

## Product/Process Change Notification

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<b>Initiation Date</b>	22-JUL- 2022	<b>Notification No.</b>	20220328
<b>Implementation Date</b>	TDB	<b>Initiator's Name</b>	Sharon Tomo-Bustamante
<b>Beginning Date Code of Implemented Change</b>			TBD

### CHANGE DESCRIPTION:

Knowles is making a change to the RAB receiver family. This change is to go from a “wet wound” coil to a thermo-bond coil.

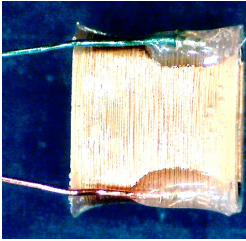
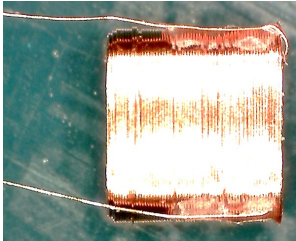
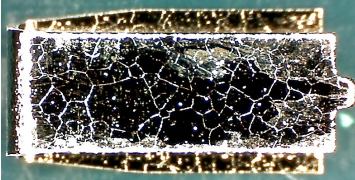
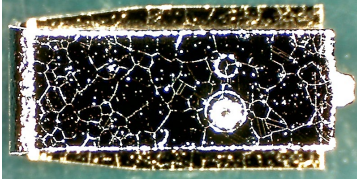
This will be an alternate component to the current RAB coil design to increase capacity and assure adequate parts supply. These changes apply to the models shown on the next page.

This change also requires a modification of the RAB reed to be compatible within this design.

Note: There are no significant changes in the product fit, acoustic performance & reliability. There is no change to the visual appearance of the receiver.

Please continue to work with your local Knowles Sales Manager if you have any questions, concerns or require samples for evaluations related to this product change notification.

Changes are shown below.

<b>CURRENT</b>	<b>NEW</b>
<p>Wet Wound Coil</p> 	<p>Thermo-bond Coil</p> 
<p>No-Bump Reed</p> 	<p>Bump Reed</p> 

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**MODELS AFFECTED: Below part numbers are covered within this PCN**

<b>PART NUMBERS</b>
RAB-32063-000
RAB-31761-000
RAB-32167-000
RAB-33726-000

**SUPPORT INFORMATION:**

The following qualification testing was conducted and shows no significant change in the performance. The test model is RAB-62001-000 receiver.

Group Identification:

Current: Wet Wound Coil  
New: Thermo-Bond Coil and Bump Reed.

Knowles Qualification Plan Number: P-R-19039

**Acoustic Performance:**

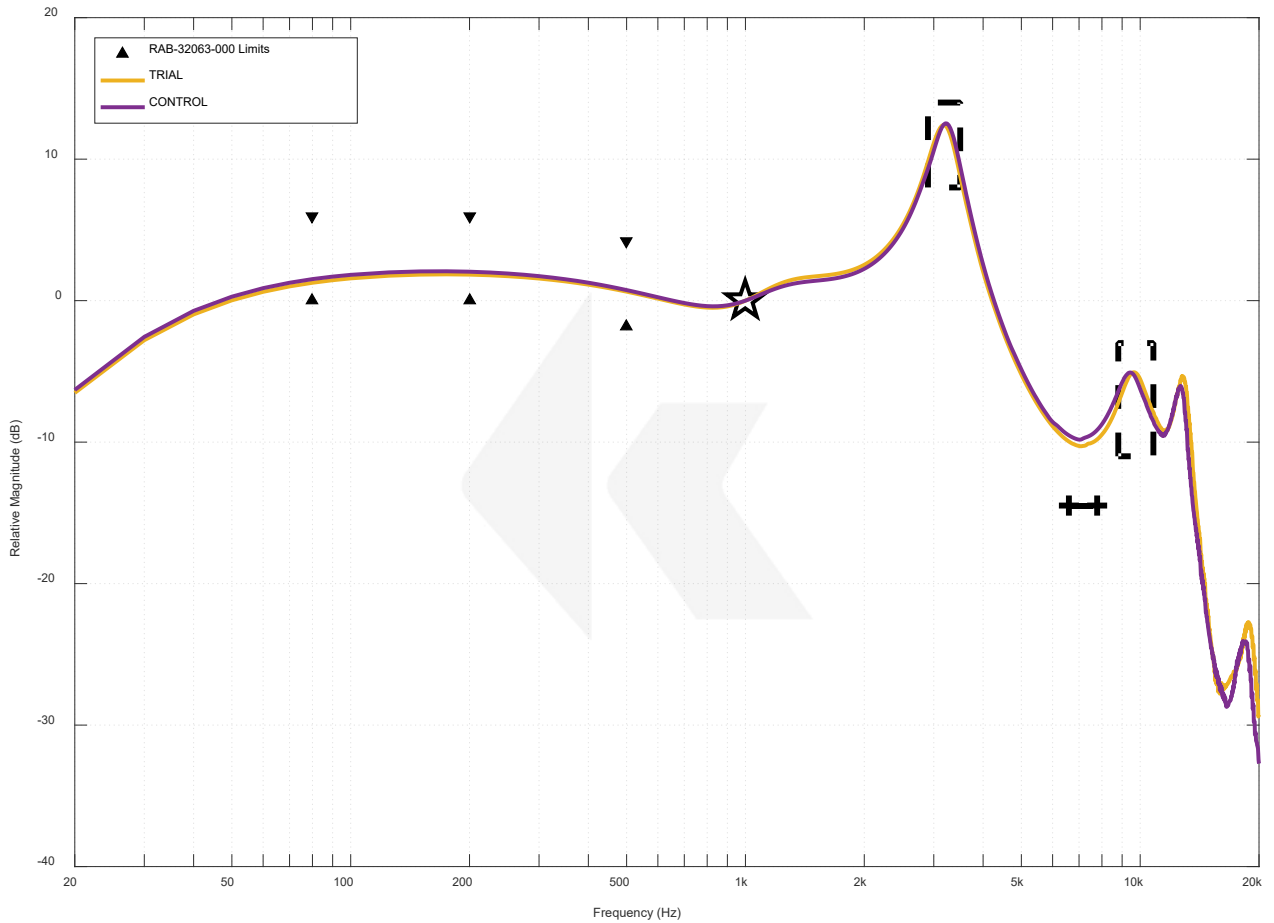
Test	Acceptance Criteria	Model Tested	Sample Size	Result
<b>Acoustical Characteristics</b>	Performance to be comparable to current product	RAB-32063-000	Preliminary Quantity: N (Trial)=150pcs N (Control)= 150pcs	All parameters met the 1.33 CpK requirements

Note: Sensitivity is measured as dB relative to 20 $\mu$ Pa.		Average	Std. Dev	Cpk
RELSSENS @80 Hz	Trial	1.260	0.207	1.99
	Control	1.538	0.264	2.13
RELSSENS @200 Hz	Trial	1.845	0.130	4.77
	Control	2.038	1.789	4.00
RELSSENS @500 Hz	Trial	0.064	0.072	11.83
	Control	0.733	0.091	8.97
SENSITIVITY @1000 Hz	Trial	103.500	0.186	4.13
	Control	103.500	0.1722	3.86
PKREL1 Amp	Trial	12.430	0.403	2.26
	Control	12.560	0.224	2.17
PKREL1 Freq	Trial	3183	38.290	2.53
	Control	3199	24.600	4.06
VLREL1 Amp	Trial	-10.340	0.350	1.39
	Control	-9.954	0.325	6.13
VLREL2 Freq	Trial	7085	129.900	1.58
	Control	7046	80.360	1.96
PKREL2 Amp	Trial	-5.044	0.616	1.83
	Control	-4.910	0.527	1.47
PKREL2 Freq	Trial	9640	131.800	2.04
	Control	9153	127.300	1.74
THD 1/3 <sup>rd</sup> PK @ Nom Drive	Trial	0.958	0.101	6.01
	Control	1.061	0.166	3.29
THD ½ PK @ Nom Drive	Trial	0.700	0.346	1.74
	Control	0.908	0.501	1.45
THD 1/3 <sup>rd</sup> PK @ +9dB Drive	New	0.962	0.446	5.53
	Current	1.248	0.700	4.02

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Note: Sensitivity is measured as dB relative to 20 $\mu$ Pa.		Average	Std. Dev	Cpk
THD $\frac{1}{2}$ PK @ +9dB Drive	Trial	1.600	0.850	2.67
	Control	1.908	1.235	1.72
IMPEDANCE @ 500Hz	Trial	28.480	0.297	5.16
	Control	28.571	0.671	2.42
IMPEDANCE @ 1KHz	Trial	40.410	0.581	3.03
	Control	41.051	0.857	2.35
DC Resistance	Trial	22.940	0.323	1.33
	Control	22.100	0.218	11.65

**Response Comparison:**



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**Reliability Tests**

Test	Acceptance Criteria	Model Tested	Sample Size	Result
<b>HALT</b>  Condition A: 63°C / 95% RH, 1008 hours total exposure, biased.	Units shall compare favourably to historical data from similar model and shall change $\leq 3.0$ dB change in sensitivity at the adjust frequency; $\leq 5\%$ distortion changes at the nominal drive ; $\leq 10\%$ distortion changes at the high drive.	RAB-62001-000	Trial = 30 Control = 30	PASSED
	<u>Average Change of Sensitivity (dB) @ 1 kHz</u> Trial = -0.03 dB Control = -0.04 dB			
<b>Stress Test</b>  1Hr at High Drive @ Motor Resonance. Drive Train Integrity Test.	Sensitivity change $\leq 3$ dB at the adjust frequency.	RAB-62001-000	Trial = 20 Control= 20	PASSED
	<u>Average Change of Sensitivity (dB) @ 1 kHz</u> Trial = 101.14 dB Control= 101.12 dB			
<b>Composite Temperature Humidity Cyclic Test</b>  Test 2b (10 cycles of 24 hrs each) 25°C / 80-100% RH for 3 h 65°C / 90-100% RH for 5 h -10°C / 0% RH for 5 h	Sensitivity changes at the adjustment frequency < 1.5 dB(FF model 3dB)	RAB-62001-000	Trial = 20 Control = 20	PASSED
	<u>Average Change of Sensitivity (dB) @ 1 kHz</u> Trial = 101.18 dB Control = 101.04 dB			

Test	Acceptance Criteria	Model Tested	Sample Size	Result
<b>Aggressive Sweat</b>  Cond 4 -10 Day exposure to sweat vapor in 38°C oven (1.8PH $\pm$ .2.)	No visual signs of corrosion, Sensitivity to change < 4 dB	RAB-62001-000	Trial = 20 Control = 20	PASSED
	<u>Average Change of Sensitivity (dB) @ 1 kHz</u> Trial= 101.15 dB Control = 101.01 dB			
<b>Powered Salt Fog Test</b>	Comparable to similar coils.	RAB-62001-000	Trial = 20 Control = 20	PASSED

<p>4 Weeks exposure to 35°C salt fog chamber with salt deposition 20~50g/sq.m/24 hours. Units powered with 0.289Vrms@1kHz</p>	<p style="text-align: center;"><u>Average Change of Sensitivity (dB) @ 1 kHz</u>            Trial = 101.15 dB            Control = 101.01 dB</p>			
<p><b>Mechanical Shock</b>            Shock at progressively higher heights until failure. "Failure" means that a unit changes &gt;3dB from initial, THD at nominal drive at 1/3 resonance &gt; 10% or THD at nominal drive at 1/2 resonance &gt; 20%.</p>	<p>90% Survivability @14.1kG</p>	<p>RAB-62001-000</p>	<p>Trial = 20            Control = 20</p>	<p>PASSED</p>
<p style="text-align: center;"><u>Average Change of Sensitivity (dB) @ 1 kHz</u>            Trial = above 90% survivability @14.1kG            Control = above 90% survivability @14.1kG</p>				

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