

# GrafCompounder 2.004

#### Working with the "GrafCompounder" Program

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www.grafcompounder.com

Dr. Hans-Joachim Graf



# GrafCompounder

The "GrafCompounder" is a software program that enables you to create recipes using your own recipe database for rubber, TPE, TP and other compounds, (it must contain ingredients, proportions and measured properties).

This software helps you save time and effort in recipe development by:

- Allowing for faster and more accurate decisions on starting formulas
  - Contributing to better ideas about further compound development
  - Allowing for use of historic data in compound development



# GrafCompounder

The GrafCompounder uses the <u>Multiple Linear Iteration method [MLI]</u> to calculate a new recipe according to properties targeted.

The GrafCompounder enables you to analyze your database and identify faulty compound data.

It allows you to identify the ratio of contribution of each compound recipe on the final formulation. This possibility is helpful, if your confirmation test results do not match the results of the calculated compound.



# GrafCompounder

This is a tutorial to familiarize you with the best way to use the "GrafCompounder 2.004" and to show you the program features.



# **Data preparation**

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1	Testdateien													1
2		Recipes:												
1	Ingredients:	50AL511	50/L512	50AL513	50AL514	50AL515	50AL516	50AL517	50AL518	50AL542			4	
4	NR (SMR - 10)	100,00	100.00	100.00	100,00	100,00	100,00	100,00	100,00	100.00			T	E.
5	N330	10,00	30,00	50,00	25,00	45,00	75,00	45,00	65,00	50,00				
6	CaG03	20,00	20,00	20,00	20,00	20,00	20,00	20,00	20,00	10.00				
1	Naphtenic Oil	5,00	25,00	45,00	5,00	25,00	45,00	5,00	25,00	10,00			- 5	81
8	ZnO	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00				a.
9	Stearic Acid	2.00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00				a.
10	IPPD	2.00	2,00	2,00	2,00	2.00	2,00	2,00	2,00	2,00				
11	S as	1,50	1,50	1,50	1,50	1,50	1,50	1,50	1,50	0,25				L
12	IMID - 80		0.00							1,00				ß
13	CBS - 80	0,65	0,65	0,65	0,65	0,65	0,65	0,65	0,65	2,10				ų.
14	Total	146,15	186,15	226,15	161,15	201,15	251,15	181,15	221,15	1/2,35				
15	Durante													
10	Properties:	20.00	20.00	24.00	24.00	20.00	40.00	co. 00	20.00	44.00				
1/	MooneviviL(1+4) 1	32,00	36,00	31,00	34,00	30,00	42,00	60,00	39,00	41,00				
10	Nooney 157 120 C	20,00	20,00	32,00	20,00	32,00	22,00	20,00	25,00	11,00				
19	Hardesee	42.00	1,12	40.00	49.00	49.00	52.00	61.00	E1.00	60.00				
20	Manufiess	42,00	41,00	40,00	40,00	40,00	52,00	9.00	7.00	55,00				
22	TS	25.00	21.00	15.00	25.00	20.00	15 30	23.00	18.00	23.00			-	
22	EB	785.00	725.00	60,00	715.00	705.00	615.00	560.00	590.00	540.00			1	
24	DVR -26°C /24h	22.00	28.00	30.00	17.00	19.00	35.00	29.00	27.00	77.00				
25	DVR 0°C /24h	10.00	14.00	14.00	8.00	12.00	16.00	13.00	12.00	16.00			1	
26	DVR 23°C /72h	8.00	10.00	14.00	9.00	13.00	16.00	10.00	17.00	18.00			1	
27	DVR 70°C /24h	39.00	50.00	61.00	44 00	50.00	54.00	44 00	50.00	17.00				
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In any calculation spreadsheet program such as Excel, prepare a data sheet that contains at least 3 formulas with their properties.

The first column has one cell named "Ingredients:" and one named "Properties:".

The next column has one cell named "Recipes:" Please insert the required information exactly .

The above example shows how and where to enter formulas and properties.

It is important that the cells highlighted in yellow contains all necessary information. Otherwise, the program will not work.



le Edit Help	Fil	e Edit	нер		
Load Demo Data Open File Save As Exit		t data:	Copy input ta Copy marked Paste cells h Delete mark Delete mark nsert empty nsert empty Clear marke	able d cells eere ed rows ed columns row column d cells	
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At this point you need to transfer the data into the GrafCompounder program. There are three options to assign the data:

- 1) Paste the information from the previous Excel sheet by right clicking to get the short-cut menu or by clicking "Paste Input Data From Clipboard"
- 2) As an alternative you can "Load test data" in same pull down menu.
- 3) Open a file previously stored in .gc format. This is a new feature.



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2	restudieren	Recipes:												25
3	Ingredients:	50AL511	50AL512	50AL513	50AL514	50AL515	50AL516	50AL517	50AL518	50AL542			1	25
4	NR (SMR - 10)	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00				100
5	N330	10,00	30,00	50,00	25,00	45,00	75,00	45,00	65,00	50,00				
6	CaCO3	20,00	20,00	20,00	20,00	20,00	20,00	20,00	20,00					(3)
7	Naphtenic Oil	5,00	25,00	45,00	5,00	25,00	45,00	5,00	25,00	10,00			E	~
8	ZnQ	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00				K
9	Stearic Acid	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00				-
10	IPPD	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00				
	S DATE DA	1,50	1,50	1,50	1,50	1,50	1,50	1,50	1,50	0,25			- 1	
	1W1D - 80	0.65	0.05	0.65	0.65	0.65	0.65	0.65	0.65	1,00				
	CDS - 00 Total	146 15	10,05	20,00	101 10	201 15	251.15	101 10	20,0	172.26				
15	Total	140,15	100,15	220,15	101,15	201,15	201,10	101,15	221,13	112,55				1
16	Properties:													
17	MoonevML(1+4) 1	32,00	36,00	31,00	34,00	30,00	42.00	60,00	39,00	41,00	10			
18	Mooney t5 / 120°C	28,00	28,00	32,00	28,00	32,00	22,00	20,00	25,00	11,00				
19	Density	1,08	1,12	1,16	1,13	1,16	1,19	1,19	1,20	1,11				
20	Hardness	42,00	41.00	40,00	48,00	48,00	52,00	61,00	61,00	59,00				
21	M300	1,80	3,00	3,00	4,40	4,60	5,30	8,00	7,60	9,40				
22	TS	25,00	21,00	15,00	25,00	20,00	15,30	23,00	18,00	23,00				
23	EB	785,00	725,00	690,00	715,00	705,00	615,00	560,00	590,00	540,00				
24	DVR -26°C /24h	22,00	28,00	30,00	17,00	19,00	35,00	29,00	27,00	77,00				
25	DVR 0°C /24h	10,00	14,00	14,00	8,00	12,00	16,00	13,00	12,00	16,00				
26	DVR 23°C //2h	8,00	10,00	14,00	9,00	13,00	16,00	10,00	17,00	18,00				
27	DVR 70°C /24h	39,00	50,00	61,00	44,00	50,00	54,00	44,00	50,00	17,00				
	Tabelle1 (Tabelle1	abelle2 (Tabelle	3/								m		1	
Tab	elle 1 / 2	and the A robelle	BageStyle T-	bellat		9	STD	1	Summe-1	1605.84	10-	6	-	100%
Tab	ene 1/5		Fagestyle_la	Denet			310		Summe=1	1000,84	U.			100%

### To use option one: Highlight the compound formula table

Copy the formula / property table:

Insert the license Dongle into a USB port on your PC/Laptop computer

Once the dongle is in place, open the GrafCompounder program.

 If you try to do this in the reverse order an error message will be displayed.



GrafCompounder version 2.003	Sec. 1		100						81 (C)	- <b>-</b> - 2
ile Edit Help			l logación						To that	
ut data.	1	1	Criteria.	Min	Here	From	Te	Weight Trdoff	Output	
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C			30 45					2+	at	7
cipe ratios in %:									Sum of recipe ratios (should be 100%):	
	Number format 1	2345.67	Import input data	from clipboar	d A	uto mix (c	verwrite	e mixture) Aut	nix (new mixture)	

# After insertion of the dongle and start of the GrafCompounder program the screen should appear as shown



File Edit Help																		
input data:										Criteria:							Output:	
	50AL51	50AL512	50AL51	50AL51	50AL515	50AL516	50AL517	50AL518	50AL542	Name	Min	Max	From	To	Wei	Trdoff		
Testdateien					Contract of the second s						1	1100/001		14 111	1	1		
1.0.007.00151.001	Recipes:																	
Ingredients:	50AL511	50AL512	50AL513	50AL514	50AL515	50AL516	50AL517	50AL518	50AL542								Mixture1	
NR (SMR - 10)	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	NR (SMR - 10)						1		
N330	10.00	30,00	50,00	25,00	45,00	75,00	45,00	65,00	50,00	N330								
CaCO3	20.00	20,00	20,00	20,00	20,00	20,00	20.00	20,00		CaCO3	0	d						
Naphtenic Oil	5,00	25,00	45,00	5,00	25,00	45,00	5,00	25,00	10,00	Naphtenic Oil								
ZnO	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	ZnO		1						
Stearic Acid	2.00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	Stearic Acid								
IPPD	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2.00	2,00	IPPD		1						
S	1,50	1,50	1,50	1,50	1,50	1,50	1,50	1,50	0,25	S								
TMTD - 80									1.00	TMTD - 80	0	0						
CBS - 80	0,65	0,65	0.65	0,65	0.65	0,65	0,65	0,65	2,10	CBS - 80			1					
Total	146,15	186,15	226,15	161,15	201,15	251,15	181,15	221,15	172,35	Total				_				
Properties:																		
MooneyML(1+4) 100°C	32,00	36,00	31,00	34,00	30,00	42,00	60,00	39,00	41,00	MooneyML(1+4)							n	
Mooney t5 / 120°C	28,00	28.00	32,00	28,00	32,00	22,00	20,00	25,00	11.00	Mooney t5 / 120°	С							
Density	1,08	1,12	1,16	1,13	1,16	1,19	1,19	1,20	1,11	Density								
Hardness	42,00	41.00	40,00	48,00	48,00	52,00	61,00	61,00	59.00	Hardness								
M300	1,80	3,00	3,00	4,40	4,60	5,30	8,00	7,60	9,40	M300								
TS	25,00	21,00	15,00	25,00	20,00	15,30	23,00	18,00	23,00	7S								
EB	785,00	725,00	690,00	715,00	705,00	615,00	560,00	590,00	540,00	EB								
DVR -26°C /24h	22,00	28,00	30,00	17,00	19,00	35,00	29,00	27,00	77,00	DVR -26°C /24h								
DVR 0°C /24h	10.00	14,00	14,00	8,00	12,00	15,00	13,00	12,00	16.00	DVR 0*C /24h				1				
DVR 23°C /72h	8,00	10,00	14,00	9,00	13,00	16,00	10,00	17,00	18,00	DVR 23°C /72h				1				
DVR 70°C /24h	39,00	50,00	61,00	44.00	50,00	54,00	44,00	50,00	17,00	DVR 70°C /24h				1				
Recipe ratios in %:						/	/	/	,								Sum of recipe	ratios (should be 100%

Click Paste and the data is copied into the program The example above shows the Formula data now inserted into the GrafCompounder.

However - the cells are highlighted in yellow. This signifies that no values are currently recognized and can not be used for any calculation.

- Min and Max rows are empty!

To fix this, the number format needs to be adjusted in the bottom left corner to take into account the fact the data have been input using a comma for the decimal place.

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File Edit Help																		
Input data:										Criteria:							Output	
	50AL51	50AL512	50AL513	50AL514	50AL516	50AL516	50AL517	50AL518	50AL542	Name	Min	Max	From	To	Wei	Trdoff		
Testdateien																		i i i i i i i i i i i i i i i i i i i
	<b>Recipes:</b>																	1
Ingredients:	50AL511	50AL512	50AL513	50AL514	50AL515	50AL516	50AL517	50AL518	50AL542								Mixture1	
NR (SMR - 10)	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	NR (SMR - 10)	100	100						
N330	10,00	30,00	50,00	25,00	45,00	75,00	45,00	65,00	50,00	N330	10	75						
CaCO3	20,00	20,00	20,00	20,00	20,00	20,00	20,00	20,00		CaCO3	0	20						
Naphtenic Oil	5,00	25,00	45,00	5,00	25,00	45,00	5,00	25,00	10,00	Naphtenic Oil	5	45						
ZnO	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	ZnO	5	5						
Stearic Acid	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	Stearic Acid	2	2						
IPPD	2,00	2.00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	IPPD	2	2						
S	1,50	1,50	1,50	1,50	1,50	1,50	1,50	1,50	0,25	S	0,25	1,5						
TMTD - 80									1,00	TMTD - 80	0	1						
CBS - 80	0.65	0.65	0.65	0,65	0.65	0.65	0.65	0,65	2,10	CBS - 80	0.65	2.1						
Total	146,15	186,15	226,15	161,15	201,15	251,15	181,15	221,15	172,35	Total	146,13	5 251,15						
Properties:																		
MooneyML(1+4) 100°C	32,00	36.00	31,00	34,00	30.00	42.00	60,00	39,00	41,00	MooneyML(1+4)	30	60			1	1	0	
Mooney t5 / 120°C	28,00	28.00	32.00	28,00	32,00	22,00	20,00	25,00	11,00	Mooney t5 / 120°C	: 11	32						
Density	1,08	1,12	1,16	1,13	1,16	1,19	1,19	1.20	1,11	Density	1,08	1,2						
Hardness	42,00	41.00	40.00	48,00	48.00	52,00	61,00	61.00	59,00	Hardness	40	61						
M300	1,80	3,00	3,00	4,40	4,60	5,30	8,00	7,60	9,40	M300	1,8	9,4						
TS	25,00	21,00	15,00	25,00	20,00	15,30	23,00	18,00	23,00	TS	15	25						
EB	785,00	725.00	690.00	715.00	705.00	615,00	560,00	590,00	540,00	EB	540	785						
DVR -26*C /24h	22.00	28.00	30,00	17.00	19,00	35.00	29,00	27.00	77.00	DVR -26"C /24h	17	77						
DVR 0°C /24h	10.00	14,00	14.00	8.00	12.00	16.00	13.00	12.00	16,00	DVR 0°C /24h	8	16						
DVR 23°C /72h	8,00	10.00	14.00	9.00	13,00	16,00	10.00	17.00	18.00	DVR 23*C /72h	8	18						
DVR 70°C /24h	39,00	50,00	61.00	44,00	50,00	54,00	44,00	50,00	17,00	DVR 70°C /24h	17	61						
DVR 70 07241	39,00	20,00	01,00	44,00	00,00	04,00	44,00	50,00	17,00	DVR 10 01240	11	07						
-										4							-	7.
Recipe ratios in %:																	Sum of recipe	ratios (should be 1009
	-								1000	3							0	

Once the "Number format" is adjusted to accommodate the comma:

- The recipes now appear red and the properties show as green
- The Min and Max columns show the highest and lowest numbers of the related row.

# Now you are ready for the first calculation if you choose this option

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Other options for adding data:

- 2) As a second option you can open the GrafCompounder program and hit "Load test data" in the pull down menu.
- 3) A third option is to open the GrafCompounder program and open a file previously stored in .gc format. This is a new feature.

### Now you are ready for the first calculation if you choose these options



# Data analysis

										The protect							le a contra de la
nput data:	Electronic and a			escarios II	100020434004	Contractor In	2/2-1/0+15/7-1-	HILSON FILL SHARE		Criteria:	1.0001	EV.	Depression 110	-10 I			Output:
	50AL511	50AL512	50AL513	50AL514	50AL 515	50AL516	50AL517	58AL518	50AL542	Name	Min	Max	From	To	Wel	Trdoff	
Testdateien																	
	Recipes:																A
ingredients:	50AL511	50AL512	50AL513	50AL5148	50AL515	50AL516 5	0AL517 5	0AL518 5	0AL542								Mixture 1
NR (SMR - 10)	100,00	100,00	100.00	100,00	100,00	100,00	100,00	100,00	100,00	NR (SMR - 10)	100	100				-	
N330	10,00	30,00	50,00	25,00	45,00	75,00	45,00	65,00	50,00	N330	10	75	48	52			
CaCO3	20,00	20,00	20.00	20,00	20,00	20,00	20,00	20,00		CaCO3	0	20					
Naphtenic Oil	5,00	25,00	45.00	5,00	25,00	45,00	5,00	25,00	10,00	Naphtenic Oil	3	45					
ZnO	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	200	5	5					
Stearic Acid	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	Steanc Acid	2	2					
PPU	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	IPPD	2	2					
5	1,50	1,50	1,50	1,50	1,50	1,50	1,50	1,50	0,25	5	0,25	1,5					
IMID-80	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	1,00	IMID-80	0.05	1					
CBS-80	0.65	0,65	0.65	0.65	0,65	0,65	0.65	0.65	2,10	CBS-80	0.65	2,1				-	
rotar	146,15	186,15	220,15	101,15	201,15	251,15	181,15	221,15	1/2,35	/ota/	140,1	5 251,15	_		_	-	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Droportion																	
MooneyMI (1+4) 100°C	32.00	36.00	31.00	34.00	30.00	42.00	60.00	30.00	41.00	MoosevMI /1+41	30	60	_	_	_		
Mooney IS / 120°C	28.00	28.00	32.00	28.00	32.00	22.00	20.00	25.00	11.00	Mooney 15 / 120°C	11	32					
Density	1.08	1 12	1 16	1.13	1.16	1.10	1 19	1.20	1 11	Density	1.08	12				-	
Hardness	42.00	41.00	40.00	48.00	48.00	52.00	61.00	61.00	59.00	Hardness	40	61	40	45			
M300	1.80	3.00	3.00	4 40	4 60	5 30	8.00	7 60	9.40	M300	18	94	Г				
TS	25.00	21.00	15.00	25.00	20.00	15.30	23.00	18.00	23.00	TS	15	25		_			
EB	785.00	725.00	690.00	715.00	705.00	615.00	560.00	590.00	540.00	EB	540	785					
DVR -26°C /24h	22.00	28.00	30.00	17.00	19.00	35.00	29.00	27.00	77.00	DVR -26°C /24h	17	77					
DVR 0*C /24h	10.00	14,00	14,00	8.00	12.00	16.00	13.00	12.00	16,00	DVR 0°C /24h	8	16					
DVR 23*C /72h	8.00	10.00	14,00	9.00	13,00	16,00	10,00	17,00	18,00	DVR 23°C/72h	8	18				-	
	39.00	50,00	61.00	44.00	50.00	54,00	44.00	50,00	17.00	DVR 70°C /24h	17	61					

To begin the analysis, enter a range of values under criteria in the "Ingredients" or "Properties" rows that you wish to match.

The example shows the following criteria:

- Carbon black N 330 from 48 to 52
- Hardness from 40 to 45 Shore A



# Data analysis

nput data: 50 Festdateien Rec ngredients: 504 VR (SMR - 10) 1 V330 2aCO3 2abntenic Oil	0AL511 AL511 5 100,00 10,00	50AL512 50AL512 5 100,00	50AL513 50AL513 5 100.00	50AL514	50AL515	50AL516	50AL517	50AL518	50AL542	Criteria Name	Min	Max	From	To	Wai	Trdoff	Output	
50 Festdateien ngredients: 504 VR (SMR - 10) 1 V330 3aCO3 4 Japhtenic Oil	0AL511 AL511 5 100,00 10,00	50AL512 50AL512 5 100,00	50AL513 50AL513 5 100.00	50AL514	50AL515	50AL516	50AL517	50AL518	50AL542	Name	Min	Max	From	To	Wai	Trdoff		
Testdateien Rec ngredients: 504 VR (SMR - 10) 1 V330 DaCO3 Japhtenic Oil	AL511 5 100,00 10,00	50AL512 5 100,00	50AL513 5 100.00	50AL514 5	50AL515 5	0AL516			A A A A A A A A A A A A A A A A A A A	Li comune				10	VVH.	1 1 1 1 1 1 1		
Rec           ngredients:         504           VR (SMR - 10)         1           V330         1           DaCO3         1           Japhtenic Oil         1	AL511 5 100,00 10,00	50AL512 5 100,00	50AL513 5 100.00	50AL514 5	50AL515 5	0AL516						1 /// 2514	LMIG-SORE L	1.70:	1		1	
ngredients:         50/           VR (SMR - 10)         1           V330         2           CoC03         2           Japhtenic Oil         1	AL5115 100,00 10,00	50AL512 5 100,00	50AL513 5 100.00	50AL514 5	50AL515	0AL516												
NR (SMR - 10) 1 V330 DaCO3 Japhtenic Oil	100,00	100,00	100,00	100.00			50AL517	0AL5185	50AL542								Mixture 1	
V330 DaCO3 Japhtenic Oil	10,00	20.00		100.00	100,00	100.00	100.00	100.00	100.00	NR (SMR - 10)	100	100	1		1	1		
DaCO3	20.00	30.00	50,00	25.00	45.00	75.00	45.00	65.00	50,00	N330	10	75	48	52				
Japhtenic Oil	20.00	20,00	20.00	20.00	20.00	20.00	20.00	20.00		CaCO3	0	20						
	5,00	25,00	45,00	5,00	25,00	45,00	5,00	25,00	10,00	Naphtenic Oil	5	45						
únO On	5,00	5,00	5,00	5,00	5.00	5,00	5,00	5,00	5,00	ZnO	5	5						
Stearic Acid	2.00	2,00	2.00	2,00	2,00	2,00	2.00	2.00	2.00	Stearic Acid	2	2						
PPD	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	IPPD	2	2						
5	1,50	1,50	1,50	1,50	1,50	1,50	1,50	1,50	0,25	S	0,25	1,5						
/MTD - 80									1,00	TMTD - 80	0	1						
CBS - 80	0,65	0,65	0,65	0,65	0,65	0,6						1						
otal 1	146,15	186,15	226,15	161,15	201,15	251,1	Automatic	: mixing fi	inished, resu	It matches all criteria		51,15		_	_	_		
roperties:						_	0											
AooneyML(1+4) 100°C	32,00	36,00	31,00	34,00	30,00	42,0	Score of	best mixt	ture so far (lo	ver is better): 0.0000		0						
Aconey t5 / 120°C	28,00	28,00	32,00	28,00	32,00	22,0						2						
Density	1,08	1,12	1,16	1,13	1,16	1,1	10	-				2						
Hardness	42,00	41,00	40,00	48,00	48,00	52,0	6	Take this	mixture	Cancel		1	40	45				
//300	1,80	3,00	3,00	4,40	4.60	5,3						4						
/S	25,00	21,00	15,00	25,00	20.00	15,30	23,00	18.00	23,00	TS	15	25				-		
:B 7	785.00	725,00	690.00	715,00	705,00	615,00	560,00	590,00	540,00	EB	540	785						
)VR -26°C /24h	22,00	28,00	30,00	17,00	19.00	35,00	29,00	27,00	77,00	DVR -26°C /24h	17	77						
JVR 0°C /24h	10,00	14,00	14,00	8,00	12,00	16,00	13,00	12,00	16,00	DVR 0*C /24h	8	16						
DVR 23°C /72h	8,00	10,00	14,00	9,00	13,00	16,00	10,00	17,00	18,00	DVR 23°C /72h	8	18				-		
DVR 70°C /24h	39,00	50,00	61,00	44.00	50,00	54,00	44,00	50,00	17,00	DVR 70°C /24h	17	61						

Click on "auto mix (overwrite mixture)"

This tells the program to mix and where to place your results in the compounder form.

The mixture is created

In this example a mixture is found, which satisfies the chosen criteria:

- If all criteria are met the "Score of best mixture so far (lower is better)" will equal 0
- Otherwise the score will be a number greater than 0.



# Data analysis

iput data:																	
										Criteria:						Output	
	50AL51	50AL513	50AL513	50AL514	50AL515	50AL516	50AL517	50AL518	50AL542	Name	Min	Max	From T	o Wei	Trdoff		
estdateien																	
1	Recipes:																
igredients:	50AL511	50AL512	50AL513	50AL514	50AL515	50AL516 5	0AL517 5	50AL518	50AL542							Mixture 1	
R (SMR - 10)	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	NR (SMR - 10)	100	100				100	
330	10,00	30,00	50,00	25,00	45.00	75,00	45,00	65,00	50,00	N330	10	75	48	52		48,225	
aCO3	20,00	20,00	20,00	20,00	20,00	20,00	20,00	20,00		CaCO3	0	20				20	
aphtenic Oil	5,00	25,00	45,00	5,00	25,00	45,00	5,00	25,00	10,00	Naphtenic Oil	5	45				34,5	
10	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	ZnO	5	5				5	
tearic Acid	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	Stearic Acid	2	2				2	
PPD	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	IPPD	2	2				2	
	1,50	1,50	1,50	1,50	1,50	1,50	1,50	1,50	0,25	S	0,25	1,5				1,5	
MTD - 80									1,00	TMTD - 80	0	1					
BS - 80	0,65	0,65	0,65	0,65	0,65	0,65	0,65	0,65	2,10	CBS - 80	0,65	2,1				0,65	
otal	146,15	186,15	226,15	161,15	201,15	251,15	181,15	221,15	172,35	Total	146,1	5 251,15	_	_	-	213,875	
roperties;																	
ooneyML(1+4) 100°C	32.00	36,00	31,00	34.00	30.00	42,00	60,00	39,00	41,00	MooneyML(1+4)	30	60				33,7975	
ooney t5 / 120°C	28,00	28,00	32,00	28,00	32,00	22,00	20.00	25,00	11,00	Mooney 15 / 120°C	211	32				29,2	
ensity	1,08	1,12	1,16	1,13	1,15	1,19	1,19	1,20	1,11	Density	1.08	1,2				1,15685	
ardness	42,00	41,00	40,00	48.00	48,00	52,00	61,00	61,00	59.00	Hardness	40	61	40	45		44,875	
300	1,80	3,00	3.00	4,40	4,60	5,30	8,00	7,60	9,40	M300	1,8	9,4				3,8755	
S	25,00	21,00	15,00	25,00	20,00	15,30	23,00	18.00	23,00	TS	15	25				17,6155	
B	785,00	725,00	690,00	715,00	705.00	615,00	560,00	590,00	540,00	EB	540	785				683,8625	
VR -26°C /24h	22,00	28,00	30,00	17.00	19,00	35.00	29,00	27,00	77,00	DVR -26°C /24h	17	77				27,805	
VR 0°C /24h	10,00	14,00	14,00	8,00	12,00	16,00	13,00	12,00	16,00	DVR 0°C /24h	8	16				13,32	
VR 23°C /72h	8,00	10,00	14,00	9,00	13,00	16,00	10,00	17,00	18,00	DVR 23°C /72h	8	18				13,345	
0/D 70*C /24h	39,00	50,00	61,00	44,00	50,00	54.00	44,00	50,00	17,00	DVR 70°C/24h	17	61				54,58	

Click on "take this mixture"

Because we chose "Auto mix (overwrite mixture)", the application has placed it in the first column and automatically assigned the name "Mixture1" to it. This mixture is a combination of several of the compounds in the database. The ratios the formula is made of can be seen from the line at the bottom of the page: "Recipe ratios in %"

The horizontal sum should always equal 100%



# Naming the mixture

GrafCompounder ve	rsion 2.00	3	-	No. 14		1												
File Edit Help										-					_			
Input data:										Criteria:							Output:	
	50AL51	50AL512	50AL513	50AL514	50AL515	50AL516	50AL 517	50AL518	50AL542	Name	Min	Max	From	To	Wei	Trdoff		
Testdateien	1111111111				10 percent and a second	HEARING	STI OCTION OF	100 11000		hand the second second			- Constant	1.142		-	-	
	Recipes:																	
Ingredients:	50AL511	50AL512	50AL513	50AL514	50AL515	50AL516	50AL517	50AL518	50AL 542								50AL45Test	
NR (SMR - 10)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	NR (SMR - 10)	100	100	1		1	1	100	
N330	10.00	30.00	50.00	25.00	45.00	75.00	45.00	65.00	50.00	N330	10	75	48	5	2		48.225	
CaCO3	20.00	20.00	20,00	20,00	20.00	20.00	20.00	20.00		CaCO3	0	20					20	
Naphtenic Oil	5,00	25,00	45,00	5,00	25,00	45,00	5,00	25,00	10,00	Naphtenic Oil	5	45					34,5	
ZnO	5,00	5,00	5,00	5,00	5,00	5.00	5,00	5,00	5,00	ZnO	5	5					5	
Stearic Acid	2,00	2,00	2.00	2,00	2,00	2,00	2,00	2,00	2,00	Stearic Acid	2	2					2	
IPPD	2.00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	IPPD	2	2					2	
S	1,50	1,50	1,50	1,50	1,50	1,50	1,50	1,50	0.25	S	0,25	1,5					1,5	
TMTD - 80									1,00	TMTD - 80	0	1						
CBS - 80	0,65	0,65	0,65	0,65	0.65	0,65	0,65	0,65	2,10	CBS - 80	0,65	2,1					0,65	
Total	146,15	186,15	226,15	161,15	201,15	251,15	181,15	221,15	172,35	Total	146,1	5 251,15	5	_			213,875	
Properties:																		
MooneyML(1+4) 100°C	32,00	36,00	31,00	34,00	30,00	42.00	60,00	39,00	41,00	MooneyML(1+4)	30	60					33,7975	
Mooney t5 / 120°C	28.00	28,00	32,00	28,00	32,00	22,00	20,00	25,00	11,00	Mooney (5 / 120*	C11	32					29,2	
Density	1,08	1,12	1,16	1,13	1,16	1,19	1,19	1,20	1,11	Density	1,08	1,2					1,15685	
Hardness	42,00	41,00	40,00	48,00	48.00	52,00	61,00	61,00	59.00	Hardness	40	61	40	45	5		44,875	
M300	1,80	3,00	3,00	4,40	4,60	5,30	9,00	7,60	9,40	M300	1,8	9,4					3,8755	
TS	25,00	21,00	15,00	25,00	20,00	15,30	23,00	18,00	23,00	TS	15	25	-				17,6155	
EB	785,00	725,00	690,00	715,00	705,00	615,00	560,00	590,00	540,00	EB	540	785	_				683,8625	
DVR -26°C /24h	22,00	28,00	30,00	17,00	19,00	35,00	29,00	27,00	77.00	DVR -26°C /24h	17	77					27,805	
DVR 0°C /24h	10,00	14.00	14,00	8,00	12,00	16,00	13.00	12,00	16.00	DVR 0°C /24h	8	16					13,32	
DVR 23*C /72h	8,00	10.00	14,00	9,00	13.00	16,00	10,00	17,00	18,00	DVR 23*C /72h	8	18					13,345	
DVR 70°C 724h	39,00	0. 50,00	61,00	44,00	50,00	54,00	44,00	50,00	17,00	DVR 70°C724n	17	01					04,08	
																		Ť
41																P	147	7.
Recipe ratios in %:	5.25	i 11	45.25	6	11	13.5	0.00	8	0.00								Sum of recipe ratio	os (should be 100%):
		Nu	mber form	nat 123	45.67	]	<b>,,,,</b> ,	mport inp	ut data from cl	pboard Auto mix	(overw	rite mixtu	re) A	Auto m	ix (new )	mixture}		
	_	140				2											-	

### You can double-click the cell "Mixture 1" to rename it

In the example above, the cell is being renamed to "50 AL45Test"



# Naming the mixture

File Fall Links					_											_		
File Ealt Help	_									Warman and	_			_			Min and a	
input data:	Freedoments	D-D/DMD-D3-D	Contraction of the local division of the loc			(Deputy of the stand	+50/10/2+54/04			Criteria:	15205	Taxasta		2023	Times	Destaura and	Output:	
-	50AL51	50AL512	50AL513	50AL514	50AL515	50AL516	50AL517	50AL518	50AL542	Name	Min	Max	From	To	Wei	Trdoff	-	
Testdateien																		4
	Recipes:			and the second														
Ingredients:	50AL511	50AL512	50AL513	50AL514	50AL515	50AL516	50AL517	50AL518	50AL542		1						50AL45Test	
NR (SMR - 10)	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	NR (SMR - 10)	100	100			-	-	100	
N330	10,00	30,00	50,00	25,00	45,00	75,00	45.00	65,00	50,00	N330	10	75	48	5	2		48,225	
CaCO3	20,00	20,00	20,00	20,00	20,00	20,00	20,00	20,00	40.00	CaCO3	0	20					20	
Naphtenic Oil	5,00	25,00	45,00	5,00	25,00	45,00	5,00	25,00	10,00	Napriteriic Oli	5	40					34,5	
ZhO	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	2n0	0	0					5	
Steanic Acid	2,00	2,00	2.00	2,00	2,00	2,00	2,00	2,00	2,00	Steanc Acid	2	2					2	
IPPD	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	IPPD	2	2				-	2	
TUTO OO	1,50	1,50	1,50	1,50	1,50	1,50	1,50	1,50	0,25	5	0,25	1,0					1,0	
IMID - 80	0.00	0.05	0.05	0.05	0.05	0.05	0.05	0.05	1,00	IMID - 80	0	1					0.05	
CBS-80	0,65	0,05	0,05	0,00	0,05	0.05	0,05	0,05	2,10	CBS - 80	0,65	2,1					0,05	
Total	146,15	185,15	226,15	161,15	201,15	251,15	181,15	221,15	1/2,35	/ ota/	146,1	5 251,15					213,8/5	
Properties:																		
MooneyML(1+4) 100°C	32,00	36,00	31,00	34,00	30,00	42,00	60,00	39,00	41,00	MooneyML(1+4)	30	60					33,7975	
Mooney 15 / 120°C	28,00	28,00	32,00	28,00	32,00	22,00	20.00	25,00	11,00	Mooney t5 / 120*C	:11	32					29,2	
Density	1,08	1,12	1,16	1,13	1,16	1,19	1,19	1,20	1,11	Density	1,08	1,2					1,15685	
Hardness	42,00	41,00	40,00	48,00	48,00	52,00	61,00	61,00	59.00	Hardness	40	61	40	4	5		44,875	
M300	1,80	3,00	3,00	4,40	4,60	5,30	8,00	7,60	9,40	M300	1,8	9,4					3,8755	
TS	25,00	21,00	15,00	25,00	20,00	15,30	23,00	18,00	23,00	TS	15	25	-				17,6155	
EB	785,00	725,00	690,00	715,00	705,00	615,00	560,00	590,00	540,00	EB	540	785					683,8625	
DVR -26°C /24h	22,00	28,00	30,00	17,00	19,00	35,00	29,00	27,00	77.00	DVR -26°C /24h	17	77					27,805	
DVR 0°C /24h	10,00	14,00	14,00	8,00	12,00	16,00	13.00	12,00	16,00	DVR 0°C /24h	8	16					13,32	
DVR 23*C /72h	8,00	10.00	14,00	9,00	13.00	16,00	10,00	17,00	18,00	DVR 23°C /72h	8	18					13,345	
DVR 70°C /24h	39,00	50,00	61,00	44,00	50,00	54,00	44,00	50,00	17,00	DVR 70°C /24h	17	61					54,58	
											_			_		7.	-	7.
Recipe ratios in %																	Sum of recipe ratio	os (should be 100%)
10000 11 10.	5,25	11	45,25	6	11	13,5	0,00	8	0,00								100	e (enouis ec 19070).
		1457				1	-						107					

There are two options for analysis:

- 1) Copy "50 AL45Test" column information and insert in a separate spreadsheet.
- 2) Copy "50 AL45Test" column and append in last column in next column after 50AL542



# Data analysis – Option 1

)ate	i <u>B</u> earbeiten <u>A</u> nsicht	<u>Einfügen</u>	ormat Extras	Daten Fenst	er <u>H</u> ilfe								
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						*							
	+ 7	$\sqrt{2}$ =											
	A	В	С	D	E	F	G	н	I	J	к	L	
6	Testdateien												
2		Recipes:											
3	Ingredients:	50AL511	50AL512	50AL513	50AL514	50AL515	50AL516	50AL517	50AL518	50AL542	50AL45Test		
8	NR (SMR - 10)	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00		
5	N330	10,00	30,00	50,00	25,00	45,00	75,00	45,00	65,00	50,00	48,23		
6	CaCO3	20,00	20,00	20,00	20,00	20,00	20,00	20,00	20,00		20,00		
7	Naphtenic Oil	5,00	25,00	45,00	5,00	25,00	45,00	5,00	25,00	10,00	34,50		
8	ZnQ	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00		
9	Stearic Acid	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00		
10	IPPD	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00		
11	S	1,50	1,50	1,50	1,50	1,50	1,50	1,50	1,50	0,25	1,50		
12	TMTD - 80			1105656						1,00			
13	CBS - 80	0,65	0,65	0,65	0,65	0,65	0,65	0,65	0.65	2,10	0,65		
14	Total	146,15	186,15	226,15	161,15	201,15	251,15	181,15	221,15	172,35	213,88		
15													
16	Properties:							699140-44-99					
17	MooneyML(1+4) 1	32,00	36,00	31,00	34,00	30,00	42,00	60,00	39,00	41,00	33,80		
18	Mooney t5 / 120°C	28,00	28,00	32,00	28,00	32,00	22,00	20,00	25,00	11,00	29,20		
19	Density	1,08	1,12	1,16	1,13	1,16	1,19	1,19	1,20	1,11	1,16		_
20	Hardness	42,00	41,00	40,00	48,00	48,00	52,00	61,00	61,00	59,00	44,88		
21	M300	1,80	3,00	3,00	4,40	4,60	5,30	8,00	7,60	9,40	3,88		
22	TS	25,00	21,00	15,00	25,00	20,00	15,30	23,00	18,00	23,00	17,62		
23	EB	785,00	725,00	690,00	715,00	705,00	615,00	560,00	590,00	540,00	683,86		
24	DVR -26°C /24h	22,00	28,00	30,00	17,00	19,00	35,00	29,00	27,00	77,00	27,81		
25	DVR 0°C /24h	10,00	14,00	14,00	8,00	12,00	16,00	13,00	12,00	16,00	13,32		
26	DVR 23°C /72h	8,00	10,00	14,00	9,00	13,00	16,00	10,00	17,00	18,00	13,35		
27	DVR 70°C /24h	39,00	50,00	61,00	44,00	50,00	54,00	44,00	50,00	17,00	54,58		
28													

# Option 1: Right click on the "50 AL501test" column and open the short cut menu

Choose "copy this mixture to clipboard"



### **Creating the Formula – Option 1**

ate	Bearbeiten Ansicht	<u>E</u> infügen <u>E</u>	ormat E <u>x</u> tras	Daten Fengt	er <u>H</u> ilfe								
1	• 🙉 • 🗖 🗠 🖟		Q ABS ABC		• 🛷 🖄 •	@ + I 🙈 I	A ZA Ish	>2 AA 🐼		0	nden 💌	B m	
					~ ~	· ·					Control Control	· • •	
94	Arial	• 10	• F K	U E E	3 8 🖽	J % 5%	000 000.	🔹 🗆 🔹	🖾 · 🗛 ·				
						+							
	+ 7	$\Sigma = [$											
-		D	C	D	6	E	G	ц	I	-		1	
1	Tostdataion	0		U	E		0		1	1	<u>~</u>	L	
2	restuateren	Pecines											
3	Ingredients:	50AL 511	50AL512	50AL513	50AI 514	50AL515	50AL516	50AI 517	50AI 518	50AI 542	50AI 45Test		
4	NR (SMR - 10)	100.00	100 00	100.00	100 00	100.00	100 00	100 00	100 00	100 00	100.00		
5	N330	10.00	30.00	50.00	25.00	45.00	75.00	45.00	65.00	50.00	48,23		
6	CaCO3	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00		20.00		
7	Naphtenic Oil	5.00	25.00	45.00	5.00	25.00	45.00	5.00	25.00	10,00	34,50		2
8	ZnO	5,00	5.00	5.00	5.00	5,00	5.00	5.00	5,00	5.00	5.00		
9	Stearic Acid	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00		
10	IPPD	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00		
11	S	1,50	1,50	1,50	1,50	1,50	1,50	1,50	1,50	0,25	1,50		
12	TMTD - 80									1,00			
13	CBS - 80	0,65	0,65	0,65	0,65	0,65	0,65	0,65	0,65	2,10	0,65		
14	Total	146,15	186,15	226,15	161,15	201,15	251,15	181,15	221,15	172,35	213,88		
15		· · · · · · · · · · · · · · · · · · ·											
16	Properties:							CONTRACTOR					
17	MooneyML(1+4) 1	32,00	36,00	31,00	34,00	30,00	42,00	60,00	39,00	41,00	33,80		
18	Mooney t5 / 120°C	28,00	28,00	32,00	28,00	32,00	22,00	20,00	25,00	11,00	29,20		
19	Density	1,08	1,12	1,16	1,13	1,16	1,19	1,19	1,20	1,11	1,16		
20	Hardness	42,00	41,00	40,00	48,00	48,00	52,00	61,00	61,00	59,00	44,88		
21	M300	1,80	3,00	3,00	4,40	4,60	5,30	8,00	7,60	9,40	3,88		
22	IS	25,00	21,00	15,00	25,00	20,00	15,30	23,00	18,00	23,00	17,62		
23	EB	785,00	725,00	690,00	/15,00	705,00	615,00	560,00	590,00	540,00	683,86		
24	DVR -26°C /24h	22,00	28,00	30,00	17,00	19,00	35,00	29,00	27,00	77,00	27,81		
25	DVR 0°C /24h	10,00	14,00	14,00	8,00	12,00	16,00	13,00	12,00	16,00	13,32		
20	DVR 23°C //2h	8,00	10,00	14,00	9,00	13,00	16,00	10,00	17,00	18,00	13,35		
10	DVR /0°C /24h	39,00	50,00	61,00	44,00	50,00	54,00	44,00	50,00	17,00	54,58		
28										1.000			1

Switch to the calculation program sheet with the formulas in it.

Insert the copied cells after the last formula column.

- Adjust any minute amounts or eliminate them
- Select number format you want.

### Review the formula by comparing it with the formulas it was compounded from.



### **Review the Formula - Option 1**

atei	Bearbeiten Ansich	t <u>E</u> infügen <u>E</u>	ormat Extras	Daten Fenst	er <u>H</u> ilfe									
1	• 🎯 • 🗖 👒 🖟	2 8 8	Q ABS ABC	🗙 🖏 👘	• 🛷 🖏 •	(di • ) 🙈	AL 24 Ide	22 # 🐼		0	nden 두	5 m		
-											Contraction (Contraction)	×		
34	Arial	• 10	• F K	⊻≣≣	3 8 🖽	J % 3	.000 .000	•	፼・鼻・					
_						• • • • •								1
_		$\langle \Sigma \rangle = 1$												
	A	В	С	D	E	F	G	н	I	J.	ĸ	L		
	Testdateien													81
		Recipes:												L
	Ingredients:	50AL511	50AL512	50AL513	50AL514	50AL515	50AL516	50AL517	50AL518	50AL542	50AL45Test			1
	NR (SMR - 10)	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00			e.
	N330	10,00	30,00	50,00	25,00	45,00	75,00	45,00	65,00	50,00	48,23			1
	CaCO3	20,00	20,00	20,00	20,00	20,00	20,00	20,00	20,00		20,00			8
	Naphtenic Oil	5,00	25,00	45,00	5,00	25.00	45.00	5,00	25,00	10,00	34,50		12	
	ZnO	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00			E
	Stearic Acid	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00			8
	IPPD	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00			E.
1	S	1,50	1,50	1,50	1,50	1,50	1,50	1,50	1,50	0,25	1,50			e.
	TMTD - 80		1.10	26						1,00				k
	CBS - 80	0,65	0,65	0,65	0,65	0,65	0,65	0,65	0.65	2,10	0,65			
4	Total	146,15	186,15	226,15	161,15	201,15	251,15	181,15	221,15	172,35	213,88			÷
		10 C												
	Properties:													
	MoonevML(1+4) 1	32,00	36,00	31,00	34,00	30,00	42,00	60,00	39,00	41,00	33,80			
	Mooney t5 / 120°C	28,00	28,00	32,00	28,00	32,00	22,00	20,00	25,00	11,00	29,20			
	Density	1,08	1,12	1,16	1,13	1,16	1,19	1,19	1,20	1,11	1,16			
	Hardness	42,00	41,00	40,00	48,00	48,00	52,00	61,00	61,00	59,00	44,88			
1	M300	1,80	3,00	3,00	4,40	4,60	5,30	8,00	7,60	9,40	3,88			
	TS	25,00	21,00	15,00	25,00	20,00	15,30	23,00	18,00	23,00	17,62			
	EB	785,00	725,00	690,00	715,00	705,00	615,00	560,00	590,00	540,00	683,86			
1	DVR -26°C /24h	22,00	28,00	30,00	17,00	19,00	35,00	29,00	27,00	77,00	27,81			
	DVR 0°C /24h	10,00	14,00	14,00	8,00	12,00	16,00	13,00	12,00	16,00	13,32			
	DVR 23°C /72h	8,00	10,00	14,00	9,00	13,00	16,00	10,00	17,00	18,00	13,35			
	DVR 70°C /24h	39,00	50,00	61,00	44,00	50,00	54,00	44,00	50,00	17,00	54,58			
2													-	31

You have now created your first formula using the GrafCompounder.

Analyse the "Properties" Are they within the expected range? Carry out a confirming experiment!



# Data Analysis – Option 2

GrafCompounder ve	rsion 2.003	1	Sugar St.														-	
File Edit Help											HI DRAWN M							
Input data:											Criteria						Output	
	50AL51	50AL513	50AL513	504L514	50AL514	58AL518	50AL511	50AL516	50AL54	50AL45Tes	Name	Min	Max	Fr.	To N	N. Tr.	+	
Testdateien											1							
	Recipes:																	
ngredients:	50AL511	50AL5125	50AL513	50AL514	50AL5153	50AL5163	50AL517	50AL518	50AL5423	0AL45Test							50AL45Test	
NR (SMR - 10)	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100	NR (SMR -	100	100				100	
1330	10.00	30,00	50,00	25.00	45,00	75,00	45,00	65,00	50,00	48,23	N330	10	75	48	52		48,225	
CaCO3	20,00	20,00	20.00	20.00	20.00	20,00	20,00	20,00		20	CaCO3	0	20				20	
Vaphtenic Oll	5,00	25,00	45,00	5,00	25,00	45,00	5.00	25,00	10,00	34,5	Naphtenic Oi	15	45				34,5	
nO	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5	ZnO	5	5	-			5	
Rearic Acid	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2	Stearic Acid	2	2				2	
PPD	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2	IPPD	2	2			_	2	
5	1,50	1.50	1,50	1,50	1,50	1,50	1.50	1.50	0.25	1,5	S	0,25	1,5				1,5	
IMTD - 80	0.07	0.00	0.00	0.00	0.05	0.00	0.00	0.00	1,00	0.00	TM/D - 80	0	1					
CBS - 80	0,65	0,05	0,65	0,65	0,65	0,65	0,65	0,65	2,10	0.65	CBS - 80	0,65	2,1	_			0,65	
rotal	148,15	186,15	226,15	161,15	201,15	251,15	181,15	221,15	172,35	213,88	Total	146,	1.251,1	-	i di la contra di la	-	213.875	
Properties:																		
MooneyML(1+4) 100°C	32,00	36,00	31,00	34,00	30.00	42.00	60,00	39,00	41,00	33,80	MooneyML(1	+30	60				33,7975	
looney t5 / 120°C	28,00	28,00	32.00	28.00	32,00	22,00	20.00	25,00	11,00	20.5	Mannou IS I		-32				29,2	
Density	1,08	1,12	1,16	1,13	1,16	1,19	1,19	1,20	1.11	Copy input ta	ble		1,2				1,15685	
Hardness	42,00	41,00	40,00	48,00	48,00	52,00	61,00	61,00	59,00	Copy marked	i cells		51	40	45		44,875	
//300	1,80	3,00	3,00	4,40	4,60	5,30	8,00	7,60	9,40	Paste cells h	ere		9,4	_			3,8755	
rs.	25,00	21,00	15.00	25,00	20,00	15,38	23,00	18.00	23,00	Delete marke	ed rows		25				17,6155	
EB	785,00	725,00	690,00	715.00	705,00	615,00	560,00	590.00	540,00	Delete marke	ad columns		785				683,8625	
DVR -26"C /24h	22,00	28,00	30,00	17,00	19,00	35,00	29:00	27.00	77.00	losed empty	TO SOUTHING		//				27,805	
DVR 0°C /24h	10,00	14,00	14,00	8,00	12,00	10,00	13,00	12,00	15,00	mount empty	101		10	-			13,32	
JVR 23°C //2h	00,8	10,00	14,00	9,00	13,00	16,00	10,00	17.00	18,00	Insert empty	column		18				13,345	
DVR 70°C 724h	39,00	50,00	01.00	44,00	50,00	54,00	44,00	50,00	17,00	Append emp	ty column		<b>D1</b>	L			04,08	
										Clear market	d cells							
										Round value:	s to two decimal pi	laces						
										-			-					
41										,	P at						F 46	7,
tecipe ratios in %:	6.76	44	45.25	8		43.5	0.00		0.00		-						Sum of recipe ra	dios (should be 10
	0,20	- 11	40,20	0	- 0	10,0	0,00	0	0,00								1.04	

# Option 2: You can paste this formula into the Grafcompounder spreadsheet

- Round the values to two decimal places with a right click to get the pull down menu



# Data analysis – Option 2

GrafCompounder ve	ersion 2.00	3	-	· · · · ·	- 1			5.0												
File Edit Help																		_		
Input data:												Criteria:							Output:	
	50AL51	50AL512	50AL513	50AL514	50AL51	50AL516	50AL51	50AL518	50AL542	50AL45Tes		Name	Min	Max	Fr	To	W	Tr		
Testdateien																				
	Recipes:																			
Ingredients:	50AL511	50AL512	50AL513	50AL514	50AL515	50AL516	50AL517	50AL518	50AL542	50AL45Test									50AL45Test	
NR (SMR - 10)	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00		NR (SMR -	100	100					100	
N330	10,00	30,00	50,00	25,00	45,00	75,00	45,00	65,00	50,00	48,00		N330	10	75	48	52			48,225	
CaCO3	20,00	20,00	20,00	20,00	20,00	20,00	20,00	20,00		20,00		CaCO3	0	20					20	
Naphtenic Oil	5,00	25.00	45,00	5.00	25,00	45,00	5.00	25,00	10,00	35.00		Naphtenic Oil	15	45					34,5	
ZnO	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00		ZnO	5	5					5	
Stearic Acid	2.00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00		Stearic Acid	2	2					2	
IPPD	2.00	2.00	2,00	2.00	2,00	2.00	2,00	2,00	2.00	2,00		IPPD	2	2					2	
S	1,50	1,50	1,50	1,50	1,50	1,50	1,50	1,50	0,25	1,50		S	0.25	1,5	-				1,5	
TMTD - 80									1.00			TMTD - 80	0	1						
CBS - 80	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	2.10	0.65		CBS - 80	0.65	21					0.65	
Total	146,15	5 186,15	226,15	161,15	201,15	251,15	181,15	221,15	172,35	214,15		Total	146,	1.251,1	_				213,875	
Properties:																				
MooneyML(1+4) 100°C	32.00	36.00	31.00	34,00	30.00	42.00	60.00	39,00	41.00	33,80		MoonevML(1-	+30	60	_			_	33,7975	
Mooney t5 / 120°C	28,00	28,00	32,00	28,00	32,00	22.00	20,00	25,00	11,00	29,20		Mooney t5 /	11	32					29,2	
Density	1.08	1,12	1,16	1,13	1,16	1,19	1,19	1,20	1,11	1,16		Density	1,08	1,2					1,15685	
Hardness	42.00	41.00	40.00	48.00	48.00	52.00	61.00	61.00	59.00	44,88		Hardness	40	61	40	45			44,875	
M300	1,80	3,00	3.00	4,40	4,60	5,30	8.00	7,60	9,40	3,88		M300	1.8	9,4					3,8755	
TS	25.00	21,00	15.00	25.00	20.00	15,30	23.00	18.00	23,00	17.52		TS	15	25					17,6155	
EB	785.00	725.00	690.00	715.00	705.00	815.00	560.00	590.00	540.00	683.86		EB	540	785					683,8625	
DVR -26°C /24h	22.00	28.00	30.00	17.00	19.00	35.00	29.00	27.00	77.00	27.81		DVR -26*C	17	77					27.805	
DVR 0*C /24h	10.00	14.00	14.00	8.00	12.00	16.00	13.00	12.00	16.00	13.32		DVR 0*C	8	16					13.32	
DVR 23°C /72h	8.00	10.00	14.00	9.00	13.00	16.00	10.00	17.00	18.00	13,35		DVR 23°C	8	18					13.345	
DVR 70°C /24h	39,00	50,00	61,00	44,00	50,00	54,00	44,00	50,00	17,00	54,58		DVR 70°C	17	61					54,58	
4			_									-						7.		
Recipe ratios in %:	6.20		15.05			45.5	0.00		0.00										Sum of recipe ra	tios (should be 100%
	5,25	11	45,25	6	11	13,5	0,00	8	0,00	6 G									130	
		Nu	mber form	nat 123	45.67	1		Import inp	ut data fro	m clipboard	Auto	mix (overwrite	mixtu	re) (	Auto	mix (ne	ew mb	dure)		

# You may want to manipulate the ingredient data in the formula

- i.e. take out odd or small numbers
- You need to recalculate the total if you do this



# Data Analysis – Option 2

Grancompounder ve	ersion 2.00	2	Contraction of the local division of the loc					and the second second												
File Edit Help																				
nput data:							_					Criteria:							Output:	
	50AL511	50AL512	50AL513	50AL514	50AL515	50AL 516	50AL517	50AL518	50AL542	50AL45Tes		Name	Min	Max	Fr	To	W	Tr		
Testdateien																				
	Recipes:																			
Ingredients:	50AL511	50AL512 5	0AL513	50AL514	50AL515	50AL516	50AL517	50AL518 5	50AL542 5	0AL45Test									50AL45Test	
NR (SMR - 10)	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100.00	100,00		NR (SMR -	100	100					100	
N330	10,00	30,00	50,00	25,00	45,00	75,00	45,00	65,00	50,00	48,00		N330	10	75	48	52	£	_	48,225	
CaCO3	20,00	20,00	20,00	20,00	20,00	20,00	20,00	20,00		20,00		CaCO3	0	20	-				20	
Vaphtenic Oil	5,00	25,00	45,00	5,00	25,00	45,00	5.00	25,00	10,00	35.00		Naphtenic Oil	5	45					34,5	
2nO	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00		ZhO Chuada taid	0	0				-	5	
stearic Acid	2.00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00		Stearic Acid	2	2				-	2	
e	1.60	1.50	1.50	1.50	1.50	1.50	1.50	1.50	0.25	1.50		S	0.25	18					15	
TMTD - 80	1,00	1,00	1,00	1,50	1,00		3,50	1,00	1.00	1,00		TMTD - 80	0.20	1	-				1,0	
CBS - 80	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	2 10	0.65		CBS - 80	0.65	21					0.65	
Total	146,15	186,15	226,15	161,15	201,15	251,15	181,15	221,15	172,35	214,15		Total	146	1.251,1					213,875	
Properties:																				
MooneyML(1+4) 100°C	32,00	36,00	31,00	34,00	30,00	42,00	60,00	39,00	41,00	33,80		MooneyML(1-	30	60					33,7975	
Mooney t5 / 120°C	28,00	28,00	32,00	28,00	32,00	22,00	20,00	25,00	11,00	29,20		Mooney t5 /	11	32					29,2	
Density	1.08	1,12	1,16	1,13	1,16	1,19	1,19	1,20	1,11	1,16		Density	1,08	1,2					1,15685	
Hardness	42,00	41.00	40,00	48,00	48,00	52,00	61.00	61,00	59,00	44.88		Hardness	40	61	40	) 45	£		44,875	
M300	1,80	3,00	3,00	4,40	4,60	5,30	8,00	7,60	9,40	3,88		M300	1,8	9,4					3,8755	
TS	25,00	21,00	15,00	25,00	20,00	15,30	23,00	18,00	23.00	17,62		TS	15	25					17,6155	
EB	785,00	725,00	690,00	715,00	705,00	615,00	560,00	590,00	540,00	683,86		EB	540	785					683,8625	
DVR -26°C /240	22,00	28,00	30,00	17,00	19,00	35,00	29,00	27.00	15.00	27,81		DVR-201C	11	16				-	27,805	
DVR 0 C /2411	9.00	10,00	14,00	0.00	12,00	16,00	10.00	12,00	10,00	12.36		DVROC	9	10				-	12 245	
DVR 23 C//20	20.00	50.00	61.00	44.00	50.00	54.00	44.00	50.00	17.00	54 59		DVR 23 C	47	61					5,545	
						- Aller	1.055						0.550							
-									_	_	7.	-	_	_	_		_	7.	-	
Recipe ratios in %:												Feature							Sum of recipe	ratios (should be 10
	5,25	11	45,25	6	11	13,5	0,00	8	0,00		1								100	

The formula is now added to your database and will be used in further calculations.

It is strongly recommended that you:

- Perform a confirmation experiment

- Make necessary corrections of properties, if there is any differences seen from calculated and confirmation experiment values

- You need to recalculate the total



## **Creating a 2<sup>nd</sup> Formula**

GrafCompounder ve	rsion 2.004	Ł	-							1									- • ×
File Edit Help	-		-		_			/									-		
Input data:											Criteria:							Output:	
	50AL51	50AL51	50AL513	50AL514	50AL515	50AL516	50AL511	50AL518	50AL 543	EGAL45Ter	Name	Min	Max	From	То	Wei	Trd.		
Demo Data	1110.00000011	CONSISTENT OF	104-102-112-112	100.000 1000021	Internet and the second s		1200017211001		0.000000000		102-102	100004551	CASSOS	2307-2234G III	1457		0.000		
A STREET AND AND A STREET	Recipes:																		1
Ingredients:	50AL5115	0AL512	50AL513	50AL514 8	50AL515	0AL516	50AL517	50AL518	50AL542	50AL45T								50AL45Test	
NR (SMR - 10)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	NR (SMR - 10)	100	100					100	
N330	10.00	30.00	50.00	25.00	45.00	75.00	45.00	65.00	50.00	48.23	N330	10	75	48	52			48.225	
CaCO3	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00		20.00	CaCO3	0	20					20	
Naphtenic Oil	5.00	25.00	45.00	5.00	25.00	45.00	5.00	25.00	10.00	34.50	Naphtenic Oll	5	45					34.5	
ZnO	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	ZnO	5	5					5	
Stearic Acid	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	Stearic Acid	2	2					2	
IPPD	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	IPPD	2	2					2	
S	1,50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	0.25	1.50	S	0.25	1.5					1.5	
TMTD - 80									1.00		TMTD - 60	0	1						
CBS - 80	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	2.10	0.65	CBS - 80	0.65	2.1					0.65	
Total	146.15	186.15	226.15	161.15	201.15	251.15	181.15	221.15	172.35	213.88	Total	146.1	5251.15	_	_	_	_	213.875	
Properties:																			
MooneyML(1+4) 100°C	32.00	36.00	31.00	34.00	30.00	42.00	60.00	39.00	41.00	33.80	MooneyML(1+4)	30	60				1	33.7975	
Mooney t5 / 120°C	28.00	28.00	32 00	28.00	32.00	22 00	20 00	25.00	11.00	29.20	Mooney t5 /	11	32					29.2	
Density	1.08	1.12	1.16	1.13	1,16	1.19	1.19	1.20	1.11	1.16	Density	1.08	1.2					1.15685	
Hardness	42.00	41.00	40.00	48.00	48.00	52.00	61.00	61.00	59.00	44.88	Hardness	40	61	40	45			44.875	
M300	1.80	3.00	3.00	4.40	4.60	5.30	8.00	7.60	9.40	3.88	M300	1.8	9.4					3.8755	
TS	25.00	21.00	15.00	25.00	20.00	15.30	23,00	18.00	23.00	17.62	TS	15	25	20				17.6155	
EB	785.00	725.00	690.00	715.00	705.00	615.00	560.00	590.00	540.00	683.86	EB	540	785					683.8625	
DVR -26"C /24h	22.00	28.00	30.00	17.00	19.00	35.00	29.00	27.00	77.00	27.81	DVR -26*C /24h	17	77					27.805	
DVR 0°C /24h	10.00	14.00	14.00	8.00	12.00	16.00	13,00	12.00	16.00	13.32	DVR 0*C /24h	8	16					13.32	
DVR 23°C /72h	8.00	10.00	14.00	9.00	13.00	16.00	10.00	17.00	18.00	13.35	DVR 23*C /72h	8	18					13.345	
DVR 70°C /24h	39.00	50.00	61.00	44.00	50.00	54.00	44.00	50:00	17:00	54.58	DVR 70°C /24h	17	61					54.58	
Recipe ratios in %:										,		_			_	_	<b>,</b> ,	Sum of recipe ratios	(should be 100%):
	5.25	11	45.25	6	11	13.5		8	8									100	

To create a 2nd formula:

- Change the chosen criteria or introduce a new criterion
- We have added "Tensile Strength (TS) greater than 20 MPa" to the list of criteria in the example above.
  - We disable 50AL45Test, because no confirmation experiment has been done yet.



# **Creating a 2<sup>nd</sup> Formula**

di GrafCompounder ver	sion 2.00	4																- E	- 8 X
File Edit Help																			
Input data:											Criteria:							Output	
	50AL51	50AL512	50AL513	50AL514	50AL51	50AL516	50AL517	50AL 518	50AL542	50AL45T4	Name	Min	Max	From	To	Wel.	Trd		
Demo Data																			
	Recipes:																		n
Ingredients:	50AL511	50AL512	50AL513	50AL514	50AL515	50AL516	50AL517	50AL518	50AL542 5	0AL45T								50AL45Test	
NR (SMR - 10)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	NR (SMR - 10)	100	100	· · · · ·				100	
N330	10.00	30.00	50.00	25.00	45.00	75.00	45.00	65.00	50.00	48.23	N330	10	75	48	5	2		48.225	
CaCO3	20.00	20.00	20,00	20.00	20.00	20.00	20.00	20.00		20.00	CaCO3	0	20					20	
Naphtenic Oil	5.00	25.00	45.00	5.00	25.00	45.00	5.00	25.00	10.00	34.50	Naphtenic Oil	5	45					34.5	
ZnO	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	ZnO	5	5					5	
Stearic Acid	2.00	2.00	2,00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	Stearic Acid	2	2					2	
IPPD	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	IPPD	2	2					2	
S	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	0.25	1.50	S	0.25	1.5					1.5	
TMTD - 80							-		1.00		TMTO - 80	0	71						
CBS - 80	0.65	0.65	0.65	0.65	0.65	0.65	Auto	matic mi	xing in pro	cess			2.1					0.65	
Total	146.15	186.15	226.15	161.15	201.15	251.15	1	_					251.1	5				213.875	
Properties:								ore of her	et mixture d	o for ilmunri	s batter): 102.9664							-	
MooneyML(1+4) 100°C	32.00	36.00	31.00	34.00	30.00	42,00	30	ore or bea	SI ITAXIDI E 3	so iai (iowei i	5 Deller). 105.5004		60					33.7975	
Mooney t5 / 120°C	28.00	28.00	32.00	28.00	32.00	22,00							32					29.2	
Density	1.08	1.12	1.16	1.13	1.16	1.19		Tak	e best mixt	ture so far	Cancel		1.2					1.15685	
Hardness	42.00	41.00	40.00	48.00	48.00	52.00							61	40	4	5		44.875	
M300	1.80	3.00	3.00	4.40	4.60	5,30	8.00	7.00	9.40	3,66	M300	7.0	9.4					3.8755	
TS	25.00	21.00	15.00	25.00	20.00	15.30	23.00	18.00	23.00	17.62	TS	15	25	20	ř.			17.6155	
EB	785.00	725.00	690.00	715.00	705.00	615.00	560.00	590.00	540.00	683.86	EB	540	785					683.8625	
DVR -26*C /24h	22.00	28.00	30.00	17.00	19.00	35.00	29.00	27.00	77.00	27.81	DVR -26*C /24h	17	77					27.805	
DVR 0°C /24h	10.00	14.00	14.00	8,00	12.00	16.00	13.00	12.00	16.00	13.32	DVR 0°C /24h	8	16					13.32	
DVR 23°C /72h	8.00	10.00	14.00	9.00	13.00	16.00	10.00	17.00	18.00	13.35	DVR 23°C /72h	8	18					13.345	
DVR 70°C /24h	39.00	50.00	61,00	44.00	50.00	54.00	44.00	50.00	17.00	54.58	DVR 70*C /24h	17	61					54.58	
																	_		
14 N										7.1							17.H	41	7.8
Recipe ratios in %:	5.25	11	45.25	6	11	13.5	1	8										Sum of recipe ratios 100	(should be 100%):
-			hiumh		100.45	-		Laura	at loanst start	the second set in the					ute co	in teacor	an hite or a	7	
			Numbe	er tormat:	12345.6			Impo	n input dat	a from clipbo	ard Auto mix (o	verwrite	e mixture		uto m	ix (new	mixture)		

Because we do not want the first formula to be overwritten, and because we will use the 2nd formula for comparison,

- click on: "Auto mix (new mixture)"
- Since no mixture is found which exactly fulfils all criteria in this case, the new compound has a score of 100.2232.
- Click on " Take best mixture so far "



# Creating a 2nd formula

File Edit Help				1.0																
nput data:												Criteria:							Output	
	50AL511	50AL512	50AL513	50AL514	50AL516	50AL516	50AL517	50AL518	50AL542 5	0AL45Tes		Name	Min	Max	Fr	To	W T	f.,		1
Testdateien													1	11 11						
	<b>Recipes:</b>																			
Ingredients:	50AL511	50AL5125	50AL513	50AL514 5	0AL5153	50AL516 5	0AL517	0AL518 5	0AL542 50	AL45Test									50AL45Test	Abdure2
NR (SMR - 10)	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00		NR (SMR -	100	100					100	100
N330	10.00	30,00	50,00	25,00	45,00	75,00	45.00	65,00	50,00	48,00		N330	10	75	48	52			48,225	41,525
CaCO3	20.00	20,00	20,00	20,00	20,00	20,00	20,00	20,00		20,00		CaCO3	0	20					20	19,2
Naphtenic Oil	5,00	25,00	45,00	5,00	25,00	45,00	5,00	25,00	10,00	35,00		Naphtenic Oil	5	45					34,5	27,7
ZnO	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00	5,00		ZnO	5	5					5	5
Stearic Acid	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00		Stearic Acid	2	2					2	2
IPPD	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00		IPPD	2	2	_				2	2
S	1,50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	0.25	1.50		S	0.25	1.5					1.5	1.45
TMTD - 80									1.00			TMTD - 80	0	1						0.04
CBS - 80	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	2.10	0.65		CBS - 80	0.65	21					0.65	0.708
Total	146,15	186,15	226,15	161,15	201,15	251,15	181,15	221,15	172,35	214,15		Total	146,	1.251,1					213,875	199,623
Properties:																				
MooneyML(1+4) 100°C	32,00	36,00	31,00	34,00	30,00	42,00	60,00	39,00	41,00	33,80		MooneyML(1+	+30	60					33,7975	37,52
Mooney t5 / 120°C	28,00	28,00	32,00	28,00	32,00	22,00	20,00	25,00	11,00	29,20		Mooney t5 /	11	32					29,2	25,835
Density	1.08	1,12	1,16	1,13	1,16	1,19	1,19	1,20	1,11	1,16		Density	1.08	1.2					1,15685	1,13775
Hardness	42,00	41.00	40,00	48.00	48,00	52,00	61.00	61.00	59,00	44.88		Hardness	40	61	40	45			44,875	45.02
M300	1.80	3.00	3.00	4,40	4.60	5.30	8.00	7.60	9,40	3.88		M300	1.8	9.4					3.8755	3,94075
TS	25.00	21.00	15.00	25.00	20.00	15.30	23.00	18.00	23.00	17.62		TS	15	25	20				17.6155	19,99925
EB	785.00	725 00	690.00	715.00	705.00	615.00	560.00	590.00	540.00	683 86		EB	540	785					683,8625	689.55
DVR -26°C /24h	22.00	28.00	30.00	17.00	19.00	35.00	29.00	27.00	77.00	27.81		DVR-26°C	17	77					27.805	30,785
DVR 0°C /24h	10.00	14.00	14 00	8.00	12.00	15.00	13.00	12 00	16.00	13 32		DVR 0°C	8	16					13.32	14 08
DVR 23*C /72h	8.00	10.00	14.00	9.00	13.00	16.00	10.00	17.00	18.00	13 35		DVR 23°C	8	18					13 345	117225
DVR 70°C /24h	39.00	50.00	61 00	44.00	50.00	54.00	44 00	50.00	17.00	54 58		DVB 70°C	17	61					54 58	49 175
											7.	-1						1.	-	
Recipe ratios in %:																			Sum of recipe i	atios (should b
	0.00	63	0.00	8 25	0.00	24.75	0.00	0.00	4										100	100000000000000000000000000000000000000

# The 2nd formula will be inserted into the next available column and named automatically Mixture2.

- The reason that the new mixture does not have a perfect score of 0 is because the CB N330 ingredient of the new compound missed the limits of 48 to 52 phr.
- Further mixtures with additional criteria can be produced, renamed and transferred in your calculation program in the same manner.



AL515 50AL515 50AL 1515 50AL516 50AL 00.00 100.00 100 45.00 75.00 42 20.00 20.00 22 50.0 50.00 5 200 2.00 2 150 1.50 0.65 0.65 ( 01.15 251.15 18'	L517 50AL518 L517 50AL518 L517 50AL518 500 00 100 00 45.00 65.00 200 2000 5.00 25.00 5.00 25.00 5.00 200 2.00 2.00 1.50 1.50 0.65 0.85	50AL542         50AL45Te           50AL542         50AL45Te           50AL542         50AL45Te           50.00         100.00           50.00         48.23           20.00         20.00           5.00         5.00           5.00         2.00           2.00         2.00           0.05         1.50           1.00         1.50	Criteria: Name NR (SMR - 10) N330 CaCO3 Naphtenic Oil ZnO Steanc Acid IPPD S	Min 100 10 5 5 2 2	Max 100 75 20 45 5 2	From To	W 52	el Trd 5	Output	lixture3 100 48 20
ALS15 SOALS16 SOAL LS15 SOALS16 SOAL 45.00 75.00 42 20.00 20.00 22 5.00 45.00 5 2.00 2.00 2 2.00 2.00 2 1.50 1.50 1 0.65 0.65 ( 0.1.15 251.15 18'	L517 50AL518 00.00 100.00 45.00 65.00 20.00 25.00 5.00 25.00 2.00 2.00 2.00 2.00 1.50 1.50 0.65 0.65	50AL542 50AL45Ta 100.00 100.00 50.00 48.23 20.00 10.00 34.50 5.00 5.00 2.00 2.00 2.00 2.00 0.25 1.50 1.00	Name NR (SMR - 10) N330 CaCO3 Naphtenic Oll ZnO Stearic Acid IPPD S	Min 100 10 5 5 2 2	Max 100 75 20 45 5 2	From To	52	5	50AL45Test N 100 48.225 20	lixture3 100 48 20
L515 50AL516 50AL1 00.00 100.00 100 20.00 20.00 22 500 45.00 5 500 5.00 5 200 2.000 2 200 2.00 5 200 2.00 5 150 1.50 0.65 0.65 ( 01.15 251.15 18'	L517 50AL518 5 00.00 100.00 45.00 65.00 20.00 20.00 5.00 25.00 5.00 5.00 2.00 2.00 2.00 2.00 1.50 1.50 0.65 0.65	30AL542         50AL45T           100.00         100.00           50.00         48.23           20.00         10.00           10.00         34.50           5.00         5.00           2.00         2.00           2.00         2.00           2.00         2.00           2.00         2.00           1.00         1.50	NR (SMR - 10) N330 CaCO3 Naphienic Oll ZnO Stearic Acid IPPD S	100 10 5 5 2	100 75 20 45 5 2	48	52	5	50AL45Test N 100 48.225 20	lixture3 100 48 20
L515 50AL516 50AL 00.00 100.00 101 45.00 75.00 42 20.00 20.00 22 25.00 45.00 5 2.00 2.00 2 2.00 2.00 5 1.50 1.50 5 0.65 0.65 (0) 0.15 251.15 18'	L517 50AL518 5 00 00 100.00 45.00 65.00 20 00 20.00 5.00 5.00 5.00 5.00 2.00 2.00 2.00 2.00 1.50 1.50 0.65 0.65	SOAL542         SOAL45T           100.00         100.00           50.00         48.23           20.00         10.00           100.00         5.00           20.00         2.00           20.00         2.00           20.00         2.00           20.00         2.00           2.00         2.00           0.25         1.50	NR (SMR - 10) N330 CaCO3 Naphtenic Oll ZnO Stearic Acid IPPD S	100 10 5 5 2	100 75 20 45 5 2	48	52	5	50AL45Test M 100 48.225 20 24.5	lixture3 100 48 20
L515 50AL.518 50AL. 00.00 100.00 101 45.00 75.00 44 20.00 20.00 22 5.00 5.00 5 2.00 2.00 2 2.00 2.00 5 2.00 2.00 5 1.50 1.50 1.50 0.65 (0) 0.65 0.65 (0) 01.15 251.15 18	L517 50AL518 5 00.00 100.00 45.00 65.00 20.00 25.00 5.00 25.00 2.00 2.00 2.00 2.00 1.50 1.50 0.65 0.65	30AL542 50AL45T           100.00         100.00           50.00         48.23           20.00         10.00           5.00         5.00           5.00         20.00           20.00         2.00           20.00         2.00           2.00         2.00           2.00         2.00           2.00         2.00           0.25         1.50           1.00         1.00	NR (SMR - 10) N330 CaCO3 Naphtenic Oll ZnO Stearic Acid IPPD S	100 10 5 5 2	100 75 20 45 5 2	48	52	5	50AL45Test 1 100 48.225 20	lbture3 100 48 20
00.00         100.00         100           45.00         75.00         48           20.00         20.00         2           25.00         45.00         5           5.00         5.00         5           2.00         2.00         2           1.50         1.50         1.50           0.65         0.85         (0)           0.15         251.15         18'	00.00 100.00 45.00 65.00 5.00 20.00 5.00 25.00 5.00 2.00 2.00 2.00 1.50 1.50 0.65 0.65	100.00 100.00 50.00 48.23 20.00 5.00 5.00 2.00 2.00 2.00 2.00 0.25 1.50 1.00	NR (SMR - 10) N330 CaCO3 Naphtenic Oil ZnO Stearic Acid IPPD S	100 10 5 5 2 2	100 75 20 45 5 2	48	52	5	100 48.225 20	100 48 20
45:00 75:00 42 20:00 20:00 22 25:00 45:00 5 5:00 5:00 5 2:00 2:00 2 1:50 1:50 5 0:65 0:65 0 001 15 251.15 18	45.00         65.00           20.00         20.00           5.00         25.00           5.00         2.00           2.00         2.00           2.00         2.00           1.50         1.50           0.65         0.65	50.00 48.23 20.00 10.00 34.50 5.00 5.00 2.00 2.00 2.00 2.00 0.25 1.50 1.00	N330 CaCO3 Naphtenic Oll ZnO Stearic Acid IPPD S	10 0 5 5 2 2	75 20 45 5 2	48	52	5	48.225	48 20
20.00         20.00         20           25.00         45.00         5           5.00         5.00         5           2.00         2.00         2           2.00         2.00         2           1.50         1.50         5           0.65         0.65         (0)           0.115         251.15         18'	20.00 20.00 5.00 25.00 5.00 5.00 2.00 2.00 2.00 2.00 1.50 1.50 0.65 0.65	20.00 10.00 34.50 5.00 5.00 2.00 2.00 2.00 2.00 0.25 1.50 1.00	CaCO3 Naphtenic Oll ZnO Stearic Acid IPPD S	0 5 5 2 2	20 45 5 2			+	20	20
26:00 45:00 5 5:00 5:00 2 2:00 2:00 2 1:50 1:50 5 0:65 0:85 ( 01:15 251:15 18	5.00 25.00 5.00 5.00 2.00 2.00 2.00 2.00 1.50 1.50 0.65 0.65	10.00         34.50           5.00         5.00           2.00         2.00           2.00         2.00           0.25         1.50           1.00         1.00	Naphtenic Oil ZnO Stearic Acid IPPD S	5 5 2 2	45 5 2			T	245	
5.00 5.00 5 2.00 2.00 2 1.50 1.50 5 0.65 0.65 0 01.15 251.15 18	5.00 5.00 2.00 2.00 2.00 2.00 1.50 1.50 0.65 0.65	5.00 5.00 2.00 2.00 2.00 2.00 0.25 1.50 1.00	ZnO Stearic Acid IPPD S	5 2 2	5 2				.04.0	33
200 200 2 200 200 2 1.50 1.50 0.65 0.65 0 01.15 251.15 18	200 200 200 2.00 1.50 1.50 0.65 0.65	2.00 2.00 2.00 2.00 0.25 1.50 1.00	Stearic Acid IPPD S	2	2				5	5
2.00 2.00 2 1.50 1.50 0.65 0.65 ( 01.15 251.15 18	2.00 2.00 1.50 1.50 0.65 0.65	2.00 2.00 0.25 1.50 1.00	IPPD	2				1	2	2
1.50 1.50 0.65 0.65 ( 01.15 251.15 18	1.50 1.50 0.65 0.65	0.25 1.50	S	Station and state	2				2	2
0.65 0.65 ( 01.15 251.15 18	0.65 0.65	1.00	1000	0.25	1.5				1.5	1.5
0.65 0.65 0	0.65 0.65		TMTD - 80	0	1					
01.15 251.15 18		2.10 0.65	CBS - 80	0.65	21				0.65	0.65
	81.15 221.15	172.35 213.88	Total	146.1	5251.15				213.875	212.15
30.00 42.00 60	60.00 39.00	41.00 33.80	MooneyML(1+4)	30	60				33.7975	38.4
32.00 22.00 20	20,00 25.00	11.00 29.20	Mooney t5 /	11	32				29.2	25.6
1.16 1.19	1.19 1.20	1.11 1.16	Density	1.08	1.2				1.15685	1.148
48.00 52.00 61	61.00 61.00	59.00 44.88	Hardness	40	61	40	45		44.875	45,4
4.60 5.30 8	8.00 7.60	9.40 3.88	M300	1.8	9.4				3.8755	3.92
20.00 15.30 23	23.00 18.00	23.00 17.62	TS	15	25	20			17.6155	18.72
05.00 615.00 560	60.00 590.00	540.00 683.86	EB	540	785				683.8625	681
19.00 35.00 29	29.00 27.00	77.00 27.81	DVR -26*C /24h	17	77				27.805	30.8
12.00 16.00 13	13:00 12:00	16.00 13.32	DVR 0°C/24h	8	16				13.32	14.8
13.00 16.00 10	10.00 17.00	18.00 13.35	DVR 23*C /72h	8	18				13.345	12.4
50.00 54.00 44	44.00 50.00	17.00 54.58	DVR 70°C /24h	17	61				54.58	51.6
20 0 05 0 19 0 12 0 13 0 50 0	00 15.30 00 615.00 5 10 35.00 10 16.00 10 16.00 10 54.00	0         15.30         23.00         18.00           10         615.00         560.00         590.00           10         35.00         29.00         27.00           10         16.00         13.00         12.00           10         16.00         10.00         17.00           10         54.00         44.00         50.00	10         15.30         23.00         18.00         23.00         17.82           0         615.00         560.00         590.00         540.00         683.65           0         35.00         229.00         27.00         77.00         27.81           10         16.00         13.00         12.00         16.00         13.35           10         54.00         44.00         50.00         17.00         54.58	10         15.30         23.00         18.00         23.00         17.62         TS           0         615.00         560.00         590.00         540.00         683.66         EB           0         35.00         22.00         27.01         27.81         DVR-26*C/24h           00         16.00         13.00         12.00         15.00         13.35         DVR 25*C/24h           10         54.00         44.00         50.00         17.00         54.58         DVR 70*C/24h	10         15.30         23.00         18.00         23.00         17.62         TS         15.00           0         615.00         560.00         590.00         540.00         683.86         EB         54.00           0         35.00         220.00         27.00         77.00         27.81         DVR-26°C/24h         17           00         16.00         13.00         12.00         16.00         13.35         DVR 23°C/278         8           10         54.00         44.00         50.00         17.00         54.56         DVR 70°C/24h         17	10         15.30         23.00         18.00         23.00         17.62         TS         15.25           0         615.00         560.00         590.00         540.00         683.86         EB         250/274         78           0         35.00         220.00         27.00         77.00         27.81         DVR-26*C/24h         17         77           0         16.00         13.00         12.00         16.00         13.35         DVR 25*C/72h         8         16           10         54.00         44.00         50.00         17.00         54.58         DVR 70*C/24h         17         61	10         15.30         23.00         18.00         23.00         17.62         TS         15         25         20           0         615.00         560.00         590.00         540.00         683.86         EB         50.47         763         50.00         54.07         763         15         25         20           0         16.50         560.00         590.00         77.00         27.81         DWR-26'C/24h         17         77           0         16.00         13.00         12.00         16.00         13.35         DVR 23'C/72h         8         16           00         54.00         44.00         50.00         17.00         54.58         DVR 70'C/24h         17         61	10         15.30         23.00         18.00         23.00         17.62         TS         15         25         20           0         616.00         560.00         590.00         540.00         683.66         EB         540         785         15         25         20           0         16.00         13.00         17.00         77.01         27.81         DVR -26*C/24h         17         77           0         16.00         13.00         12.00         16.00         13.35         DVR 23*C/72A         8         16           00         54.00         44.00         50.00         17.00         54.56         DVR 70*C/24h         17         61	10         15.30         23.00         18.00         23.00         17.62         TS         15         25         20           0         616.00         560.00         580.00         580.00         683.66         EB         540         785           0         36.00         29.00         27.00         77.00         27.81         DVR-26*C/24.17         77           0         16.00         13.00         13.25         DVR 27*C/24.16         8         16           00         54.00         44.00         50.00         17.00         54.58         DVR 70*C/24.17         61	10         15.30         23.00         18.00         23.00         17.62         TS         15         25         20         17.6155           0         616.00         560.00         590.00         540.00         683.66         EB         540         785         683.8625         683.8625         27.81         13.32         27.81         27.81         27.81         13.32         13.345

"Mixture 2" – Choices:

- In the previous example CB N 330 has dropped, but we want it to stay at that level.
- Put a weight (5 in our example) on that property.
   This will lift the importance of the selected property above other selections.
- With "Auto mix (new mixture) " you can see the result of the weight in Mixture 3 now. Notice, that differences between Mixture1 and Mixture2 are small.
- In such cases you may chose "Auto mix (overwrite mixture) to save mixture column space on your screen.



GrafCompounder ve	rsion 2.00	4	-							1										- • ×
File Edit Help	_																			_
Input data:											Criteria:			_	_			Output:		
	50AL51	50AL512	50AL513	50AL 514	50AL515	50AL510	50AL517	50AL518	50AL542	50AL 45Te	Name	Min	Max	From	To	Wei	Trd			
Demo Data						1000									1.1.22	10100/000				Á
Superconductory.	Recipes:																		1	3
Ingredients:	50AL511	50AL512	50AL513	50AL514	50AL515	50AL516	50AL517	50AL518	50AL542	50AL45T								50AL45Test	Mixture3	Mixture4
NR (SMR - 10)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	NR (SMR - 10)	100	100	_				100	100	100
N330	10.00	30.00	50.00	25.00	45.00	75.00	45.00	65.00	50.00	48.23	N330	10	75	.48	3 5	2	5	48.225	48	48
CaCO3	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00		20.00	CaCO3	0	20	-				20	20	9
Naphtenic Oil	5.00	25.00	45.00	5.00	25.00	45.00	5.00	25.00	10.00	34.50	Naphtenic Oil	5	45					34.5	33	23.75
ZnO	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	ZnO	5	5					5	5	5
Stearic Acid	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	Stearic Acid	2	2					2	2	2
IPPD	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	IPPD	2	2					2	2	2
S	1.50	1.50	1.50	1,50	1,50	1.50	1.50	1.50	0.25	1.50	S	0.25	1.5					1.5	1.5	0.8125
TMTD - 80									1.00		TMTD - 80	0	1							0.55
CBS - 80	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	2.10	0.65	CBS - 80	0.65	2.1	· · · · ·				0.65	0.65	1.4475
Total	146.15	186,15	226.15	161.15	201.15	251.15	181.15	221.15	172.35	213.88	Total	146.1	5251.13	5	_	_	_	213.875	212.15	192.56
Properties:																			i i i	
MooneyML(1+4) 100°C	32.00	36.00	31.00	34.00	30.00	42.00	60,00	39.00	41.00	33.80	MooneyML(1+4)	30	60					33.7975	38.4	37
Mooney t5 / 120°C	28.00	28.00	32.00	28.00	32.00	22.00	20.00	25.00	11.00	29.20	Mooney t5 /	11	32					29.2	25.6	20.05
Density	1:08	1.12	1.16	1.13	1.16	1.19	1.19	1.20	1.11	1.16	Density	1.08	1.2	-				1.15685	1.148	1.1285
Hardness	42.00	41,00	40.00	48.00	48.00	52.00	61.00	61.00	59.00	44.88	Hardness	40	61	40	) 4	5		44.875	45.4	50.55
M300	1.80	3.00	3.00	4.40	4.60	5.30	8.00	7.60	9.40	3.88	M300	1.8	9.4					3.8755	3.92	6.52
TS	25.00	21.00	15.00	25.00	20.00	15,30	23.00	18.00	23.00	17.62	TS	15	25	20	)			17.6155	18.72	20
EB	785.00	725.00	690.00	715.00	705.00	615.00	560.00	590.00	540.00	683.86	EB	540	785		55	0		683.8625	681	611
DVR -26*C /24h	22.00	28.00	30.00	17.00	19.00	35.00	29.00	27,00	77.00	27.81	DVR -26*C /24h	17	77					27.805	30.8	55.65
DVR 0*C /24h	10.00	14.00	14.00	8.00	12.00	16.00	13,00	12.00	16.00	13.32	DVR 0°C /24h	8	16					13.32	14.8	15.1
DVR 23*C /72h	8.00	10.00	14.00	9.00	13.00	16.00	10.00	17.00	18.00	13.35	DVR 23*C /72h	8	18					13.345	12.4	15.8
DVR 70°C /24h	39.00	50.00	61.00	44.00	50.00	54.00	44.00	50,00	17.00	54 58	DVR 70°C /24h	17	61					54.58	51.6	35.7
Recipe ratios in %:		10	35						55	,	•	_			_			Sum of recipe	ratios (should	1 be 100%):
			Numbe	er format	12345.6	7		Impo	rt input da	ata from clipboa	rd Auto mix (ov	verwrit	e mixture		Auto m	ix (new	mixture)	)		

# In our example we noticed the high Elongation (EB) and high C-Set Values (DVR) at the same time.

- By changing the criteria the formulas can be improved: if we set EB to 550 max, this should improve the DVR as well
- When we select "Auto mix (new Mixture)" and accept the formula at score 513,27 this formula becomes new "Mixture 4".
- The result shows shorter EB still far from 550%, with improved DVR; but now Hardness has increased



GrafCompounder ve	rsion 2.00	4	-							-										- 8 %
File Edit Help							_													
Input data:											Criteria:							Output		
	50AL51	50AL512	50AL513	50AL514	50AL518	50AL516	50AL517	50AL518	50AL542	50AL45Tel	Name	Min	Max	From	To	Wei	Trd			
Demo Data			1														0.4 F - 4775-6411			TA I
	Recipes:																			<b>F</b>
Ingredients:	50AL511	50AL512	50AL513	50AL514	50AL515	50AL516	50AL517 5	0AL518 5	0AL542 5	50AL45T								50AL45Test	Mixture4	
NR (SMR - 10)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	NR (SMR - 10)	100	100					100	100	
N330	10.00	30.00	50,00	25.00	45.00	75.00	45.00	65.00	50.00	48.23	N330	10	75	48	53	2	5	48.225	48	
CaCO3	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00		20.00	CaCO3	0	20					20	9	
Naphtenic Oil	5.00	25.00	45.00	5.00	25.00	45.00	5.00	25.00	10.00	34.50	Naphtenic Oil	5	45					34.5	23.75	
ZnO	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	ZnO	5	5					5	5	
Stearic Acid	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	Stearic Acid	2	2					2	2	
IPPD	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	IPPD	2	2					2	2	3
S	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	0.25	1.50	S	0.25	1.5					1.5	0.8125	
TMTD - 80							6		1.00	Vitin	TMTD - 80	0	1						0.55	
CBS - 80	0.65	0.65	0.65	0.65	0.65	0.65	Auto	matic mis	ding in pro	00000			21					0.65	1.4475	
Total	146.15	186.15	226.15	161.15	201.15	251.15	1	maac mis	ang in pro	00033			251.1	5				213.875	192.56	
Properties:																				
MooneyML(1+4) 100°C	32.00	36.00	31.00	34.00	30.00	42.00	30	ore or bes	I mixiure :	so far (lower i	s Dener) 4392.5880	2	60					33.7975	37	
Mooney t5 / 120°C	28.00	28.00	32.00	28.00	32.00	22.00							32					29.2	20.05	
Density	1.08	1.12	1.16	1.13	1.16	1.19		Take	best mix	ture so far	Cancel		1.2					1.15685	1.1285	
Hardness	42.00	41:00	40.00	48.00	48.00	52.00							61	40	45	5 1	10	44.875	50.55	
M300	1.80	3.00	3.00	4.40	4.60	5.30	0.00	1.00	9.40	3.00	M300	1.0	9.4					3.8755	6.52	
TS	25.00	21.00	15.00	25.00	20.00	15.30	23.00	18.00	23.00	17.62	TS	15	25	20				17.6155	20	
EB	785.00	725.00	690.00	715.00	705.00	615.00	560.00	590.00	540.00	683.86	EB	540	785		55	0 1	10	683.8625	611	
DVR -26°C /24h	22.00	28.00	30.00	17.00	19.00	35.00	29.00	27.00	77.00	27.81	DVR -26°C /24h	17	77					27.805	55.65	
DVR 0°C /24h	10.00	14.00	14.00	8.00	12.00	16.00	13.00	12.00	16.00	13.32	DVR 0°C /24h	8	16					13.32	15.1	
DVR 23°C /72h	8.00	10.00	14.00	9.00	13.00	16.00	10.00	17.00	18.00	13.35	DVR 23°C/72h	8	18					13.345	15.8	
DVR 70°C /24h	39.00	50.00	61.00	44.00	50.00	54.00	44.00	50.00	17.00	54.58	DVR 70°C /24h	17	61					54.58	35.7	
Recipe ratios in %:		10	35						55	,		_			_	_	7.	Sum of recipe	ratios (should	9 + be 100%):
			Numbe	er format:	12345.6	37 💌		Impor	t input da	ta from clipbo	ard Auto mix (o	verwrite	e mixture		uto mi	x (new	mixture)	J		

#### In case of a conflict: we have a conflicting target between elongation (EB) and Hardness so we proceed using "Weight" and "Trdoff":

- On Hardness we change the weight to 10
- Elongation stays with the same weight of 10
- For CB N 330 we stay with 5 to stay close to the value at least.

#### Run with Auto mix (new mixture)



File         Edit. Help           Input data:         50AL51         50AL51           Demo Data         Recipes:           Ingredients:         50AL51         50AL512           Ingredients:         50AL512         50AL512           NR (SMR - 10)         100.00         100.00           N330         10.00         30.00           CaC03         20.00         25.00           ZnO         5.00         5.00           Stearic Acid         2.00         2.00           S         1.50         1.50           TMTD - 80         -         -           CBS - 80         0.655         0.855           Total         146.15         186.15           Mooney/L(1+4) 100°C         32.00         36.00           Mooney/L(1+4) 100°C         32.00         28.00           Lardness         42.00         41.00           M300         1.89         3.00           TS         25.00         21.00           EB         785.00         725.00           DVR 2°C /24h         10.00         14.00           DVR 2°C /24h         10.00         14.00           DVR 70°C /24h         39.00																
Input data: SOAL51 SOAL51 Demo Data Recipes: Ingredients: SOAL51150AL512 NR (SIMR - 10) 100.00 100.00 N330 10.00 20.00 CaCO3 20.00 20.00 CaCO3 20.00 20.00 Stearic Acid 20.00 20.00 Stearic Acid 20.00 2.00 SPD 2.00 2.00 S 150 150 CBS - 80 0.65 0.65 Total 146.15 186.15 Properties: Mooney/b1/120°C 32.00 36.00 Mooney 51/120°C 28.00 28.00 Density 108 12 Hardness 42.00 41.00 M300 180 3.00 TS 25.00 21.00 EB 785.00 725.00 DVR 2°C /24h 10.00 14.00 DVR 2°C /24h 39.00 50.00													_			
SOAL 51         SOAL 51         SOAL 51           Demo Data         Recipes:           Ingredients:         SOAL 511 ISOAL 512 5           NR (SMR - 10)         100.00         100.00           N330         10.00         30.00           CaCO3         20.00         20.00           Na (SMR - 10)         500         25.00           Naghtenic Oil         5.00         5.00           Staric Acid         2.00         2.00           S         1.50         1.50           IMTD - 80         CSS - 80         0.65         0.65           CSS - 80         0.65         0.85         Total         146.15         186.15           Properties:         Mooneyth/1/120°C         28.00         28.00         28.00         28.00           Mooneyth/1/20°C         28.00         28.00         28.00         28.00         28.00           Lardneess         42.00         41.00         3.00         180         3.00           TS         25.00         21.00         28.00         28.00         28.00           DVR 28°C /24h         20.00         28.00         28.00         28.00         28.00           DVR 28°C /24h         0.00							Criteria:							Output		
Demo Data         Recipes:           Ingredients:         50AL51150AL512 5           NR (SIR - 10)         100.00         100.00           N330         100.00         20.00           N330         20.00         20.00           Na (SIR - 10)         5.00         5.00           Staric Acid         2.00         2.00           ZhO         5.00         5.00           Stearic Acid         2.00         2.00           STMTD - 80         CES - 80         0.65         0.65           CBS - 80         0.65         0.65         1.50           Total         146.15         186.15           Properties:         Mooneyt51/120*C         28.00         28.00           Density         1.80         3.00         1.80         3.00           TS         25.00         21.00         25.00         226.00           DVR -28*C /24h         22.00         28.00         28.00         28.00           Density         1.80         3.00         TS         25.00         21.00           EB         785.00         725.00         275.00         20.00         28.00           DVR 23*C //24h         10.00         14.00	AL512 50AL513	50AL514 50AL51	50AL516 50	DALST SOALS	18 50AL 543	50AL45Ta	Name	Min	Max	From T	0	Wei	Trd			
Recipes:           Ingredients:         50AL51150AL5125           NR (SMR - 10)         100.00         100.00           N320         10.00         200.00           Naphtenic Oll         5.00         25.00           ZnO         5.00         5.00           Stearic Acid         2.00         2.00           PPD         2.00         2.00           Stearic Acid         0.05         0.65           CBS - 80         0.65         0.65           Total         146.15         186.15           Properties:         MooneyHL(1+4) 100°C         32.00         36.00           MooneyHL(1+4) 100°C         32.00         36.00         36.00           MaoneyHL(1+4) 100°C         32.00         28.00         28.00           Density         1.08         1.02         1.00           M300         1.80         30.00         180         30.00           DVR 25°C /24h         25.00         21.00         25.00           DVR 26°C /24h         10.00         14.00         14.00           DVR 26°C /24h         10.00         14.00         0.00           DVR 70°C /24h         39.00         50.00         10.0							and the second s		diriting 1							
Ingredients:         50AL51150AL512 fs           NR (SMR - 10)         100.00         100.00           N30         10.00         30.00           CaCO3         20.00         20.00           Naphtenic Oil         5.00         25.00           ZnO         5.00         5.00           Stearic Acid         2.00         2.00           S         1.50         2.00           S         1.50         1.50           CBS - 80         0.65         0.65           Total         146.15         186.15           Properties:         Mooney15/120*C         28.00           Mason         1.80         3.00           TS         25.00         21.00           B         785.00         725.00           DVR -28*C /24h         220.00         28.00           DVR 25*C /24h         20.00         14.00           DVR 70*C /24h         10.00         14.00																
NR (SIR - 10)         100.00         100.00           N330         10.00         30.00           CaCO3         20.00         20.00           Naphtenic Oil         5.00         25.00           ZhO         5.00         5.00           Stearic Acid         2.00         2.00           IPPD         2.00         2.00           S         1.50         1.50           TMTD - 80         -         -           CSB - 80         0.65         0.65           Total         146.15         186.15           Properties:         -         -           Mooneyt51 / 120*C         28.00         28.00           Density         1.88         3.00           TS         25.00         21.00           EB         785.00         725.00           DVR -26*C / 24h         20.00         28.00           DVR 0*C / 24h         10.00         14.00           DVR 25*C / 72h         8.00         10.00           DVR 70*C / 24h         10.00         10.00	AL512 50AL513 5	0AL514 50AL515	50AL516 50	AL517 50AL5	8 50AL542	50AL45T								50AL45Test Mit	xture4	Mixture5
N330         10.00         30.00           CaCO3         20.00         20.00           CaCO3         20.00         20.00           Naphtenic Oil         5.00         25.00           ZnO         5.00         5.00           Stearic Acid         2.00         2.00           PPD         2.00         2.00           Stearic Acid         0.05         1.50           TMTD - 80         -         -           CBS - 80         0.65         0.65           Total         146.15         186.15           Properties:         -         -           Mooneylit / 120°C         28.00         28.00           Density         1.08         1.02           Hardness         42.00         41.00           M300         1.80         30.00           EB         785.00         725.00           DVR -26°C /24h         22.00         28.00           DVR 26°C /24h         10.00         14.00           DVR 70°C /24h         39.00         50.00	100.00 100.00	100.00 100.00	100.00	100.00 100.	00 100.00	100.00	NR (SMR - 10)	100	100					100	100	100
CaCO3         20.00         20.00           Naphtenic Oil         5.00         25.00           ZnO         5.00         5.00           Stearic Acid         2.00         2.00           IPPD         2.00         2.00           S         1.50         1.50           TMTD - 80         CBS - 80         0.65         0.65           Total         146.15         186.15           Properties:	30.00 50.00	25.00 45.00	75.00	45.00 65.	00 50.00	48.23	N330	10	75	48	52	5		48.225	48	50
Naphtenic Oil         5 00         25 00           ZnO         5 00         5 00           ZnO         5 00         5 00           Steaic Acid         2 00         2 00           IPPD         2 00         2 00           S         1 50         1 50           TMTD - 80         CBS - 80         0.65         0.65           CBS - 80         0.65         0.65         7           MooneyML(1+4) 100°C         32 00         36.00           MooneyML(1+4) 100°C         28 00         28.00           Density         1 08         1.12           Hardness         42.00         41.00           M300         1.80         3.00           DVR 75C /24h         22.00         28.00           DVR 70°C /24h         10.00         14.00           DVR 70°C /24h         30.00         50.00	20.00 20.00	20.00 20.00	20.00	20.00 20.	00	20.00	CaCO3	0	20					20	9	14.75
ZnO         5.00         5.00           Stearic Acid         2.00         2.00           Stearic Acid         2.00         2.00           S         1.50         1.50           TMTD - 80         -         -           CBS - 80         0.65         0.655           Total         146.15         186.15           Properties:         -         -           Mooney.15.120°C         28.00         28.00           Density         1.08         1.12           Hardness         42.00         41.00           M300         1.80         3.00           TS         25.00         21.00           DVR -26°C /24h         22.00         28.00           DVR -26°C /24h         22.00         28.00           DVR -26°C /24h         20.00         1.400           DVR 26°C /24h         10.00         14.00           DVR 70°C /24h         39.00         50.00	25.00 45.00	5.00 25.00	45.00	5.00 25.	00 10.00	34.50	Naphtenic Oil	5	45					34.5	23.75	35.8125
Stearic Acid         2.00         2.00           IPD         2.00         2.00           S         1.50         1.50           TMTD - 80         -         -           CSB - 80         0.65         0.65           Total         146.15         186.15           Properties:         -         -           Mooney 15/120*C         28.00         28.00           Density         1.88         3.00           TS         25.00         21.00           EB         785.00         725.00           DVR 25*C /24h         22.00         28.00           DVR 25*C /72h         8.00         10.00           DVR 70*C /24h         10.00         14.00           DVR 70*C /24h         39.00         50.00	5.00 5.00	5.00 5.00	5.00	5.00 5.	00 5.00	5.00	ZnO	5	5					5	5	5
IPPD         2.00         2.00           S         1.50         1.50           TMTD - 80	2.00 2.00	2.00 2.00	2.00	2.00 2.	2.00	2.00	Stearic Acid	2	2					2	2	2
S         150         150           TMTD - 80         0.65         0.65           CES - 80         0.65         0.65           Total         146.15         186.15           Properties:	2.00 2.00	2.00 2.00	2.00	2.00 2.	2.00	2.00	IPPD	2	2					2	2	2
TMTD - 80         0.65         0.65           CBS - 80         0.65         0.65           Total         146.15         186.15           Properties:	1.50 1.50	1.50 1.50	1.50	1.50 1.	50 0.25	1.50	S	0.25	1.5					1.5	0.8125	1,171875
CBS - 80         0.65         0.65           Total         146.15         186.15           Properties:					1.00		TMTD - 80	0	1						0.55	0.2625
Total         146.15         186.15           Properties:	0.65 0.65	0.65 0.65	0.65	0.65 0.	65 2.10	0.65	CBS - 80	0.65	21					0.65	1.4475	1.030625
Properties:         32.00         36.00           Mooney (b/120°C)         28.00         28.00         28.00           Density         108         1.12         14ardness         42.00         41.00           Ma00         180         3.00         180         3.00         180         5.00           M300         180         3.00         180         3.00         15         25.00         21.00         E8         785.00         725.00         20.00         28.00         DVR .0°C /24h         20.00         28.00         DVR .0°C /24h         10.00         DVR .2°C /72h         8.00         10.00         10.00         DVR .2°C /72h         10.00         10.00         10.00         10.00         10.00         10.00         10.00         10.00 </td <td>186.15 226.15</td> <td>161.15 201.15</td> <td>251.15</td> <td>181.15 221.</td> <td>15 172.35</td> <td>213.88</td> <td>Total</td> <td>146.1</td> <td>5251.15</td> <td></td> <td>_</td> <td>_</td> <td></td> <td>213.875</td> <td>192.56</td> <td>212.0275</td>	186.15 226.15	161.15 201.15	251.15	181.15 221.	15 172.35	213.88	Total	146.1	5251.15		_	_		213.875	192.56	212.0275
Mooneytkll (1+4) 100°C         32.00         36.00           Mooneyt5 / 120°C         28.00         28.00           Density         1.08         1.12           Hardness         42.00         41.00           M300         1.80         3.00           TS         25.00         21.00           EB         785.00         725.00           DVR -26°C /24h         22.00         28.00           DVR 0°C /24h         10.00         14.00           DVR 23°C /72h         8.00         10.00           DVR 70°C /24h         39.00         50.00							0							0		
Mooneyt5/120°C         28 00         28 00         28 00           Density         108         1.12           Hardness         42.00         41.00           M300         180         3.00           TS         25.00         21.00           EB         785.00         725.00           DVR -26°C /24h         22.00         28.00           DVR 0°C /24h         10.00         14.00           DVR 23°C /72h         8.00         10.00           DVR 70°C /24h         39.00         50.00	36.00 31.00	34.00 30.00	42.00	60.00 39	00 41.00	33.80	MooneyML(1+4)	30	60					33.7975	37	33.625
Density         106         1.12           Hardness         42.00         41.00           M300         1.80         3.00           TS         25.00         21.00           DVR 25:00         725.00         DVR           DVR 0°C /24h         20.00         48.00           DVR 0°C /24h         10.00         14.00           DVR 23°C /72h         8.00         10.00           DVR 70°C /24h         39.00         50.00	28.00 32.00	28.00 32.00	22.00	20.00 25	00 11.00	29.20	Mooney 157	11	32					29.2	20.05	26.4875
Hardness         42.00         41.00           M300         1.80         3.00           TS         25.00         21.00           EB         785.00         725.00           DVR -26'C /24h         22.00         28.00           DVR 0°C /24h         10.00         14.00           DVR 23°C /72h         8.00         10.00           DVR 70°C /24h         39.00         50.00	1.12 1.16	1.13 1.16	1 19	1.19 1.	20 1.11	1.16	Density	1.08	1.2					1.15685	1,1285	1.146875
M300         180         3.00           TS         25.00         21.00           EB         785.00         725.00           DVR-26°C /24h         22.00         28.00           DVR 0°C /24h         10.00         14.00           DVR 23°C /72h         8.00         10.00           DVR 70°C /24h         39.00         50.00	41.00 40.00	48.00 48.00	52.00	61.00 61.	00 59.00	44.88	Hardness	40	61	40	45	10		44.875	50.55	44.9875
TS         25.00         21.00           EB         785.00         725.00           DVR-26°C /24h         22.00         28.00           DVR 0°C /24h         10.00         14.00           DVR 23°C /72h         8.00         10.00           DVR 70°C /24h         39.00         50.00	3.00 3.00	4.40 4.60	5.30	8.00 7.	60 9.40	3,88	M300	1.8	9.4					3.8755	6.52	4.68
EB 78500 72500 DVR -267/24h 22.00 28.00 DVR 0°C /24h 10.00 14.00 DVR 23°C /72h 8.00 10.00 DVR 70°C /24h 39.00 50.00	21.00 15.00	25.00 20.00	15.30	23.00 18	00 23.00	17.62	TS	15	25	20				17.6155	20	17.1
DVR -26°C /24h         22.00         28.00           DVR 0°C /24h         10.00         14.00           DVR 23°C /72h         8.00         10.00           DVR 70°C /24h         39.00         50.00	725.00 690.00	715.00 705.00	615.00	560.00 590.	00 540.00	683.86	EB	540	785		550	10		683.8625	611	650.625
DVR 0°C /24h         10 00         14.00           DVR 23°C /72h         8 00         10.00           DVR 70°C /24h         39 00         50.00	28.00 30.00	17.00 19.00	35.00	29.00 27.	00 77.00	27.81	DVR -26°C /24h	17	77					27.805	55.65	42.3375
DVR 23°C /72h 8.00 10.00 DVR 70°C /24h 39.00 50.00	14.00 14.00	8.00 12.00	16.00	13.00 12	16.00	13.32	DVR 0°C/24h	8	16					13.32	15,1	14.525
DVR 70°C /24h 39.00 50.00	10.00 14.00	9.00 13.00	16.00	10.00 17.	00 18.00	13.35	DVR 23*C /72h	8	18					13.345	15.8	15.05
	50.00 61.00	44.00 50.00	54.00	44.00 50	00 17:00	54,58	DVR 70°C /24h	17	61					54.58	35.7	49.45
			_	_	_		-	_	_		_	_	7.	-1		1.
Recipe ratios in %:	73.75		_		26.25									Sum of recipe ra	tios (shoul	d be 100%):
	13.15				20.25		101									

#### The result shows

- Hardness is in target
- ICB N 330 has a minor increase

-However, Elongation is much too high, and DVR (C-Set) has increased again.

To solve the conflict, we set "Trdoff" to 10 on Elongation again and run Auto Mix



nput data: 50 Demo Data Rec Ingredients: 50/4 NR (SMR - 10) 1 N330 CaCO3 2 Naphtenic Oll ZnO Stearic Acid	0AL51 AL5115 100.00 10.00 20.00 5.00 5.00	50AL512 50AL512 5 100.00 30.00 20.00	0AL513 0AL513 5 100.00 50.00	50AL514 0AL514 5 100.00 25.00	50AL515 0AL515 5 100.00 45.00	50AL516 0AL516 5 100.00	0AL517 0AL517 5 100.00	50AL518	50AL542 (	0AL45Tel	Criteria: Name	Min	Max	From	To	Wei	Trd	Output:	
50 Demo Data Rete Ingredients: 504 NR (SINR - 10) 1 N330 CaCO3 1 Naphtenic Oil ZnO Stearic Acid	0AL51 AL5115 100.00 10.00 20.00 5.00 5.00	50AL512 50AL512 5 100.00 30.00 20.00	0AL513 100.00 50.00	50AL514 0AL514 5 100.00 25.00	50AL515 0AL515 5 100.00 45.00	50AL516 50AL516 5 100.00	0AL517	50AL518	50AL543 4	0AL45Te	Name	Min	Max	From	To	Wei	Trd		
Demo Data         Rec           Ingredients:         504           NIR (SIMR - 10)         1           N330         2           CaCO3         3           Naphtenic Oil         2nO           Stearic Acid         3	AL5115 100.00 10.00 20.00 5.00 5.00	0AL512 5 100.00 30.00 20.00	0AL513 5 100.00 50.00	0AL5145 100.00 25.00	0AL5155 100.00	0AL5165 100.00	0AL517 5 100.00	50AL518 :	0AL542 5	0AL45T									
Rec           Ingredients:         504           NR (SMR - 10)         1           N330         2           CaC03         3           Naphtenic Oil         2           ZnO         Stearic Acid	AL5115 100.00 10.00 20.00 5.00 5.00	0AL512 5 100.00 30.00 20.00	0AL513 5 100.00 50.00	0AL514 5 100.00 25.00	0AL5155 100.00 45.00	0AL5165 100.00	0AL517 5	50AL518 5	0AL542 5	0AL45T									
Ingredients: 504 NR (SMR - 10) 1 N330 CaCO3 Naphtenic Oil ZnO Stearic Acid	AL5115 100.00 10.00 20.00 5.00 5.00	0AL512 5 100.00 30.00 20.00	0AL513 5 100.00 50.00	0AL5145 100.00 25.00	0AL5155 100.00 45.00	0AL516 5	0AL517 5 100.00	50AL518 5	0AL542 5	0AL45T									
NR (SMR - 10) 1 N330 CaCO3 Naphtenic Oil ZnO Stearic Acid	100.00 10.00 20.00 5.00	100.00 30.00 20.00	100.00	100.00 25.00	100.00	100.00	100.00	100.00										Minture4	lixture5
N330 CaCO3 Naphtenic Oil ZnO Stearic Acid	10.00 20.00 5.00	30.00	50.00	25.00	45.00			100.00	100.00	100.00	NR (SMR - 10)	100	100			1		100	100
CaCO3 Naphtenic Oil ZnO Stearic Acid	20.00	20.00	20.00			75.00	45.00	65.00	50.00	48.23	N330	10	75	48	52	5	5	48	50
Naphtenic Oil ZnO Stearic Acid	5.00	05.00	20.00	20.00	20.00	20.00	20.00	20.00		20.00	CaCO3	0	20					9	14.75
ZnO Stearic Acid	5.00	25.00	45.00	5.00	25.00	45.00	5.00	25.00	10.00	34.50	Naphtenic Oil	5	45					23.75	35.8125
Stearic Acid		5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5,00	ZnO	5	5					5	5
	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	Stearic Acid	2	2					2	2
IPPD	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	IPPD	2	2					2	2
S	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	0.25	1.50	S	0.25	1.5					0.8125	1.171875
TMTD - 80							1000		1.00	10.3	TMT0 - 80	0	1					0.55	0.2625
CBS - 80	0.65	0.65	0.65	0.65	0.65	0.65	Auto	matic mi	king in pro	cess			21					1.4475	1.030625
Total 1	146.15	186.15	226.15	161.15	201.15	251.15	1						251.15					192.56	212.0275
Properties:							80	ore of bor	t misture o	a for downriv	bottory 4000 0526								
MooneyML(1+4) 100°C	32.00	36.00	31.00	34.00	30.00	42.00	30	ore of pes	a maxime s	o lai (lowel is	s better), 4968.0520		60					37	33.625
Mooney t5 / 120°C	28.00	28.00	32.00	28.00	32.00	22.00							32					20.05	26.4875
Density	1.08	1.12	1.16	1,13	1.16	1.19		Tak	e best mixt	ure so far	Cancel		1.2					1.1285	1.146875
Hardness	42.00	41.00	40.00	48.00	48,00	52.00							61	40	45	10	5	50.55	44.9875
M300	1.80	3.00	3.00	4.40	4.60	5.30	0.00	1.00	9,40	3.00	M300	1.0	9.4					6.52	4.68
TS	25.00	21.00	15.00	25.00	20.00	15.30	23.00	18.00	23.00	17.62	TS	15	25	20				20	17.1
EB 7	785.00	725.00	690.00	715.00	705.00	615:00	560.00	590.00	540.00	683.86	EB	540	785		550	10	10	611	650.625
DVR -26°C /24h	22.00	28.00	30.00	17.00	19.00	35.00	29.00	27.00	77.00	27.81	DVR -26°C /24h	17	77					55.65	42.3375
DVR 0°C /24h	10.00	14.00	14.00	8.00	12.00	16.00	13.00	12.00	16.00	13.32	DVR 0°C /24h	8	16					15.1	14.525
DVR 23°C /72h	8.00	10.00	14.00	9.00	13.00	16,00	10.00	17.00	18.00	13.35	DVR 23°C /72h	8	18					15.8	15.05
Chief and a state of the state					and the state of the state of	and in the same size			and the second	and the set of the	the state of the s	100	100						

The score at 4988 shows, that the conflict can not be solved (at least with this small example database).

 We removed 50AL45Test column from the output to allow the comparison of only Mixture 4 and Mixture 5 with the next one.



GrafCompounder ve	ersion 2.00	4	-	1				Sec.		10.0									18	- = X
File Edit Help							_	_								_				
nput data:											Criteria:							Output:		
	50AL51	50AL512	50AL513	50AL514	50AL516	50AL516	50AL517	50AL518	50AL542	SOAL45Te	Name	Min	Max	From	To	Wel	Trd			
Demo Data																				
	Recipes:																			
Ingredients:	50AL511	50AL512	50AL513	50AL514	50AL515	50AL516	50AL517 5	50AL518	50AL542	50AL45T								dixture4	Aixture5	Mixture6
NR (SMR - 10)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	NR (SMR - 10)	100	100					100	100	100
N330	10.00	30.00	50.00	25.00	45.00	75.00	45.00	65.00	50.00	48.23	N330	10	75	48	52	2 5		48	50	50
CaCO3	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00		20.00	CaCO3	0	20					9	14.75	3.95
Naphtenic Oil	5.00	25.00	45,00	5.00	25.00	45.00	5.00	25.00	10.00	34.50	Naphtenic Oil	5	45					23.75	35.8125	16.9125
ZnO	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5,00	5.00	ZnO	5	5					5	5	5
Stearic Acid	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	Stearic Acid	2	2					2	2	2
IPPD	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	IPPD	2	2					2	2	2
S	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	0.25	1.50	S	0.25	1.5					0.8125	1.171875	0.496875
TMTD - 80									1.00		TMTD - 80	0	1					0.55	0.2625	0.8025
CBS - 80	0.65	0.65	0.65	0.65	0.65	0,65	0.65	0.65	2.10	0.65	CBS - 80	0.65	21					1.4475	1.030625	1.813625
Total	146,15	186.15	226.15	161.15	201.15	251.15	181.15	221.15	172.35	213.88	Total	146.1	5251.15	8	_	-		192.56	212.0275	182.9755
Properties:											0									
MooneyML(1+4) 100°C	32.00	36.00	31.00	34.00	30.00	42.00	60.00	39.00	41.00	33.80	MooneyML(1+4)	30	60					37	33.625	39.025
Mooney t5 / 120°C	28.00	28.00	32.00	28.00	32.00	22.00	20.00	25.00	11.00	29.20	Mooney t5 /	11	32					20.05	26.4875	15.1475
Density	1.08	1,12	1.16	1.13	1.16	1.19	1.19	1.20	1.11	1.16	Density	1.08	1.2					1.1285	1.146875	1.119875
Hardness	42.00	41.00	40.00	48.00	48,00	52.00	61.00	61.00	59.00	44.88	Hardness	40	61	40	45	5 10		50.55	44.9875	55.2475
M300	1.80	3.00	3.00	4.40	4.60	5,30	8.00	7.60	9.40	3.88	M300	1.8	9.4					6.52	4.68	8.136
TS	25.00	21.00	15.00	25.00	20.00	15.30	23.00	18.00	23.00	17.62	TS	15	25	20				20	17.1	21.42
EB	785.00	725.00	690.00	715.00	705.00	615.00	560.00	590.00	540.00	683.86	EB	540	785		550	0 10	10	611	650.625	569.625
DVR -26°C /24h	22.00	28.00	30.00	17.00	19.00	35,00	29.00	27.00	77.00	27.81	DVR -26°C /24h	17	77					55.65	42.3375	67.7175
DVR 0°C /24h	10.00	14.00	14.00	8.00	12.00	16.00	13.00	12.00	16.00	13.32	DVR 0°C/24h	8	16					15.1	14.525	15.605
DVR 23*C /72h	8.00	10.00	14.00	9.00	13.00	16.00	10.00	17.00	18.00	13.35	DVR 23°C/72h	8	18					15.8	15.05	17.21
DVR 70°C /24h	39.00	50,00	61.00	44.00	50.00	54.00	44.00	50.00	17.00	54.58	DVR 70°C/24h	17	61					35.7	49.45	25.69
-					_			_			-							-(		• ا
Recipe ratios in %:																		Sum of recipe	ratios (should	d be 100%):
			19.75						80.25									100		
			Numbe	rformat	12245.6	7		Impo	rt innut de	ta from clinhos	Auto mix (or	ionwrite	a mixtura		uto mi	(naw n	(arutvic	1		

The analysis of the result is:

- Hardness at 55ShA again
- Elongation at 570% now close to target and DVR 70C is improved
- CB N330 is at 50 phr, which is in target

# We then set "Trdoff" to 10 on hardness again and run Auto Mix, overwriting Mixture 6



GrafCompounder ve	ersion 2.00	4	-		1					100										- = ×
File Edit Help								_												
Input data:	r										Criteria:							Output:		
	50AL51	50AL512	50AL51	50AL51-	50AL515	50AL516	50AL517	50AL518	50AL542	50AL 45Te	Name	Min	Max	From	To	Wei	Trd			
Demo Data													1.0 - 50/2		in the state				1	
	<b>Recipes:</b>																			
Ingredients:	50AL511	50AL512	50AL513	50AL514	50AL515	50AL516	50AL517 8	50AL518	50AL542	50AL45T								Mixture4 N	lixture5	Mixture7
NR (SMR - 10)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	NR (SMR - 10)	100	100					100	100	100
N330	10.00	30.00	50.00	25.00	45.00	75.00	45.00	65.00	50.00	48.23	N330	10	75	48	52	5		48	50	50
CaCO3	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00		20.00	CaCO3	0	20					9	14.75	13.1
Naphtenic Oil	5,00	25.00	45.00	5.00	25.00	45.00	5.00	25.00	10.00	34.50	Naphtenic Oil	5	45					23.75	35.8125	32.925
ZnO	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	ZnO	5	5					5	5	5
Stearic Acid	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	Stearic Acid	2	2					2	2	2
IPPD	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	IPPD	2	2					2	2	2
S	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	0.25	1.50	S	0.25	1.5					0.8125	1.171875	1.06875
TMTD - 80									1.00		TMTD - 80	0	1					0.55	0.2625	0.345
CBS - 80	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	2.10	0.65	CBS - 80	0.65	21					1.4475	1.030625	1.15025
Total	146.15	186.15	226.15	161.15	201.15	251.15	181.15	221.15	172.35	213.88	Total	146.1	5251.15		_		_	192.56	212.0275	207.589
Properties:																				
MooneyML(1+4) 100°C	32.00	36.00	31.00	34.00	30.00	42.00	60,00	39.00	41.00	33.80	MooneyML(1+4)	30	60					37	33.625	34.45
Mooney t5 / 120°C	28.00	28.00	32.00	28.00	32.00	22.00	20.00	25.00	11.00	29.20	Mooney t5 /	11	32					20.05	26.4875	24.755
Density	1.08	1.12	1.16	1.13	1.16	1.19	1.19	1.20	1.11	1.16	Density	1.08	1.2					1.1285	1,146875	1.14275
Hardness	42.00	41.00	40.00	48.00	48.00	52.00	61.00	61.00	59.00	44.88	Hardness	40	61	40	45	10	10	50.55	44.9875	46.555
M300	1.80	3.00	3.00	4.40	4.60	5.30	8.00	7.60	9.40	3.88	M300	1.8	9.4					6.52	4.68	5.208
TS	25.00	21.00	15.00	25.00	20.00	15.30	23.00	18.00	23.00	17.62	TS	15	25	20				20	17.1	17.76
EB	785.00	725.00	690.00	715.00	705.00	615.00	560.00	590.00	540,00	683.86	EB	540	785		550	10		611	650.625	638.25
DVR -26*C /24h	22.00	28.00	30.00	17.00	19.00	35.00	29.00	27.00	77.00	27.81	DVR -26*C/24h	17	77					55.65	42.3375	46.215
DVR 0°C /24h	10.00	14.00	14.00	8.00	12.00	16.00	13,00	12.00	16.00	13.32	DVR 0*C/24h	8	16					15.1	14.525	14.69
DVR 23°C /72h	8.00	10.00	14.00	9.00	13.00	16.00	10.00	17.00	18.00	13.35	DVR 23"C /72h	8	18					15.8	15.05	15.38
DVR 70°C /24h	39.00	50.00	61.00	44.00	50.00	54.00	44.00	50.00	17.00	54.58	DVR 70°C /24h	17	61				_	35.7	49.45	45.82
વર											4	_		_			7.4	-		
Recipe ratios in %:	_	_	65 E					_	34 E									Sum of recipe r	atios (shoul	1 be 100%):
			05.5		,	1125	-		34.5		41									
			Numbe	er format:	12345.6	57		Impo	irt input d	ata from clipbo	ard Auto mix (o	verwrite	e mixture		uto mix	(new m	ixture)	J		

#### The analysis of this result is:

- Hardness is at 45ShA again

- Elongation is at 640%, now far from target again, and DVR 70C much higher as before

- CB N330 with 50 phr is in target

#### **Conclusion:**

- Weight and Trdoff are tools for optimization in case of conflicting targets

# **Mixing Manually**



GrafCompounder ver	rsian 2.00	4	-							1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1										
File Edit Help																	-			
nput data:			_		_						Criteria:							Output		_
	50AL51	50AL512	50AL513	50AL514	50AL515	50AL516	50AL517	50AL518	50AL542	50AL45Te	Name	Min	Max	From	To	Wel	Trd			
Demo Data									Contraction of the local division of the loc	and the second s										F
101010101010101	Recipes:																			1
Ingredients:	50AL511	50AL512	50AL513	50AL514	50AL515	50AL516	50AL517	50AL518	50AL542	50AL45T								50AL54Test		
NR (SMR - 10)	100.00	100.00	100.00	100,00	100.00	100.00	100.00	100.00	100.00	100.00	NR (SMR - 10)	100	100					100		
N330	10.00	30.00	50.00	25.00	45.00	75.00	45.00	65.00	50.00	48.23	N330	10	75	48	5	2		48.15		
CaCO3	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00		20.00	CaCO3	0	20					20		
Naphtenic Oil	5.00	25.00	45.00	5.00	25.00	45.00	5.00	25.00	10.00	34.50	Naphtenic Oil	5	45					34,4		
ZnO	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5,00	5.00	ZnO	5	5					5		
Stearic Acid	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	Stearic Acid	2	2					2		
IPPD	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	IPPD	2	2					2		
S	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	0.25	1.50	S	0.25	1.5					1.5		
TMTD - 80									1.00	(	TMTD - 80	0	1							
CBS - 80	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	2.10	0.65	CBS - 80	0.65	21					0.65		
Total	146.15	186.15	226.15	161.15	201.15	251.15	181.15	221.15	172.35	213.88	Total	146.1	5251.13	ð		-		213.7		
Properties:																				
MooneyML(1+4) 100°C	32.00	36.00	31.00	34.00	30.00	42.00	60.00	39.00	41.00	33.80	MooneyML(1+4)	30	60					33.81		
Mooney t5 / 120°C	28.00	28:00	32.00	28.00	32.00	22.00	20.00	25.00	11.00	29.20	Mooney 157	11	32					29.22		
Density	1.08	1,12	1.16	1.13	1.16	1.19	1.19	1.20	1.11	1.16	Density	1.08	1.2					1.157		
Hardness	42.00	41.00	40.00	48.00	48.00	52.00	61.00	61.00	59.00	44.88	Hardness	40	61	40	4	5		44.88		
M300	1.80	3.00	3.00	4.40	4.60	5.30	8.00	7.60	9.40	3.88	M300	1.8	9.4					3.893		
TS	25.00	21.00	15.00	25.00	20.00	15.30	23,00	18:00	23.00	17.62	TS	15	25					17.649		
EB	785.00	725.00	690.00	715.00	705.00	615.00	560.00	590.00	540.00	683.86	EB	540	785					683.65		
DVR -26*C /24h	22.00	28.00	30.00	17.00	19.00	35.00	29.00	27.00	77.00	27.81	DVR -26*C /24h	17	77					27.73		
DVR 0*C /24h	10.00	14.00	14.00	8.00	12.00	16.00	13.00	12.00	16.00	13.32	DVR 0°C /24h	8	16					13.3		
DVR 23°C /72h	8.00	10.00	14.00	9.00	13.00	16.00	10.00	17.00	18.00	13.35	DVR 23*C /72h	8	18					13.32		
DVR 70°C /24h	39.00	50.00	61.00	44,00	50.00	54.00	44.00	50.00	17.00	54.58	DVR 70°C /24h	17	61					54.61		
2.6				_	_					(Crown	1 41							41		1
Recipe ratios in %:	4	12	45	7	11	13	-	8	_	_	a							Sum of recipe ratios () 100	should be 100%	j;
			14100000		Cannari			Causes			10							5		

Note that the mixture 50AL45test is composed of different formulas in differing ratios, shown in the row at the bottom

- Some recipes are very similar and you may want to eliminate all the recipes with a percentage smaller than 10
- Or, you may want to see the effect on the final test mixture by changing those ratios manually

# **Mixing Manually**



GrafCompounder ve	ersion 2.00	•	-					Sec.		- 6.4										0	x
File Edit Help																					
Input data:											Criteria						~ .	Output			
	50AL51	50AL512	50AL513	50AL514	50AL515	50AL510	50AL51	50AL518	50AL542	SOAL45Te	Name	Min	Max	From	To	Wei	Trd				
Demo Data												1									14
	Recipes:																				1
Ingredients:	50AL511	50AL512	50AL513	50AL514	50AL5153	50AL516 5	50AL517 5	50AL518 5	0AL542 5	0AL45T								50AL54Test			
NR (SMR - 10)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	NR (SMR - 10)	100	100					100			
N330	10.00	30.00	50.00	25.00	45.00	75.00	45.00	65.00	50.00	48.23	N330	10	75	48	5	2		50.85			
CaCO3	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00		20.00	CaCO3	0	20					20			
Naphtenic Oil	5.00	25.00	45.00	5.00	25.00	45.00	5.00	25.00	10.00	34.50	Naphtenic Oll	5	45					38			
ZnÓ	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	ZnO	5	5					5			
Stearic Acid	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	Stearic Acid	2	2					2			
IPPD	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	IPPD	2	2					2			
S	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	0.25	1.50	S	0.25	1.5					1.5			
TMTD - 80									1.00		TMTD - 80	0	1								
CBS - 80	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	2.10	0.65	CBS - 80	0.65	21					0.65			
Total	146.15	186.15	226.15	161.15	201.15	251.15	181.15	221.15	172,35	213.88	Total	146.1	15251.15		_		_	220			
Properties:																					
MooneyML(1+4) 100°C	32.00	36.00	31.00	34.00	30.00	42.00	60.00	39,00	41.00	33.80	MooneyML(1+4)	30	60					33.81			
Mooney t5 / 120°C	28.00	28.00	32.00	28.00	32.00	22.00	20.00	25.00	11.00	29.20	Mooney t5 /	11	32					29.36			
Density	1.08	1.12	1,16	1,13	1.16	1,19	1.19	1.20	1,11	1.16	Density	1.08	1.2					1.1596			
Hardness	42.00	41.00	40.00	48.00	48.00	52.00	61.00	61.00	59.00	44.88	Hardness	40	61	40	4	5		44.08			
M300	1.80	3.00	3.00	4.40	4.60	5.30	8.00	7.60	9,40	3.88	M300	1.8	9.4					3.764			
TS	25.00	21.00	15.00	25.00	20.00	15.30	23.00	18.00	23.00	17.62	TS	15	25					16.97			
EB	785.00	725.00	690.00	715.00	705.00	615.00	560.00	590.00	540.00	583.86	EB	540	785					683.45			
DVR -26*C /24h	22.00	28.00	30.00	17.00	19.00	35.00	29.00	27.00	77 00	27.81	DVR -26°C /24h	17	77					28.59			
DVR 0°C /24h	10.00	14.00	14.00	8.00	12.00	16.00	13.00	12:00	16.00	13.32	DVR 0°C/24h	8	16					14.02			
DVR 23°C /72h	8.00	10.00	14.00	9.00	13.00	16.00	10.00	17.00	18.00	13.35	DVR 23°C /72h	8	18					13.57			
DVR 70°C /24h	39.00	50.00	61.00	44.00	50.00	54.00	44.00	50.00	17.00	54.58	DVR 70°C /24h	17	61					55.75			
at												_	_	_	_	_		-			7.
Recipe ratios in %:	1200	-			_		-											Sum of recipe	ratios (sh	ould be 10	10%):
		16	45		19	20												100			
			Numbe	r format:	12345.6	7		Impo	rt input dat	a from clipbo	ard Auto mix (or	verwrit	e mixture)		uto m	ix (new l	mixture)	]			

- Just double click and set the values to whatever percentage you want
- While doing that, you will see the changes in the 50AL45Test column!
- Take care that the total adds up always to 100%



#### **Creating a Formula** Excluding a Compound

File Edit Help	10000		-	-	-			-	-								-			
nut data:											Criteria							Output		
por data.	504151	50AL 512	5041.513	5041514	504151F	50AL 518	5041 511	5041515	5041543	KOAL (STal	Name	Min	Max	From	To	Wei	Trd	output.		
emo Data	001201	00112011	ourser in	50.001	20.000	00.000	00.0011	CONCON	00/100/10			minit	max	TION	10		11 days			
into Data	Recipes:																			
gredients:	50AL511	50AL512	50AL513	50AL514	50AL515	50AL516	50AL517	50AL518	50AL542	50AL,45T								50AL54Test	lixture8	
IR (SMR - 10)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	NR (SMR - 10)	100	100			1	11	100	100	
330	10.00	30.00	50.00	25.00	45.00	75.00	45.00	65.00	50.00	48.23	N330	10	75	48	5	2		50.85	48	
aCO3	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00		20.00	CaCO3	0	20					20	20	
aphtenic Oil	5.00	25.00	45.00	5.00	25.00	45.00	5.00	25.00	10.00	34.50	Naphtenic Oil	5	45					38	33	
nO	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	ZnO	5	5					5	5	
tearic Acid	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	Stearic Acid	2	2					2	2	
PPD	2.00	2.00	2.00	2.00	2.00	2,00	2.00	2.00	2.00	2.00	IPPD	2	2					2	2	
	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	0.25	1.50	S	0.25	1.5					1.5	1.5	
MTD - 80									1.00		TMTD - 80	0	1							
BS-80	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	2.10	0.65	CBS - 80	0.65	21					0.65	0.65	
otal	146,15	186.15	226.15	161.15	201.15	251.15	181.15	221.15	172,35	213.88	Total	146.1	5251.15		_		1	220	212.15	
roperties:																				
looneyML(1+4) 100°C	32.00	36.00	31.00	34.00	30.00	42.00	60.00	39.00	41.00	33.80	MooneyML(1+4)	30	60					33.81	38.4	
looney t5 / 120*C	28.00	28.00	32.00	28.00	32.00	22.00	20.00	25.00	11.00	29.20	Mooney t5 /	11	32					29.36	25.6	
ensity	1.08	1.12	1.16	1.13	1.16	1.19	1.19	1.20	1.11	1.16	Density	1.08	1.2					1.1596	1.148	
lardness	42.00	41.00	40.00	48.00	48.00	52.00	61.00	61.00	59.00	44.88	Hardness	41	61	40	4	5		44.08	45.4	
1300	1.80	3.00	3.00	4.40	4.60	5.30	8.00	7.60	9.40	3.88	M300	1.8	9.4					3.764	3.92	
S	25.00	21.00	15.00	25.00	20.00	15.30	23.00	18.00	23.00	17.62	TS	15.3	25					16.97	18.72	
B	785.00	725.00	690.00	715.00	705.00	615.00	560.00	590.00	540.00	683.86	EB	540	785					683.45	681	
VR -26°C /24h	22.00	28.00	30:00	17.00	19.00	35.00	29.00	27.00	77.00	27.81	DVR -26°C/24h	17	77					28.59	30.8	
VR 0°C /24h	10.00	14.00	14.00	8 00	12.00	16.00	13.00	12.00	16.00	13.32	DVR 0°C /24h	8	16					14.02	14.8	
WR 23°C /72h	8.00	10.00	14.00	9.00	13.00	16.00	10.00	17.00	18.00	13.35	DVR 23°C /72h	8	18					13.57	12.4	
VR 70°C /24h	39,00	50.00	61.00	44.00	50.00	54,00	44.00	50.00	17.00	54.58	DVR 70°C /24h	17	54					55.75	51.6	
41											-1	_						4		
ecipe ratios in %:		60				40		11										Sum of recipe ra	atios (should	be 100%):
																		(H.		

Say we make an assumption that the data of 50AL513 formula is in question and should be excluded from all calculations

-Deactivation is done with a right click of the cell with the compound name 50AL513 and the name is crossed out

-In the recipes ratio % row we now see a blank cell -The score is still unequal to zero, but now goes to 19.0476

Dr. Hans-Joachim Graf



#### GrafCompounder Data Storage

U GrafCompounder ve	rsion 2.00	4	-					1		1											- 0	x
File Edit Help																						
input data:											Criteria	Č.				1			Output:			
	50AL51	50AL512	50AL513	50AL514	50AL515	50AL518	50AL511	50AL518	50AL 542	504L45Tal	Name		Min	Max	From	To	Wei_	Trd_			4	
Demo Data															1		1				Ĺ	
	Recipes:																					1
Ingredients:	50AL511	50AL512	50AL513	50AL514	50AL515	50AL516	50AL517.5	0AL518	50AL542	50AL45T									50AL54Test	Mixture8	]	
NR (SMR - 10)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	NR (SI	MR - 10)	100	100					100	100	)	
N330	10.00	30.00	50.00	25.00	45.00	75.00	45.00	65.00	50.00	48.23	N330		10	75	48	5	2		50.85	48	3	
CaCO3	20.00	20.00	20.00	20.00	20.00	20.00	20,00	20.00		20.00	CaCOS	3	0	20					20	20	2	
Naphtenic Oil	5,00	25.00	45.00	5.00	25.00	45.00	5.00	25.00	10.00	34.50	Naphte	anic Oll	5	45				-	38	33	3	
ZnO	5.00	5.00	5.00	5:00	5.00	5.00	5.00	5.00	5.00	5.00	ZnO		5	5				_	5	8 (D	2	
Stearic Acid	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	Stearic	Acid	2	2					2		2	
IPPD	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	IPPD		2	2				-	2	1	2	
S	1.50	1.50	1.50	1,50	1.50	1.50	1.50	1.50	0.25	1.50	S		0.25	1.5	· · · · ·			-	1.5	1.5	5	
TMTD - 80			-		-			Exit Co	ofirmatic	n		X	0	1								
CBS - 80	0.65	0.65	0.65	0.65	0.65	0.65	0.65		PANSAR MAR	ж.			0.65	2.1					0.65	0.65	2	
Total	146,15	186.15	226.15	161.15	201.15	251.15	181.15	1 0	-				146.1	5251.1	9	_	<u> </u>	-	220	212.15	2	
								- 66			duour doto?	0										
Properties:	00.00	00.00	24.00		20.00	10.00	00.00		- 11	nave you save	u your uatar		-			_			00.04			
MooneyML(1+4) 100 C	32.00	30.00	31.00	34.00	30.00	42.00	00.00		-				30	00				-	33.61	30.4		
Deports / 120 C	28.00	28.00	32.00	28,00	32.00	22.00	20,00	-11		0.000			11	32	· · · · ·			-	29.30	20.0		
Uersky	1.00	44.00	1.10	10.00	49.00	50.00	81.00	- 10		Yes, Exit	No, Cano	xei	1.00	1.4	40				1.1590	1.140		
M200	1.00	2.00	3.00	40.00	40.00	5 30	9.00				1 ×		48	0.4	40		3	-	2 764	2.0	<u>.</u>	
TS	25.00	21.00	15.00	25.00	20.00	15 30	23.00	19.00	23.00	17.62	TS		15.2	25				-	16.07	19.72		
CD	795.00	725.00	890.00	715.00	705.00	615.00	560.00	500.00	540.00	202.05	EP		540	785	· · · ·			-	602.45	10.74		
DVR -26°C (24h	22.00	28.00	30.00	17.00	19.00	35.00	29.00	27.00	77:00	27.81	DVR-2	26"C /24h	17	77					28.50	30.5		
DVR 01C /24h	10.00	14.00	14.00	8.00	12.00	16.00	13.00	12.00	16.00	13.32	DVRA	*C /24h	8	16				-	14 02	14.5		
DVR 23*C /72h	8 00	10.00	14.00	9.00	13.00	16.00	10.00	17.00	18.00	13.35	DVR 2	3°C/72h	B	18	-				13.57	12.		
DVR 70°C /24h	39.00	50.00	61.00	44.00	50.00	54 00	44.00	50.00	17.00	54 58	DVR 7	0°C/24h	17	54					55.75	51.6		
Salta State	22.00	20,00					44,99		111,000			e entra	100					-	00,10	0110	s.	
																						, v
4											2 31							Y.H.	4			1
Recipe ratios in %:		60				40													Sum of recipe 100	ratios (shoul	d be 1009	s):
			Numbe	er format:	12345.6	7		Impo	rt input da	ata from clipb	ard Au	uto mix (o	verwrite	e mixtur	e) A	uto mi	x (new	mixture)	]			

# You need to store your results before closing the program

- There are two options:

1) Copy the data table and paste it into your Excel spread sheet



#### GrafCompounder Data Storage

GrafCompounder ve	rsion 2.00	<b>9</b> 8	-				(Aug		1											- 0	×
File Edit Help						_									_						
Input data:										Criteria:							Outpu	at .			
	50AL51	50AL512	50AL512 50AL	514 50AL51	50AL516	50AL511	50AL518	50AL542 8	OAL45Tet	Name	Min	Max	From	To	Wei.	Trd					
Demo Data																					
	Recipes:																				8
Ingredients:	50AL511	50AL512	50AL513 50AL	514 50AL515	50AL516 5	0AL517.5	0AL518 5	0AL542 5	DAL45T								50AL	54Test	Mixture8		
NR (SMR - 10)	100.00	100.00	100.00 10	0.00 100.00	100.00	100,00	100.00	100.00	100.00	NR (SMR - 10)	100	100						100	100		
N330	10.00	30.00	50.00 2	5.00 45.00	75.00	45.00	65.00	50.00	48.23	N330	10	75	48	52	2			50.85	48		
CaCO3	20.00	20.00,	20.00 2	0.00 20.00	20.00	20.00	20.00		20.00	00002	0	- 20		-	-	-	m D	20	20		
Naphtenic Oil	5.00	25.00	C Speichern		1000			10.000	1000	Capital Cold						1	25	38	33		
ZnO	5.00	5.00	[								_	_	-					5	5		
Stearic Acid	2.00	2.00	Suchen in:	GRAF C	OMPOUN	DER Tutor	rial					(internet	6	1 1		E		2	2		
IPPD	2.00	2.00	Construction but	-								<u> </u>	1.00				<u>عا</u> ا	2	2		
S	1.50	1.50	COR DALL OF															1.5	1.5		
TMTD - 80			MI KN_80																		
CBS - 80	0.65	0.65																0.65	0.65		
Total	146.15	186.15																220	212.15		
Properties:																					
MooneyML(1+4) 100°C	32.00	35.00																33.81	38.4		
Mooney t5 / 120°C	28.00	28.00																29.36	25.6		
Density	1,08	1.12																1.1596	1.148		
Hardness	42.00	41.00																44.08	45,4		
M300	1.80	3.00																3.764	3.92		
15	25.00	21.00															_	16.97	18.72		
DVD ORTO DATE	785.00	725.00	Detainoma	Report to a	Mileo 2.001		_	_				_					-	083.45	581		
DVR -20 C /240	10.00	28.00	Datemame.	tutorial tes	anes 2.004	•												28.09	30.8		
DVR 23*C /72h	8.00	10.00	Dataityn	GrafCom	ounder Fil	es (* cc)											1.	13.57	12.4		
DVR 70°C (24h	29.00	50.00	Dalenin	Grandonit	vuluer Fil	eal Act										_		55 75	516		
													Sp	aichern		Abbreche	n				Ļ
121										5	_			_	_		100				
Deples retics in No.										- End							140				1000
recipe ratios in %		60			40												100	or recipe n	atios (should	De 100%	1.
			Number for	nat 12345.	67 💌		Impor	rt input dat	a from clipbo	ard Auto mix (o	overwrit	e mixtur	e) [/	Auto mit	x (new )	mixture)	J				

- The 2<sup>nd</sup> option is:

2)Give the file a new name and store the data in .gc format.

Note that this format can be opened by the GrafCompounder only



# Summary

With the GrafCompounder you have a newly created tool, which allows you to analyse a compound database using:

- Limits,
- Weight's and
- Trade off's

Similar to a simulation tool.

You can see the influence of each compound on the result.

You can influence this result manually via changing the ratio of the compounds used.

Quick analysis of the compounds, which are the result of different criteria and formulation inputs, enables you to make fast and accurate decisions, saving you time and money



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# Summary

The formulas produced due to the selection criteria correspond to the general rules of compounding.

These formulas will show property scores larger than the 90% confidence interval compared to those seen in the confirmation experiment.