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2018年中国家用电器技术大会
2018 China Household Electrical Appliances Technical Conference



论文集

中国家用电器协会 《电器》杂志社 编



中国轻工业出版社 | 全国百佳图书出版单位

加大研发力度，积蓄力量

(前言)

金色的秋天是美丽的，而2018年的秋天，行业人更多感到的是压力。9月在南京召开的中国家用电器协会常务理事会上，从经济学家的宏观分析到企业高管在一线的亲身感受，均传递着相同的对经济形势走势的看法——宏观经济形势稳中有变；美国不断增加关税产品和税幅，确实影响中国家电产业的持续发展，这种影响不能简单地用数字来计算；7月以来市场持续走低，2018年的收关不完美应该是大概率，同时2018年很可能是往后的三年内最好的一年……

尽管我们不希望如此，但我们必须为此做好准备。国内外的历史经验告诉我们，经济总是有波动的，在经济下行之时，优秀的企业要做的是加大研发投入，积蓄力量，迎接下一个市场波峰的到来。

2017年以来，卡萨帝品牌在市场上的辉煌表现，已经被称为“卡萨帝现象”，成为中国家电打造高端品牌的典范。打造一个高端品牌，需要企业内部各个环节的协同和投入，其中研发投入是万万少不得的。可以说，“卡萨帝现象”不仅是品牌的成功，也是满足消费升级、产品升级的成功。高端产品不仅要颜值，内涵也要极丰富、有个性。要做到有个性，起点是挖掘消费痛点，即那些看似司空见惯、习以为常、似有似无的“小问题”。解决这一个个“小问题”，需要依赖技术基础、技术手段，或许还要突破性技术。回过头来看，卡萨帝产品正是如此。例如卡萨帝的酒柜，由于葡萄酒存放忌讳振动，为了解决这个痛点，卡萨帝采用了新的制冷技术——固态制冷，实现了酒柜的0振动，0噪音，0温度波动。再说“空气洗”洗衣机。不少人不以为然，认为好多品牌的洗衣机都有“空气洗”功能，却不知道别人家的“空气洗”只能去除衣物上的异味，而卡萨帝的“空气洗”不仅去异味还有近似干洗的功效。有的洗衣机技术专业人士觉得这没有什么深奥的技术。然而，可能差

别就是这些：你不以为然的点，人家却洞察到那里存在的真实需求；你以为那儿没有高深的技术，人家却下了狠功夫把解决问题的技术方案研究到极致、突破。这不正是我们产品升级的路径吗？不正是产品创新、技术创新要做的事情、要下的功夫吗？

从这本论文集可以看到，中国家电行业的技术工作者在做的努力。为促进行业的技术进步、产品升级，中国家用电器协会每年召开中国家用电器技术大会。行业技术骨干参会的踊跃程度一年超过一年。2018年，技术大会共计收到论文318篇。从产品分类上看，收到的论文中，内容涉及冰箱、厨房电器、空调的占比均在1/5~1/4之间。从论文来源的企业分布上看，海尔、美的两大龙头企业的投稿量都超过40篇，博西家电、海信、老板电器投稿量均超过20篇，三星、TCL、奥克斯均超过10篇，投稿5篇以上的企业还有美芝、方太、长虹、东贝。从论文中可以看出这些企业技术研发的活跃程度，表明了这些企业不仅进行了众多研发课题，而且及时地进行了研究成果的梳理，并以开放的心态积极参与行业交流。特别是美的40多篇论文中，半数以上来自美的集团中央研究院，其中有3个研究团队的论文数量为5~10篇之多，每个团队有各自的研究方向，涉及多个产品领域。不难看出，美的加大研发投入，中央研究院人才集聚，布局基础性、共性技术研究，不断积蓄的力量，正在对夯实美的的技术底蕴、提升美的产品的技术内涵带来积极影响。

论文的原创性是技术大会论文集的最大特色之一。论文与论文库中论文重合率(以下简称“查重率”)低于10%的259篇，而其中为0的113篇。这本论文集收录论文的查重率全部低于15%。近300篇论文交由专家审核，经过专家评审，共有253篇论文入选论文集，入选论文有以下特征中的部分或全部：研究具有一定新颖性；能针对问题，提出相对应的

解决方案；实验设计合理，实验结果具有较好的参考价值；论文思路比较清晰，叙述准确，结论合理，其研究结论具有一定的工程实用性、有推广应用价值或对产品研究有借鉴意义。专家也指出部分论文需要改进的问题：有的对实验结果的分析讨论不充分，有的文中实验具体设计、对验证实验的描述及方案描述略显不足或缺少实际应用的例子，还有的相关参考文献收集不全面。专家意见最集中的问题则是论文写作有待规范，标题、摘要、英文摘要和关键词、图注、文献引用等写作规范性有待提高。经过评审，本次淘汰了部分创新性不够、分析浅显、内容单薄、研究内容或观点不明确的论文，共计65篇。

优秀论文不仅研究成果值得借鉴，也为我们树立了提高论文水平和提升研究能力的标杆。青岛经济技术开发区海尔热水器有限公司杨玉敏《压力传感器的应用探讨》、美的集团中央研究院程杰锋《微波炉振动噪声与电磁仿真研究》、杭州老板电器股份有限公司岳晓锋《锯齿形叶片对吸油烟机噪声影响的研究》、青岛海尔智慧厨房电器有限公司周佳强《多指标协同的大火力燃气灶热效率优化实验研究》、宁波方太厨具有限公司周华《关于抖频技术在减小电磁灶传导干扰中的应用研究》、美的集团中央研究院张辉《吸尘器尘杯尘气分离机理分析及优化》、青岛经济技术开发区海尔热水器有限公司王爽《基于云Smart的电热水器节能用水研究》、海信（山东）冰箱有限公司王国庆《压差传感器在冰箱化霜控制中的应用研究》、中国家用电器研究院赵金丹《带有除菌功能电冰箱除菌效果的分析研究》、东华大学服装与艺术设计学院刘红《基于量纲分析的家庭滚筒洗涤研究》、四川长虹空调有限公司周奇杰《百叶窗建筑内家用空调性能现状分析及优化研究》、海信（山东）空调有限公司杨帅《有源PFC电路IGBT结温测算方法研究与应用》、上海交通大学陈晓宁《R290低温空气源热泵减充注的理论与实验研究》、艾默生环境优化技术（苏州）有限公司王蒙《变频R290热泵系统在北方煤改电中的应用研究》、上海海立电器

有限公司黄小龙《LCCP在中国家用空调中的应用研究》、四川长虹空调有限公司邓培生《基于压缩机激励源特性的管路应力仿真及软件开发》、苏州三星电子有限公司高超《BLDC电机风扇噪声发生机理探讨》等论文获得了多位专家的一致推荐而入选优秀论文。2018年共评出优秀论文48篇，优秀论文比例为15%。评审专家对这些论文的评价如下：研究工作相对完整和严谨；具有很好的创新性；实验设计合理，实验数据丰富，数据可信，论述详实，内容深入，学术性强，得到了有意义的结论，其研究方法和结果均值得肯定；论文写作规范认真，重点突出，行文通顺，逻辑严密，结构紧凑，条理清晰，语言简炼，表达准确，结论准确有较好的应用参考价值。

在此，我代表中国家用电器协会感谢所有作者们踊跃发表论文参与行业技术交流！感谢大家为技术进步和家电产业升级所做的努力和取得的成绩！

我也代表所有的论文作者，感谢吴建华、陈江平、何国庚、李红旗、张华、王瑞祥、黎晓云、吴俐俊、晏刚、巫江虹、黄敏、万春晖等专家参与本次的论文评审工作，感谢各位专家在炎热暑期、在繁忙的工作和社会活动间隙中，不辞辛苦地仔细阅读论文，并对作者的研究工作和论文写作给予的热情肯定、鼓励以及宝贵的意见和建议表示感谢。

最后，感谢所有编辑工作者，与往年相比，今年的编辑工作量大增，这给你们带来了很大压力。谢谢你们辛苦付出！

感谢所有人的参与！

下行的压力就在那里，我们要做的是加大研发力度，积蓄力量！相信未来可期！

中国家用电器协会副理事长

2018年10月8日

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