

SMART RSPT
Electromagnetic Analysis of Reed Switch Position Transmitter (RSPT)
for SMART Control Element Drive Mechanism

150

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Abstract

A numerical electromagnetic analysis was performed for the reed switch position transmitter (RSPT) which is installed in the control element drive mechanism (CEDM) of the integral reactor SMART. Design parameters related to effective operating force were identified, and the optimum design point was determined by analyzing the trend of the magnetic flux density with finite element method.

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2.

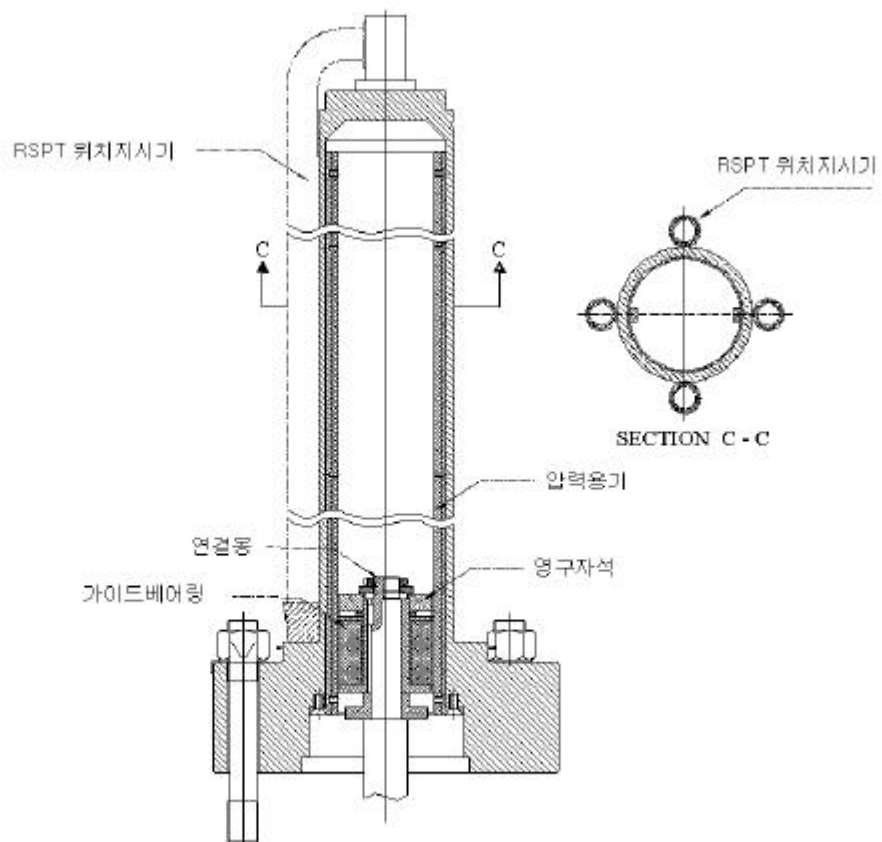
2.1

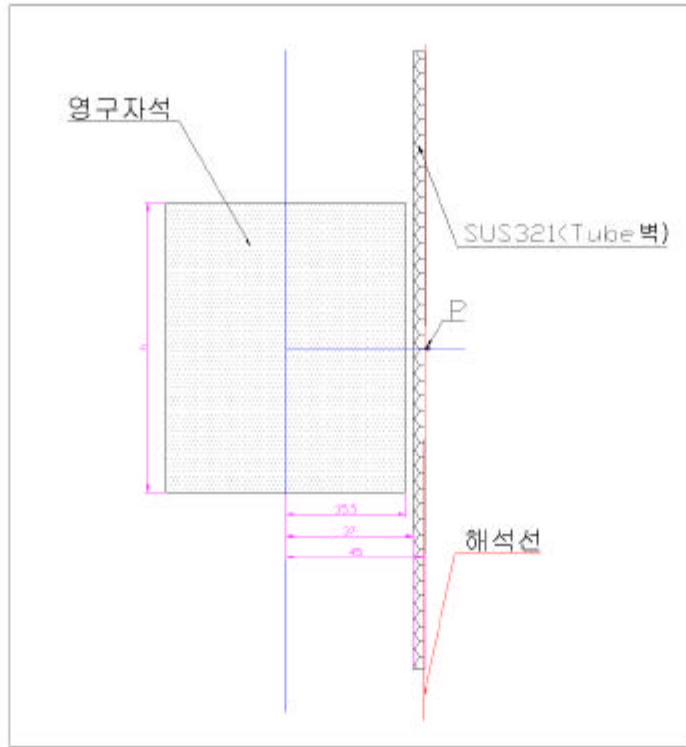
SMART

1 가

(㉠)가

[1][2][5].





2 SMART

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[3].

Maxwell-2D

solver : Magnetostatic

: RZ-plane

(define model-draw model)

materials -BH Curve ,

boundaries/sources - balloon

executive parameter

()

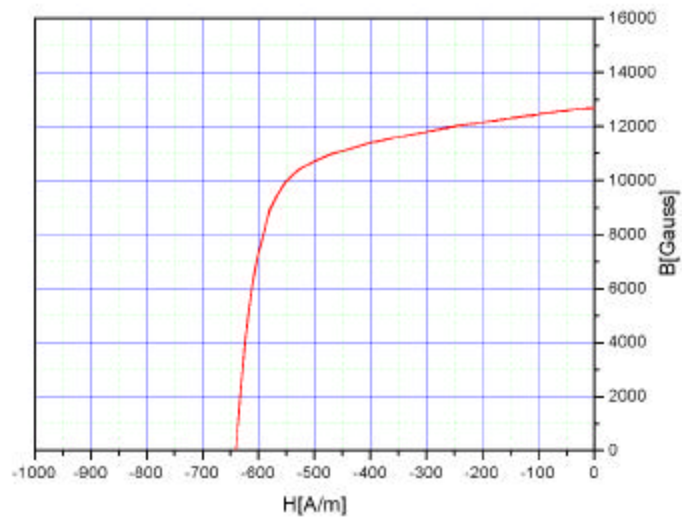
post-processing

1

1			71mm	Alnico 5
			10mm	
2			74mm	SUS321
			90mm	$\mu = 1.02$
3		[Gauss]	180	tangential
4		[mm]	1.5	

1

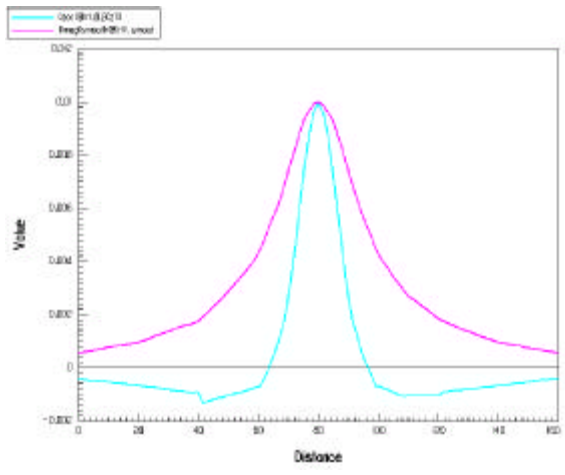
3 materials



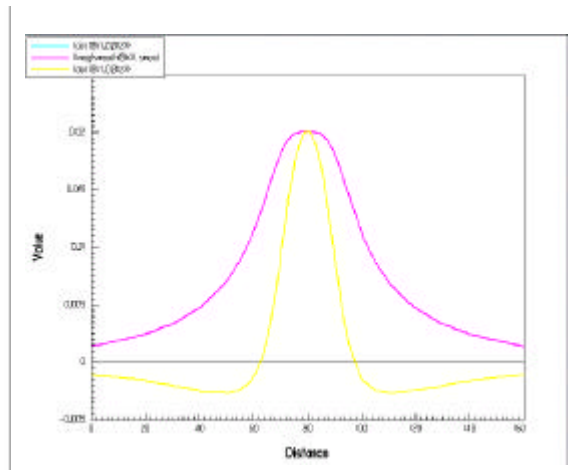
2

2 P tangential 180[Gauss]가
 B_r H_c 2
 (h)

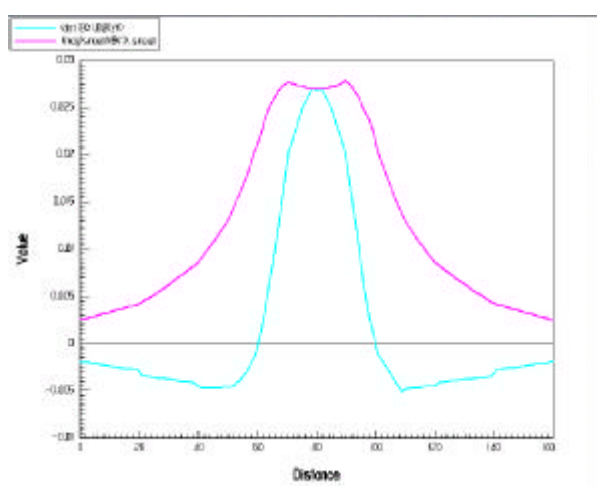
h가 20[mm] P 180[Gauss]가
 H_r 51,000 [A/m] , B_r 1.268[T] [4].
 h 10 가 P



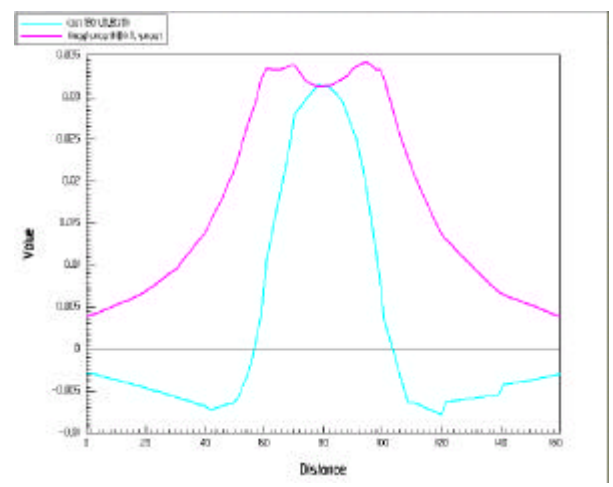
4 h가 10[mm] P
 : 100[Gauss]



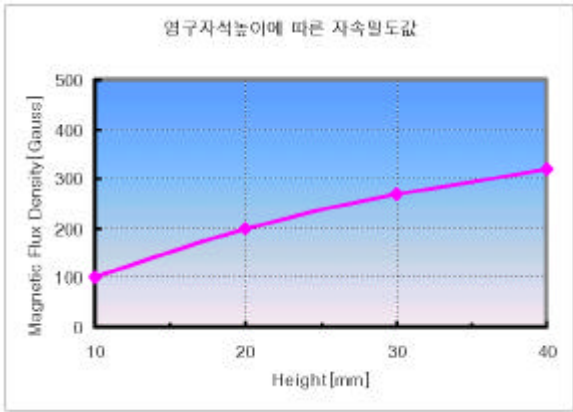
5 h가 20[mm] P
 : 200[Gauss]



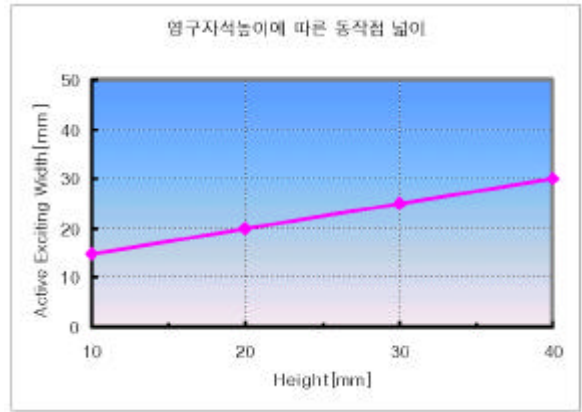
6 h가 30[mm] P
 : 270[Gauss]



7 h가 40[mm] P
 : 320[Gauss]



8



9

3.

SMART

2 가

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180 [Gauss]

H_r 51,000

[A / m] , B_r 1.268 [T]

가

가

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[1] , -KAERI / AR- 551/99, , 1999

[2] , SMART CEDM , pp. 105, '99 , 1999

[3] Systems Manual Pressurized Water Reactors Combustion Engineering design Vol. 1, Inspection and Enforcement Training Center

[4] , -KAERI / RR- 1889/98- 1 , , 1999

[5] , , , 1990