An internet LAN is required.
 2. Access the factory system database.
 3. Remote maintenance is performed using the Internet.



SYSTEM CONFIGURATION EXAMPLE (CONSTANT SPEED EXTRUSION / ISOTHERMAL EXTRUSION)

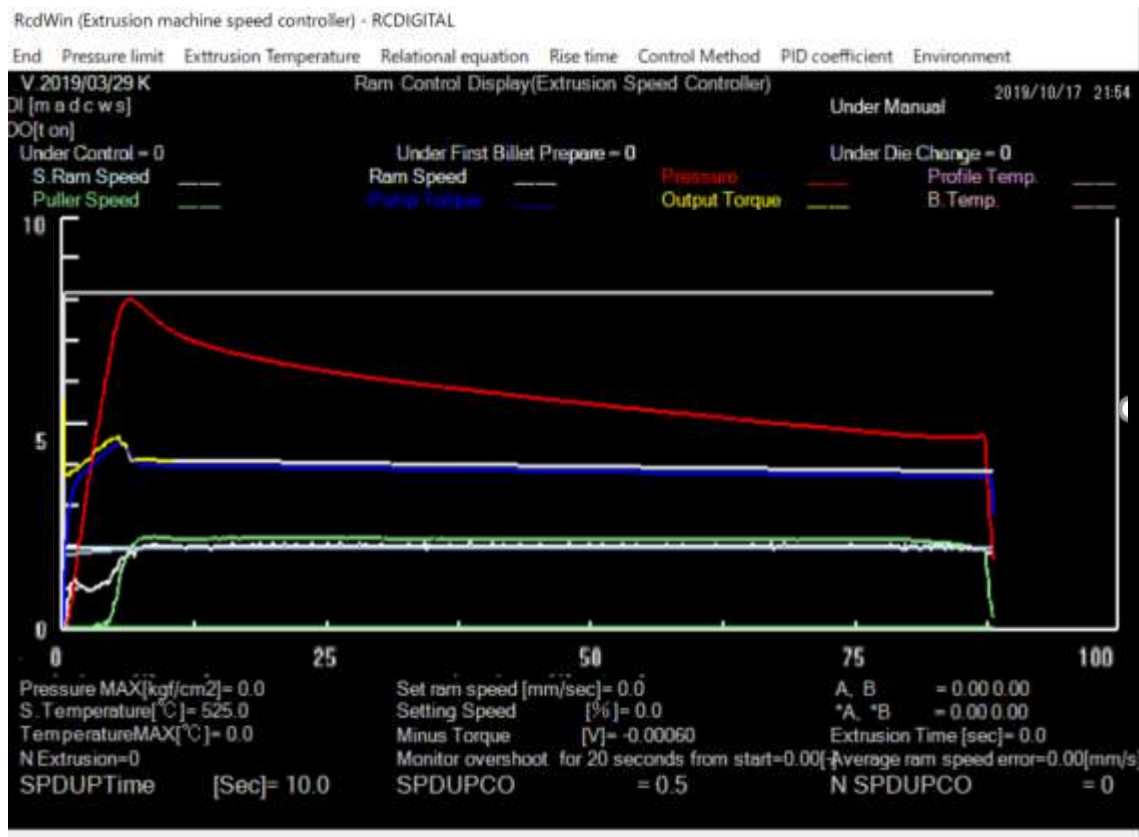
1. Constant speed extrusion
 1. Analog-in data requires main pressure, ram speed, (set ram speed) Note 1, puller speed, monitor torque, and manual volume.
 2. Digital-in is during extrusion, cycle stop (Wait), first billet extrusion prepare, die change, extrusion control used / not used.
 3. Analog out is output control torque.
 4. For Digital Out, a constant speed program is in operation.
2. Additional signals for isothermal extrusion
 1. Product outlet temperature, billet temperature, set billet temperature, output billet temperature.
3. The PLC network is a CC-Link IE field network.
4. Remote maintenance is performed using the Internet.

Note 1> When using extrusion management (EM), the set ram speed is not required.



CONSTANT SPEED EXTRUSION (RCDWIN)-CONTROL SCREEN

1. Graph line name
 1. Light blue: Setting speed
 2. White: Ram speed
 3. Red: Pressure
 4. Green: Puller speed
 5. Blue: Monitor torque (torque signal actually output to the pump, oil flow rate in the pipe)
 6. Yellow: Torque signal by RcdWin (white when steady)
 7. 8V white: Pressure limit value

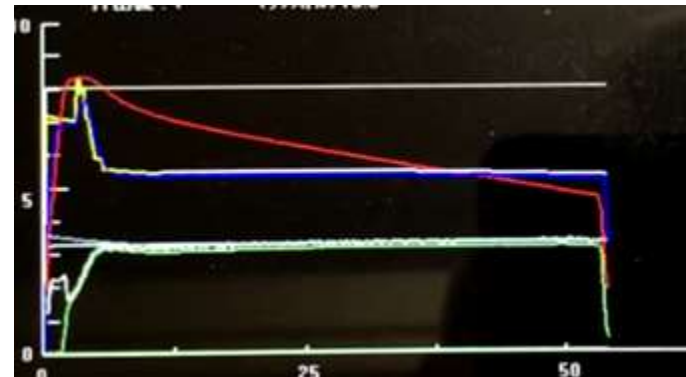
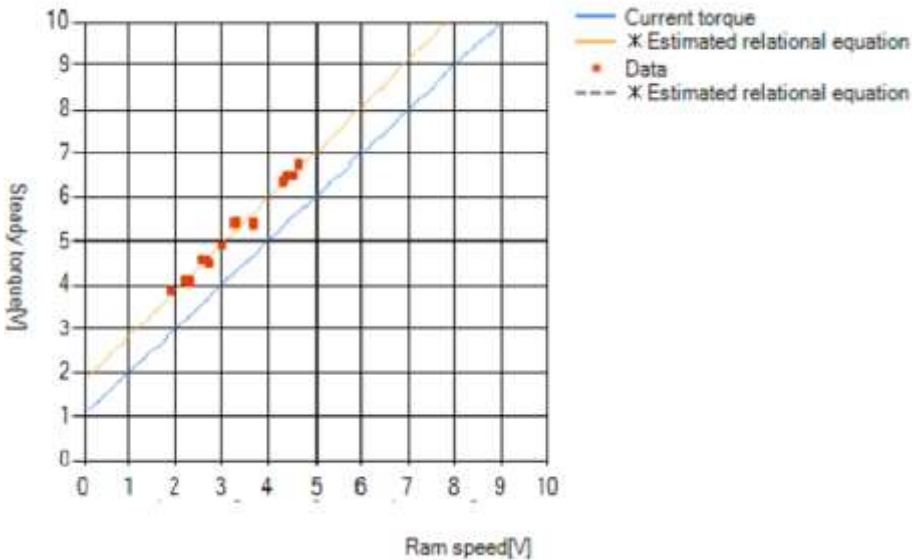


In about 5 seconds from the start, the ram speed becomes constant.

CONSTANT SPEED EXTRUSION (RCDWIN)-OVERSHOOT PREVENTION

1. Overshoot prevention
 1. Predicts the rise of the ram speed by the torque and ram speed relational expression and prevents overshoot.
 2. With normal PID control, the amount of overshoot is large.
2. Productivity improvement
 1. The extrusion setting speed can be increased by preventing overshoot. Therefore, production increases.
3. Improved maintainability
 1. The ram and torque relational expression, start-up coefficient and constant speed parameters can be automated.

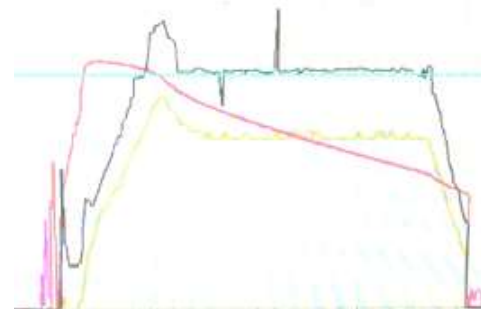
Relational equation between ram speed and steady torque



RcdWin does not overshoot.

Ram speed and torque have a linear relationship.

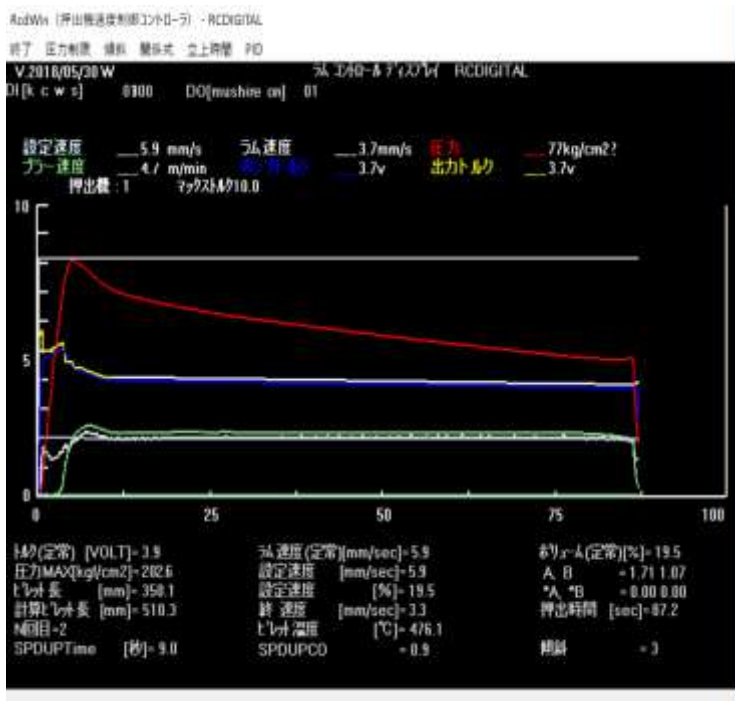
Note> The term torque is used to mean the oil flow rate.



Normal PID control overshoots.

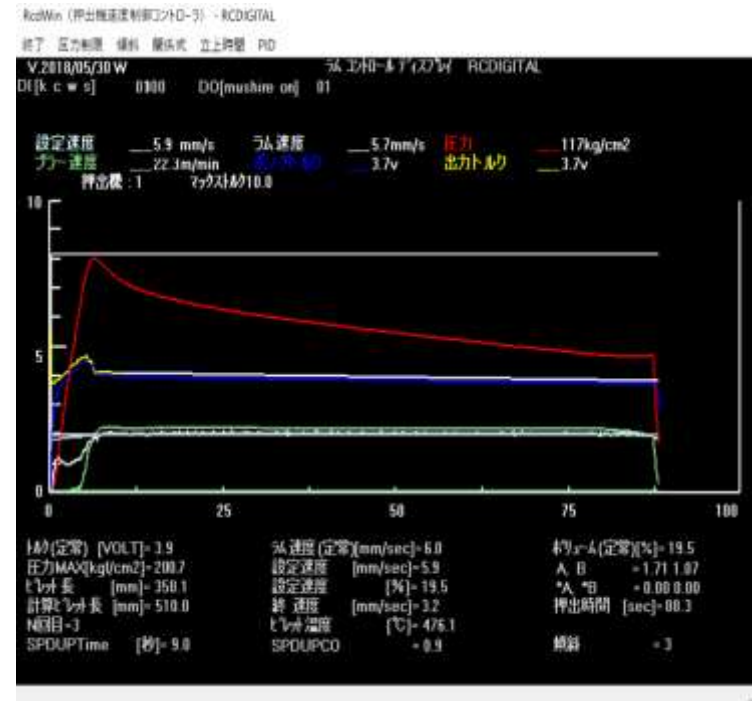
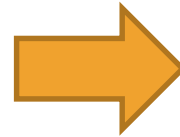
CONSTANT SPEED EXTRUSION (RCDWIN)-AUTOMATION OF RISE ADJUSTMENT (1)

1. Automatic adjustment to suppress overshoot and shorten rise time.
 1. Even if the die changes, the rise is automatically adjusted.
 2. Automation parameters are rise factor and rise time.



Overshoot with a rise factor of 1.0.

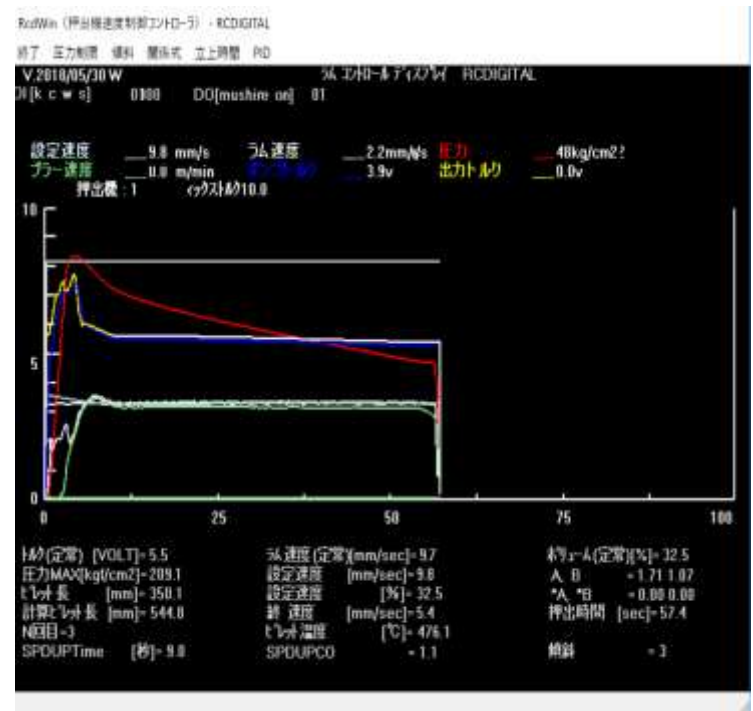
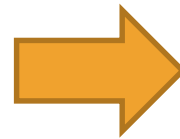
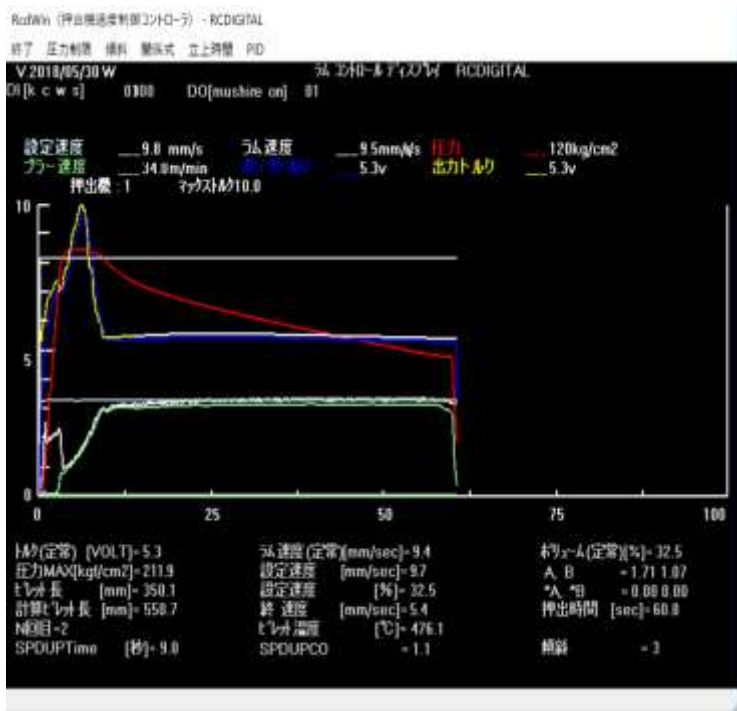
Note> Rise factor: Ratio to set ram speed



The rise factor is now automatically 0.9. There is almost no overshoot.

CONSTANT SPEED EXTRUSION (RCDWIN)-AUTOMATION OF RISE ADJUSTMENT (2)

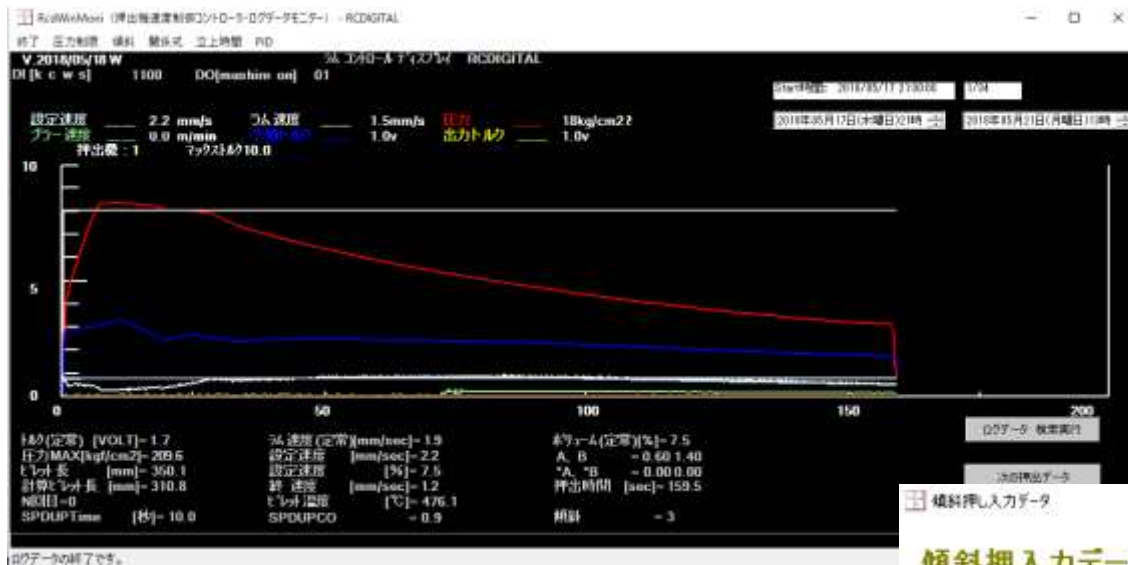
1. Automatic adjustment to suppress overshoot and shorten rise time.
 1. Even if the die changes, the rise is automatically adjusted.
 2. Automation parameters are rise factor and rise time.



The rise factor is 1.0 and the rise time is 9 seconds or more.

The rise factor is automatically 1.1. It became constant speed by the rise time 9 seconds.

CONSTANT SPEED EXTRUSION (RCDWIN)-PRESSURE LIMIT AND INCLINED EXTRUSION



1. Pressure limit

1. At startup, the main pressure exceeds the relief valve value. Therefore, the blue torque is suppressed.
2. It has the effects of reducing pressure load on equipment and devices, reducing motor load, reducing power consumption, preventing pump output from stopping, and preventing ram speed overshoot.

Note> Billet length is required for inclined extrusion.
 Inclined extrusion is optional.

1. Inclined speed extrusion

1. The ram speed is inclined about 80 seconds from the start of extrusion. It has the effect of suppressing the rise in product temperature.
2. Inclination speed extrusion parameters
 1. Deceleration start coefficient: The ratio of billet length to start tilting.
 2. End speed coefficient: Ratio to the set speed at the end of extrusion.

傾斜押し入データ

0	減速開始係数 =	<input type="text" value="0.5"/>	終速係数 =	<input type="text" value="1"/>
1	減速開始係数 =	<input type="text" value="0.6"/>	終速係数 =	<input type="text" value="0.7"/>
2	減速開始係数 =	<input type="text" value="0.6"/>	終速係数 =	<input type="text" value="0.6"/>
3	減速開始係数 =	<input type="text" value="0.5"/>	終速係数 =	<input type="text" value="0.55"/>
4	減速開始係数 =	<input type="text" value="0.4"/>	終速係数 =	<input type="text" value="0.5"/>
5	減速開始係数 =	<input type="text" value="0.85"/>	終速係数 =	<input type="text" value="0"/>

傾斜押しパターンを入力して下さい(0~5)

OK Cancel

CONSTANT SPEED EXTRUSION (RCDWIN) -PLC INTERFACE DATA

Plc Interface Data

— □ ×

Plc Interface Data

Item number	Tag name	comment	type	Plc No.	Plc device	Word count	Low resolution	High resolution	Low Volt	Hig
1	DO9-15	DI	AI	PLC1	D100	12	0	4000	0	
2	DI16-31	DI002		PLC1	D101	0	0	1	0	
3	Billet Length	AI Billet L		PLC1	D102	0	0	1	0	
4	Profile Temperat..	AI P. T.		PLC1	D103	0	350	600	0	
5	Pressure	AI Pressure		PLC1	D104	0	0	250	0	
6	Torque(Flow rate)	AI Torque		PLC1	D105	0	0	4000	0	
7	Ram Speed	AI Ram		PLC1	D106	0	0	30000	0	
8	Puller Speed	AI Puller		PLC1	D107	0	0	1000	0	
9	Billet Temperatu..	AI B. T.		PLC1	D108	0	350	600	0	
10	Setting Billet Te..	AI R. B. T.		PLC1	D109	0	350	600	0	
11	Setting Ram Spe..	AI R.R.		PLC1	D110	0	0	300	0	
12	Setting Volume	I		PLC1	D111	0	0	100	0	
13	AO Torque I	Torque	AO	PLC1	D0126	3	0	4000	0	
14	AO Setting Billet..	R. B. T.		PLC1	D0127	0	0	1	0	
15	AO Average ram ..	R. ERROR		PLC1	D0128	0	0	1	0	
16	DO9-15	PC ON	AO	PLC1	D0125	1	0	1	0	

1. Plc data

1. Set the Plc type, IP address, port, and protocol.

OK

Cancel

1. Plc interface data

1. Set the Plc device, measurement data, output data scale, etc.
2. Maintenance is better.
3. Data type AI Plc device numbers must be consecutive.
4. DI is also imported as AI.
5. DO is also output as AO.

Plc

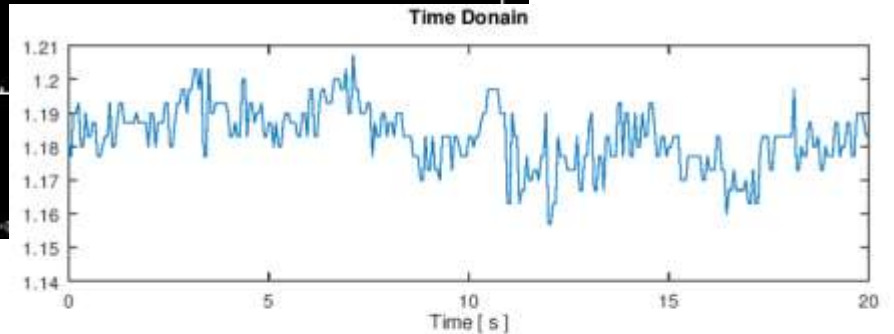
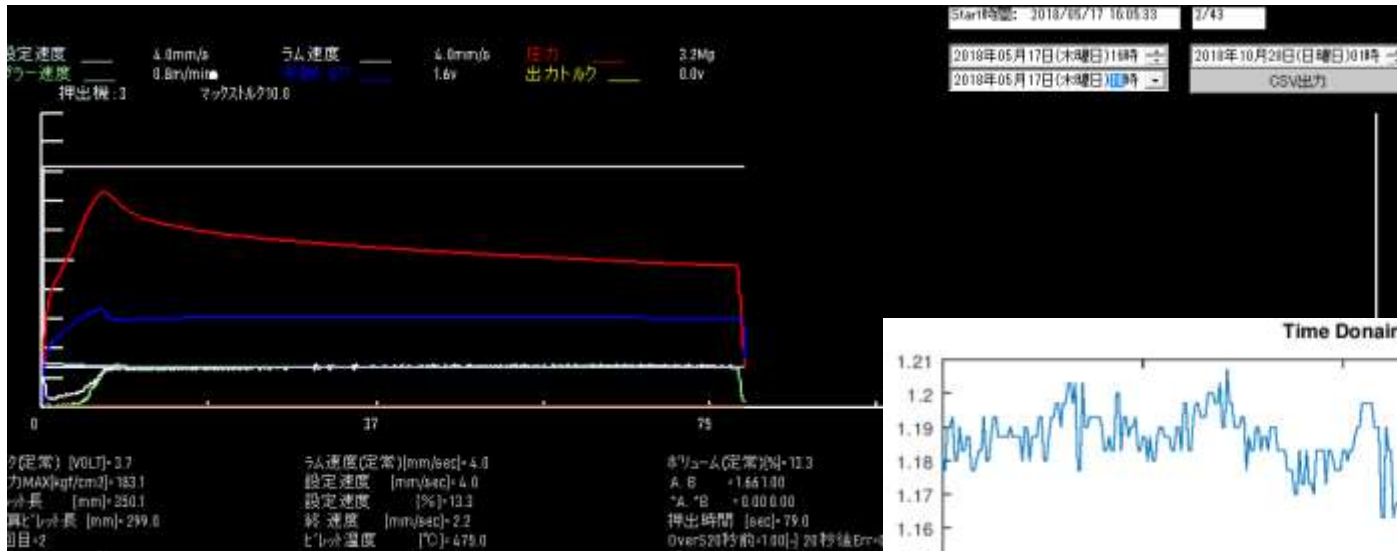
Plc Data

Item Number	Plc Number	Plc Type	Plc Host	Plc Port	Plc Protocol
1	PLC1	MELSECQ_Q03	192.168.12.2	2000	UDP

EXTRUSION DATA SEARCH (RCDWINMONI)

1. Extrusion data search

1. The latest 20,000 extrusion data can be searched by date and displayed as a graph.
2. Display data can be output as a CSV file.
3. Data has a sampling time of 0.1 seconds or less. Data is also logged in extrusion data analysis (EDA). However, EDA sampling time is 1 second.



1. Application of CSV file

1. The figure on the right is a ram speed spectrum analysis.
2. The ram speed is vibrating due to friction. Amplitude 0.03 ± 0.015 [V] 0.09 ± 0.045 [mm / s] Period about 0.3 seconds
3. If done regularly, it will help maintain the machine.



EXTRUSION MANAGEMENT (EM)-VARIOUS FUNCTIONS

1. Extrusion management (EM) functions

1. You can register, change, and search for each die of constant speed extrusion and isothermal extrusion parameters.
2. Constant speed extrusion and isothermal extrusion parameters can be set in the machine.
3. You can create an extrusion schedule for each die
4. You can get the extrusion schedule from the factory system database.
5. Even if the extrusion speed is the product speed [m / min], it can be used as it is (converted to the ram speed [mm / s] by the extrusion ratio).
6. Billet length schedule simulation is possible.
7. Can detect aluminum extrusion profile defects.



1. Constant speed extrusion (RcdWin) and extrusion management (EM)

1. The extrusion parameters are set with EM, and constant speed extrusion is executed with RcdWin.
2. RcdWin can run without EM. However, productivity will be improved if the extrusion schedule can be entered and extrusion parameters can be searched from the database.

EXTRUSION MANAGEMENT (EM)-SCHEDULE FUNCTION AND DATABASE FUNCTION

1. Schedule function

1. The extrusion schedule can be obtained for three days from the factory system database.
2. Ten extrusion dies can be entered manually.
3. Any of the 10 extrusion dies can be selected.
4. Click [Number 1 ~ 10] to move the extrusion die number to [Inquiry Extrusion Die].
5. [11 Number] can select the extrusion die number from all schedules.

1. Database function

1. Click [Search] to set the extrusion parameters from the database.
2. The extrusion die number moves to [Extrusion Dies under Control].
3. Click [Register Database] to set the extrusion parameters in the database.

Click Set to Machine to set the extrusion parameters to the machine

EXTRUSION MANAGEMENT (EM)-BILLET LENGTH SCHEDULE SIMULATION

1. Characteristic

1. Billet length schedule simulation program that can be used conveniently at the extrusion work site.
2. Billet length schedule can be set in the machine.
3. Long billet length can be considered.
4. Changes in profile extrusion length (product unit weight changes due to heat) can be taken into account.

1. Five schedule functions

1. Considering the long billet length, keep the billet length constant.
2. Simulate billet cutting plan so that there is no remaining long billet.
3. A mode that does not consider long billets. Specify the first billet length.
4. A mode that does not consider long billets. The first billet length is calculated by the distance between platens.
5. A mode that does not consider long billets. Calculate without specifying the first billet length.

Extrusion Management RCDIGITAL

2019/05/09 17:52

Menu

Press No : 3 **Billet length schedule simulation**

Order quantity	Order length [m]	Product Unit Weight [kg/m]	Billet Unit Weight [kg/m]	Butt Thickness [mm]	Calculated Products 202
202	5.0	0.596	67.0	5	
Number of holes	Extrusion Table L. [m]	Platen distance [m]	Cutting Consumption L. [mm]	Extra length [m]	
2	45.0	1.5	1	1.5	
1st billet length [mm]	1st Billet Length Calculation		Long Billet Length [mm]	Ext. Die Cross Sec. [mm ²]	
400	<input checked="" type="radio"/> OFF <input type="radio"/> Billet length specification <input type="radio"/> Platen distance [m]		6500	221	
Long Billet L. Ini. Value [mm]	Long Billet L. Consideration		Billet Length Min. [mm]	Maximum billet length	Split Minimum L. [mm]
400	<input type="radio"/> OFF <input checked="" type="radio"/> ON Fixed billet length <input type="radio"/> ON No long billet left		280	650	100
Calculation results			Extrusion Length Min. [m]	No Calc. Product Num. Error	Meas. Extrusion L. [m]
			20.0	<input checked="" type="radio"/> OFF <input type="radio"/> ON	44.0
					Meas. Extrusion ratio
					44.3
					Meas. Prod. U.W. [kg/m]
					0.494
					Drawing Unit W. [kg/m]
					0.60
					One Prod. Billet Len. [mm]
					44

	Long billet no	1-1	2-1	2-2	2-3	3-1	3-2
Billet length [mm]	400	165	565	104	461	565	
Number of bill...	1	1	11	1	1	4	
Extrusion lengt...	22.2	31.5	31.5	5.6	31.5	31.5	
Long billet rem...	0	6335	104	0	6039	3509	
Number of pro...	8	2	12	2	10	12	
Total number	8	2	132	2	10	48	

Calculation execution

Set parameters to machine

Return

Constant velocity extr. Billet length schedule si

Billet length schedule that keeps billet length constant considering long billet.

EXTRUSION MANAGEMENT (EM)-ALUMINUM EXTRUSION PROFILE DEFECT DETECTION

1. Characteristic

1. Collecting profile images during extrusion automatically / manually.
2. Read prediction model file by deep learning.
3. Automatic / manual profile defect detection.

1. application

1. As an application of aluminum extrusion profile defect detection to constant speed control, it is possible to incline the set extrusion speed when a defect sign is detected.

Aluminum extrusion profile defect detection screen (not an image during extrusion)

Use the free surveillance camera software iSpy plug-in to send the image to EM.

Aluminum extrusion profile defect detection

Menu

Press No : **Aluminum extrusion profile defect detection**

2019/07/31 18:25

Automatic image acquisition
 OFF
 ON

Automatic profile defect detection
 OFF
 ON

Non-defective / defective tag
 Unknown
 Good product
 Defective product

Manual defect detection execution

Result:
Good product

Manual image collection execution

Predictive model selection

Constant speed | Billet length | Defect detection

© FPS 3.00.0 Objects Camera 0

EXTRUSION DATA ANALYSIS (EDA)-DIE SELECTION AND IDLE TIME GRAPH

1. Characteristic

1. The aluminum extrusion factory can be converted to IT.
2. Various functions are realized using the data stored in the database by the constant velocity extrusion, isothermal extrusion program (RcdWin), and extrusion management (EM).

1. Various functions

1. Graphing of form data.
2. Detection of equipment abnormal data
3. Non-extrusion time (idle time) graph, short stop time, die change time CSV.
4. History of extrusion parameters per die (extrusion speed is particularly important).
5. Extrusion die usage history.
6. Extruded billet table
7. Real-time monitor.
8. Yield

押出データ解析-RCDIGITAL VER. 2018.06.21

2018/12/03 13:56

押出機 : 1 **ダイス選択表**

Start [2017年06月17日(土曜日)00時] End [2017年06月18日(日曜日)12時] **ダイス型番 例>38710** 検索

開始時間	ダイス型番	ダイス枚数	ラム速度設定 [%]	ラム速度設定 最大 [%]	ホール数	シート厚設定 有無	型枠断面積	押出比
2017/06/17 7...	38710	1	46	46	1	False	1039.0	25.3
2017/06/17 7...	38710	1	40	40	1	False	450.0	58.4
2017/06/17 6...	25712	4	52	52	1	False	1355.0	19.4
2017/06/17 5...	27981	1	36	36	1	False	879.0	29.9
2017/06/17 5...	44229	2	59	59	1	True	1141.0	23.0
2017/06/17 5...	44779	3	36	36	1	False	978.0	26.9
2017/06/17 3...	40540	12	50	50	1	False	435.0	60.4
2017/06/17 3...	5136	6	50	50	1	False	700.0	37.6
2017/06/17 3...	5176	10	48	48	1	False	475.0	55.3
2017/06/17 2...	3990	7	46	46	1	True	515.0	51.0
2017/06/17 2...	23810	2	29	32	2	True	131.4	100.0
2017/06/17 2...	38710	1	25	25	2	False	81.7	143.3
2017/06/17 1...	38710	6	31	31	2	False	133.0	98.8
2017/06/17 0...	38710	4	31	31	2	False	133.0	98.8

ダイス選択表 8093

注1>ダイス型名を入力した場合は、検索でダイス使用履歴に移動します。

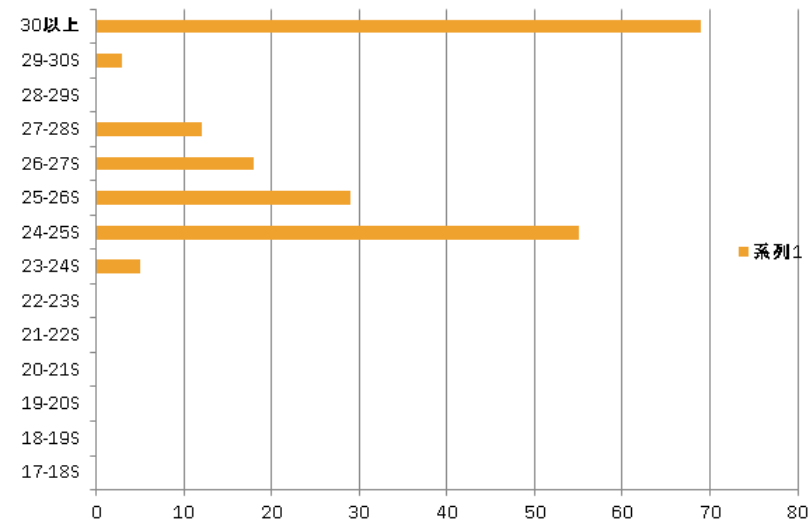
ダイス交換時間Csv
 チョロ付Csvファイル
 非押出時間xlsxファイル

ダイス選択表 | ダイス使用履歴 | リアルタイムモニタ | 終了

- Select [Extrusion Die Model Number] and click [Die Usage History].
- Transit to [Extrusion Die Usage History] screen.

1. Non-extrusion time Xlsx file

1. Click the [Non-extrusion time Xlsx file] button.
2. The idle time of the Start and End periods is output to the Xlsx file as a graph.



EXTRUSION DATA ANALYSIS (EDA)-DIE USAGE HISTORY AND EXTRUSION BILLET TABLE

1. Usage history of extrusion dies

1. The usage history of the same extrusion die is displayed in order from the newest.
2. The extrusion parameters of the extrusion die on the selected day are displayed in the table below.
3. The extrusion manager can examine the parameter transitions.
4. You can ask the operator why the parameter was changed. In particular, changes in extrusion speed are important because they directly affect productivity.
5. When [Extruded Billet Table] is executed, the screen switches to the extrusion form printing screen of the extrusion die on the selected day.

1. Extruded billet table

1. By executing the [Print] button, you can print forms on a printer, Excel, PDF, or Word.
2. Extrusion can be seen in a graph by executing the [Graph] button.
3. You can set abnormal values for measurement data in the table below. The top is above, the bottom is below. Abnormal values are preceded by ** before the numerical value in the form.

押出データ解析-RCDIGITAL VER. 2018.06.21

2018/12/03 18:39

押出機 : 1 **ダイス使用履歴**

開始時間	ダイス型番	ダイス枝番	ラム速度設定 [%]	ラム速度設定 最大[%]	ビレット合計	ダイス予熱炉 1	ダイス予熱炉 2	ダイス予熱炉 3	ホール数
2017/06/17 3		12	50	50.0	57	496	588	492	1
2017/06/15 1		19	36	36.0	1	587	586	519	1
2017/06/14 6		19	36	36.0	81	586	586	452	1
2017/06/10 4		13	34	34.0	114	377	505	432	1
2017/06/08 5		19	36	36.0	114	586	587	454	1
2017/06/06 2		12	40	40.0	116	586	580	534	1

過去のパラメータ

ビレットNo	設定製品温度High	設定製品温度Low	設定ビレット温度	立上時間	立上係数	製品速度 [m/min]	ラム速度設定 [%]	ラム速度設定 (押出比から) [mm/s]
1	545	535	480	10	0.9	25	38	6
2	545	535	480	10	0.9	25	42	6
3	545	535	480	10	0.9	25	46	6
4	545	535	480	10	0.9	25	48	6

ダイス選択表 48546 選択ダイス枝番 12

ダイス使用履歴 押出ビレット表

押出データ解析-RCDIGITAL VER. 2018.06.21

2018/12/03 19:35

押出機 : 1 **押出ビレット表**

日付 2017/06/17 開始時間 03:33:43 終了時間 05:05:29

ダイス型番 48546 - 12 ダイス予熱炉1 496°C ダイス予熱炉2 588°C ダイス予熱炉3 492°C

ホール 1 型材断面積 435.0mm² ダイス交換時間1 152

押出機 N. 1 無 押出比 60.4 ダイス交換時間2 152

押出ビレット数	バット厚 [mm]	ビレット長 [mm]	ビレット温度設定 [°C]	ビレット温度 [°C]	押出型材出口温度 [°C(0秒)]	終了温度 [°C(0秒)]	最高温度 [°C]	メイン圧力 [bar]
1	14	658	480	460	494.4	495.2	497.2	143.0
2	14	658	480	480	501.5	500.9	504.0	156.0
3	14	661	480	460	505.0	503.0	506.3	156.0
4	14	663	480	460	503.8	503.9	507.6	156.0
5	14	663	480	460	504.9	504.2	508.1	156.0
6	14	660	480	460	508.1	505.8	510.6	154.0
7	14	652	480	460	508.1	504.7	508.4	155.0

異常値の設定 上段:以上 下段:以下

バット厚	ビレット長	ビレット温度設定	ビレット温度	型材設定温度	押出型材出口温度	終了温度	最高温度	メイン圧力
50	1000	500	500	550	550	550	550	200
3	300	400	400	400	400	400	400	0

ダイス選択表 48546 選択ダイス枝番 12 ビレット合計 57

押出ビレット表 印刷 グラフ 戻る

EXTRUSION DATA ANALYSIS (EDA)-EXTRUSION BILLET LIST AND EXTRUSION DATA SEARCH

1. Extruded billet list
 1. Information for each extrusion die: die number, die cross-sectional area, etc.
 2. Information for each billet: Setting ram speed, ram speed, puller speed, main pressure, Max main pressure, Max main pressure duration, etc.
 3. The number of items displayed varies depending on the factory. The Excel form is about 3 pages in A4 landscape.

押出 ビレット一覧表

ダイス型番	-1	ダイス予熱炉1	381□	ダイス予熱炉2	562□
ホール	2	型材断面積	144cm ²		
押出機	No. 1	押出比	91.3		
日付	2017/06/03	開始時間	04:21:58		

押出 ビレット 数	バット厚 mm	ビレット長 mm	ビレット温度前 ℃	ビレット温 ℃	押出型材 ℃	押出型材 ℃	終了温度 ℃	最高温度 ℃	メイン圧 G	メイン圧力 G	製品速度 m/min	ラム速度 %	ラム速度設定 G	ラム速度 mm/s
1	8	591	480	0	0	530.9	524.0	536.0	152.0	1	38			
2														
3		終了時間	05:29:06											
4		ダイス予熱炉3	538□											
5														
6														
7														
8														
9														
10														
11	3.9	7.7	0.0	66.9	-64.9	4.32	0	2211	30	9	-99			
12	3.9	7.7	0.0	76.0	24.6	4.89	0	2211	30	9	-99			
13	4.8	7.6	0.0	66.0	-66.0	4.38	0	2211	30	9	-99			
14	4.8	7.6	0.0	76.2	24.8	4.89	0	2211	30	9	-99			
	4.7	7.7	0.0	64.7	-64.7	4.36	0	2211	30	9	-99			
	4.7	7.7	0.0	75.3	24.5	4.89	0	2211	30	9	-99			
	6.0	7.6	0.0	64.9	-64.9	4.42	0	2211	30	9	-99			
	6.0	7.6	0.0	74.7	25.3	4.89	0	2211	30	9	-99			
	5.7	7.6	0.0	65.1	-65.1	4.44	0	2211	30	9	-99			
	5.7	7.6	0.0	74.7	25.7	4.89	0	2211	30	9	-99			
	4.2	7.6	0.0	65.2	-65.2	4.44	0	2211	30	9	-99			
	4.2	7.6	0.0	74.5	24.6	4.89	0	2211	30	9	-99			
	4.7	7.7	0.0	64.6	-64.6	4.42	0	2211	30	9	-99			
	4.7	7.7	0.0	74.4	24.3	4.89	0	2211	30	9	-99			

1. extrusion data search

1. You can view the form data in a graph.



EXTRUSION DATA ANALYSIS (EDA)-REAL-TIME MONITORING AND YIELD

1. Real-time monitor

1. Extrusion status can be viewed in real time graph.
2. Information for each extrusion die: die number, die cross-sectional area, etc.
3. Information for each billet: Setting ram speed, ram speed, puller speed, pressure, etc.



Note> Displayed contents vary depending on the factory.

1. Yield

1. Referring to the number of non-defective products for each lot of extrusion dies, the yield for the specified period is calculated.
2. If the same die is used twice, the number of non-defective items in the second die will be cumulative.
3. If the end message is 0, the number of good products has not been entered yet.

押出機: [redacted]
歩留まり
2018/12/04 01:55

Start: 2016年09月13日(火曜日)00時* End: 2016年09月14日(水曜日)01時*

押出時間	ダイス番号	ダイス副番号	ピレット数	良品数	ピレット重量	合格重量	整形重量	持機処理重量	合格総重量	合格総重量(理論値)	合格率	合格率(理論値)	終了メッセージ
2016/09/13 5:4...	[redacted]	1	28	426	1948.5	—	—	—	1537.3	1446.0	78.9	74.2	Yes
2016/09/13 6:5...	[redacted]	1	9	161	631.5	—	—	—	504.7	488.8	79.9	77.4	Yes
2016/09/13 7:2...	[redacted]	1	9	122	563.8	—	—	—	380.9	396.1	67.6	70.3	Yes
2016/09/13 7:5...	[redacted]	1	16	241	911.8	—	—	—	802.9	779.9	88.1	85.5	Yes
2016/09/13 8:2...	[redacted]	1	2	0	121.3	—	—	—	0.0	0.0	0.0	0.0	No
2016/09/13 8:2...	[redacted]	1	1	0	40.2	—	—	—	0.0	0.0	0.0	0.0	No
2016/09/13 8:3...	[redacted]	1	1	0	40.2	—	—	—	0.0	0.0	0.0	0.0	No
2016/09/13 8:3...	[redacted]	1	1	0	40.2	—	—	—	0.0	0.0	0.0	0.0	No
2016/09/13 8:4...	[redacted]	1	2	0	80.4	—	—	—	0.0	0.0	0.0	0.0	No
2016/09/13 8:4...	[redacted]	1	1	0	40.2	—	—	—	0.0	0.0	0.0	0.0	No

まとめ:

- ピレット合計: 236
- 良品合計: 2508
- ピレット総重量: 15.23 [Ton]
- 良品総重量: 13.71 [Ton]
- 収益率: 90.045 [%]
- 収益率(理論値): 91.369 [%]

Buttons: 歩留まり, 印刷, 出口

Note> Yield is optional.

ISOTHERMAL EXTRUSION (RCDWIN)-EXTRUSION PARAMETERS ENTERED IN EM

1. Isothermal extrusion features

1. Isothermal control with an error of $\pm 1^{\circ}\text{C}$ is possible by adjusting parameters.
2. Automatic adjustment of isothermal start-up by the start-up factor with proven results in constant speed extrusion.
3. Automatic adjustment of billet temperature (billet taper temperature).
4. By monitoring the upper limit extrusion speed, there is no danger of runaway extrusion speed.
5. Database of isothermal extrusion parameters by extrusion management program (EM).
6. Automatic adjustment of emissivity by extrusion management program (EM).

Emissivity is set automatically with a radiation thermometer of the type that sets the emissivity. Parameters are maximum emissivity, minimum emissivity, measured product temperature (value measured with contact thermometer)

Thermometer

Press No : 3

等温押出 2018/09/26 17:09

スケジュール

1	照会ダイス 本番) - (枝番)	照会	ダイス区分	HOLLOW	ピレット区分	6063
2	制御中ダイス 本番) - (枝番)				自動設定ピレット温度	0
3						
4	設定押出速 度mm/s	設定ピレット温度	出口温度 Low	出口温度 High	自動設定ピレット温度	OFF
5	2.0	480	500	550	ON	
6						
7			立上時間 second	立上係数		
8			10	1.5		
9	誤差押出速 度%	誤差ピレット温度%	現在放射率	設定放射率	ISOthermal Trial No.	
10	10	10				

立上時間: Startから等速になるまでの時間[秒]

立上係数: Start時のラム速度設定の割合[0~2.0]

Thermometer Received Data

RS232C: OFF

機械にセット

データベース登録

Auto Calc Emissivity

Profile Temperature Ex. 540 °C

Min emissivity Ex. 0.1

Max emissivity Ex. 0.5

Temperature tolerance 20°C

timer 1000 msecond

Start Calc Stop Calc

Set product temperature: Enter the outlet temperature low and outlet temperature high.
 Set extrusion speed: The extrusion speed is monitored even during isothermal extrusion.
 Set billet temperature: A manual / automatic switch is required on the billet heater side.
 Green input box: [Current emissivity] and [Automatic billet temperature] are displayed by the program. It cannot be entered.

Temperature and Emissivity History


```
350 -- 0.3
450 -- 0.2
500 -- 0.15
535 -- 0.125
Calculation complete
```

RS232C
Reset

End

ISOTHERMAL EXTRUSION (RCDWIN)-EXTRUSION PARAMETERS ENTERED IN RCDWIN

Isothermal extrusion parameter screen: Click [Isothermal extrusion] on the RcdWin menu bar.

 Isothermal

Extrusion setting temperature Ex>540[°C]

Allowable temperature + side 例>+3[°C]

Allowable temperature- side Ex>-3[°C]

Waiting time Ex>3.5[Sec]

Control time Ex. >1.0[Sec]

Torque slope Ex> -0.0005[V]

Torque slope Start Ex> 20[Sec]

Setting Ram Speed

Ram Speed allowable error

Time from start before Isothermal control begin

Torque up is disabled at the start for a certain ti

Error Delta Temperature to start Isothermal

Error Delta Temperature continue time

In Case SpeedUpCo is OFF

Use SpeedUpCo
 OFF
 ON

FeedForward torque Ex> 0[V]
 0 means to use Relational equation

Percentage of premiums in Relational Eq. Ex. >1.1[-]

Auto SpeedUpCo
 OFF
 ON

Max SpeedUpCo Ex> 2.0[-]

If the profile does not reach the set temperature within SpeedUpTime, SpeedupCo is adjusted.

Setting Billet Temperature Ex> 480[°C]

Billet Temperature allowable error Ex>40[°C]

Auto Setting Billet Temperature
 OFF
 ON

Allowable temperature error Ex. >1.0[V]

1. Isothermal extrusion parameters

1. [Wait time]: Enter the wait time for feedback control.

2. [Control time]: Enter the control time for feedback control.

3. [Torque slope]: Decreases the torque by a certain amount of "V".

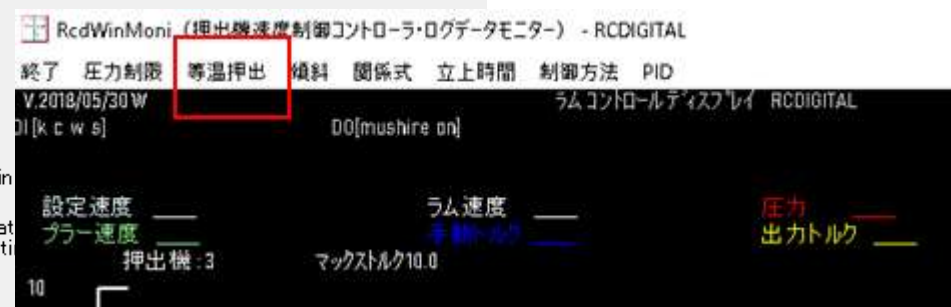
4. [Torque slop start time]: Start time of [Torque slope].

5. [Use rise coefficient]: Select whether to use the rise coefficient in isothermal start-up. When ON: The isothermal start-up is controlled by the start-up factor and start-up time. When OFF: Isothermal start-up is controlled with a constant torque [feed forward torque].

[Feed forward torque]: When [Rise coefficient use] is OFF, isothermal start-up is controlled with a constant torque. However, if the value is 0, it is controlled by the value of the relational equation.

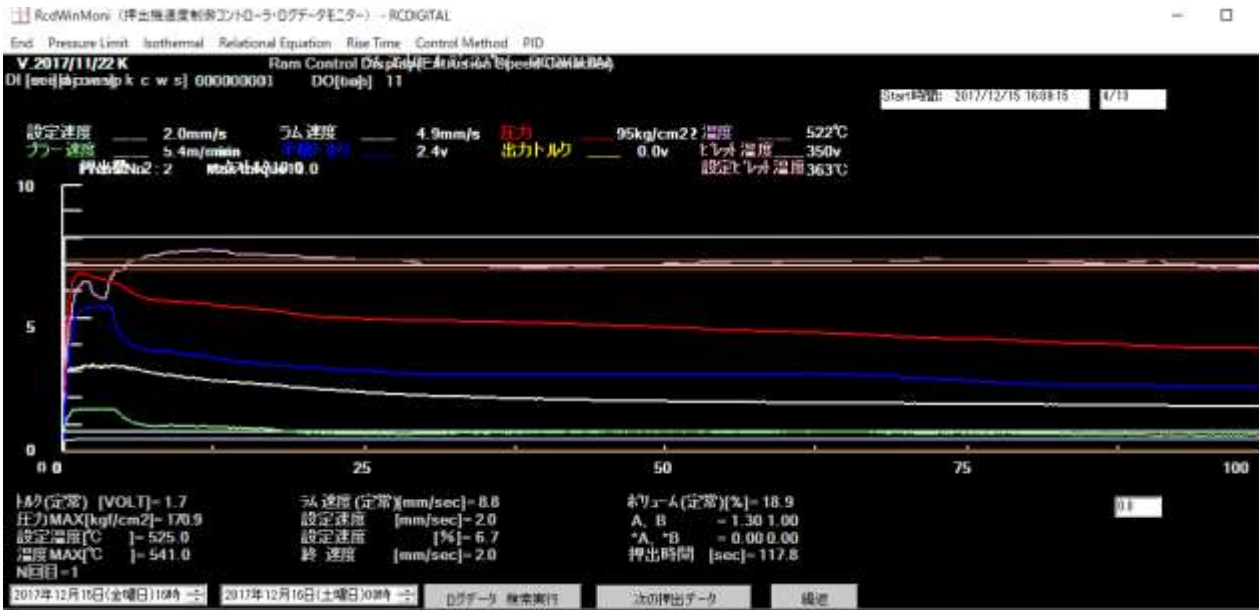
Other parameters are omitted.

■ Parameters configurable in EM

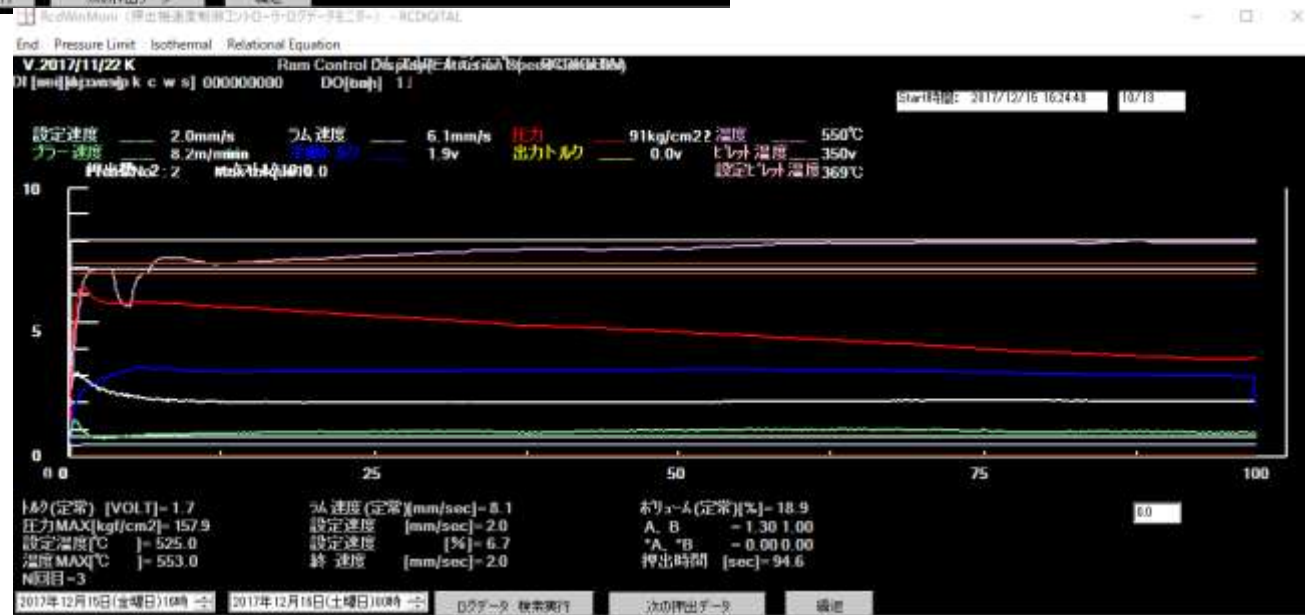


Note> Green input box: Value entered in the extrusion management program (EM).

ISOTHERMAL EXTRUSION (RCDWIN) -EXTRUSION EXAMPLES



1. When isothermal extrusion is OFF
 1. The product temperature has risen from about 13 seconds.



1. When isothermal extrusion is ON
 1. Set temperature 525 °C ± 5 °C.
 2. In order to raise the product temperature, the ram speed is overshooted by the rise factor for the first 10 seconds.
 3. The ram speed is ramped down to prevent temperature rise.

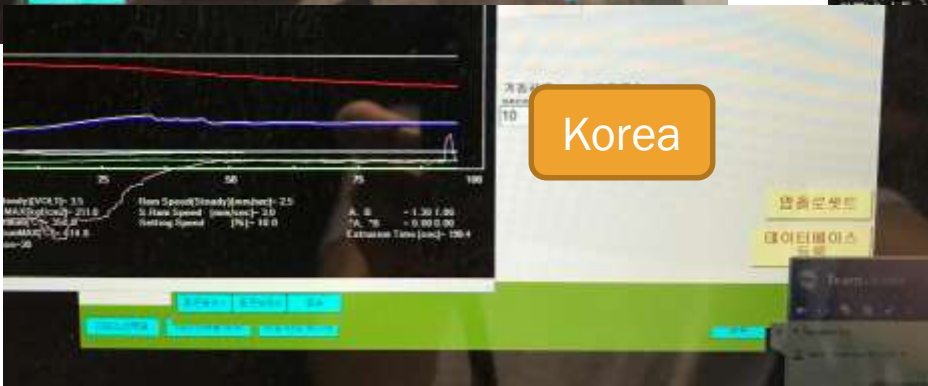
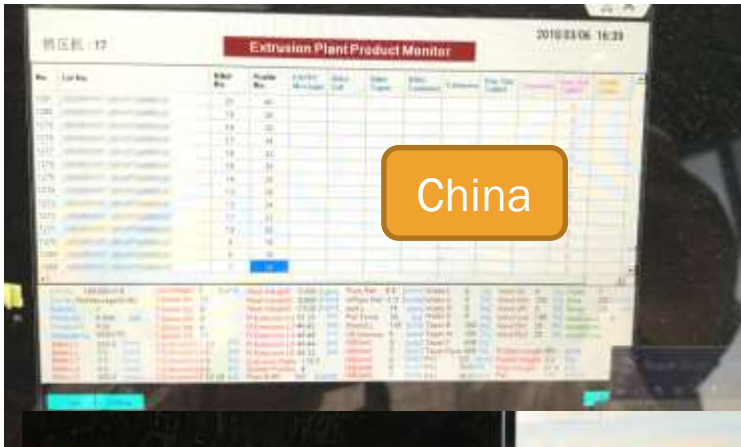
EXTRUSION PLANT AUTOMATION (EP)

1. Real-time monitoring from long billets to cutting billets, cutting billets to extruded shapes, and extruded shapes to products.
2. Acquire data from the extrusion parameter database and set it in each machine.
3. Link data with extrusion data analysis program (EDA).
4. Different die shapes can be monitored in the extrusion process, stretch process and profile cutting process.

Extrusion Plant Monitor Controller													
No.	Lot No.	Billet No.	Profile No.	Die Message	Billet Cut	Billet Taper	Billet Container	Extrusion	Run Out Table1	Stretchy	Flan Out Table2	Profile Cutter	Cutting Table
661	160415-024	1	15			1							
660	160415-024	1	14				1						
659	160415-024	1	13	28							2		
658	160415-024	1	12	24							2		
657	160415-024	1	11	22							2		
656	160415-024	1	10	20							2		
655	160415-024	1	9	18							2		
654	160415-024	1	8	16							2		
653	160415-024	1	7	14							2		
652	160415-024	1	6	12							2		
651	160415-024	1	5	10							2		
650	160415-024	1	4	8							2		
649	160415-024	1	3	6							2		
648	160415-024	1	2	4							2		

REMOTE MAINTENANCE

1. There are three maintenance methods: remote support, remote conference, and continuous monitoring. Remote monitoring software TeamViewer Host.exe can be installed for continuous monitoring.
2. Log in to a constant speed extrusion PC when you request an extrusion survey and investigate the extrusion data. Data is logged on the constant-speed extrusion PC so that past extrusion conditions can be reproduced.
3. When investigating, it is necessary to connect the local network to the Internet network. This is done by plugging the internet LAN cable into the hub for the local network.
4. Remote maintenance is performed not only in Japan but also in factories in Korea and China.
5. TeamViewer can automatically detect firewalls and proxy settings for remote monitoring. Communication is encrypted.



Use TeamViewer to log in and maintain PCs in various countries.