

FB921 - <offline>

"CutsTableOptim" Dividing shear optimization: cuts table management and cuts length calc.

Name: Family:
Author: Version: 5.0
Block version: 2
Time stamp Code: 11/29/2012 04:11:38 PM
Interface: 11/29/2012 04:11:38 PM
Lengths (block/logic/data): 07148 06216 00010

Name	Data Type	Address	Initial Value	Comment
IN		0.0		
IN_TotRemLength	DInt	0.0	L#0	Total length (before + after the divide shear) remaining from the billet [mm]
IN_NewHead	DInt	4.0	L#0	New Bar Head position after the shear [mm]
IN_FirstCutDone	Bool	8.0	FALSE	First Cut (head cut or first divide cut) has been executed
IN_SampleReq	Bool	8.1	FALSE	Sample request
IN_Restart	Bool	8.2	FALSE	Restart for new billet (initialize counters and pointers)
IN_TailDetected	Bool	8.3	FALSE	Valid Tail detected by HMDs along the mill
IN_TailBefOptShr	Bool	8.4	FALSE	Rev.03: Valid Tail detected before optimization shear
IN_DivCutExecuted	Bool	8.5	FALSE	Dividing cut executed, ONS pulse
IN_OptChopRequested	Bool	8.6	FALSE	Rev.05: does not execute calculations; instead, it shifts the previously calcul
IN_OWS	Struct	10.0		
TailSpreadEnable	Bool	10.0	FALSE	From OWS: Split tail on last full size bars, enable
ChopEnable	Bool	10.1	FALSE	From OWS: Interm. Shear or Dividing Shear Optim. Chopping Enable
SalesLength	DInt	12.0	L#0	From OWS: Sales (Cold Cut) Length (mm)
SalesNr	DInt	16.0	L#0	From OWS: Sales Bars (Cold Cuts) in a bar
DivLengthCorr	DInt	20.0	L#0	From OWS: Extra length to compensate cold cuts discarded length (mm)
FirstDivCutCorr	DInt	24.0	L#0	From OWS: First Dividing Cut Offset (mm)
MaxChoppingLength	DInt	28.0	L#0	From OWS: Max. length to be chopped [mm]
MinTailToRecover	DInt	32.0	L#0	From OWS: Minimum tail length to send the tail to cooling bed as a normal Sales
NominalDivCutLength	DInt	36.0	L#0	Dividing Cut, Nominal Length (mm)
LastBarMinLength	DInt	40.0	L#0	Last Bar Minimum Length (mm)
SampleLength	DInt	44.0	L#0	From OWS/HMI: sample length (mm)
IN_PAR	Struct	48.0		

Name	Data Type	Address	Initial Value	Comment
LastBarChopEnable	Bool	48.0	FALSE	Enable chopping the entire last bar id shorter than the minimum allowed length
DivCutMeanError	DInt	50.0	L#0	Dividing Cut Mean Error (mm)
MaxTailSpreadLength	DInt	54.0	L#0	Maximum length that can be added to the bar for tail spreading [mm]
TrackingErrTol	DInt	58.0	L#0	Tail tracking error tolerance (mm) Rev.03
IN_CutsTable	Array [0..49] Of DInt	62.0		
OUT		0.0		
OUT	Struct	262.0		
NextCutSetLength	DInt	262.0	L#0	Set length for next cut [mm]
LengthToSpread	DInt	266.0	L#0	Length to be spread among full-size bars
LengthToChop	DInt	270.0	L#0	Length to be chopped off at billet end [mm]
UsefulRemLength	DInt	274.0	L#0	
NextBarWithSample	Bool	278.0	FALSE	The next bar to be cut (first bar in the table) contains the sample
LastBar	Bool	278.1	FALSE	The bar shown in "NextCutSetLength" is the last one for cooling bed
OptImpossible	Bool	278.2	FALSE	The bars optimization is impossible (cannot be completed)
CutsTable	Array [0..49] Of DInt	280.0		Table with the length for the next cuts
IN_OUT		0.0		
STAT		0.0		
UsefulRemLength	DInt	480.0	L#0	Total Remaining Length minus Tail Length for Div. Shear
RemLengthSupport	DInt	484.0	L#0	
FullSizeBars	DInt	488.0	L#0	Full Length Bars Number (long integer)
LastBarLength	DInt	492.0	L#0	Last Bar Length, if it were not optimized in any way
LastBarLengthUseful	DInt	496.0	L#0	Last Bar Length minus CCL Discard Length
LastBarSalesBars	DInt	500.0	L#0	Sales Lengths in Last Bar (long integer)
TailLength	DInt	504.0	L#0	Last tail Length
TailLengthSupp	DInt	508.0	L#0	
LastBarLengthNet	DInt	512.0	L#0	Last Bar Length, minus Last Tail Length if this has to be Chopped
TailLength4CB	DInt	516.0	L#0	Length of the tail, if good for cooling bed
TailLengthToBeSpread	DInt	520.0	L#0	Tail length to be spread over the last nominal size bars
TailLengthToBeChopped	DInt	524.0	L#0	Tail length to be chopped
BarsForTailSpread	DInt	528.0	L#0	Number of bars where to spread the tail

Name	Data Type	Address	Initial Value	Comment
BarsForSpread	DInt	532.0	L#0	Number of bars where to spread the tail or the last bar
FullBarsAvail4Spread	DInt	536.0	L#0	Full Bars available for tail / last bar spreading
ChopSpreadLength	DInt	540.0	L#0	Length to be spread or chopped
LBLengthToBeSpread	DInt	544.0	L#0	Length of the portion of the last bar to be spread over the last nominal size b
BarsForLastBarSpread	DInt	548.0	L#0	Full size bars needed to spread the entire last bar (if Optimization is impossi
LengthToBeSpread	DInt	552.0	L#0	Length (from Tail or Last Bar) to be spread over the last nominal size bars
SpreadPieceLength	DInt	556.0	L#0	Length of each piece added to nominal bar for tail / last bar spread
LengthToBeChopped	DInt	560.0	L#0	Length (from Tail or Last Bar) to be chopped
InTabPtr	DInt	564.0	L#0	Pointer to the input table
TabPtr	DInt	568.0	L#0	Pointer to the lengths table
SpreadLengthAccum	DInt	572.0	L#0	Length to be spread, accumulator of the values added to the full-size bars
BarsSpreadCounter	DInt	576.0	L#0	
TableFullSizeBars	DInt	580.0	L#0	
TailToBeRecovered	Bool	584.0	FALSE	The tail is long enough to go to Cooling Bed like a normal Sales Length (or no
TailToBeSpread	Bool	584.1	FALSE	The tail is not OK for Cooling Bed but can be spread among nominal bars
TailToBeChopped	Bool	584.2	FALSE	The tail must be chopped
LastBarTooShort	Bool	584.3	FALSE	The last bar is too short and should be entirely spread or chopped
SampleActive	Bool	584.4	FALSE	Calculations with sample are in act
SampleImpossible	Bool	584.5	FALSE	It is impossible to get a full-size bar with sample - repeat calculations
LastBarChopEnable	Bool	584.6	FALSE	Enable chopping the last bar if shorter than min. allowed length and tail chopp
SampleLengthApplied	Bool	584.7	FALSE	Sample length added to the first full-size bar found in the table
P	DInt	586.0	L#0	
TEMP		0.0		

Block: FB921

Network: 1	SCL network
compiled by SCL compiler version: SCLCOMP K05.03.05.00_01.03.00.01 release	

```
SET
SAVE
=      L      0.1
A      #IN_OptChopRequested      #IN_OptChopRequested -- Rev.05: does not execute calculations; instead, i
t shifts the previously calcul

JCN    A7d0
L      L#0
T      #TabPtr                  #TabPtr          -- Pointer to the lengths table
A7d1: L      #TabPtr            #TabPtr          -- Pointer to the lengths table
L      L#48
<=D
JCN    A001
L      #TabPtr                  #TabPtr          -- Pointer to the lengths table
L      L#0
>=D
A      L      0.1
=      L      0.1
TAK
L      L#49
<=D
A      L      0.1
=      L      0.1
TAK
L      L#0
+D
JO     I007
JU     I008
I007: CLR
=      L      0.1
I008: L      L#32
*D
JO     I009
JU     I00a
I009: CLR
=      L      0.1
I00a: TAR2
+D
JO     I00b
JU     I00c
I00b: CLR
=      L      0.1
I00c: L      #TabPtr            #TabPtr          -- Pointer to the lengths table
TAK
T      LD      2
TAK
L      L#1
+D
JO     I00d
JU     I00e
I00d: CLR
=      L      0.1
I00e: T      LD      6
L      L#0
>=D
A      L      0.1
=      L      0.1
TAK
L      L#49
<=D
A      L      0.1
=      L      0.1
TAK
L      L#0
+D
JO     I00f
JU     I010
I00f: CLR
=      L      0.1
I010: L      L#32
*D
```

```

      JO      I011
      JU      I012
I011: CLR
      =      L      0.1
I012: TAR2
      +D
      JO      I013
      JU      I014
I013: CLR
      =      L      0.1
I014: LAR1
      L      DID [AR1, P#280.0]
      LAR1   LD      2
      T      DID [AR1, P#280.0]
      L      #TabPtr          #TabPtr          -- Pointer to the lengths table
      L      L#1
      +D
      JO      I015
      JU      I016
I015: CLR
      =      L      0.1
I016: T      #TabPtr          #TabPtr          -- Pointer to the lengths table
      JU      A7d1
      JU      A001
A7d0: CLR
      A      #IN_Restart      #IN_Restart      -- Restart for new billet (initialize counters and poi
      nters)
      JCN     A7d3
      L      L#0
      T      #InTabPtr        #InTabPtr        -- Pointer to the input table
      T      #TabPtr          #TabPtr          -- Pointer to the lengths table
      T      #OUT.LengthToSpread #OUT.LengthToSpread -- Length to be spread among full-size bars
      T      #OUT.LengthToChop   #OUT.LengthToChop -- Length to be chopped off at billet end [mm]
      T      #OUT.UsefulRemLength #OUT.UsefulRemLength
      CLR
      =      #OUT.NextBarWithSample #OUT.NextBarWithSample -- The next bar to be cut (first bar in the table)
      contains the sample
A7d4: T      #P
      L      #P
      L      L#49
      <=D
      JCN     A7d5
      L      #P
      L      L#0
      >=D
      A      L      0.1
      =      L      0.1
      TAK
      L      L#49
      <=D
      A      L      0.1
      =      L      0.1
      TAK
      L      L#0
      +D
      JO      I017
      JU      I018
I017: CLR
      =      L      0.1
I018: L      L#32
      *D
      JO      I019
      JU      I01a
I019: CLR
      =      L      0.1
I01a: TAR2
      +D
      JO      I01b
      JU      I01c
I01b: CLR
      =      L      0.1
I01c: L      #P              #P
      TAK
      T      LD      2
      TAK
      L      L#0

```

```

>=D
A      L      0.1
=      L      0.1
TAK
L      L#49
<=D
A      L      0.1
=      L      0.1
TAK
L      L#0
+D
JO     I01d
JU     I01e
I01d: CLR
=      L      0.1
I01e: L      L#32
*D
JO     I01f
JU     I020
I01f: CLR
=      L      0.1
I020: TAR2
+D
JO     I021
JU     I022
I021: CLR
=      L      0.1
I022: LAR1
L      DID [AR1, P#62.0]
LAR1   LD      2
T      DID [AR1, P#280.0]
L      #P
L      L#1
+D
JO     I023
JU     I024
I023: CLR
=      L      0.1
I024: T      #P
JU     A7d4
A7d5: L      #CutsTable[0]
L      #IN_OWS.NominalDivCutLength
>=D
A      #IN_SampleReq
JCN    A7d6
L      #CutsTable[0]
L      #IN_OWS.SampleLength
+D
JO     I025
JU     I026
I025: CLR
=      L      0.1
I026: T      #CutsTable[0]
SET    =      #OUT.NextBarWithSample
NOT    =      #OUT.NextBarWithSample
A7d6: JU     A001
A7d3: CLR
A      #IN_Restart
NOT
=      L      0.2
A      #IN_TailDetected
NOT
A      L      0.2
JCN    A7d7
A      #IN_DivCutExecuted
JCN    A7d8
L      #InTabPtr
L      L#1
+D
JO     I027
JU     I028
I027: CLR
=      L      0.1
I028: T      #InTabPtr

```

#P
 #CutsTable[0] -- Table with the length for the next cuts
 #IN_OWS.NominalDivCutLength -- Dividing Cut, Nominal Length (mm)
 #IN_SampleReq -- Sample request
 #CutsTable[0] -- Table with the length for the next cuts
 #IN_OWS.SampleLength -- From OWS/HMI: sample length (mm)
 #OUT.NextBarWithSample -- The next bar to be cut (first bar in the table) contains the sample
 #IN_Restart -- Restart for new billet (initialize counters and pointers)
 #IN_TailDetected -- Valid Tail detected by HMDs along the mill
 #IN_DivCutExecuted -- Dividing cut executed, ONS pulse
 #InTabPtr -- Pointer to the input table
 #InTabPtr -- Pointer to the input table

```

A7d8: L      L#0
      T      #TabPtr          #TabPtr          -- Pointer to the lengths table
      T      #OUT.LengthToSpread #OUT.LengthToSpread -- Length to be spread among full-size bars
      T      #OUT.LengthToChop   #OUT.LengthToChop   -- Length to be chopped off at billet end [mm]
      T      #OUT.UsefulRemLength #OUT.UsefulRemLength
      CLR
      =      #OUT.NextBarWithSample #OUT.NextBarWithSample -- The next bar to be cut (first bar in the table)
                        contains the sample
      L      #InTabPtr          #InTabPtr          -- Pointer to the input table
      L      L#49
      >D
      JCN    A7d9
      T      #InTabPtr          #InTabPtr          -- Pointer to the input table
A7d9: L      L#0
      T      #P                  #P
A7da: L      #P                  #P
      L      L#49
      <=D
      JCN    A7db
      L      #P                  #P
      L      L#0
      >=D
      A      L      0.1
      =      L      0.1
      TAK
      L      L#49
      <=D
      A      L      0.1
      =      L      0.1
      TAK
      L      L#0
      +D
      JO      I029
      JU      I02a
I029: CLR
      =      L      0.1
I02a: L      L#32
      *D
      JO      I02b
      JU      I02c
I02b: CLR
      =      L      0.1
I02c: TAR2
      +D
      JO      I02d
      JU      I02e
I02d: CLR
      =      L      0.1
I02e: L      L#0
      TAK
      LAR1
      TAK
      T      DID [AR1, P#280.0]
      L      #P                  #P
      L      L#1
      +D
      JO      I02f
      JU      I030
I02f: CLR
      =      L      0.1
I030: T      #P                  #P
      JU      A7da
A7db: L      #InTabPtr          #InTabPtr          -- Pointer to the input table
      T      #P                  #P
A7dc: L      #P                  #P
      L      L#49
      <=D
      JCN    A7dd
      L      #TabPtr          #TabPtr          -- Pointer to the lengths table
      L      L#0
      >=D
      A      L      0.1
      =      L      0.1
      TAK
      L      L#49
      <=D

```

```

      A      L      0.1
      =      L      0.1
      TAK
      L      L#0
      +D
      JO      I031
      JU      I032
I031: CLR
      =      L      0.1
I032: L      L#32
      *D
      JO      I033
      JU      I034
I033: CLR
      =      L      0.1
I034: TAR2
      +D
      JO      I035
      JU      I036
I035: CLR
      =      L      0.1
I036: L      #P      #P
      TAK
      T      LD      2
      TAK
      L      L#0
      >=D
      A      L      0.1
      =      L      0.1
      TAK
      L      L#49
      <=D
      A      L      0.1
      =      L      0.1
      TAK
      L      L#0
      +D
      JO      I037
      JU      I038
I037: CLR
      =      L      0.1
I038: L      L#32
      *D
      JO      I039
      JU      I03a
I039: CLR
      =      L      0.1
I03a: TAR2
      +D
      JO      I03b
      JU      I03c
I03b: CLR
      =      L      0.1
I03c: LAR1
      L      DID [AR1, P#62.0]
      LAR1 LD      2
      T      DID [AR1, P#280.0]
      L      #TabPtr      #TabPtr      -- Pointer to the lengths table
      L      L#1
      +D
      JO      I03d
      JU      I03e
I03d: CLR
      =      L      0.1
I03e: T      #TabPtr      #TabPtr      -- Pointer to the lengths table
      L      #P      #P
      L      L#1
      +D
      JO      I03f
      JU      I040
I03f: CLR
      =      L      0.1
I040: T      #P      #P
      JU      A7dc
A7dd: L      #CutsTable[0]      #CutsTable[0]      -- Table with the length for the next cuts
      L      #IN_OWS.NominalDivCutLength      #IN_OWS.NominalDivCutLength -- Dividing Cut, Nominal Length (mm)

```

```
>=D
A      #IN_SampleReq      #IN_SampleReq      -- Sample request
JCN    A7de
L      #CutsTable[0]      #CutsTable[0]      -- Table with the length for the next cuts
L      #IN_OWS.SampleLength #IN_OWS.SampleLength -- From OWS/HMI: sample length (mm)
+D
JO      I041
JU      I042
I041: CLR
=      L      0.1
I042: T      #CutsTable[0]      #CutsTable[0]      -- Table with the length for the next cuts
SET
=      #OUT.NextBarWithSample #OUT.NextBarWithSample -- The next bar to be cut (first bar in the table)
      contains the sample
A7de: JU      A001
A7d7: CLR
=      #SampleActive      #SampleActive      -- Calculations with sample are in act
=      #SampleImpossible  #SampleImpossible  -- It is impossible to get a full-size bar with sample
      - repeat calculations
A      #IN_PAR.LastBarChopEnable #IN_PAR.LastBarChopEnable -- Enable chopping the entire last bar id shorter
      than the minimum allowed length
A      #IN_OWS.ChopEnable      #IN_OWS.ChopEnable -- From OWS: Interm. Shear or Dividing Shear Optim. Chopp
      ing Enable
=      #LastBarChopEnable    #LastBarChopEnable -- Enable chopping the last bar if shorter than min. a
      llowed length and tail chopp
A000: L      #IN_TotRemLength  #IN_TotRemLength -- Total length (before + after the divide shear) rema
      ining from the billet [mm]
T      #UsefulRemLength      #UsefulRemLength -- Total Remaining Length minus Tail Length for Div. S
      hear
CLR
A      #IN_FirstCutDone      #IN_FirstCutDone -- First Cut (head cut or first divide cut) has been e
      xecuted
NOT
JCN    A7df
L      #UsefulRemLength      #UsefulRemLength -- Total Remaining Length minus Tail Length for Div. S
      hear
L      #IN_OWS.FirstDivCutCorr #IN_OWS.FirstDivCutCorr -- From OWS: First Dividing Cut Offset (mm)
-D
JO      I043
JU      I044
I043: CLR
=      L      0.1
I044: T      #UsefulRemLength      #UsefulRemLength -- Total Remaining Length minus Tail Length for Div. S
      hear
A7df: CLR
A      #SampleImpossible  #SampleImpossible -- It is impossible to get a full-size bar with sample
      - repeat calculations
NOT
A      #IN_SampleReq      #IN_SampleReq      -- Sample request
L      #IN_OWS.NominalDivCutLength #IN_OWS.NominalDivCutLength -- Dividing Cut, Nominal Length (mm)
L      #IN_OWS.SampleLength  #IN_OWS.SampleLength -- From OWS/HMI: sample length (mm)
+D
=      L      0.2
JO      I045
JU      I046
I045: CLR
=      L      0.1
I046: L      #UsefulRemLength      #UsefulRemLength -- Total Remaining Length minus Tail Length for Div. S
      hear
TAK
>=D
A      L      0.2
JCN    A7e0
L      #UsefulRemLength      #UsefulRemLength -- Total Remaining Length minus Tail Length for Div. S
      hear
L      #IN_OWS.SampleLength  #IN_OWS.SampleLength -- From OWS/HMI: sample length (mm)
-D
JO      I047
JU      I048
I047: CLR
=      L      0.1
I048: T      #UsefulRemLength      #UsefulRemLength -- Total Remaining Length minus Tail Length for Div. S
      hear
SET
=      #SampleActive      #SampleActive      -- Calculations with sample are in act
JU      A7e1
```

```

A7e0: SET
=      #SampleImpossible      #SampleImpossible -- It is impossible to get a full-size bar with sample
-- repeat calculations

A7e1: CLR
A      #IN_DivCutExecuted      #IN_DivCutExecuted -- Dividing cut executed, ONS pulse
JCN    A7e2
L      #InTabPtr                #InTabPtr -- Pointer to the input table
L      L#1
+D
JO      I049
JU      I04a

I049: CLR
=      L      0.1
I04a: T      #InTabPtr          #InTabPtr -- Pointer to the input table
A7e2: L      L#0
T      #TabPtr                #TabPtr -- Pointer to the lengths table
T      #OUT.LengthToSpread      #OUT.LengthToSpread -- Length to be spread among full-size bars
T      #OUT.LengthToChop        #OUT.LengthToChop -- Length to be chopped off at billet end [mm]
L      #UsefulRemLength        #UsefulRemLength -- Total Remaining Length minus Tail Length for Div. S
-- hear
T      #OUT.UsefulRemLength      #OUT.UsefulRemLength
CLR
=      #OUT.NextBarWithSample    #OUT.NextBarWithSample -- The next bar to be cut (first bar in the table)
-- contains the sample
L      #UsefulRemLength        #UsefulRemLength -- Total Remaining Length minus Tail Length for Div. S
-- hear
T      #RemLengthSupport        #RemLengthSupport
L      #InTabPtr                #InTabPtr -- Pointer to the input table
L      L#49
>D
JCN    A7e3
T      #InTabPtr                #InTabPtr -- Pointer to the input table
A7e3: L      L#0
T      #P                      #P
A7e4: L      #P                  #P
L      L#49
<=D
JCN    A7e5
L      #P                      #P
L      L#0
>=D
A      L      0.1
=      L      0.1
TAK
L      L#49
<=D
A      L      0.1
=      L      0.1
TAK
L      L#0
+D
JO      I04b
JU      I04c

I04b: CLR
=      L      0.1
I04c: L      L#32
*D
JO      I04d
JU      I04e

I04d: CLR
=      L      0.1
I04e: TAR2
+D
JO      I04f
JU      I050

I04f: CLR
=      L      0.1
I050: L      L#0
TAK
LAR1
TAK
T      DID [AR1, P#280.0]
L      #P                      #P
L      L#1
+D
JO      I051

```

```
I051: JU      I052
      CLR
      =      L      0.1
I052: T      #P
      JU      A7e4
A7e5: L      #InTabPtr      #InTabPtr      -- Pointer to the input table
      T      #P
A7e6: L      #P
      L      L#49
      <=D
      JCN     A7e7
      L      #P
      L      L#0
      >=D
      A      L      0.1
      =      L      0.1
      TAK
      L      L#49
      <=D
      A      L      0.1
      =      L      0.1
      TAK
      L      L#0
      +D
      JO      I053
      JU      I054
I053: CLR
      =      L      0.1
I054: L      L#32
      *D
      JO      I055
      JU      I056
I055: CLR
      =      L      0.1
I056: TAR2
      +D
      JO      I057
      JU      I058
I057: CLR
      =      L      0.1
I058: LAR1
      L      DID [AR1, P#62.0]
      L      #RemLengthSupport      #RemLengthSupport
      <=D
      L      #P
      L      L#0
      =      L      0.2
      >=D
      A      L      0.1
      =      L      0.1
      TAK
      L      L#49
      <=D
      A      L      0.1
      =      L      0.1
      TAK
      L      L#0
      +D
      JO      I059
      JU      I05a
I059: CLR
      =      L      0.1
I05a: L      L#32
      *D
      JO      I05b
      JU      I05c
I05b: CLR
      =      L      0.1
I05c: TAR2
      +D
      JO      I05d
      JU      I05e
I05d: CLR
      =      L      0.1
I05e: LAR1
      L      DID [AR1, P#62.0]
```

```
L      L#0
>D
A      L      0.2
JCN    A7e8
L      #TabPtr      #TabPtr      -- Pointer to the lengths table
L      L#0
>=D
A      L      0.1
=      L      0.1
TAK
L      L#49
<=D
A      L      0.1
=      L      0.1
TAK
L      L#0
+D
JO      I05f
JU      I060
I05f: CLR
=      L      0.1
I060: L      L#32
*D
JO      I061
JU      I062
I061: CLR
=      L      0.1
I062: TAR2
+D
JO      I063
JU      I064
I063: CLR
=      L      0.1
I064: L      #P      #P
TAK
T      LD      2
TAK
L      L#0
>=D
A      L      0.1
=      L      0.1
TAK
L      L#49
<=D
A      L      0.1
=      L      0.1
TAK
L      L#0
+D
JO      I065
JU      I066
I065: CLR
=      L      0.1
I066: L      L#32
*D
JO      I067
JU      I068
I067: CLR
=      L      0.1
I068: TAR2
+D
JO      I069
JU      I06a
I069: CLR
=      L      0.1
I06a: LAR1
L      DID [AR1, P#62.0]
LAR1   LD      2
T      DID [AR1, P#280.0]
L      #P      #P
L      L#0
>=D
A      L      0.1
=      L      0.1
TAK
L      L#49
```

```

<=D
A      L      0.1
=      L      0.1
TAK
L      L#0
+D
JO     I06b
JU     I06c
I06b: CLR
=      L      0.1
I06c: L      L#32
      *D
      JO     I06d
      JU     I06e
I06d: CLR
=      L      0.1
I06e: TAR2
      +D
      JO     I06f
      JU     I070
I06f: CLR
=      L      0.1
I070: L      #RemLengthSupport      #RemLengthSupport
      TAK
      LAR1
      TAK
      L      DID [AR1, P#62.0]
      -D
      JO     I071
      JU     I072
I071: CLR
=      L      0.1
I072: T      #RemLengthSupport      #RemLengthSupport
      L      #TabPtr      #TabPtr      -- Pointer to the lengths table
      L      L#1
      +D
      JO     I073
      JU     I074
I073: CLR
=      L      0.1
I074: T      #TabPtr      #TabPtr      -- Pointer to the lengths table
A7e8: L      #P      #P
      L      L#1
      +D
      JO     I075
      JU     I076
I075: CLR
=      L      0.1
I076: T      #P      #P
      JU     A7e6
A7e7: L      #RemLengthSupport      #RemLengthSupport
      T      #LastBarLength      #LastBarLength      -- Last Bar Length, if it were not optimized in any wa
      y
      L      L#0
      T      #FullSizeBars      #FullSizeBars      -- Full Length Bars Number (long integer)
      T      #P      #P
A7e9: L      #P      #P
      L      L#49
      <=D
      JCN     A7ea
      L      #P      #P
      L      L#0
      >=D
      A      L      0.1
      =      L      0.1
      TAK
      L      L#49
      <=D
      A      L      0.1
      =      L      0.1
      TAK
      L      L#0
      +D
      JO     I077
      JU     I078
I077: CLR

```

```

=      L      0.1
I078: L      L#32
      *D
      JO      I079
      JU      I07a
I079: CLR
=      L      0.1
I07a: TAR2
      +D
      JO      I07b
      JU      I07c
I07b: CLR
=      L      0.1
I07c: LAR1
      L      DID [AR1, P#280.0]
      L      #IN_OWS.NominalDivCutLength  #IN_OWS.NominalDivCutLength -- Dividing Cut, Nominal Length (mm)
      ==D
      JCN     A7eb
      L      #FullSizeBars                #FullSizeBars      -- Full Length Bars Number (long integer)
      L      L#1
      +D
      JO      I07d
      JU      I07e
I07d: CLR
=      L      0.1
I07e: T      #FullSizeBars                #FullSizeBars      -- Full Length Bars Number (long integer)
A7eb: L      #P                          #P
      L      L#1
      +D
      JO      I07f
      JU      I080
I07f: CLR
=      L      0.1
I080: T      #P                          #P
      JU      A7e9
A7ea: L      #LastBarLength              #LastBarLength     -- Last Bar Length, if it were not optimized in any way
      L      #IN_OWS.DivLengthCorr      #IN_OWS.DivLengthCorr -- From OWS: Extra length to compensate cold cuts discarded length (mm)
      -D
      JO      I081
      JU      I082
I081: CLR
=      L      0.1
I082: T      #LastBarLengthUseful         #LastBarLengthUseful -- Last Bar Length minus CCL Discard Length
      L      #LastBarLengthUseful         #LastBarLengthUseful -- Last Bar Length minus CCL Discard Length
      L      #IN_OWS.SalesLength          #IN_OWS.SalesLength -- From OWS: Sales (Cold Cut) Length (mm)
      /D
      JO      I083
      JU      I084
I083: CLR
=      L      0.1
I084: T      #LastBarSalesBars            #LastBarSalesBars  -- Sales Lengths in Last Bar (long integer)
      L      #LastBarLengthUseful         #LastBarLengthUseful -- Last Bar Length minus CCL Discard Length
      L      #IN_OWS.SalesLength          #IN_OWS.SalesLength -- From OWS: Sales (Cold Cut) Length (mm)
      MOD
      JO      I085
      JU      I086
I085: CLR
=      L      0.1
I086: T      #TailLength                  #TailLength        -- Last tail Length
      L      #LastBarSalesBars            #LastBarSalesBars  -- Sales Lengths in Last Bar (long integer)
      L      L#0
      ==D
      JCN     A7ec
      L      #LastBarLength              #LastBarLength     -- Last Bar Length, if it were not optimized in any way
      T      #TailLength                  #TailLength        -- Last tail Length
      TAK
      T      #LastBarLengthUseful         #LastBarLengthUseful -- Last Bar Length minus CCL Discard Length
A7ec: L      #TailLength                  #TailLength        -- Last tail Length
      L      #IN_OWS.MinTailToRecover    #IN_OWS.MinTailToRecover -- From OWS: Minimum tail length to send the tail to cooling bed as a normal Sales
      >=D
=      L      0.2

```

```

A      #IN_OWS.TailSpreadEnable      #IN_OWS.TailSpreadEnable -- From OWS: Split tail on last full size bars,
NOT
=      L      0.3
A      #IN_OWS.ChopEnable              #IN_OWS.ChopEnable -- From OWS: Interm. Shear or Dividing Shear Optim. Chop
NOT                                         ping Enable
A      L      0.3
O      L      0.2
=      #TailToBeRecovered              #TailToBeRecovered -- The tail is long enough to go to Cooling Bed like a
A      #TailToBeRecovered              #TailToBeRecovered -- The tail is long enough to go to Cooling Bed like a
JCN    A7ed                             normal Sales Length (or no
L      #TailLength                     #TailLength      -- Last tail Length
T      #TailLength4CB                  #TailLength4CB    -- Length of the tail, if good for cooling bed
JU     A7ee
A7ed: L      L#0
T      #TailLength4CB                  #TailLength4CB    -- Length of the tail, if good for cooling bed
A7ee: L      #TailLength                #TailLength      -- Last tail Length
L      #TailLength4CB                  #TailLength4CB    -- Length of the tail, if good for cooling bed
-D
JO     I087
JU     I088
I087: CLR
=      L      0.1
I088: T      #TailLengthSupp            #TailLengthSupp
CLR
A      #TailToBeRecovered              #TailToBeRecovered -- The tail is long enough to go to Cooling Bed like a
NOT                                         normal Sales Length (or no
A      #IN_OWS.TailSpreadEnable      #IN_OWS.TailSpreadEnable -- From OWS: Split tail on last full size bars,
=      #TailToBeSpread                #TailToBeSpread    -- The tail is not OK for Cooling Bed but can be spread
A      #TailToBeSpread                #TailToBeSpread    -- The tail is not OK for Cooling Bed but can be spread
JCN    A7ef                             among nominal bars
L      #TailLengthSupp                #TailLengthSupp
T      #TailLengthToBeSpread          #TailLengthToBeSpread -- Tail length to be spread over the last nominal s
L      #TailLengthToBeSpread          #TailLengthToBeSpread -- Tail length to be spread over the last nominal s
L      #IN_PAR.MaxTailSpreadLength    #IN_PAR.MaxTailSpreadLength -- Maximum length that can be added to the bar
>D                                         for tail spreading [mm]
JCN    A7f3
L      #TailLengthToBeSpread          #TailLengthToBeSpread -- Tail length to be spread over the last nominal s
L      #IN_PAR.MaxTailSpreadLength    #IN_PAR.MaxTailSpreadLength -- Maximum length that can be added to the bar
/D                                         for tail spreading [mm]
JO     I089
JU     I08a
I089: CLR
=      L      0.1
I08a: T      #BarsForTailSpread        #BarsForTailSpread -- Number of bars where to spread the tail
L      #BarsForTailSpread            #BarsForTailSpread -- Number of bars where to spread the tail
L      #IN_PAR.MaxTailSpreadLength    #IN_PAR.MaxTailSpreadLength -- Maximum length that can be added to the bar
*D                                         for tail spreading [mm]
JO     I08b
JU     I08c
I08b: CLR
=      L      0.1
I08c: L      #TailLengthToBeSpread    #TailLengthToBeSpread -- Tail length to be spread over the last nominal s
<D                                         size bars
JCN    A7f1
L      #BarsForTailSpread            #BarsForTailSpread -- Number of bars where to spread the tail
L      L#1
+D
JO     I08d
JU     I08e
I08d: CLR
=      L      0.1

```

I08e: T	#BarsForTailSpread	#BarsForTailSpread -- Number of bars where to spread the tail
A7f1: L	#TailLengthToBeSpread	#TailLengthToBeSpread -- Tail length to be spread over the last nominal size bars
L	#BarsForTailSpread	#BarsForTailSpread -- Number of bars where to spread the tail
/D		
JO	I08f	
JU	I090	
I08f: CLR		
=	L 0.1	
I090: T	#SpreadPieceLength	#SpreadPieceLength -- Length of each piece added to nominal bar for tail / last bar spread
L	#SpreadPieceLength	#SpreadPieceLength -- Length of each piece added to nominal bar for tail / last bar spread
L	#IN_OWS.MaxChoppingLength	#IN_OWS.MaxChoppingLength -- From OWS: Max. length to be chopped [mm]
<=D		
A	#IN_OWS.ChopEnable	#IN_OWS.ChopEnable -- From OWS: Interm. Shear or Dividing Shear Optim. Chopping Enable
JCN	A7f2	
L	#TailLengthToBeSpread	#TailLengthToBeSpread -- Tail length to be spread over the last nominal size bars
L	#IN_PAR.MaxTailSpreadLength	#IN_PAR.MaxTailSpreadLength -- Maximum length that can be added to the bar for tail spreading [mm]
MOD		
JO	I091	
JU	I092	
I091: CLR		
=	L 0.1	
I092: L	#TailLengthToBeSpread	#TailLengthToBeSpread -- Tail length to be spread over the last nominal size bars
TAK		
-D		
JO	I093	
JU	I094	
I093: CLR		
=	L 0.1	
I094: T	#TailLengthToBeSpread	#TailLengthToBeSpread -- Tail length to be spread over the last nominal size bars
L	#IN_OWS.MaxChoppingLength	#IN_OWS.MaxChoppingLength -- From OWS: Max. length to be chopped [mm]
T	#SpreadPieceLength	#SpreadPieceLength -- Length of each piece added to nominal bar for tail / last bar spread
A7f2: JU	A7f3	
A7ef: L	L#0	
T	#TailLengthToBeSpread	#TailLengthToBeSpread -- Tail length to be spread over the last nominal size bars
A7f3: L	#TailLengthSupp	#TailLengthSupp
L	#TailLengthToBeSpread	#TailLengthToBeSpread -- Tail length to be spread over the last nominal size bars
-D		
JO	I095	
JU	I096	
I095: CLR		
=	L 0.1	
I096: T	#TailLengthSupp	#TailLengthSupp
CLR		
A	#TailToBeRecovered	#TailToBeRecovered -- The tail is long enough to go to Cooling Bed like a normal Sales Length (or no
NOT		
L	L#0	
=	L 0.2	
>D		
A	L 0.2	
A	#IN_OWS.ChopEnable	#IN_OWS.ChopEnable -- From OWS: Interm. Shear or Dividing Shear Optim. Chopping Enable
A	#IN_TailBefOptShr	#IN_TailBefOptShr -- Rev.03: Valid Tail detected before optimization shear
L	#TailLength	#TailLength -- Last tail Length
L	#IN_OWS.MaxChoppingLength	#IN_OWS.MaxChoppingLength -- From OWS: Max. length to be chopped [mm]
=	L 0.2	
<=D		
A	L 0.2	
=	#TailToBeChopped	#TailToBeChopped -- The tail must be chopped
A	#TailToBeChopped	#TailToBeChopped -- The tail must be chopped
JCN	A7f4	
L	#TailLengthSupp	#TailLengthSupp
T	#TailLengthToBeChopped	#TailLengthToBeChopped -- Tail length to be chopped
JU	A7f5	

```

A7f4: L    L#0
      T    #TailLengthToBeChopped      #TailLengthToBeChopped -- Tail length to be chopped
A7f5: CLR
      A    #TailToBeRecovered          #TailToBeRecovered -- The tail is long enough to go to Cooling Bed like a
                                   normal Sales Length (or no
      NOT
      =    L      0.2
      A    #TailToBeSpread              #TailToBeSpread -- The tail is not OK for Cooling Bed but can be spread among nominal bars
      NOT
      A    L      0.2
      =    L      0.2
      A    #TailToBeChopped            #TailToBeChopped -- The tail must be chopped
      NOT
      A    L      0.2
      JCN  A7f6
      SET
      =    #TailToBeRecovered          #TailToBeRecovered -- The tail is long enough to go to Cooling Bed like a
                                   normal Sales Length (or no
      L    #TailLength                  #TailLength -- Last tail Length
      T    #TailLength4CB              #TailLength4CB -- Length of the tail, if good for cooling bed
A7f6: CLR
      A    #TailToBeSpread              #TailToBeSpread -- The tail is not OK for Cooling Bed but can be spread among nominal bars
      O    #TailToBeChopped            #TailToBeChopped -- The tail must be chopped
      JCN  A7f7
      L    #TailLength                  #TailLength -- Last tail Length
      T    #ChopSpreadLength           #ChopSpreadLength -- Length to be spread or chopped
      JU   A7f8
A7f7: L    L#0
      T    #ChopSpreadLength           #ChopSpreadLength -- Length to be spread or chopped
A7f8: CLR
      A    #TailToBeRecovered          #TailToBeRecovered -- The tail is long enough to go to Cooling Bed like a
                                   normal Sales Length (or no
      JCN  A7f9
      L    #LastBarLength              #LastBarLength -- Last Bar Length, if it were not optimized in any way
      T    #LastBarLengthNet           #LastBarLengthNet -- Last Bar Length, minus Last Tail Length if this has
                                   to be Chopped
      JU   A7fa
A7f9: L    #LastBarLength              #LastBarLength -- Last Bar Length, if it were not optimized in any way
      L    #TailLength                  #TailLength -- Last tail Length
      -D
      JO   I097
      JU   I098
I097: CLR
      =    L      0.1
I098: T    #LastBarLengthNet           #LastBarLengthNet -- Last Bar Length, minus Last Tail Length if this has
                                   to be Chopped
A7fa: L    #LastBarLengthNet           #LastBarLengthNet -- Last Bar Length, minus Last Tail Length if this has
                                   to be Chopped
      L    #IN_OWS.LastBarMinLength    #IN_OWS.LastBarMinLength -- Last Bar Minimum Length (mm)
      <D
      =    #LastBarTooShort            #LastBarTooShort -- The last bar is too short and should be entirely spread or chopped
      A    #LastBarTooShort            #LastBarTooShort -- The last bar is too short and should be entirely spread or chopped
      A    #IN_TailBefOptShr           #IN_TailBefOptShr -- Rev.03: Valid Tail detected before optimization shear
      JCN  A7fb
      CLR
      =    #TailToBeRecovered          #TailToBeRecovered -- The tail is long enough to go to Cooling Bed like a
                                   normal Sales Length (or no
      L    L#0
      T    #TailLength4CB              #TailLength4CB -- Length of the tail, if good for cooling bed
      L    #LastBarLength              #LastBarLength -- Last Bar Length, if it were not optimized in any way
      T    #ChopSpreadLength           #ChopSpreadLength -- Length to be spread or chopped
      TAK
      T    #BarsForLastBarSpread       #BarsForLastBarSpread -- Full size bars needed to spread the entire last bar (if Optimization is impossible)
      L    #ChopSpreadLength           #ChopSpreadLength -- Length to be spread or chopped
      T    #LBLEngthToBeSpread         #LBLEngthToBeSpread -- Length of the portion of the last bar to be spread over the last nominal size b

```

```

L      #LLengthToBeSpread      #LLengthToBeSpread -- Length of the portion of the last bar to be spread
                                over the last nominal size b
L      #IN_OWS.MaxChoppingLength  #IN_OWS.MaxChoppingLength -- From OWS: Max. length to be chopped [mm]
>D
TAK
L      #IN_PAR.MaxTailSpreadLength  #IN_PAR.MaxTailSpreadLength -- Maximum length that can be added to the ba
                                r for tail spreading [mm]
=      L      0.2
<=D
A      L      0.2
JCN    A7fc
L      L#1
T      #BarsForLastBarSpread      #BarsForLastBarSpread -- Full size bars needed to spread the entire last
                                bar (if Optimization is impossi
A7fc: L      #LLengthToBeSpread      #LLengthToBeSpread -- Length of the portion of the last bar to be spread
                                over the last nominal size b
L      #IN_PAR.MaxTailSpreadLength  #IN_PAR.MaxTailSpreadLength -- Maximum length that can be added to the ba
                                r for tail spreading [mm]
>D
JCN    A7fb
L      #LLengthToBeSpread      #LLengthToBeSpread -- Length of the portion of the last bar to be spread
                                over the last nominal size b
L      #IN_PAR.MaxTailSpreadLength  #IN_PAR.MaxTailSpreadLength -- Maximum length that can be added to the ba
                                r for tail spreading [mm]
/D
JO      I099
JU      I09a
I099: CLR
=      L      0.1
I09a: T      #BarsForLastBarSpread      #BarsForLastBarSpread -- Full size bars needed to spread the entire last
                                bar (if Optimization is impossi
L      #BarsForLastBarSpread      #BarsForLastBarSpread -- Full size bars needed to spread the entire last
                                bar (if Optimization is impossi
L      #IN_PAR.MaxTailSpreadLength  #IN_PAR.MaxTailSpreadLength -- Maximum length that can be added to the ba
                                r for tail spreading [mm]
*D
JO      I09b
JU      I09c
I09b: CLR
=      L      0.1
I09c: L      #LLengthToBeSpread      #LLengthToBeSpread -- Length of the portion of the last bar to be spread
                                over the last nominal size b
<D
JCN    A7fe
L      #BarsForLastBarSpread      #BarsForLastBarSpread -- Full size bars needed to spread the entire last
                                bar (if Optimization is impossi
L      L#1
+D
JO      I09d
JU      I09e
I09d: CLR
=      L      0.1
I09e: T      #BarsForLastBarSpread      #BarsForLastBarSpread -- Full size bars needed to spread the entire last
                                bar (if Optimization is impossi
A7fe: L      #LLengthToBeSpread      #LLengthToBeSpread -- Length of the portion of the last bar to be spread
                                over the last nominal size b
L      #BarsForLastBarSpread      #BarsForLastBarSpread -- Full size bars needed to spread the entire last
                                bar (if Optimization is impossi
/D
JO      I09f
JU      I0a0
I09f: CLR
=      L      0.1
I0a0: T      #SpreadPieceLength      #SpreadPieceLength -- Length of each piece added to nominal bar for tail
                                / last bar spread
L      #SpreadPieceLength      #SpreadPieceLength -- Length of each piece added to nominal bar for tail
                                / last bar spread
L      #IN_OWS.MaxChoppingLength  #IN_OWS.MaxChoppingLength -- From OWS: Max. length to be chopped [mm]
<=D
A      #IN_OWS.ChopEnable      #IN_OWS.ChopEnable -- From OWS: Interm. Shear or Dividing Shear Optim. Chop
                                ping Enable
JCN    A7fb
L      #LLengthToBeSpread      #LLengthToBeSpread -- Length of the portion of the last bar to be spread
                                over the last nominal size b
L      #IN_PAR.MaxTailSpreadLength  #IN_PAR.MaxTailSpreadLength -- Maximum length that can be added to the ba
                                r for tail spreading [mm]

```

```

/D
JO    I0a1
JU    I0a2
I0a1: CLR
=      L      0.1
I0a2: T    #BarsForLastBarSpread    #BarsForLastBarSpread -- Full size bars needed to spread the entire last
                                     bar (if Optimization is impossi
                                     #BarsForLastBarSpread -- Full size bars needed to spread the entire last
                                     bar (if Optimization is impossi
                                     #IN_PAR.MaxTailSpreadLength -- Maximum length that can be added to the ba
                                     r for tail spreading [mm]
*D
JO    I0a3
JU    I0a4
I0a3: CLR
=      L      0.1
I0a4: T    #LLengthToBeSpread        #LLengthToBeSpread -- Length of the portion of the last bar to be spread
                                     over the last nominal size b
A7fb: L    #FullSizeBars              #FullSizeBars -- Full Length Bars Number (long integer)
T    #FullBarsAvail4Spread          #FullBarsAvail4Spread -- Full Bars available for tail / last bar spreadin
                                     g
CLR
A    #SampleImpossible              #SampleImpossible -- It is impossible to get a full-size bar with sample
                                     - repeat calculations
NOT
A    #IN_SampleReq                  #IN_SampleReq -- Sample request
JCN  A800
L    #FullBarsAvail4Spread          #FullBarsAvail4Spread -- Full Bars available for tail / last bar spreadin
                                     g
L    L#1
-D
JO    I0a5
JU    I0a6
I0a5: CLR
=      L      0.1
I0a6: T    #FullBarsAvail4Spread          #FullBarsAvail4Spread -- Full Bars available for tail / last bar spreadin
                                     g
A800: L    #FullBarsAvail4Spread          #FullBarsAvail4Spread -- Full Bars available for tail / last bar spreadin
                                     g
L    L#0
<D
JCN  A801
T    #FullBarsAvail4Spread          #FullBarsAvail4Spread -- Full Bars available for tail / last bar spreadin
                                     g
A801: CLR
=      #OUT.OptImpossible            #OUT.OptImpossible -- The bars optimization is impossible (cannot be comp
                                     leted)
A    #LastBarTooShort                #LastBarTooShort -- The last bar is too short and should be entirely sp
                                     read or chopped
NOT
L    #BarsForTailSpread              #BarsForTailSpread -- Number of bars where to spread the tail
L    #FullBarsAvail4Spread          #FullBarsAvail4Spread -- Full Bars available for tail / last bar spreadin
                                     g
=      L      0.2
>D
=      L      0.3
A    #IN_OWS.TailSpreadEnable        #IN_OWS.TailSpreadEnable -- From OWS: Split tail on last full size bars,
                                     enable
NOT
O    L      0.3
A    L      0.2
=      L      0.2
A    #IN_OWS.ChopEnable              #IN_OWS.ChopEnable -- From OWS: Interm. Shear or Dividing Shear Optim. Chop
                                     ping Enable
NOT
A    L      0.2
JCN  A802
L    L#0
T    #ChopSpreadLength              #ChopSpreadLength -- Length to be spread or chopped
SET
=      #OUT.OptImpossible            #OUT.OptImpossible -- The bars optimization is impossible (cannot be comp
                                     leted)
A802: L    #BarsForLastBarSpread          #BarsForLastBarSpread -- Full size bars needed to spread the entire last
                                     bar (if Optimization is impossi
L    #FullBarsAvail4Spread          #FullBarsAvail4Spread -- Full Bars available for tail / last bar spreadin
                                     g

```

```

>D
=      L      0.2
A      #IN_OWS.TailSpreadEnable      #IN_OWS.TailSpreadEnable -- From OWS: Split tail on last full size bars,
enable
NOT
O      L      0.2
A      #LastBarTooShort      #LastBarTooShort -- The last bar is too short and should be entirely sp
read or chopped
=      L      0.2
A      #LastBarChopEnable      #LastBarChopEnable -- Enable chopping the last bar if shorter than min. a
llowed length and tail chopp
NOT
A      L      0.2
JCN    A803
L      L#0
T      #ChopSpreadLength      #ChopSpreadLength -- Length to be spread or chopped
SET
=      #OUT.OptImpossible      #OUT.OptImpossible -- The bars optimization is impossible (cannot be comp
leted)
A803: L      #ChopSpreadLength      #ChopSpreadLength -- Length to be spread or chopped
L      L#0
<D
JCN    A804
T      #ChopSpreadLength      #ChopSpreadLength -- Length to be spread or chopped
A804: L      #FullBarsAvail4Spread      #FullBarsAvail4Spread -- Full Bars available for tail / last bar spreadin
g
L      #IN_PAR.MaxTailSpreadLength      #IN_PAR.MaxTailSpreadLength -- Maximum length that can be added to the ba
r for tail spreading [mm]
*D
JO      I0a7
JU      I0a8
I0a7: CLR
=      L      0.1
I0a8: L      #ChopSpreadLength      #ChopSpreadLength -- Length to be spread or chopped
TAK
<=D
JCN    A805
L      #ChopSpreadLength      #ChopSpreadLength -- Length to be spread or chopped
T      #LengthToBeSpread      #LengthToBeSpread -- Length (from Tail or Last Bar) to be spread over th
e last nominal size bars
L      #LengthToBeSpread      #LengthToBeSpread -- Length (from Tail or Last Bar) to be spread over th
e last nominal size bars
L      #IN_PAR.MaxTailSpreadLength      #IN_PAR.MaxTailSpreadLength -- Maximum length that can be added to the ba
r for tail spreading [mm]
/D
JO      I0a9
JU      I0aa
I0a9: CLR
=      L      0.1
I0aa: T      #BarsForSpread      #BarsForSpread -- Number of bars where to spread the tail or the last
bar
L      #BarsForSpread      #BarsForSpread -- Number of bars where to spread the tail or the last
bar
L      #IN_PAR.MaxTailSpreadLength      #IN_PAR.MaxTailSpreadLength -- Maximum length that can be added to the ba
r for tail spreading [mm]
*D
JO      I0ab
JU      I0ac
I0ab: CLR
=      L      0.1
I0ac: L      #LengthToBeSpread      #LengthToBeSpread -- Length (from Tail or Last Bar) to be spread over th
e last nominal size bars
TAK
>D
JCN    A806
L      #BarsForSpread      #BarsForSpread -- Number of bars where to spread the tail or the last
bar
L      L#1
+D
JO      I0ad
JU      I0ae
I0ad: CLR
=      L      0.1
I0ae: T      #BarsForSpread      #BarsForSpread -- Number of bars where to spread the tail or the last
bar

```

```

A806: L      #LengthToBeSpread      #LengthToBeSpread -- Length (from Tail or Last Bar) to be spread over th
      L      #BarsForSpread        #BarsForSpread      -- Number of bars where to spread the tail or the last
      /D
      JO      I0af
      JU      I0b0
I0af: CLR
      =      L      0.1
I0b0: T      #SpreadPieceLength     #SpreadPieceLength -- Length of each piece added to nominal bar for tail
      L      #SpreadPieceLength     #SpreadPieceLength -- Length of each piece added to nominal bar for tail
      L      #IN_OWS.MaxChoppingLength #IN_OWS.MaxChoppingLength -- From OWS: Max. length to be chopped [mm]
      <=D
      A      #IN_OWS.ChopEnable     #IN_OWS.ChopEnable -- From OWS: Interm. Shear or Dividing Shear Optim. Chop
      JCN     A808
      L      #LengthToBeSpread      #LengthToBeSpread -- Length (from Tail or Last Bar) to be spread over th
      L      #IN_PAR.MaxTailSpreadLength #IN_PAR.MaxTailSpreadLength -- Maximum length that can be added to the ba
      /D
      JO      I0b1
      JU      I0b2
I0b1: CLR
      =      L      0.1
I0b2: T      #BarsForSpread        #BarsForSpread      -- Number of bars where to spread the tail or the last
      L      #BarsForSpread        #BarsForSpread      -- Number of bars where to spread the tail or the last
      L      #IN_PAR.MaxTailSpreadLength #IN_PAR.MaxTailSpreadLength -- Maximum length that can be added to the ba
      *D
      JO      I0b3
      JU      I0b4
I0b3: CLR
      =      L      0.1
I0b4: T      #LengthToBeSpread      #LengthToBeSpread -- Length (from Tail or Last Bar) to be spread over th
      L      #LengthToBeSpread      #LengthToBeSpread -- Length (from Tail or Last Bar) to be spread over th
      L      #BarsForSpread        #BarsForSpread      -- Number of bars where to spread the tail or the last
      /D
      JO      I0b5
      JU      I0b6
I0b5: CLR
      =      L      0.1
I0b6: T      #SpreadPieceLength     #SpreadPieceLength -- Length of each piece added to nominal bar for tail
      JU      A808
A805: L      #FullBarsAvail4Spread   #FullBarsAvail4Spread -- Full Bars available for tail / last bar spreadin
      L      #IN_PAR.MaxTailSpreadLength #IN_PAR.MaxTailSpreadLength -- Maximum length that can be added to the ba
      *D
      JO      I0b7
      JU      I0b8
I0b7: CLR
      =      L      0.1
I0b8: T      #LengthToBeSpread      #LengthToBeSpread -- Length (from Tail or Last Bar) to be spread over th
      L      #FullBarsAvail4Spread   #FullBarsAvail4Spread -- Full Bars available for tail / last bar spreadin
      T      #BarsForSpread        #BarsForSpread      -- Number of bars where to spread the tail or the last
      L      #IN_PAR.MaxTailSpreadLength #IN_PAR.MaxTailSpreadLength -- Maximum length that can be added to the ba
      T      #SpreadPieceLength     #SpreadPieceLength -- Length of each piece added to nominal bar for tail
A808: L      #LengthToBeSpread      #LengthToBeSpread -- Length (from Tail or Last Bar) to be spread over th
      L      #IN_OWS.MaxChoppingLength #IN_OWS.MaxChoppingLength -- From OWS: Max. length to be chopped [mm]
      <=D

```

```

      A      #IN_OWS.ChopEnable      #IN_OWS.ChopEnable -- From OWS: Interm.Shear or Dividing Shear Optim.Chop
      =      L      0.2              ping Enable
      A      #IN_OWS.TailSpreadEnable #IN_OWS.TailSpreadEnable -- From OWS: Split tail on last full size bars,
      NOT                                          enable
      O      L      0.2
      JCN    A809
      L      L#0
      T      #LengthToBeSpread        #LengthToBeSpread -- Length (from Tail or Last Bar) to be spread over th
      T      #BarsForSpread            e last nominal size bars
      T      #BarsForSpread            #BarsForSpread -- Number of bars where to spread the tail or the last
A809: L      #ChopSpreadLength        bar
      L      #LengthToBeSpread        #ChopSpreadLength -- Length to be spread or chopped
      L      #LengthToBeSpread        #LengthToBeSpread -- Length (from Tail or Last Bar) to be spread over th
      L      #LengthToBeSpread        e last nominal size bars
      -D
      JO     I0b9
      JU     I0ba
I0b9: CLR
      =      L      0.1
I0ba: T      #LengthToBeChopped        #LengthToBeChopped -- Length (from Tail or Last Bar) to be chopped
      L      #LengthToBeChopped        #LengthToBeChopped -- Length (from Tail or Last Bar) to be chopped
      L      L#0
      <D
      JCN    A80a
      T      #LengthToBeChopped        #LengthToBeChopped -- Length (from Tail or Last Bar) to be chopped
A80a: CLR
      A      #IN_OWS.ChopEnable        #IN_OWS.ChopEnable -- From OWS: Interm.Shear or Dividing Shear Optim.Chop
      A      #IN_OWS.ChopEnable        ping Enable
      NOT
      JCN    A80b
      L      L#0
      T      #LengthToBeChopped        #LengthToBeChopped -- Length (from Tail or Last Bar) to be chopped
A80b: L      #LengthToBeChopped        #LengthToBeChopped -- Length (from Tail or Last Bar) to be chopped
      L      #IN_PAR.TrackingErrTol    #IN_PAR.TrackingErrTol -- Tail tracking error tolerance (mm) Rev.03
      +D
      JO     I0bb
      JU     I0bc
I0bb: CLR
      =      L      0.1
I0bc: L      #RemLengthSupport        #RemLengthSupport
      TAK
      >D
      JCN    A80c
      L      #TabPtr                  #TabPtr -- Pointer to the lengths table
      L      L#0
      >=D
      A      L      0.1
      =      L      0.1
      TAK
      L      L#49
      <=D
      A      L      0.1
      =      L      0.1
      TAK
      L      L#0
      +D
      JO     I0bd
      JU     I0be
I0bd: CLR
      =      L      0.1
I0be: L      L#32
      *D
      JO     I0bf
      JU     I0c0
I0bf: CLR
      =      L      0.1
I0c0: TAR2
      +D
      JO     I0c1
      JU     I0c2
I0c1: CLR
      =      L      0.1
I0c2: L      #RemLengthSupport        #RemLengthSupport
      TAK

```

```

T      LD      2
TAK
L      #LengthToBeSpread      #LengthToBeSpread -- Length (from Tail or Last Bar) to be spread over th
                                e last nominal size bars
-D
JO     I0c3
JU     I0c4
I0c3: CLR
=      L      0.1
I0c4: L      #LengthToBeChopped      #LengthToBeChopped -- Length (from Tail or Last Bar) to be chopped
-D
JO     I0c5
JU     I0c6
I0c5: CLR
=      L      0.1
I0c6: LAR1 LD      2
T      DID [AR1, P#280.0]
L      L#0
T      #RemLengthSupport      #RemLengthSupport
JU     A80d
A80c: L      #TabPtr      #TabPtr -- Pointer to the lengths table
L      L#0
>=D
A      L      0.1
=      L      0.1
TAK
L      L#49
<=D
A      L      0.1
=      L      0.1
TAK
L      L#0
+D
JO     I0c7
JU     I0c8
I0c7: CLR
=      L      0.1
I0c8: L      L#32
*D
JO     I0c9
JU     I0ca
I0c9: CLR
=      L      0.1
I0ca: TAR2
+D
JO     I0cb
JU     I0cc
I0cb: CLR
=      L      0.1
I0cc: L      L#0
TAK
LAR1
TAK
T      DID [AR1, P#280.0]
T      #RemLengthSupport      #RemLengthSupport
A80d: L      L#0
T      #TabPtr      #TabPtr -- Pointer to the lengths table
CLR
=      #SampleLengthApplied      #SampleLengthApplied -- Sample length added to the first full-size bar fo
                                und in the table
L      #LengthToBeSpread      #LengthToBeSpread -- Length (from Tail or Last Bar) to be spread over th
                                e last nominal size bars
T      #OUT.LengthToSpread      #OUT.LengthToSpread -- Length to be spread among full-size bars
L      #LengthToBeChopped      #LengthToBeChopped -- Length (from Tail or Last Bar) to be chopped
T      #OUT.LengthToChop      #OUT.LengthToChop -- Length to be chopped off at billet end [mm]
L      #UsefulRemLength      #UsefulRemLength -- Total Remaining Length minus Tail Length for Div. S
                                hear
T      #OUT.UsefulRemLength      #OUT.UsefulRemLength
L      #FullSizeBars      #FullSizeBars -- Full Length Bars Number (long integer)
L      #BarsForSpread      #BarsForSpread -- Number of bars where to spread the tail or the last
                                bar
-D
JO     I0cd
JU     I0ce
I0cd: CLR
=      L      0.1

```

```

I0ce: T      #TableFullSizeBars      #TableFullSizeBars
      L      #TableFullSizeBars      #TableFullSizeBars
      L      L#0
      <D
      JCN     A80e
      T      #TableFullSizeBars      #TableFullSizeBars
A80e: L      #TableFullSizeBars      #TableFullSizeBars
      L      L#0
      ==D
      A      #IN_SampleReq            #IN_SampleReq      -- Sample request
      =      L      0.2
      A      #SampleImpossible        #SampleImpossible -- It is impossible to get a full-size bar with sample
                                   - repeat calculations
      NOT
      A      L      0.2
      JCN     A80f
      SET
      =      #SampleImpossible        #SampleImpossible -- It is impossible to get a full-size bar with sample
                                   - repeat calculations
      JU      A000
A80f: CLR
A810: L      #TableFullSizeBars      #TableFullSizeBars
      L      L#0
      >D
      A      #IN_SampleReq            #IN_SampleReq      -- Sample request
      =      L      0.2
      A      #SampleImpossible        #SampleImpossible -- It is impossible to get a full-size bar with sample
                                   - repeat calculations
      NOT
      A      L      0.2
      =      L      0.2
      A      #SampleLengthApplied      #SampleLengthApplied -- Sample length added to the first full-size bar fo
                                   und in the table
      NOT
      A      L      0.2
      JCN     A811
      L      #TabPtr                  #TabPtr              -- Pointer to the lengths table
      L      L#0
      >=D
      A      L      0.1
      =      L      0.1
      TAK
      L      L#49
      <=D
      A      L      0.1
      =      L      0.1
      TAK
      L      L#0
      +D
      JO      I0cf
      JU      I0d0
I0cf: CLR
      =      L      0.1
I0d0: L      L#32
      *D
      JO      I0d1
      JU      I0d2
I0d1: CLR
      =      L      0.1
I0d2: TAR2
      +D
      JO      I0d3
      JU      I0d4
I0d3: CLR
      =      L      0.1
I0d4: LAR1
      L      DID [AR1,P#280.0]
      L      #IN_OWS.NominalDivCutLength #IN_OWS.NominalDivCutLength -- Dividing Cut, Nominal Length (mm)
      ==D
      JCN     A812
      L      #TabPtr                  #TabPtr              -- Pointer to the lengths table
      L      L#0
      >=D
      A      L      0.1
      =      L      0.1
      TAK

```

```

      L      L#49
      <=D
      A      L      0.1
      =      L      0.1
      TAK
      L      L#0
      +D
      JO      I0d5
      JU      I0d6
I0d5: CLR
      =      L      0.1
I0d6: L      L#32
      *D
      JO      I0d7
      JU      I0d8
I0d7: CLR
      =      L      0.1
I0d8: TAR2
      +D
      JO      I0d9
      JU      I0da
I0d9: CLR
      =      L      0.1
I0da: L      #TabPtr      #TabPtr      -- Pointer to the lengths table
      TAK
      T      LD      2
      TAK
      L      L#0
      >=D
      A      L      0.1
      =      L      0.1
      TAK
      L      L#49
      <=D
      A      L      0.1
      =      L      0.1
      TAK
      L      L#0
      +D
      JO      I0db
      JU      I0dc
I0db: CLR
      =      L      0.1
I0dc: L      L#32
      *D
      JO      I0dd
      JU      I0de
I0dd: CLR
      =      L      0.1
I0de: TAR2
      +D
      JO      I0df
      JU      I0e0
I0df: CLR
      =      L      0.1
I0e0: LAR1
      L      DID [AR1,P#280.0]
      L      #IN_OWS.SampleLength      #IN_OWS.SampleLength -- From OWS/HMI: sample length (mm)
      +D
      JO      I0e1
      JU      I0e2
I0e1: CLR
      =      L      0.1
I0e2: LAR1
      T      LD      2
      SET
      DID [AR1,P#280.0]
      =      #SampleLengthApplied      #SampleLengthApplied -- Sample length added to the first full-size bar fo
und in the table
A812: L      #TabPtr      #TabPtr      -- Pointer to the lengths table
      L      L#49
      <D
      JCN
      L      A813
      L      #TabPtr      #TabPtr      -- Pointer to the lengths table
      L      L#1
      +D
      JO      I0e3

```

```
I0e3: JU      I0e4
      CLR
      =      L      0.1
I0e4: T      #TabPtr      #TabPtr      -- Pointer to the lengths table
      JU      A814
A813: SET
      =      #SampleLengthApplied      #SampleLengthApplied -- Sample length added to the first full-size bar found in the table
A814: JU      A810
A811: L      L#0
      T      #SpreadLengthAccum      #SpreadLengthAccum -- Length to be spread, accumulator of the values added to the full-size bars
      T      #BarsSpreadCounter      #BarsSpreadCounter
      L      L#49
      T      #TabPtr      #TabPtr      -- Pointer to the lengths table
      L      #BarsForSpread      #BarsForSpread      -- Number of bars where to spread the tail or the last bar
      L      L#0
      >D
      JCN      A815
A816: L      #TabPtr      #TabPtr      -- Pointer to the lengths table
      L      L#0
      >=D
      JCN      A815
      L      #TabPtr      #TabPtr      -- Pointer to the lengths table
      L      L#0
      >=D
      A      L      0.1
      =      L      0.1
      TAK
      L      L#49
      <=D
      A      L      0.1
      =      L      0.1
      TAK
      L      L#0
      +D
      JO      I0e5
      JU      I0e6
I0e5: CLR
      =      L      0.1
I0e6: L      L#32
      *D
      JO      I0e7
      JU      I0e8
I0e7: CLR
      =      L      0.1
I0e8: TAR2
      +D
      JO      I0e9
      JU      I0ea
I0e9: CLR
      =      L      0.1
I0ea: LAR1
      L      DID [AR1,P#280.0]
      L      #IN_OWS.NominalDivCutLength      #IN_OWS.NominalDivCutLength -- Dividing Cut, Nominal Length (mm)
      ==D
      L      #BarsSpreadCounter      #BarsSpreadCounter
      L      #BarsForSpread      #BarsForSpread      -- Number of bars where to spread the tail or the last bar
      =      L      0.2
      <D
      A      L      0.2
      JCN      A818
      L      #TabPtr      #TabPtr      -- Pointer to the lengths table
      L      L#0
      >=D
      A      L      0.1
      =      L      0.1
      TAK
      L      L#49
      <=D
      A      L      0.1
      =      L      0.1
      TAK
      L      L#0
```

```

+D
JO      I0eb
JU      I0ec
I0eb: CLR
=      L      0.1
I0ec: L      L#32
*D
JO      I0ed
JU      I0ee
I0ed: CLR
=      L      0.1
I0ee: TAR2
+D
JO      I0ef
JU      I0f0
I0ef: CLR
=      L      0.1
I0f0: L      #TabPtr      #TabPtr      -- Pointer to the lengths table
TAK
T      LD      2
TAK
L      L#0
>=D
A      L      0.1
=      L      0.1
TAK
L      L#49
<=D
A      L      0.1
=      L      0.1
TAK
L      L#0
+D
JO      I0f1
JU      I0f2
I0f1: CLR
=      L      0.1
I0f2: L      L#32
*D
JO      I0f3
JU      I0f4
I0f3: CLR
=      L      0.1
I0f4: TAR2
+D
JO      I0f5
JU      I0f6
I0f5: CLR
=      L      0.1
I0f6: LAR1
L      DID [AR1, P#280.0]
L      #SpreadPieceLength      #SpreadPieceLength -- Length of each piece added to nominal bar for tail
/ last bar spread
+D
JO      I0f7
JU      I0f8
I0f7: CLR
=      L      0.1
I0f8: LAR1
T      LD      2
L      DID [AR1, P#280.0]
L      #SpreadLengthAccum      #SpreadLengthAccum -- Length to be spread, accumulator of the values added
to the full-size bars
L      #SpreadPieceLength      #SpreadPieceLength -- Length of each piece added to nominal bar for tail
/ last bar spread
+D
JO      I0f9
JU      I0fa
I0f9: CLR
=      L      0.1
I0fa: T      #SpreadLengthAccum      #SpreadLengthAccum -- Length to be spread, accumulator of the values added
to the full-size bars
L      #BarsSpreadCounter      #BarsSpreadCounter
L      L#1
+D
JO      I0fb
JU      I0fc

```

```
I0fb: CLR
      = L 0.1
I0fc: T #BarsSpreadCounter #BarsSpreadCounter
A818: L #TabPtr #TabPtr -- Pointer to the lengths table
      L L#1
      -D
      JO I0fd
      JU I0fe
I0fd: CLR
      = L 0.1
I0fe: T #TabPtr #TabPtr -- Pointer to the lengths table
      JU A816
A815: L #IN_OWS.NominalDivCutLength #IN_OWS.NominalDivCutLength -- Dividing Cut, Nominal Length (mm)
      L #IN_OWS.SampleLength #IN_OWS.SampleLength -- From OWS/HMI: sample length (mm)
      +D
      JO I0ff
      JU I100
I0ff: CLR
      = L 0.1
I100: L #CutsTable[0] #CutsTable[0] -- Table with the length for the next cuts
      TAK
      ==D
      A #IN_FirstCutDone #IN_FirstCutDone -- First Cut (head cut or first divide cut) has been e
      xecuted
      L #IN_OWS.NominalDivCutLength #IN_OWS.NominalDivCutLength -- Dividing Cut, Nominal Length (mm)
      L #IN_OWS.SampleLength #IN_OWS.SampleLength -- From OWS/HMI: sample length (mm)
      +D
      = L 0.2
      JO I101
      JU I102
I101: CLR
      = L 0.1
I102: L #IN_OWS.FirstDivCutCorr #IN_OWS.FirstDivCutCorr -- From OWS: First Dividing Cut Offset (mm)
      +D
      JO I103
      JU I104
I103: CLR
      = L 0.1
I104: L #CutsTable[0] #CutsTable[0] -- Table with the length for the next cuts
      TAK
      ==D
      = L 0.3
      A #IN_FirstCutDone #IN_FirstCutDone -- First Cut (head cut or first divide cut) has been e
      xecuted
      NOT
      A L 0.3
      O L 0.2
      L #IN_OWS.NominalDivCutLength #IN_OWS.NominalDivCutLength -- Dividing Cut, Nominal Length (mm)
      L #IN_OWS.SampleLength #IN_OWS.SampleLength -- From OWS/HMI: sample length (mm)
      +D
      = L 0.2
      JO I105
      JU I106
I105: CLR
      = L 0.1
I106: L #IN_OWS.MaxChoppingLength #IN_OWS.MaxChoppingLength -- From OWS: Max. length to be chopped [mm]
      +D
      JO I107
      JU I108
I107: CLR
      = L 0.1
I108: L #IN_OWS.FirstDivCutCorr #IN_OWS.FirstDivCutCorr -- From OWS: First Dividing Cut Offset (mm)
      +D
      JO I109
      JU I10a
I109: CLR
      = L 0.1
I10a: L #CutsTable[0] #CutsTable[0] -- Table with the length for the next cuts
      TAK
      >=D
      = L 0.3
      A #IN_FirstCutDone #IN_FirstCutDone -- First Cut (head cut or first divide cut) has been e
      xecuted
      NOT
      A L 0.3
      O L 0.2
```

```
L      #IN_OWS.NominalDivCutLength  #IN_OWS.NominalDivCutLength -- Dividing Cut, Nominal Length (mm)
L      #IN_OWS.SampleLength          #IN_OWS.SampleLength -- From OWS/HMI: sample length (mm)
+D
=      L      0.2
JO     I10b
JU     I10c
I10b: CLR
=      L      0.1
I10c: L      #IN_OWS.MaxChoppingLength  #IN_OWS.MaxChoppingLength -- From OWS: Max. length to be chopped [mm]
+D
JO     I10d
JU     I10e
I10d: CLR
=      L      0.1
I10e: L      #CutsTable[0]              #CutsTable[0] -- Table with the length for the next cuts
TAK
>=D
A      #IN_FirstCutDone                #IN_FirstCutDone -- First Cut (head cut or first divide cut) has been e
xecuted
O      L      0.2
A      #IN_SampleReq                  #IN_SampleReq -- Sample request
=      #OUT.NextBarWithSample          #OUT.NextBarWithSample -- The next bar to be cut (first bar in the table)
contains the sample
A001: L      #CutsTable[0]              #CutsTable[0] -- Table with the length for the next cuts
T      #OUT.NextCutSetLength            #OUT.NextCutSetLength -- Set length for next cut [mm]
L      #CutsTable[1]                  #CutsTable[1] -- Table with the length for the next cuts
L      L#0
==D
=      #OUT.LastBar                    #OUT.LastBar -- The bar shown in "NextCutSetLength" is the last one
for cooling bed
A      L      0.1
SAVE
BE
```