

Fig. 1

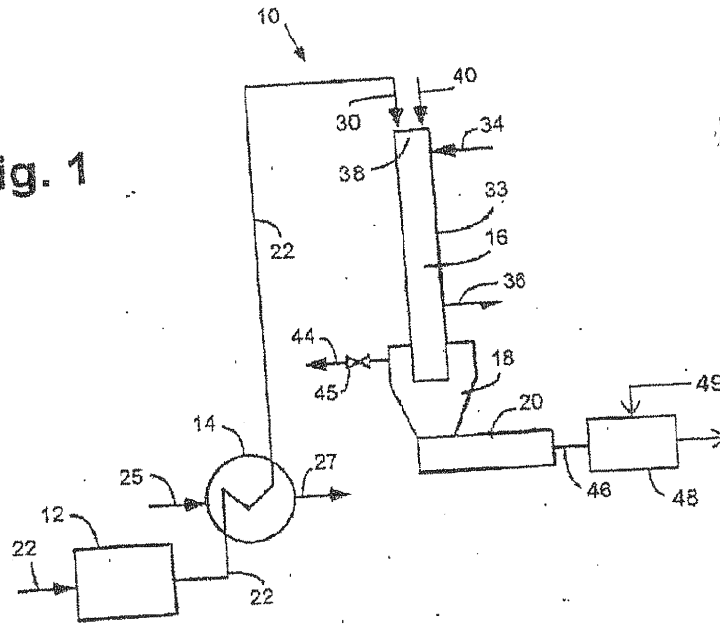
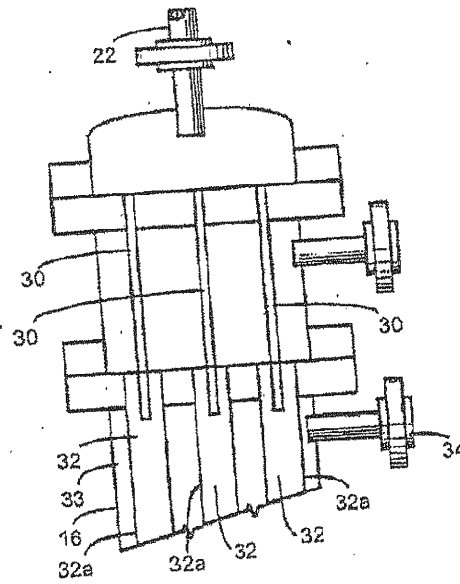
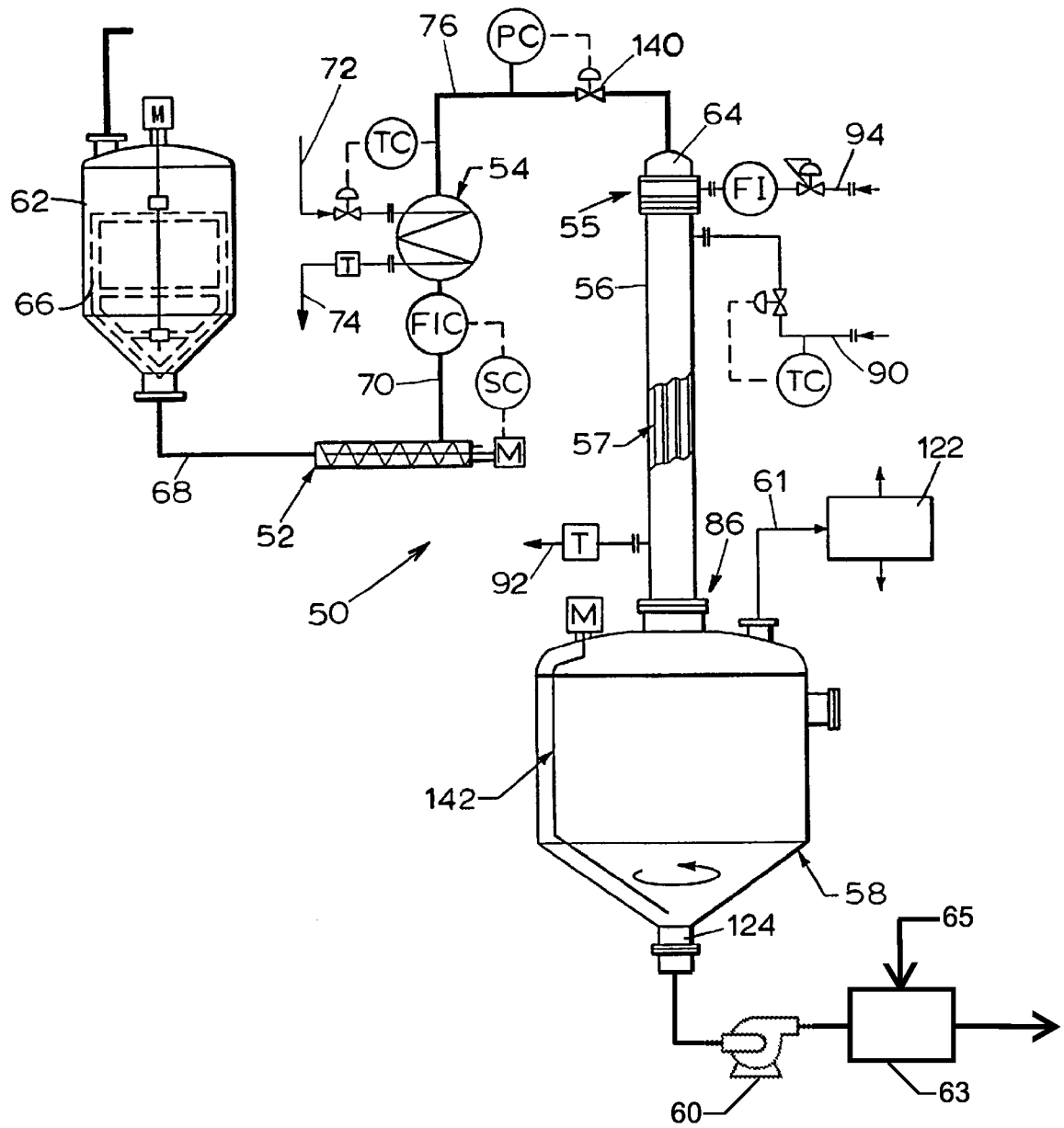


Fig. 2



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**Fig. 3**

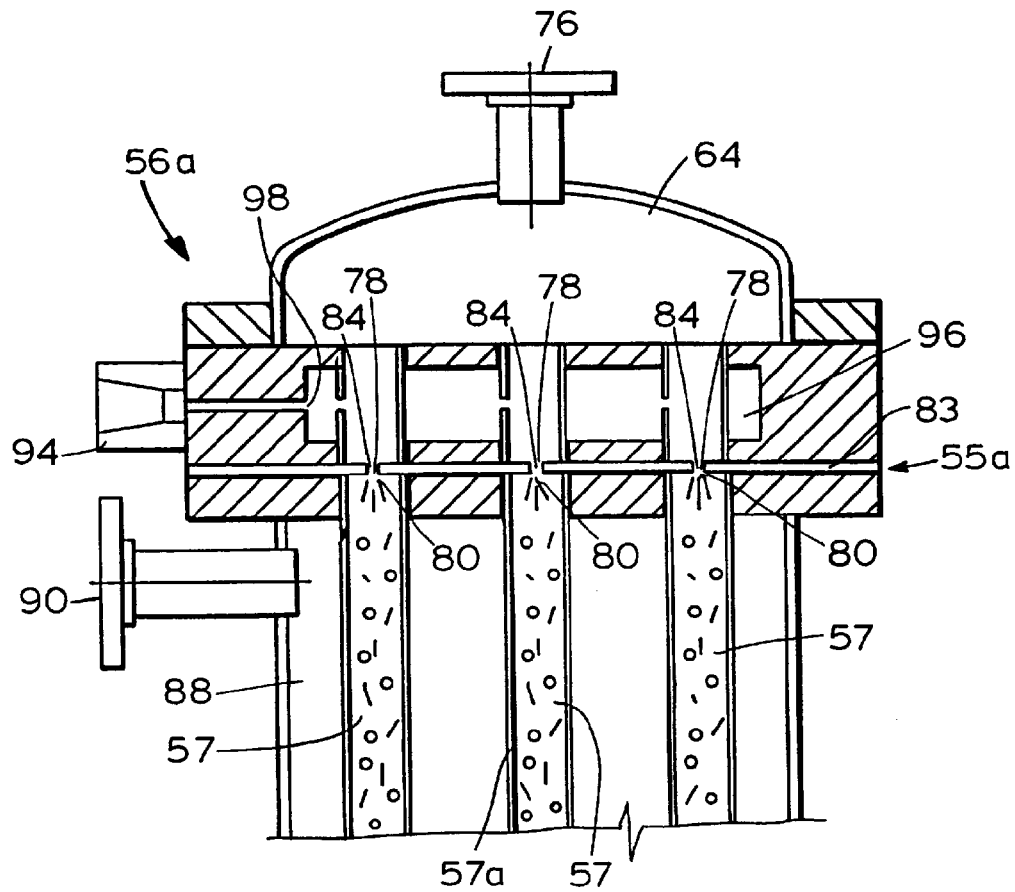


Fig. 4

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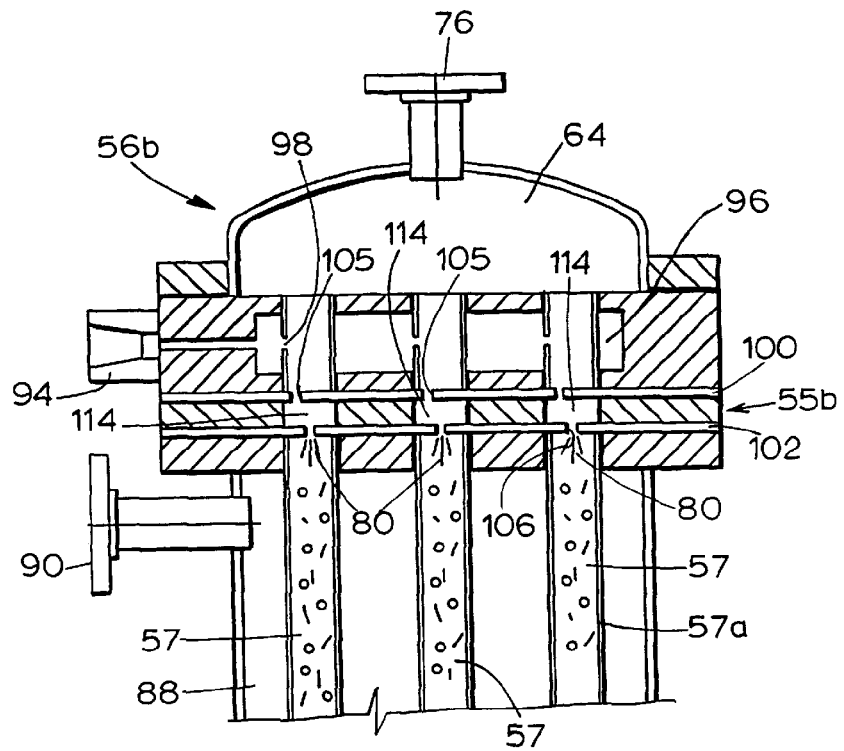


Fig. 5

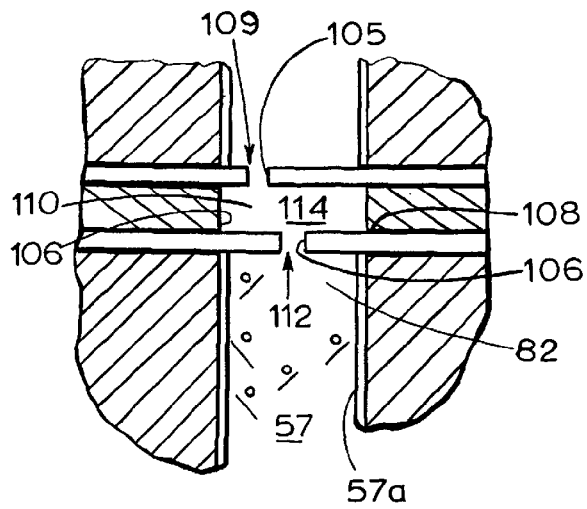


Fig. 5A

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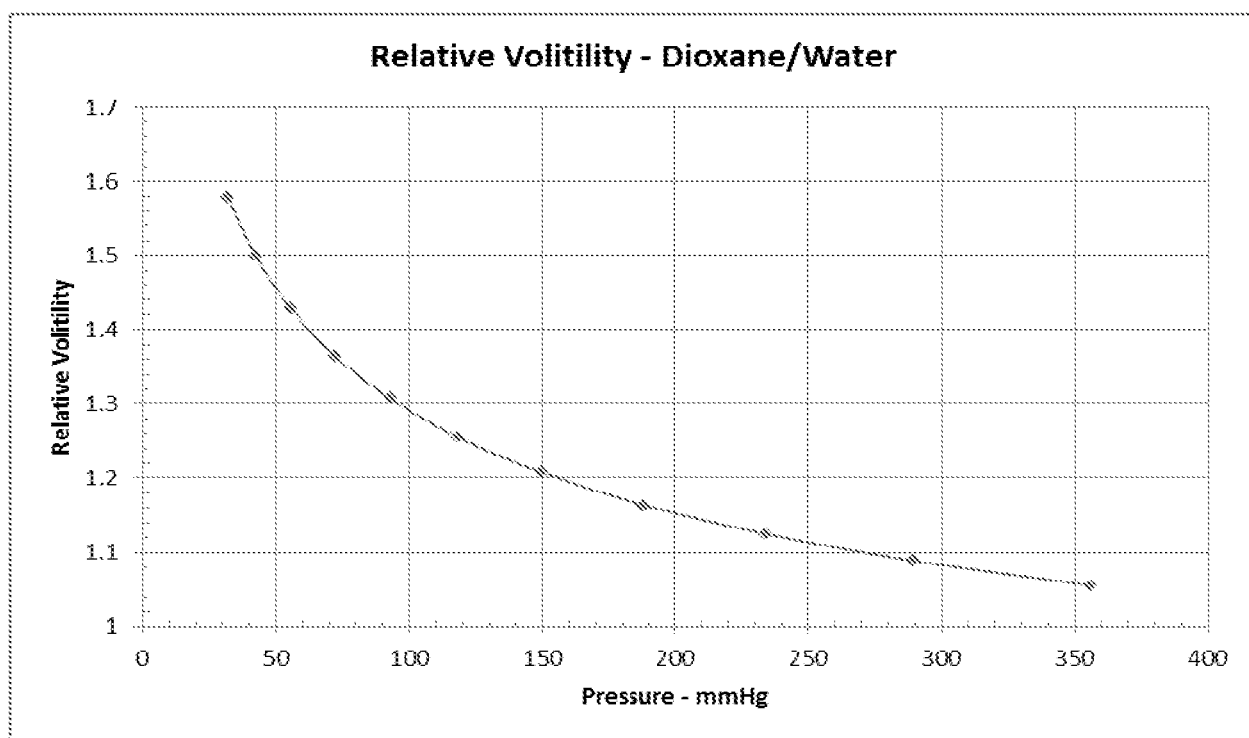


Fig. 6

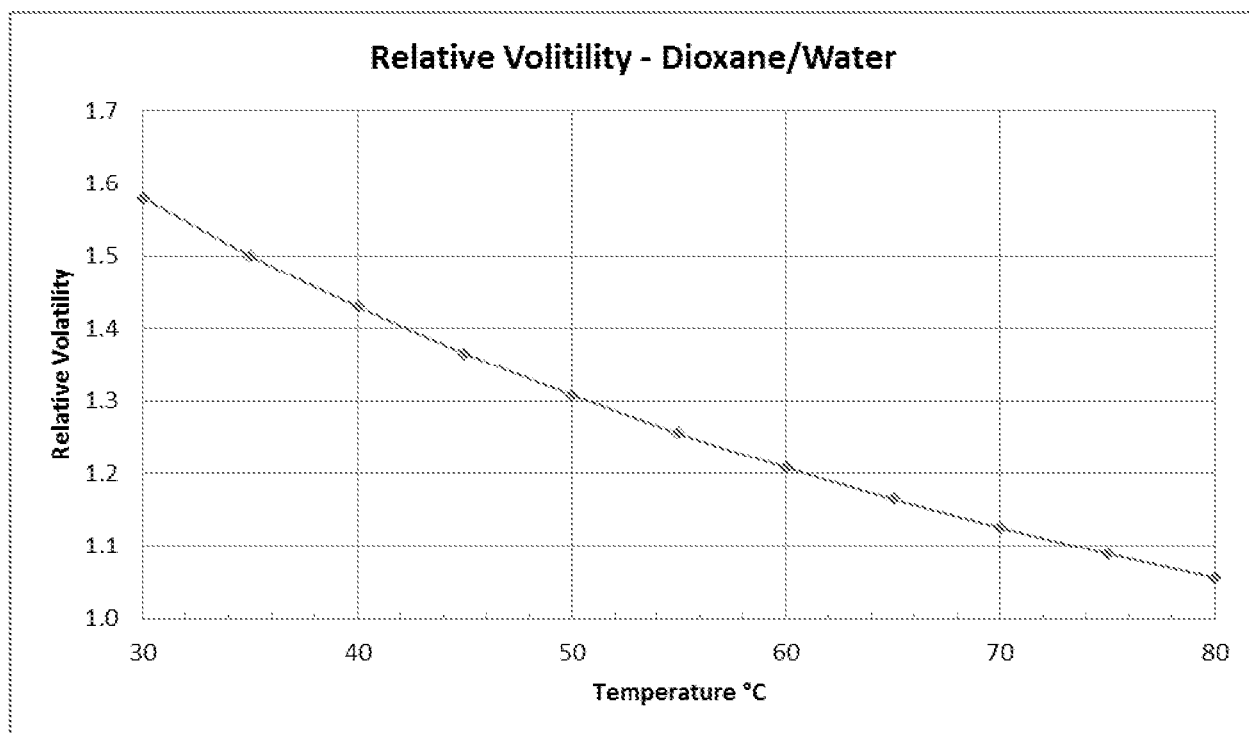


Fig. 7

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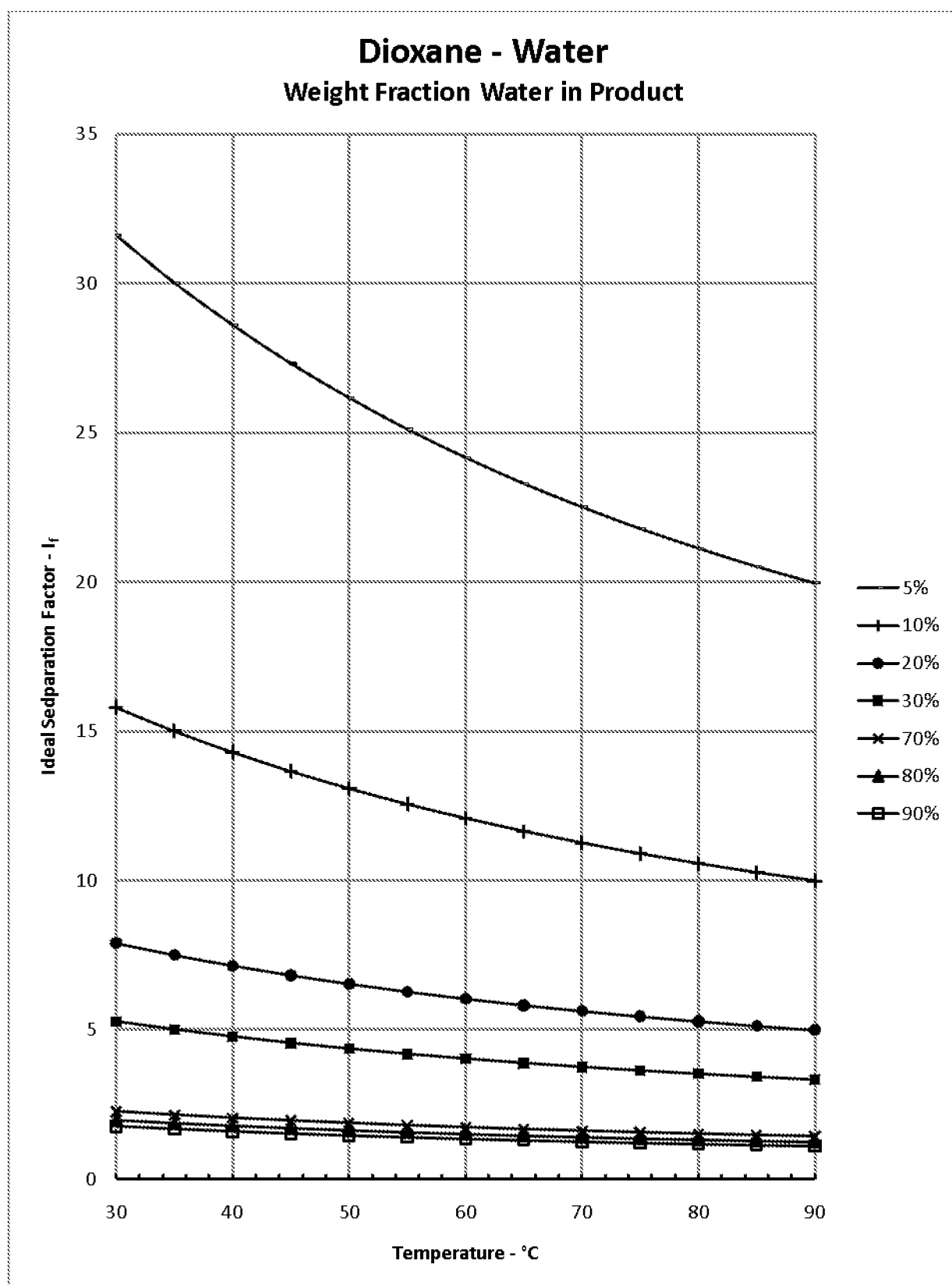


Fig. 8

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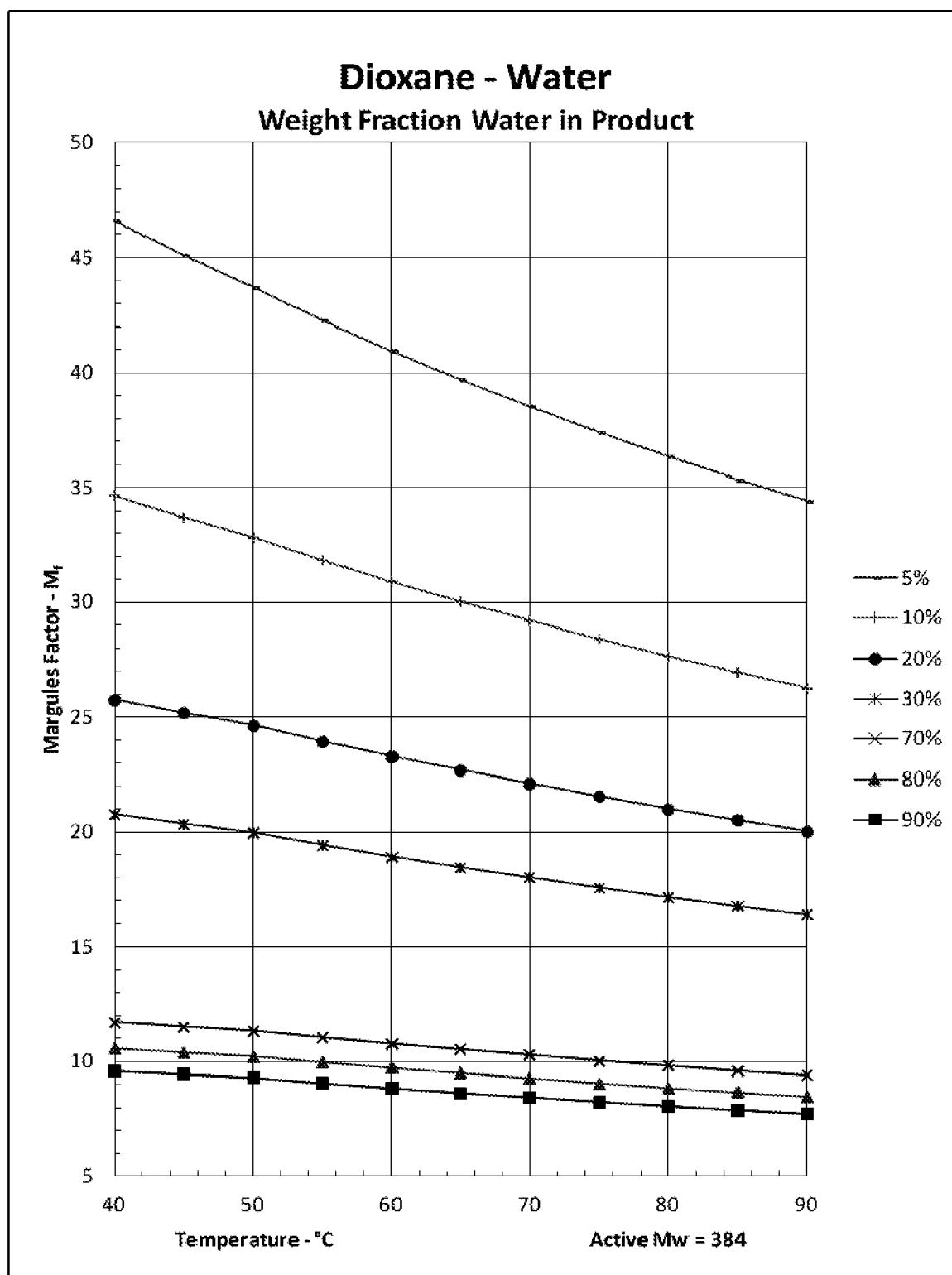


Fig. 9

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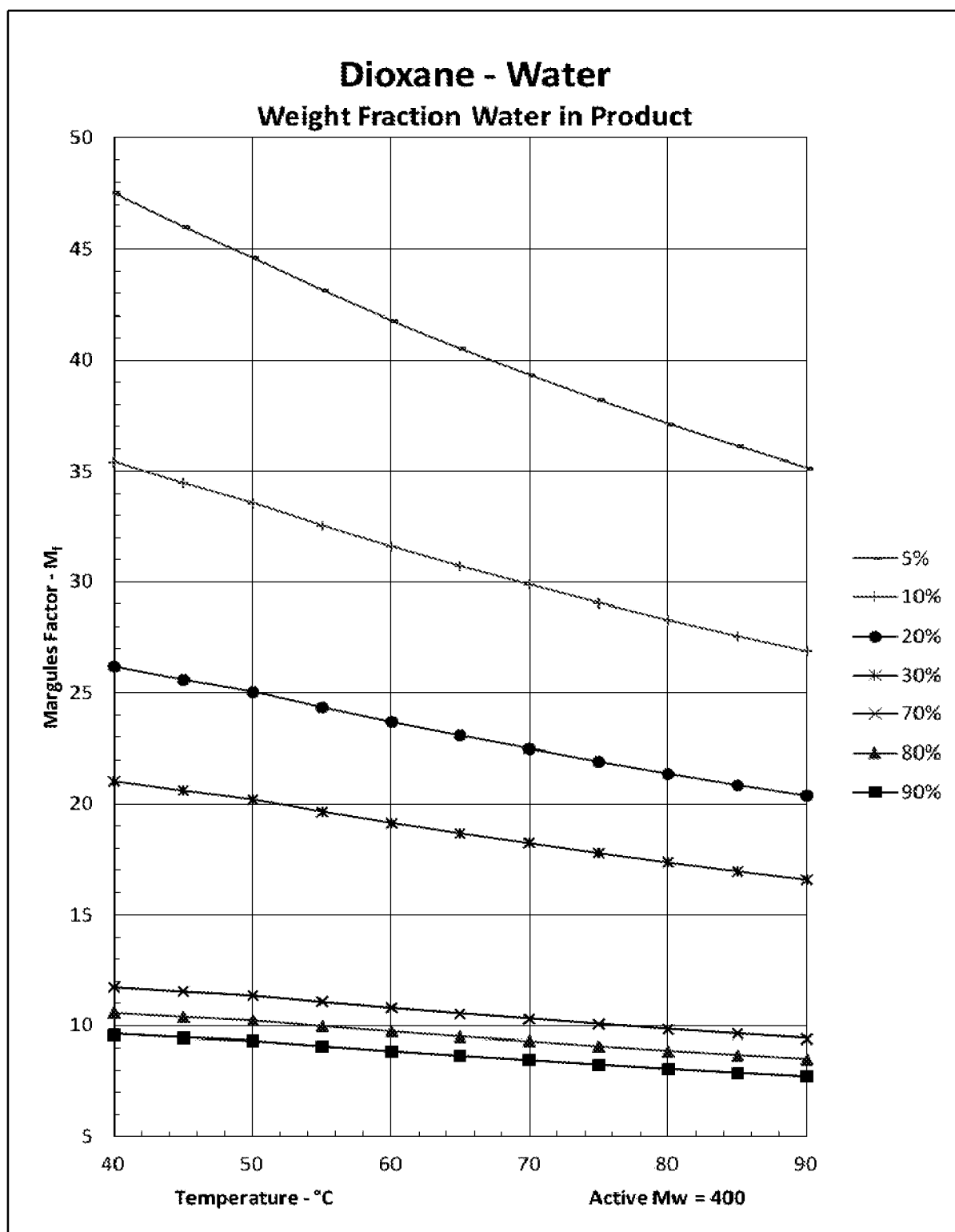


Fig. 10

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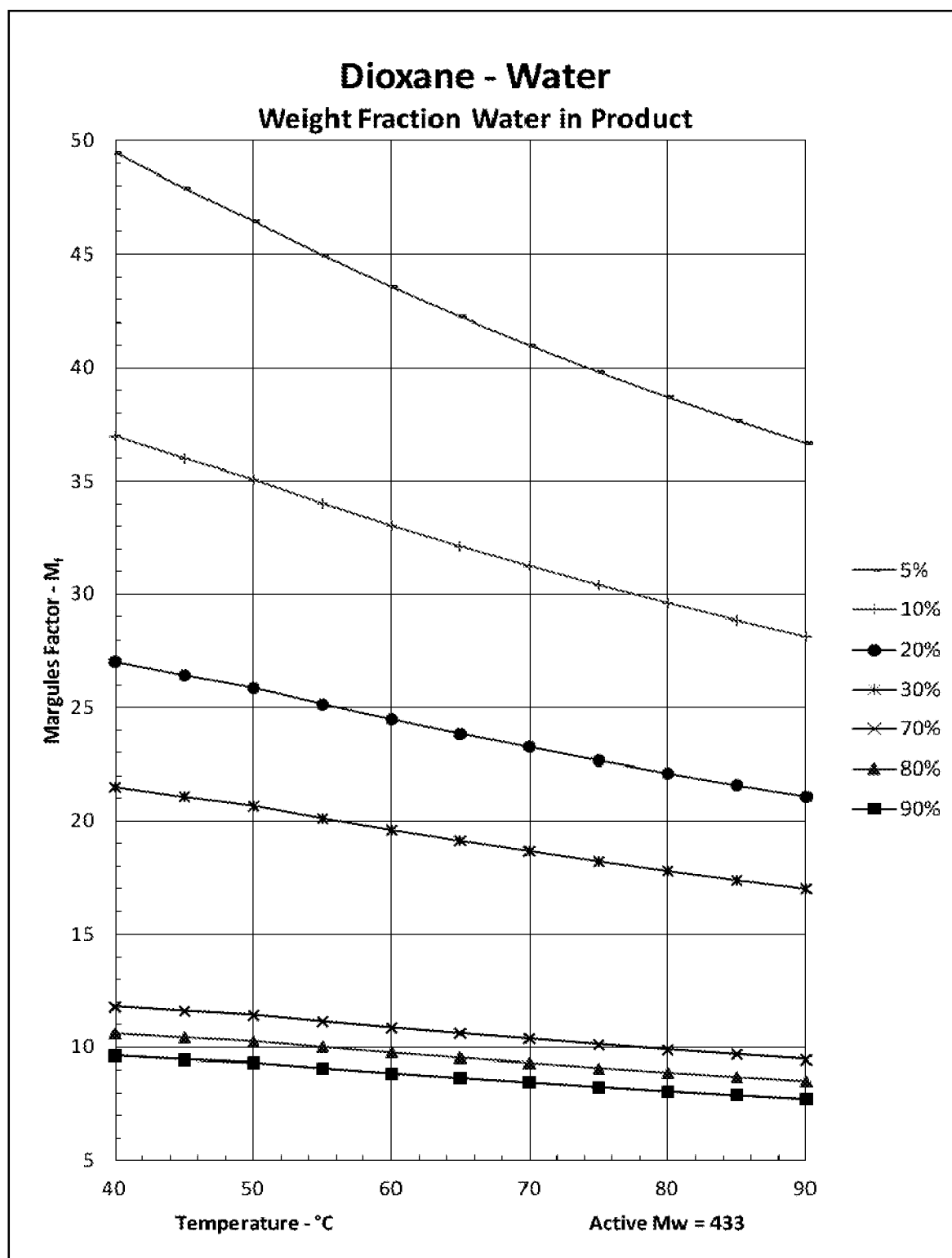


Fig. 11

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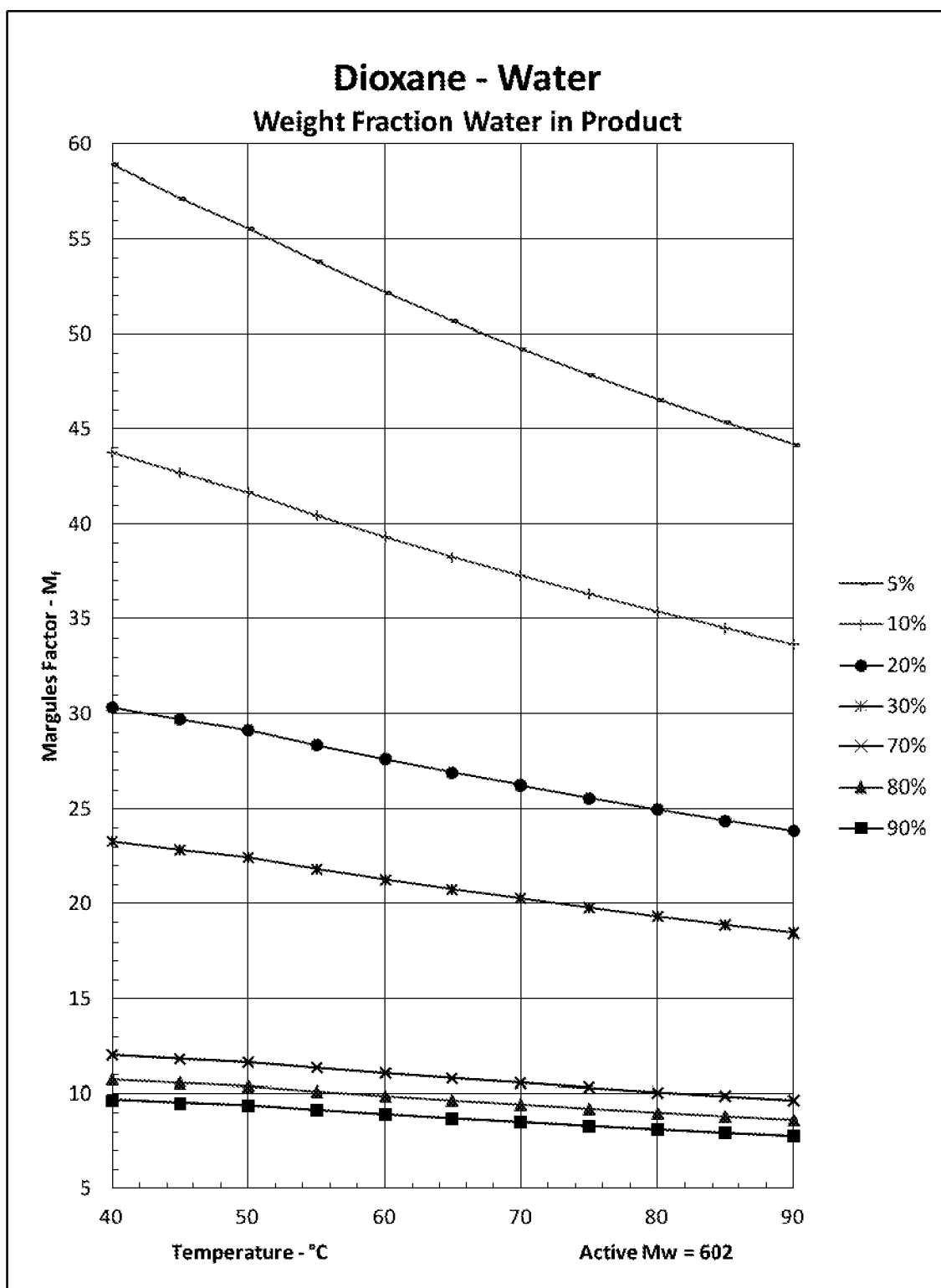


Fig. 12

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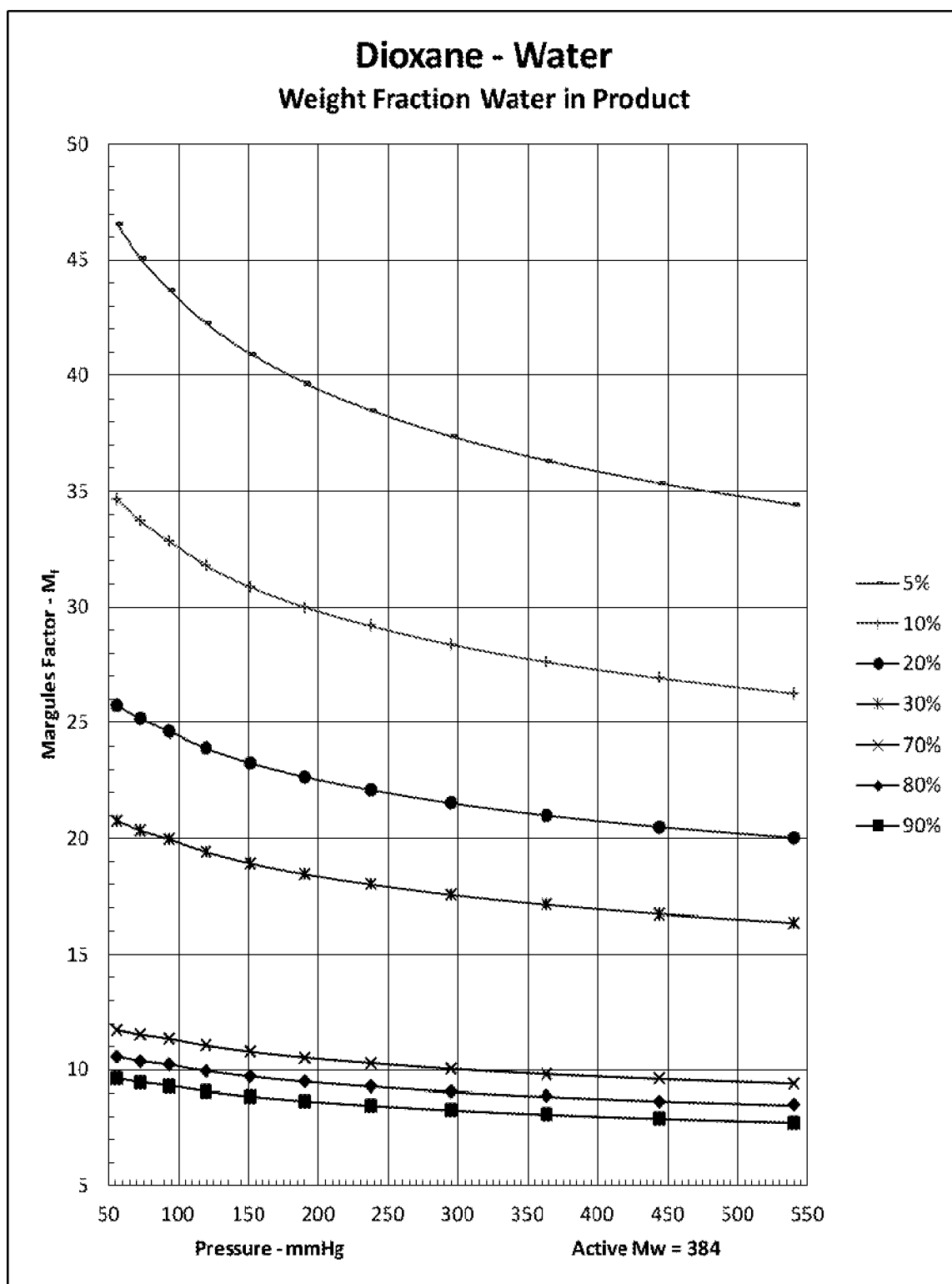


Fig. 13

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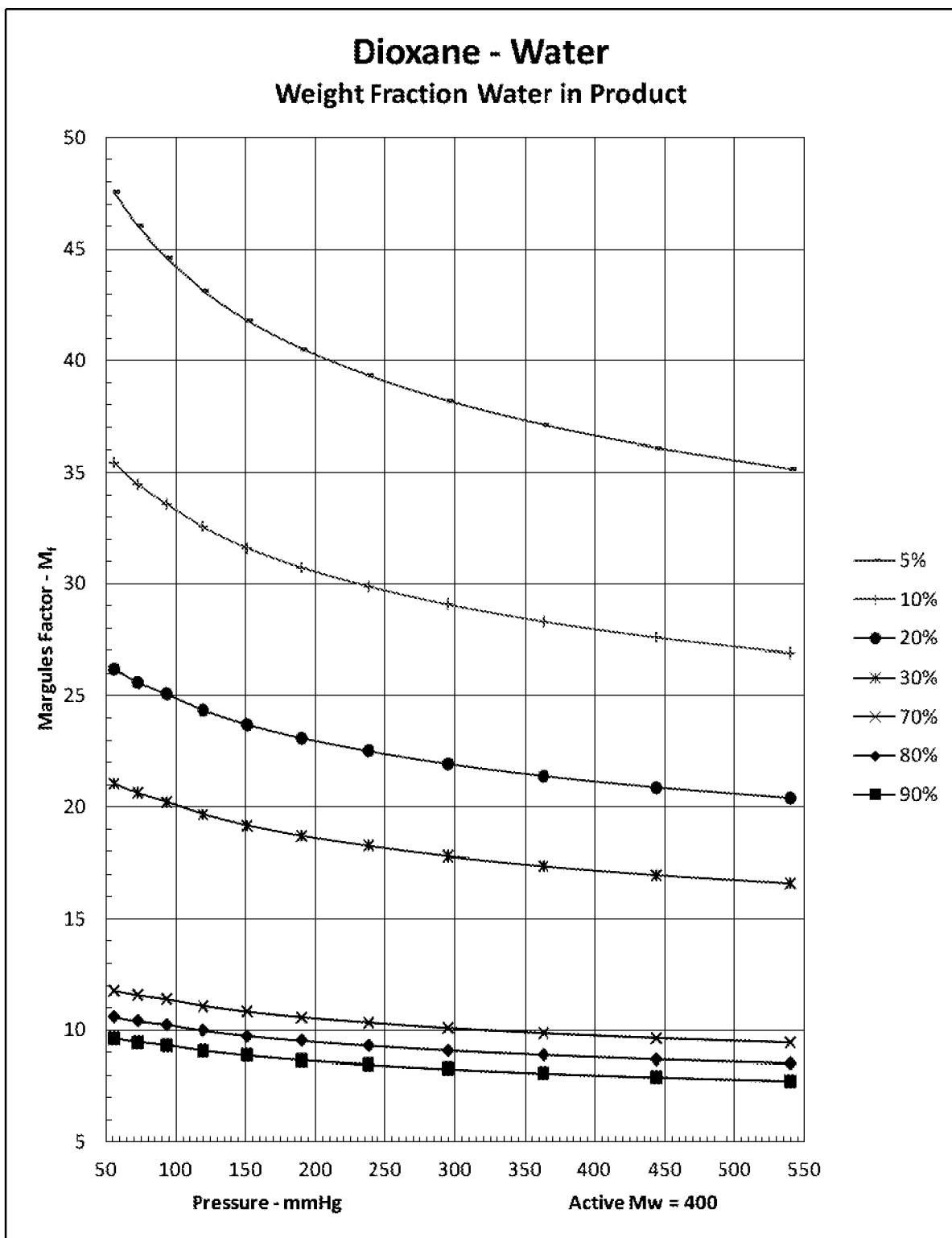


Fig. 14

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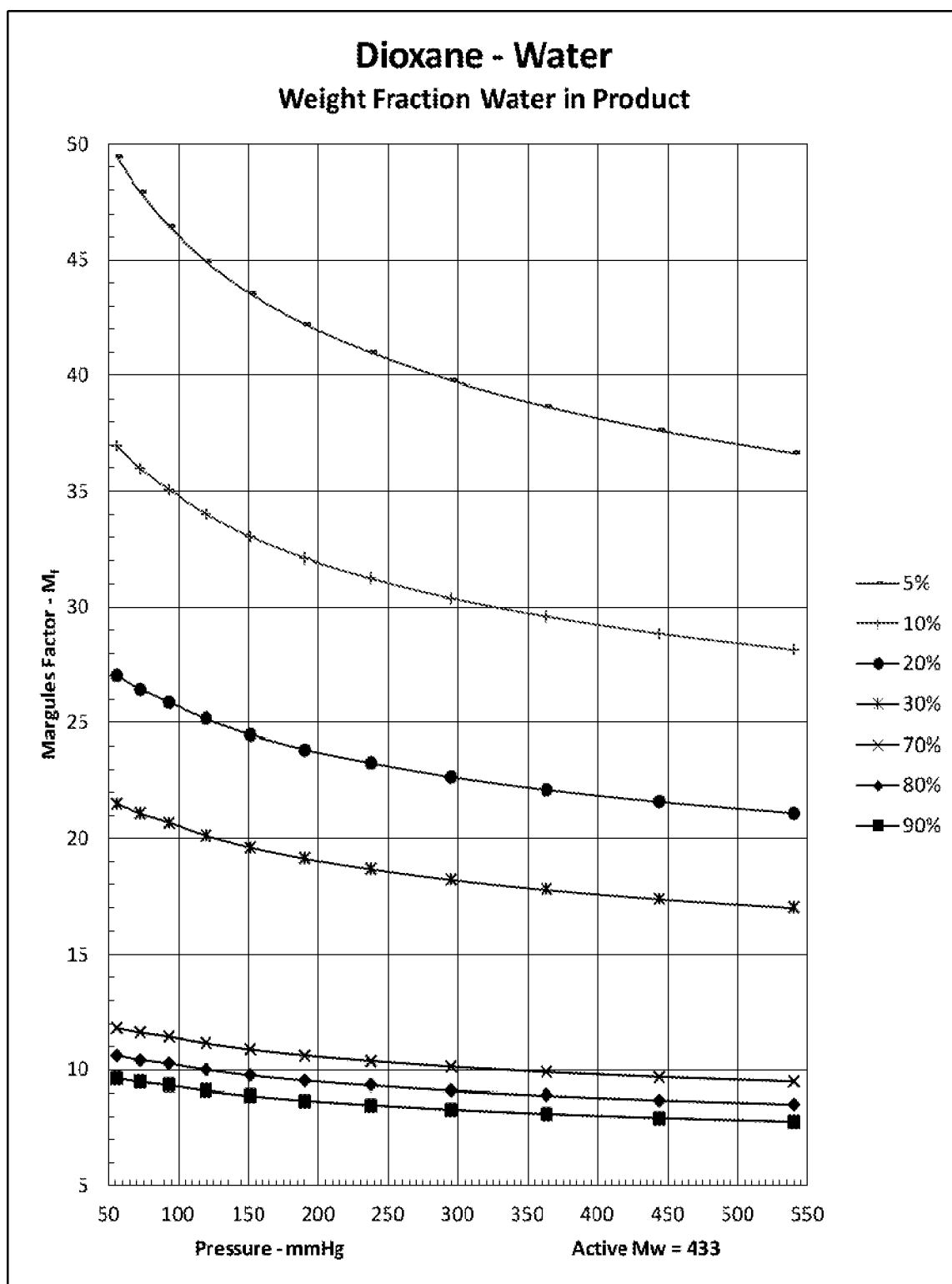


Fig. 15

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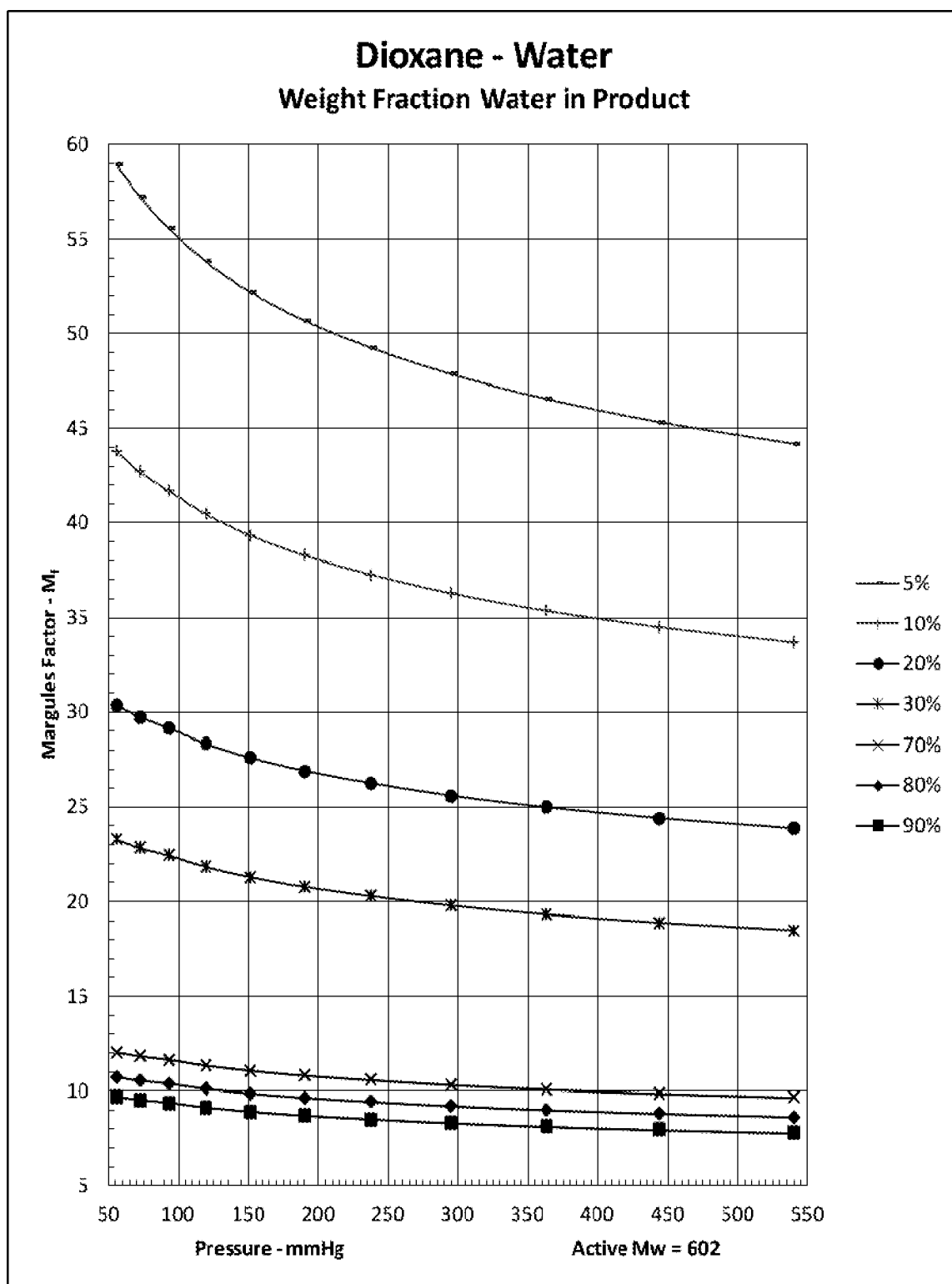


Fig. 16

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Ex. #	Tube length ft	AES type cation/ moles EO	Feed As is lb/hr	Feed 100% active basis lb/hr	Injection steam lb/hr	Feed out preheater °F	Jac	Jacket °F	Flash tank vapor °F Torr	Feed active %	Product active %	Delta active %
1	10+10	Na/3	90	62	42	240	Stm	242	153 149	69.3	87.1	17.9
2	10+10		90	62	42	262		263	160 149		91.7	22.5
3	10		150	109	75	201	TW	207	156 150	72.8	79.0	6.2
4	10		150	109	75	217		223	154 150		81.9	9.1
5	10		150	109	75	183		192	150 148		76.7	4.0
6	10	Na/3	100	72	44	206	TW	206	153 149	72.4	80.5	8.0
7	10		100	72	44	221		221	153 150		83.6	11.2
8	10		100	72	44	188		189	148 149		77.5	5.1
9	10		150	109	75	220		224	165 148		81.2	8.8
10	10		150	109	75	204		205	159 151		78.0	5.6
11	10	Na/2.5	150	109	75	187	Stm	190	155 150	79.2	76.2	3.7
12	10		150	119	30	217		241	158 150		91.1	12.0
13	10		150	111	30	214		232	165 148		87.6	13.7
14	10		150	106	15	240		241	170 150		84.7	14.0
15	10		150	106	30	242		241	167 151	70.8	85.1	14.4
16	10	Na/3	150	106	0	242		241	154 150		81.1	10.3
17	10		150	106	30	241		240	160 150		84.7	14.0

Stm = steam, TW = tempered water, EO = moles of ethylene oxide polymerized onto one mole of fatty alcohol

Fig. 17a

Ex. #	Feed water %	Product water %	Feed 1,4-dioxane 100% active basis ppm	Product 1,4-dioxane 100% active basis ppm	1,4-dioxane In / Out 100% active basis ppm to ppm ratio	Injection steam to feed 100% active basis mass ratio	Water evaporated from feed 100% active basis mass ratio	Total water vapor to feed 100% active basis mass ratio
1	28.7	10.2	82.2	1.8	45.7	0.67	0.26	0.93
2		5.3		0.8				
3	25.5	19.0	67.0	5.0	13.4	0.69	0.09	0.77
4		17.1		3.5				
5		21.7		4.9				
6	26.0	17.8	37.0	5.8	6.4	0.61	0.11	0.72
7		15.0		3.3				
8		21.0		5.6				
9		17.1		2.5				
10		20.0		3.2				
11		22.2		4.6				
12	19.4	7.1	44.5	0.9	49.4	0.25	0.15	0.40
13	23.7	10.1	21.6	1.3	19.8	0.27	0.19	0.46
14	26.2	11.7	83.6	6.6	12.7	0.14	0.20	0.34
15		11.0		3.3				
16		13.2		11.6				
17		10.4		3.1				

Stm = steam, TW = tempered water, EO = moles of ethylene oxide polymerized onto one mole of fatty alcohol

Fig. 17b

