**河南心兴化学材料有限公司**

**甲醇下游深加工项目（一期）**

**竣工环境保护验收报告**

建设单位：河南心兴化学材料有限公司

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# 1 项目概况

河南心兴化学材料有限公司成立于2019年11月，是中国心连心化肥有限公司投资设立的公司，位于新乡经济技术产业集聚区青龙路东段。中国心连心化肥有限公司在河南省下辖河南心连心化学工业集团股份有限公司与河南心兴化学材料有限公司。

河南心兴化学材料有限公司利用现有空地新建厂房进行建设，并委托河南省化工研究所有限责任公司于2021年1月编制完成了《河南心兴化学材料有限公司甲醇下游深加工项目环境影响评价报告书》，2021年5月10日，新乡市生态环境局以新环书审[2021]8号文对该项目环评报告书进行了批复。

在环评中该项目分期进行建设，其中一期建设20万t/a甲醛（37%）和1万t/a氨基树脂，二期建设3万t/a氨基树脂、1万t/a甲酰胺类产品（其中1万t/a甲酰胺（AMF）和配套1.5万t/a甲酸甲酯中间产品）。本次仅对环评中的一期项目进行验收。一期项目于2021年6月开工建设，并于2022年5月竣工。该项目于2022年6月16日申请排污许可证，排污许可证编号为91410700MA47PEUA88001P。调试完成后建设单位对本项目开始验收，本次验收范围为甲醇下游深加工项目（一期），于2022年10月17日编制了验收监测方案，并委托河南中弘国泰检测技术有限公司于2022年10月21日~23日进行了现场监测，监测报告编号：ZHGT202210076。监测完成后，建设单位按照《建设项目竣工环境保护验收暂行办法》（国环规环评[2017]4号）和《建设项目竣工环境保护验收技术指南 污染影响类》（生态环境部公告2018年第9号），编制了本项目验收监测报告。

# 2 验收依据

1《中华人民共和国环境保护法》(主席令2014年第9号)；

2.《中华人民共和国环境影响评价法》（2018修正版）；

3.《建设项目环境保护管理条例》（国务院令第253号）；

4.《建设项目竣工环境保护验收暂行办法》（国环规环评[2017]4号）；

5.《河南省建设项目环境保护条例》（2016年修正版）；

6.《排污单位自行监测技术指南 总则》（HJ 819-2017）；

7.《建设项目竣工环境保护验收技术指南 污染影响类》（生态环境部，2018.5.16）；

8. 《建设项目竣工环境保护验收暂行办法》（国环规环评〔2017〕4号，2017.11.22）；

9. 关于印发《污染影响类建设项目重大变动清单（试行）》的通知（生态环境部，环办环评函（2020）688号，2020.12.13）；

10.《河南心兴化学材料有限公司甲醇下游深加工项目环境影响报告书》，河南省化工研究所有限责任公司，2022.1；

11.《河南心兴化学材料有限公司甲醇下游深加工项目环境影响报告书》的批复（新环书审[2021]8号），新乡市生态环境局，2021.5.10；

12. 河南心兴化学材料有限公司监测报告（ZHGT202210076）

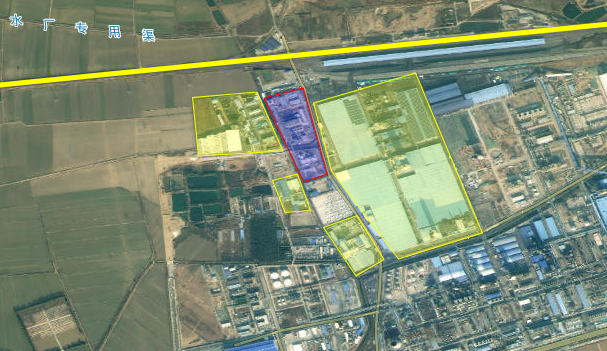
13. 河南心兴化学材料有限公司排污许可证（排污许可证编号：91410700MA47PEUA88001P）

# 3 项目建设情况

## 3.1地理位置及平面布置

本项目位于新乡经济技术产业集聚区（河南心连心化学工业集团股份有限公司复合肥分公司，强能新型墙材有限公司空地）（项目厂区中心位置经度：113.843617，纬度：35.221905），项目四周环境为：东侧隔路为心连心复合肥分公司，南侧紧邻新乡强能新型墙材有限公司，西侧向北紧邻黑色生态科技有限公司和顺达塑业有限公司，其余为空地。北侧100米为新菏铁路。项目选址路线及周边环境敏感点与环评报告书中一致，没有发生变化。

本项目周边环境及周边环境保护目标示意图见图3-1。

卡通人物

描述已自动生成

本项目

新菏铁路

顺达塑业有限公司

黑色生态科技有限公司

强能新型墙材有限公司

心连心复合肥分公司

图3-1 项目周围及周边环境保护目标示意图

## 3.2建设内容

本项目基本概况与建设内容与环评一致性分析分别见表3-1和表3-2。

表3-1 本项目基本概况一览表

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **序号** | **项目** | **环评批复** | **实际建设** | **一致性** |
| 1 | 项目名称 | 河南心兴化学材料有限公司甲醇下游深加工项目 | 河南心兴化学材料有限公司甲醇下游深加工项目 | 一致 |
| 2 | 建设地点 | 新乡经济技术产业集聚区（复合肥以西，强能砖厂空地） | 新乡经济技术产业集聚区（复合肥以西，强能砖厂空地） | 一致 |
| 3 | 总投资 | 55000万元（分两期建设，一期31000万元，二期24000万元） | 一期31000万元 | 一致 |
| 4 | 建设性质 | 新建（分两期建设） | 新建（分两期建设） | 一致 |
| 5 | 产品生产规模 | 20万t/a甲醛（37%）和1万t/a氨基树脂 | 甲醛（37%）20万t/a和氨基树脂1万t/a | 一致 |
| 6 | 工作制度 | 年工作日300天，评价按7200小时/年计算 | 四班三运转，年工作300天，年工作时间7200小时 | 一致 |
| 7 | 劳动定员 | 劳动定员为 169人（一期63人，二期106人） | 一期63人 | 一致 |
| 8 | 排水去向 | 项目外排废水拟排入心连心二分公司污水处理站处理后，排入新乡县综合污水处理厂深度处理，最终进入东孟姜女河。 | 项目外排废水排入心连心二分公司污水处理站处理。 | 一致 |
| 9 | 供热 | 本项目甲醛吸收尾气ECS催化氧化副产蒸汽提供（20.8t/h） | 甲醛反应器及ECS反应器副产蒸汽（20.8t/h） | 一致 |
| 10 | 供水 | 新鲜水由心连心供给，采用黄河水；脱盐水由心连心供给 | 新鲜水由心连心供给，采用黄河水；脱盐水由心连心供给 | 一致 |
| 11 | 建设周期 | 一期12个月 | 一期12个月 | 一致 |

环评提出本项目废水通过管道通入心连心二分公司污水处理站进行处理，处理后再排入新乡县综合污水处理厂，本项目实际建设为废水通过管道通入心连心二分公司污水处理站进行处理，处理后排入东孟姜女河，心连心二分公司污水处理站直接排河是暂时的主要原因为心连心与新乡县综合污水处理厂的管道正在铺设，目前尚不具备接通条件，管网预计在2022年12月份铺设完成，待管网铺设后将按照要求排入新乡县综合污水处理厂。根据《新乡市生态环境局关于河南心连心化学工业集团股份有限公司产业升级项目排放废水去向的意见》（详见附件5），在新乡县综合污水处理厂建成前同意河南心连心化学工业集团股份有限公司的废水经处理后排入东孟姜女河，心连心二分公司的排水方式的变化已经得到环保部门的许可，不属于重大变动。项目废水产生后全部按照环评要求排入心连心二分公司污水处理站进行处置，后续排水变化情况符合现有的环境管理要求，外排水质可以满足《地表水环境质量标准》（GB3838-2002）V类标准（TN≤15mg/L）、《省辖海河流域水污染物排放标准》（DB 41/777—2013）及《合成树脂工业污染排放标准》GB31572-2015）的标准要求。

本项目建设内容与环评一致性分析见表3-2。

表3-2 本项目工程组成及建设内容一览表

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **编号** | **类别** | **名称** | **建设内容及规模** | | | **一致性** |
| **环评及批复内容** | **实际建设情况** | |
| 1 | 主体工程 | 甲醛装置 | 铁钼法生产20万t/a甲醛（37%计）装置一套 | 铁钼法生产20万t/a甲醛（37%计）装置一套 | | 一致 |
| 氨基树脂车间 | 1万t/a氨基树脂  （甲醚化氨基树脂7000t/a，混合甲醚化氨基树脂3000t/a） | 1万t/a氨基树脂  （甲醚化氨基树脂7000t/a，混合甲醚化氨基树脂3000t/a） | | 一致 |
| 2 | 公用及辅助工程 | 循环水冷却水装置 | 新建循环水站5000m3/h | 已建循环水站5000m3/h | | 一致 |
| 生产、生活系统 | 供水为黄河水，本次工程依托心连心产业升级项目供水站 | 供水为黄河水，本次工程依托心连心产业升级项目供水站 | | 一致 |
| 排水系统 | 新建雨污分流排水系统，废水由管道送入心连心二分公司污水处理站处理后，达到《化工行业水污染物间接排放标准》（DB41/1135-2016）、《合成树脂工业污染物排放标准》（GB31572-2015）和新乡县综合污水处理厂进水水质标准，经心连心总排口排入新乡县综合污水处理厂后排入东孟姜女河。 | 已建雨污分流排水系统，废水由管道送入心连心二分公司污水处理站处理后，达到《化工行业水污染物间接排放标准》（DB41/1135-2016）、《合成树脂工业污染物排放标准》（GB31572-2015）和新乡县综合污水处理厂进水水质标准，经心连心总排口直接排入东孟姜女河。 | | 不一致 |
| 总变电站 | 依托四分公司220KV总变电站，新增6座低压变电所 | 依托四分公司220KV总变电站，已新建6座低压变电所 | | 一致 |
| 脱盐水站 | 由四分司脱盐水站装置提供 | 由四分司脱盐水站装置提供 | | 一致 |
| 供热 | 利用甲醛装置尾气焚烧余热供热 | 利用甲醛装置尾气焚烧余热供热 | | 一致 |
| 办公设施 | 新建综合办公楼一幢 | 已建综合办公楼一幢 | | 一致 |
| 3 | 储运设施 | 原料中间罐区 | 甲醇罐2个100m3、甲醛罐3个100m3、稀甲醛罐1个50m3、盐酸罐1个20m3、正丁醇罐2个50m3、异丁醇罐1个50m3、氢氧化钠罐1个50m3、废水回用罐1个50m3 | 甲醇罐2个100m3、甲醛罐3个100m3、稀甲醛罐1个50m3、盐酸罐1个20m3、正丁醇罐2个50m3、异丁醇罐1个50m3、氢氧化钠罐1个50m3、废水回用罐1个50m3 | | 一致 |
| 产品罐区 | 甲醛产品罐4个1500m3 | 甲醛产品罐4个1500m3 | | 一致 |
| 仓库 | 原料、成品仓库 | 原料、成品仓库 | | 一致 |
| 4 | 环保工程 | 废水  治理 | 依托现有二分公司150m3/h废水处理装置 | 依托现有二分公司150m3/h废水处理装置 | | 一致 |
| 甲醛吸收尾气 | 管道收集+ECS催化氧化+40m排气筒排放P1 | 管道收集+吸收塔 | ECS催化氧化+40m排气筒排放P1 | 本项目新增吸收塔处理甲醛装置尾气，新增洗涤塔处理甲醛成品罐呼吸气，优于环评设计 |
| 氨基树脂工艺废气 |
| 甲醛成品罐呼吸气 | 洗涤塔 |
| 投料废气 | / | 袋式除尘器+15m高排气筒 | | 环评未识别颗粒物，实际建设新增袋式除尘器+15m高排气筒处理颗粒物，由于环评设计 |
| 一般固废间 | 60 m2 | 60 m2 | | 一致 |
| 危废间 | 80m2 | 80m2 | | 一致 |
| 事故池 | 300m3 | 300m3 | | 一致 |

环评提出本项目废水通过管道通入心连心二分公司污水处理站进行处理，处理后再排入新乡县综合污水处理厂，本项目实际建设为废水通过管道通入心连心二分公司污水处理站进行处理，处理后通过心连心化学工业集团股份有限公司总排口排入东孟姜女河，心连心二分公司污水处理站直接排河是暂时的主要原因为心连心与新乡县综合污水处理厂的管道正在铺设，目前尚不具备接通条件，待管网铺设后将按照要求排入新乡县综合污水处理厂。根据《新乡市生态环境局关于河南心连心化学工业集团股份有限公司产业升级项目排放废水去向的意见》（详见附件5），在新乡县综合污水处理厂建成前同意河南心连心化学工业集团股份有限公司的废水经处理后排入东孟姜女河，心连心二分公司的排水方式的变化已经得到环保部门的许可（排污许可证中许可的排放方式为直接排入东孟姜女河），不属于重大变动。项目废水产生后全部按照环评要求排入心连心二分公司污水处理站进行处置，心连心二分公司污水处理站外排水质可以满足《地表水环境质量标准》（GB3838-2002）V类标准（TN≤15mg/L）、《省辖海河流域水污染物排放标准》（DB 41/777—2013）及《合成树脂工业污染排放标准》GB31572-2015）的标准要求。

## 3.3主要原辅材料

本项目主要原辅材料消耗情况见表3-4。

表3-3 本项目主要原辅材料消耗情况

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **序号** | **名称** | **环评批复用量（单耗）** | **实际用量（单耗）** | **一致性** |
|
| 一、**20万t/a甲醛生产装置（t/t)** | | | | |
| 1 | 甲醇 | 0.428 | 0.428 | 一致 |
| 2 | 电耗（万KWh/a） | 65 | 65 | 一致 |
| 3 | 蒸汽 | -0.75（副产）\* | -0.75（副产） | 一致 |
| 4 | 循环水 | 60 | 60 | 一致 |
| 5 | 脱盐水 | 1.14 | 1.14 | 一致 |
| 6 | 催化剂 | 1.33×10-5 | 1.33×10-5 | 一致 |
| 7 | 新鲜水 | 1.53 | 1.53 | 一致 |
| 8 | 氮气（万Nm3/a） | 0.5 | 0.5 | 一致 |
| **二、1万t/a氨基树脂装置（t/t)** | | | | |
| 7000t/a甲醚化氨基树脂产品原料消耗 | | | | |
| 1 | 三聚氰胺 | 0.3186 | 0.3186 | 一致 |
| 2 | 多聚甲醛 | 0.4813 | 0.4813 | 一致 |
| 3 | 甲醛 | 0.07 | 0.07 | 一致 |
| 4 | 甲醇 | 0.5 | 0.5 | 一致 |
| 5 | 氢氧化钠 | 0.008 | 0.008 | 一致 |
| 6 | 盐酸 | 0.0169 | 0.0169 | 一致 |
| 3000 t/a混合醚化氨基树脂产品原料消耗 | | | | |
| 1 | 三聚氰胺 | 0.255 | 0.255 | 一致 |
| 2 | 多聚甲醛 | 0.385 | 0.385 | 一致 |
| 3 | 甲醛 | 0.056 | 0.056 | 一致 |
| 4 | 甲醇 | 0.4 | 0.4 | 一致 |
| 5 | 氢氧化钠 | 0.0064 | 0.0064 | 一致 |
| 6 | 盐酸 | 0.0135 | 0.0135 | 一致 |
| 7 | 正丁醇 | 0.1 | 0.1 | 一致 |
| 8 | 异丁醇 | 0.1 | 0.1 | 一致 |
| 氨基树脂公用工程 | | | | |
| 1 | 电耗（KWh/a） | 400 | 400 | 一致 |
| 2 | 蒸汽 | 0.2 | 0.2 | 一致 |
| 3 | 循环水（m³/a） | 122.4 | 122.4 | 一致 |
| 4 | 新鲜水（m³/a） | 3.407 | 3.407 | 一致 |
| 5 | 氮气（Nm3/a） | 2.5 | 2.5 | 一致 |

注：蒸汽为甲醛工艺中产生的副产物，并于后续工艺进行消耗，所以蒸汽消耗量为负数。

## 3.4主要设备

项目主要的生产设备见下表。

表3-4 甲醛装置生产设备一览表

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 序号 | 环评批复 | | | | 实际建设 | | | | 一致性 |
| 设备名称 | 型号规格 | 材质 | 数量 | 设备名称 | 型号规格 | 材质 | 数量 |
| 1 | 甲醛反应器 | 内径\*厚度\*高度：4960\*18\*9110，换热面积：1954.7m² | S30408 S30403 | 2 | 甲醛反应器 | 内径\*厚度\*高度：4960\*18\*9110，换热面积：1954.7m² | S30408 S30403 | 2 | 一致 |
| 2 | 甲醇蒸发器 | 内径\*厚度\*高度：2205\*16\*9742，换热面积：下层639，上层213m² | S30408 | 2 | 甲醇蒸发器 | 内径\*厚度\*高度：2205\*16\*9742，换热面积：下层639，上层213m² | S30408 | 2 | 一致 |
| 3 | 甲醛吸收塔 | 内径\*厚度\*高度：4100\*4650\*16\*36600，容积：502m³ | S30408 | 1 | 甲醛吸收塔 | 内径\*厚度\*高度：4100\*4650\*16\*36600，容积：502m³ | S30408 | 1 | 一致 |
| 4 | 产品冷却器 | 厚度\*高度：600\*1543，换热面积：46.7m² | 换热管板316L 框架CS | 1 | 产品冷却器 | 厚度\*高度：600\*1543，换热面积：46.7m² | 换热管板316L 框架CS | 1 | 一致 |
| 5 | 填料段冷却器 | 厚度\*高度：890\*2286，换热面积：197.2m² | 换热管板316L 框架CS | 1 | 填料段冷却器 | 厚度\*高度：890\*2286，换热面积：197.2m² | 换热管板316L 框架CS | 1 | 一致 |
| 6 | HTF冷凝器 | 内径\*厚度\*高度：2500\*14\*7190，换热面积：410m² | Q345R | 2 | HTF冷凝器 | 内径\*厚度\*高度：2500\*14\*7190，换热面积：410m² | Q345R | 2 | 一致 |
| 7 | 空气悬浮风机 | 风量：22600 kg/h | 多种材料 | 4 | 空气悬浮风机 | 风量：22600 kg/h | 多种材料 | 4 | 一致 |
| 8 | 离心循环风机 | 风量：59000 kg/h | 多种材料 | 4 | 离心循环风机 | 风量：59000 kg/h | 多种材料 | 4 | 一致 |
| 9 | ECS 反应器 | 内径\*厚度\*高度：4160\*14\*10720，换热面积：壳程7.5m²管程3.3m² R-5506 12.9m² | S30408 | 1 | ECS 反应器 | 内径\*厚度\*高度：4160\*14\*10720，换热面积：壳程7.5m²管程3.3m² R-5506 12.9m² | S30408 | 1 | 一致 |
| 10 | ECS蒸汽发生器 | 内径\*厚度\*高度：1500\*12\*3950，换热面积：287m² | S30408/Q345R | 1 | ECS蒸汽发生器 | 内径\*厚度\*高度：1500\*12\*3850，换热面积：287m² | S30408/Q345R | 1 | 一致 |
| 11 | 导热油储罐 | 内径\*厚度\*高度：3000\*14\*10313，容积：68 m³ | Q345R | 1 | 导热油储罐 | 内径\*厚度\*高度：3000\*14\*10313，容积：68 m³ | Q345R | 1 | 一致 |
| 12 | 甲醇原料储槽 | 固定顶100m3 | S31608/S30403 | 1 | 甲醇原料储槽 | 固定顶100m3 | S31608/S30403 | 1 | 一致 |
| 13 | 甲醛中间储罐 | 固定顶100m3 | S31608/S30403 | 1 | 甲醛中间储罐 | 固定顶100m3 | S31608/S30403 | 1 | 一致 |
| 14 | 甲醛产品罐 | 固定顶1500m3 | S31608/S30403 | 4 | 甲醛产品罐 | 固定顶1500m3 | S31608/S30403 | 4 | 一致 |
| 15 | HTF泵 | 流量40m3 /h，扬程38m | 碳钢 | 1 | HTF泵 | 流量40m3 /h，扬程38m | 碳钢 | 1 | 一致 |
| 16 | 甲醛采出泵 | 流量28.7m3 /h，扬程52m | 不锈钢 | 1 | 甲醛采出泵 | 流量28.7m3 /h，扬程52m | 不锈钢 | 1 | 一致 |
| 17 | 甲醇泵 | 流量18m3 /h，扬程100m | 碳钢 | 2 | 甲醇泵 | 流量18m3 /h，扬程100m | 碳钢 | 2 | 一致 |

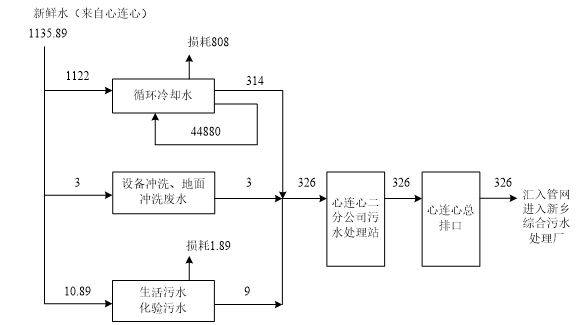
表3-5 氨基树脂生产设备一览表

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **车间** | **环评建设** | | | | **实际建设** | | | | **一致性** |
| **设备名称** | **规格** | **材质** | **数量** | **设备名称** | **规格** | **材质** | **数量** |
| 甲醚化氨基树脂 | 1’st反应釜 | 25m³ | 不锈钢 | 6 | 1’st反应釜 | 25m³ | 不锈钢 | 6 | 一致 |
| 2’st反应釜 | 16m³ | 不锈钢 | 6 | 2’st反应釜 | 16m³ | 不锈钢 | 6 | 一致 |
| 精馏塔 | 70m³ | 不锈钢 | 1 | 精馏塔 | 70m³ | 不锈钢 | 1 | 一致 |
| 1’st冷凝器 | 内径\*厚度\*高度：812\*6\*3050，换热面积：40m² | 不锈钢 | 6 | 1’st冷凝器 | 内径\*厚度\*高度：812\*6\*3050，换热面积：40m² | 不锈钢 | 6 | 一致 |
| 2’st冷凝器 | 内径\*厚度\*高度：600\*8\*2850，换热面积：60.7m² | 碳钢/不锈钢 | 6 | 2’st冷凝器 | 内径\*厚度\*高度：600\*8\*2850，换热面积：60.7m² | 碳钢/不锈钢 | 6 | 一致 |
| 过滤器 | 硅藻土过滤器 | 不锈钢 | 2 | 过滤器 | 硅藻土过滤器 | 不锈钢 | 2 | 一致 |
| 精密过滤器 | 滤芯式过滤器 | 不锈钢 | 2 | 精密过滤器 | 滤芯式过滤器 | 不锈钢 | 2 | 一致 |
| 计量罐 | 内径\*厚度\*高度：1200\*6\*1800 | 不锈钢 | 6 | 计量罐 | 内径\*厚度\*高度：1200\*6\*1800 | 不锈钢 | 6 | 一致 |
| 灌装机 | 灌装能力：15t/h；灌装重量：100~300kg/桶 | 物料接触为不锈钢 | 1 | 灌装机 | 灌装能力：15t/h；灌装重量：100~300kg/桶 | 物料接触为不锈钢 | 1 | 一致 |
| 甲醇回收罐 | 内径\*厚度\*高度：2000\*8\*3200，全容积：12.3m³ | 不锈钢 | 12 | 甲醇回收罐 | 内径\*厚度\*高度：2000\*8\*3200，全容积：12.3m³ | 不锈钢 | 12 | 一致 |
| 粗产品接受罐 | 内径\*厚度\*高度：2800\*14\*3300，全容积：26.6m³ | 不锈钢 | 4 | 粗产品接受罐 | 内径\*厚度\*高度：2800\*14\*3300，全容积：26.6m³ | 不锈钢 | 4 | 一致 |
| 成品接收罐 | 内径\*厚度\*高度：2400\*10\*2800，全容积：16.7m³ | 不锈钢 | 2 | 成品接收罐 | 内径\*厚度\*高度：2400\*10\*2800，全容积：16.7m³ | 不锈钢 | 2 | 一致 |
| 三合一过滤器 | 尺寸：DN1600×H1100 | 不锈钢 | 1 | 三合一过滤器 | 尺寸：DN1600×H1100 | 不锈钢 | 1 | 一致 |
| 产品输送泵 | 齿轮泵 | 物料接触为不锈钢 | 16 | 产品输送泵 | 齿轮泵 | 物料接触为不锈钢 | 16 | 一致 |
| 一级真空泵 | 抽速：260m³/h，电机功率：5.5kW | 球墨铸铁哈氏合金 | 8 | 一级真空泵 | 抽速：260m³/h，电机功率：5.5kW | 球墨铸铁哈氏合金 | 8 | 一致 |
| 二级真空泵 | 抽速：2160m³/h，电机功率：22.5kW | 球墨铸铁哈氏合金 | 8 | 二级真空泵 | 抽速：2160m³/h，电机功率：22.5kW | 球墨铸铁哈氏合金 | 8 | 一致 |
| 混合醚化氨基树脂 | 反应釜 | 16m³ | 不锈钢 | 2 | 反应釜 | 16m³ | 不锈钢 | 2 | 一致 |
| 冷凝器 | 内径\*厚度\*高度：812\*6\*3200，换热面积：50m² | 不锈钢 | 2 | 冷凝器 | 内径\*厚度\*高度：812\*6\*3200，换热面积：50m² | 不锈钢 | 2 | 一致 |
| 异丁醇接受罐 | 内径\*厚度\*高度：2000\*8\*3200，全容积：12.3m | 不锈钢 | 3 | 异丁醇接受罐 | 内径\*厚度\*高度：2000\*8\*3200，全容积：12.3m | 不锈钢 | 3 | 一致 |
| 正丁醇接受罐 | 内径\*厚度\*高度：1600\*8\*2500，全容积：6.2m³ | 不锈钢 | 3 | 正丁醇接受罐 | 内径\*厚度\*高度：1600\*8\*2500，全容积：6.2m³ | 不锈钢 | 3 | 一致 |
| 丁醇暂存罐 | 内径\*厚度\*高度：2000\*8\*3200，全容积：12.3m | 不锈钢 | 2 | 丁醇暂存罐 | 内径\*厚度\*高度：2000\*8\*3200，全容积：12.3m | 不锈钢 | 2 | 一致 |
| 过滤器 | 硅藻土过滤器 | 不锈钢 | 2 | 过滤器 | 硅藻土过滤器 | 不锈钢 | 2 | 一致 |
| 精密过滤器 | 滤芯式过滤器 | 不锈钢 | 2 | 精密过滤器 | 滤芯式过滤器 | 不锈钢 | 2 | 一致 |
| 计量罐 | 内径\*厚度\*高度：1200\*6\*1800 | 不锈钢 | 4 | 计量罐 | 内径\*厚度\*高度：1200\*6\*1800 | 不锈钢 | 4 | 一致 |
| 三合一过滤器 | 尺寸：DN1600×H1100 | 不锈钢 | 1 | 三合一过滤器 | 尺寸：DN1600×H1100 | 不锈钢 | 1 | 一致 |
| 产品输送泵 | 齿轮泵 | 物料接触为不锈钢 | 6 | 产品输送泵 | 齿轮泵 | 物料接触为不锈钢 | 6 | 一致 |
| 真空泵 | 抽速：2160m³/h，电机功率：22.5kW | 球墨铸铁哈氏合金 | 4 | 真空泵 | 抽速：2160m³/h，电机功率：22.5kW | 球墨铸铁哈氏合金 | 4 | 一致 |
| 装置中间罐区  （一、二期共用） | 甲醇储槽 | 100m³ | 不锈钢 | 2 | 甲醇储槽 | 100m³ | 不锈钢 | 2 | 一致 |
| 甲醛储槽 | 100m³ | 不锈钢 | 3 | 甲醛储槽 | 100m³ | 不锈钢 | 3 | 一致 |
| 稀甲醛储槽 | 50m³ | 不锈钢 | 1 | 稀甲醛储槽 | 50m³ | 不锈钢 | 1 | 一致 |
| 正丁醇储槽 | 50m³ | 不锈钢 | 2 | 正丁醇储槽 | 50m³ | 不锈钢 | 2 | 一致 |
| 异丁醇储槽 | 50m³ | 不锈钢 | 1 | 异丁醇储槽 | 50m³ | 不锈钢 | 1 | 一致 |
| 液碱储槽 | 50m³ | 不锈钢 | 1 | 液碱储槽 | 50m³ | 不锈钢 | 1 | 一致 |
| 废水回用罐 | 50m³ | 不锈钢 | 1 | 废水回用罐 | 50m³ | 不锈钢 | 1 | 一致 |
| 盐酸储槽 | 20m³ | 玻璃钢 | 1 | 盐酸储槽 | 20m³ | 玻璃钢 | 1 | 一致 |

## 3.5水源及水平衡

本项目用水来自二分公司现有供水能力1370m3/h及产业升级项目2500m3/h的供水站。本项目无工艺废水产生，循环冷却水、设备冲洗、地面冲洗废水以及生活污水、实验用水依托管网全部通入心连心二分公司污水处理站进行处理，因本项目与二分公司共用污水管网和污水处理站，本项目废水流量不具备监测条件，故按照厂内实际用水量进行核算，产污系数为0.8。

本项目调试期间实际水平衡图见下图：



暂时排入东孟姜女河

![图形用户界面

描述已自动生成](data:image/png;base64,iVBORw0KGgoAAAANSUhEUgAAAikAAADDCAYAAABH04HTAAAACXBIWXMAAA7EAAAOxAGVKw4bAAAgAElEQVR4AQCrgVR+AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA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图3-2 项目实际水平衡图

## 3.6生产工艺

本项目生产工艺与环评工艺完全一致，未发生变动。

1、甲醛装置工艺流程及产污环节

（1）工艺原理

本工程采用铁钼催化剂，将甲醇经空气氧化制成甲醛。

主反应方程式：

CH3OH+1/2O2 CH2O+H2O+159kJ/mol

该反应是放热反应，副反应较少，产生微量的二甲醚、甲酸等。

副反应方程式：

2CH3OH CH3-O-CH3+H2O

CH2O+1/2O2 HCOOH+H2O

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LOzswBZWVkAoKCgAJiYmADV1dUAd3d3AAAAAAAAAAAADAwMAD4+PgAAAAAAeXl5AExMTABMTEwAAAAAACYmJgB0dHQATExMAExMTAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAD///8AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAADCwsIAGRkZACUlJQDb29sAJSUlAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAIqKigBqamoADAwMAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAIAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAADAwMADExMQD09PQAMTExAPPz8wBZWVkAdnZ2ANjY2AAyMjIAl5eXAAAAAAAxMTEAAAAAAAAAAAAAAAAAhYWFAHt7ewAAAAAAAAAAAMzMzAAQEBAAwsLCAOjo6AAAAAAAAAAAAAAAAAAYGBgAPj4+AB8fHwAoKCgAMTExAAAAAAAAAAAAzc3NADExMQBZWVkAKioqAD4+PgAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAP///wD///8A////AP///wD///8A////AP///wD///8A////AP///wD///8A////ANXV1QAYGBgA////ADExMQDV1dUAwcHBAKampgBnZ2cA////AP///wD///8A////ANXV1QAYGBgA////ADY2NgDw8PAA////ALm5uQDz8/MADg4OAP///wD///8A////AP///wDBwcEAVlZWADo6OgA/Pz8Azs7OAPPz8wD///8Ai4uLAI6OjgAICAgAl5eXAPPz8wD///8A////AP///wD///8A////AP///wD///8A////AP///wD///8A////AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA29vbAMLCwgAAAAAAt7e3AA0NDQAAAAAA5+fnAFdXVwD09PQAAAAAAAAAAAAAAAAAAAAAAAAAAADCwsIAAAAAAAAAAACjo6MADAwMAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAC0tLQAAAAAAAAAAACnp6cAAAAAANvb2wAAAAAAAAAAAJiYmAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAACAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAJgAAADMAAAAzAAAAMwAAAEAAAABOAAAAAAAAACYAAAB6AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA////AP///wD///8A////AP///wD///8A////AP///wD///8A////AP///wC0tLQAycnJAP///wD///8AmJiYAP///wANDQ0AhYWFAP///wDy8vIAiYmJAP///wD///8AwcHBAGFhYQALCwsA5+fnAKampgAaGhoAhoaGAH5+fgBvb28AaWlpALS0tADn5+cA////AP///wAAAAAA19fXAM7OzgAAAAAA////AOzs7ADOzs4Azs7OAAAAAAD///8A////AP///wD///8A////AP///wD///8A////AP///wD///8A////AP///wD///8AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAADR0dEAJSUlAAAAAAAAAAAAQ0NDAEdHRwAvLy8AAAAAAAAAAAAAAAAAAAAAAAAAAADy8vIAJSUlAAAAAAAxMTEAXFxcAAAAAAA+Pj4Azs7OAFxcXAAAAAAAAAAAAAAAAADb29sAPj4+AAAAAAAbGxsAs7OzALu7uwDb29sAhYWFANvb2wBkZGQAj4+PAGhoaAAMDAwAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAK+vrwAAAAAAAAAAAN7e3gAYGBgAAAAAAD4+PgBBQUEAwMDAAAAAAAAAAAAAAAAAAAAAAAD09PQAa2trAPT09AAAAAAAKioqAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAo6OjAM/PzwDPz88AsLCwAAAAAAB8fHwAz8/PAM/PzwDy8vIAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAABAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAH6dz3cAACAASURBVAAAAAAAAAAAAAAAAAB6AAAAuQAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAFgAAAB1AAAAAAAAAOYAAAD0AAAAawAAAAAAAACVAAAAGQAAADMAAAAAAAAANAAAADMAAAApAAAA8gAAALIAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA5OTkAFtbWwAAAAAAMjIyAAAAAAAAAAAAS0tLABoaGgAAAAAAS0tLAAAAAAAAAAAA9PT0ADIyMgD09PQAwsLCABkZGQBZWVkAAAAAAAAAAAAYGBgAqKioAM/PzwDY2NgAGBgYAAAAAAAAAAAANjY2ABkZGQAYGBgAampqAAAAAABjY2MAMTExAAAAAABqamoAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA////AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAADPz88AWFhYAP///wD09PQAs7OzAAAAAAD29vYAp6enAGlpaQBLS0sAS0tLAAAAAAD09PQAHBwcAP///wAAAAAAAAAAAAsLCwD///8AAAAAAOTk5AA9PT0AtLS0AAAAAABLS0sAJCQkAP///wAAAAAAMDAwAP///wDx8fEA////AB8fHwAwMDAA////AMrKygD///8AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAD///8AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAPT09ADNzc0AdXV1AP///wAAAAAA////AAAAAAAAAAAAW1tbAAAAAACYmJgAW1tbAAwMDAAAAAAAwMDAAIeHhwALCwsA////AAAAAAD///8AAAAAAPT09ACGhoYAenp6AAwMDAAAAAAAAAAAAAAAAAAwMDAAAAAAAAAAAAD///8AAAAAADAwMAAAAAAAqqqqAP///wAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAQAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAANAAAAIYAAAAAAAAAAAAAAK4AAABSAAAAAAAAAAAAAAB7AAAAAAAAAAAAAAANAAAANAAAACAAAAAAAAAAawAAALsAAAAbAAAA5QAAAIUAAAANAAAA8gAAALIAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAABAQEAgAAAAAMDAwOAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAD///8AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAGZmZgAAAAAA////AAsLCwA9PT0A////AAAAAAAwMDAA////AAAAAABKSkoA////AAsLCwAAAAAACwsLABcXFwAAAAAA////AAAAAAAAAAAAAAAAAAAAAAAwMDAAMDAwAP///wAAAAAAAAAAADAwMAAAAAAA////AD09PQD///8AWFhYAP///wAAAAAAPT09AP///wAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAD///8AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAD09PQA2NjYADQ0NADCwsIAAAAAAFlZWQAAAAAAAAAAAFlZWQBBQUEAkpKSAI+PjwCkpKQA5+fnAE1NTQDPz88AAAAAAAAAAAAAAAAAAAAAAAAAAAAoKCgAz8/PABoaGgAAAAAAAAAAAAAAAAAAAAAAAAAAAM/PzwDY2NgADg4OAAAAAADh4eEAz8/PANjY2AAODg4AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAABAQEBAwMDAwAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAXV1dAM/PzwDz8/MAEhISAM/PzwAAAAAAAAAAAAAAAAAAAAAANjY2AAAAAAAAAAAAAAAAALW1tQBlZWUAz8/PAAAAAADs7OwAz8/PAAAAAAAAAAAAVVVVAPT09AAMDAwAAAAAAAAAAAASEhIAz8/PAAAAAAAiIiIA29vbADIyMgCKiooAODg4AC0tLQAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAEAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAGgAAAPMAAADgAAAAAAAAAAAAAADmAAAAiAAAAFIAAAAAAAAAMwAAACsAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA6AAAAO9AQECoAAAAgcDAwOAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAP///wD///8AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA////AFhYWAAAAAAAJCQkAAAAAAD///8AAAAAAAAAAAAAAAAAFxcXAIWFhQAAAAAAAAAAAAsLCwALCwsAMDAwAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAP///wAAAAAAAAAAAKenpwAAAAAAMDAwAAAAAAD09PQAhYWFAAAAAAAwMDAAAAAAAP///wAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAEBAQEAAAAB/AAAAAAAAAMAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAP///wAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAACwsLAEpKSgAAAAAAw8PDAD09PQAwMDAAAAAAAAAAAADo6OgA8/PzACUlJQAAAAAA////AM/PzwBYWFgAMDAwAAAAAAAAAAAAFBQUADAwMAAAAAAAAAAAAAAAAAAAAAAA////AAAAAAAAAAAAlZWVAAAAAAAAAAAAqqqqAMzMzAB1dXUA29vbAJ+fnwBhYWEAtLS0AEtLSwAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAP///wAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA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注：G：废气，S：固废，N：噪声

图3-4 甲醛生产工艺及产污环节示意图

（2）工艺流程

①反应工序

新鲜空气经加压风机加压，和吸收塔顶的尾气混合后经过循环风机共同加压，混合气和甲醇送入蒸发器上部预蒸发器，由吸收塔二段的甲醛吸收液提供热量预热；加热后的反应物进入下部蒸发器，由反应器出口反应气加热反应物，反应物进入反应器在铁钼催化剂催化下氧化生成甲醛，反应器壳程为导热油，通过导热油的气化移走反应器内产生的热量，通过调节气相导热油的压力调节反应器的温度。气相导热油通过与锅炉给水换热而冷凝，回收的热量用于副产蒸汽。反应器出口反应气经过蒸发器回收热量后送入吸收塔。

②吸收工序

在吸收塔内，反应气从塔顶进入，甲醛气体经过三段循环吸收，每段吸收外部均有板式换热器对吸收液进行冷却，塔底得到含量37-55%的甲醛溶液，吸收塔顶的尾气主要为惰性气体和在副反应中生成的少量有机物，2/3的尾气循环返回风机，1/3的尾气通过排放控制系统（ECS）处理后排出。

③ECS工序

在ECS中，预热后的气体流经一个贵金属催化剂床层，将甲醇、甲醛、二甲醚等有机物转化为CO2，转化后的气体热量可进一步回收副产蒸汽或对反应器副产的蒸汽进行过热。

（3）甲醛装置产排污分析

表3-8 甲醛装置产污环节分析

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 项目 | 编号 | 污染源 | 污染物 | 处置措施 | 排放方式 |
| 废气 | G1-1 | 催化氧化炉尾气 | 甲醇、甲醛、氢、非甲烷总烃 | 吸收塔+ECS催化氧化+40m排气筒P1 | 连续 |
| / | 甲醇原料储槽、甲醛中间储罐储罐、甲醛产品罐呼吸气 | 甲醇、甲醛 | 洗涤塔+ECS催化氧化+40m排气筒P1 |
| / | 生产区、储罐区无组织排放 | 甲醇、甲醛、非甲烷总烃 | 设备密闭、甲醛装车平衡管、LDAR | 连续 |
| 固体废物 | S1-1 | 甲醛合成废催化剂 | 铁、钼 | 资质厂家安全处置 | 间歇 |
| S1-2 | 催化氧化废催化剂 | 铂 | 厂家回收 | 间歇 |
| 噪声 | -- | 生产区 | 泵、风机等 | 消声、减震、隔声 | 连续 |

2、甲醚化氨基树脂装置工艺流程及产污环节

（1）工艺原理

两步法甲醚化氨基树脂的合成工艺中,第一步:以三聚氰胺、甲醛为原料在碱性条件下经羟甲基化过程制备羟甲基三聚氰胺，第二步：以羟甲基三聚氰胺为原料在酸性条件下经甲醇醚化改性制备甲醚化氨基树脂。

反应方程式：

1. 羟甲基化反应

图表

低可信度描述已自动生成

1. 醚化反应

图片包含 文本

描述已自动生成![图形用户界面, 应用程序, Teams

描述已自动生成](data:image/png;base64,iVBORw0KGgoAAAANSUhEUgAAAkYAAAMjCAYAAABAk98xAAAACXBIWXMAAA7EAAAOxAGVKw4bAAAgAElEQVR4AQB3iIh3AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA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ABgAAAAjwAAAAgAAABxAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAQAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAOcAAADnAAAAAAAAACYAAACMAAAAGgAAAOcAAAAAAAAAEgAAAAAAAAAAAAAAAAAAAAAAAAANAAAAAAAAANcAAABYAAAA0QAAAOUAAADlAAAADQAAAAAAAAAAAAAAAAAAAAAAAAAMAAAArgAAAAAAAAAAAAAAAAAAAAAAAACLAAAAPAAAAD0AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAC5AAAARwAAAAAAAAAAAAAA5wAAAKwAAACIAAAAvQAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAC4AAAAaAAAAHgAAABQAAAAaQAAAMAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAD09PQAkpKSAMzMzADg4OAA7+/vAIODgwDLy8sALCwsADMzMwAzMzMA8vLyAHBwcACcnJwAAAAAAAAAAAAAAAAAa2trAAAAAAAAAAAAvb29AGtrawAAAAAAAAAAAL29vQAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAADU1NQAlZWVAAAAAAAAAAAAvb29ADg4OAAAAAAAlZWVAGtrawAAAAAAAAAAALKysgBRUVEAJiYmAAAAAAAAAAAAAAAAANfX1wDPz88AnJycAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAOfn5wBDQ0MA8/PzAAAAAACurq4AAAAAAKSkpAAsLCwAAAAAAAAAAABDQ0MAUFBQALCwsABycnIAAAAAANHR0QBcXFwAAAAAANfX1wBQUFAA9PT0AAwMDAAAAAAAAAAAAJWVlQCoqKgAWFhYAFJSUgAbGxsA5eXlANjY2AB/f38A8/PzAGtrawCkpKQAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAGAAAAJ8AAABIAAAAAAAAAOgAAADYAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAE7uahcAACAASURBVAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAFxcXAAAAAAAvb29AAwMDAAAAAAAz8/PAIaGhgDv7+8A8fHxAN7e3gDr6+sAAAAAAAAAAAAAAAAAAAAAAAAAAAAnJycAyMjIAAAAAAAAAAAASUlJAFhYWAAAAAAAvb29ADg4OAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAACgAAACfAAAAOAAAAAAAAADIAAAA8AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAd4iIdwQAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAXAAAAB4AAAAyAAAAXwAAACAAAACOAAAAAAAAAAAAAAAAAAAAAAAAAAAAAADaAAAAMwAAAAAAAAAAAAAAAAAAAA0AAAAcAAAAzQAAAAAAAAAAAAAAAAAAAAAAAAD0AAAA9AAAAAAAAAAAAAAAAAAAAHoAAAC1AAAAIwAAAAAAAAAAAAAAAAAAABkAAADnAAAAAAAAAM0AAAAAAAAA6wAAAM0AAAAAAAAAOAAAAEcAAACfAAAAAAAAANoAAACgAAAAHQAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAADpAAAAAAAAAAAAAAAoAAAAvwAAAKAAAABxAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAMDAwAenp6AJWVlQA4ODgAMzMzAMDAwAAAAAAATk5OAAAAAAAAAAAAKSkpAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAPT09ACSkpIADw8PAAAAAAAAAAAA8fHxAA8PDwAAAAAAEhISALm5uQC5ubkAzMzMAEVFRQAmJiYAzc3NAGlpaQCFhYUAAAAAAAAAAAAAAAAAAAAAAIKCggDOzs4AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAANnZ2QA4ODgA8/PzAPT09AAMDAwAAAAAAK6urgCurq4AAAAAAAAAAAAZGRkA5+fnAAAAAAAZGRkA5+fnAIyMjAB/f38AgYGBABEREQChoaEAvb29AJWVlQAZGRkAAAAAAFJSUgBfX18ADAwMAAAAAAAZGRkA8/PzAMbGxgBPT08AlJSUAGtrawBcXFwAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAABwAAAAfwAAABAAAAAAAAAAAAAAAPAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA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图3-5 甲醚化氨基树脂生产工艺流程及产污环节图

（2）生产工艺

①羟甲基化及缩聚

在反应釜中加入37%甲醛、固体甲醛、氢氧化钠、三聚氰胺，升温至 55℃，pH约8-9，反应2h。反应过程气体经冷凝后有G2-1产生。

1. 一次醚化

之后在反应釜中加99%的甲醇，加入酸将pH调至2-3,温度约30℃，进行一次醚化反应1h，反应结束加入氢氧化钠调节pH至9。反应过程气体经冷凝后有G2-2产生。

1. 减压脱醇

开真空泵，-0.09MPa减压条件下，脱去甲醇。此过程有G2-3产生。

1. 二次醚化

在反应釜中加入99%甲醇、酸将pH再次调至2-3左右，温度约30℃，进行二次醚化反应，反应结束加入氢氧化钠调节pH至9左右。反应过程气体经冷凝后有G2-4产生。

1. 减压脱醇

反应结束-0.09MPa减压脱去甲醇。此过程气体经冷凝后有G2-5产生。

⑥精馏

一次醚化和二次醚化减压脱去的甲醇、水、甲醛，精馏冷凝，塔顶出甲醇回用，塔底出甲醛，与固体甲醛混合调配成37%的甲醛后回用于羟甲基化反应，多余的甲醛作为副产物F1-1/外送甲醛装置吸收塔，作为生产甲醛的吸收液。精馏过程有不凝气G2-6产生。

1. 过滤、包装

减压脱醇后的产物过滤，经管道输送至全自动包装机包装，此过程产生G2-7、G2-8、S2-1。

（3）甲醚化氨基树脂装置产排污分析

表3-9 甲醚化氨基树脂装置产污环节分析表

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 项目 | 编号 | 污染源 | 污染物 | 处置措施 | 排放  方式 |
| 废气 | G2-1 | 羟甲基及缩聚：投料排气 | 甲醛 | 吸收塔+ECS催化氧化+40m排气筒P1 | 间歇 |
| 颗粒物 | 袋式除尘器+15m高排气筒 |
| G2-2 | 一次醚化：反应挥发气 | 甲醇、甲醛 | 吸收塔+ECS催化氧化+40m排气筒P1 |
| G2-3 | 一次减压脱醇：抽真空尾气 | 甲醇、甲醛 |
| G2-4 | 二次醚化：反应挥发气 | 甲醇、甲醛 |
| G2-5 | 二次减压脱醇：抽真空尾气 | 甲醇、甲醛 |
| G2-6 | 精馏塔：精馏不凝气 | 甲醇、甲醛 |
| G2-7 | 过滤：物料挥发气 | 非甲烷总烃 |
| G2-8 | 包装：包装挥发气 | 非甲烷总烃 |
| G2-9 | 甲醇、甲醛罐呼吸气 | 甲醇、甲醛 | 洗涤塔+ECS催化氧化+40m排气筒P1 |
|  | 生产车间无组织排放 | 甲醇、甲醛、非甲烷总烃 | 设备密闭、LDAR | 连续 |
| 废水 | W2-1 | 精馏塔工艺废水 | 甲醛、甲醇等有机物 | 回用于甲醛吸收，不外排 | 连续 |
| 固体废物 | S2-1 | 过滤：废盐 | 氯化钠、树脂 | 危废安全处置 | 连续 |
| 噪声 | -- | 生产区 | 真空泵、物料泵 | 减震降噪措施 | 连续 |

3、混合醚化氨基树脂装置工艺流程及产污环节

（1）工艺原理

混合醚化氨基树脂是在甲醚化氨基树脂的基础上，采用正丁醇、异丁醇进行调配改性制得，其生产原理、生产过程的与两步法甲醚化氨基树脂的合成工艺基本一致。

反应方程式：

①羟甲基化反应

图表

低可信度描述已自动生成

1. 醚化反应

图片包含 文本

描述已自动生成

![图形用户界面, 应用程序

描述已自动生成](data:image/png;base64,iVBORw0KGgoAAAANSUhEUgAAAkYAAALJCAYAAABRO+xhAAAACXBIWXMAAA7EAAAOxAGVKw4bAAAgAElEQVR4AQB3iIh3AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA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图3-6 混合醚化氨基树脂生产工艺流程及产污环节图

（2）生产工艺

其中①至⑦步生产工艺与甲醚化氨基树脂一致。

1. 羟甲基化及缩聚

在反应釜中加入37%甲醛、固体甲醛、氢氧化钠、三聚氰胺，升温至 55℃，pH约8-9，反应2h。反应过程有G3-1/产生。

1. 一次醚化

之后在反应釜中加99%的甲醇，加入酸将pH调至2-3,温度约30℃，进行一次醚化反应1h，反应结束加入氢氧化钠调节pH至9。反应过程有G3-2产生。

1. 减压脱醇

开真空泵，-0.09MPa减压条件下，脱去甲醇。此过程有G3-3产生。

1. 二次醚化

在反应釜中加入99%甲醇、酸将pH再次调至2-3左右，温度约30℃，进行二次醚化反应，反应结束加入氢氧化钠调节pH至9左右。反应过程有G3-4产生。

1. 减压脱醇

反应结束-0.09MPa减压脱去甲醇。此过程有G3-5产生。

⑥精馏

一次醚化和二次醚化减压脱去的甲醇、水、甲醛，精馏冷凝，塔顶出甲醇回用，塔底出甲醛，与固体甲醛混合调配成37%的甲醛后回用于羟甲基化反应，多余的甲醛作为副产物F3-1/外送甲醛装置吸收塔，作为生产甲醛的吸收液。精馏过程有废气G3-6产生。

1. 过滤

减压脱醇后的产物经密闭过滤机过滤，除盐。此过程产生G3-7、G3-8、S3-1。

1. 调配改性

采用异丁醇、正丁醇进行物理调配改性。此过程产生废气G3-9。

⑨包装

改性好的物料通过管道输送至全自动包装机进行包装，包装过程产生废气（G3-10）。

（3）混合醚氨基树脂产排污分析

表3-10 混合醚化氨基树脂产污环节分析表

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 项目 | 编号 | 污染源 | 污染物 | 处置措施 | 排放  方式 |
| 废气 | G3-1 | 羟甲基及缩聚：投料排气 | 颗粒物 | 袋式除尘器+15m高排气筒 | 间接 |
| 甲醛 | 吸收塔+ECS催化氧化装置+40m高排气筒P1 |
| G3-2 | 一次醚化：反应挥发气 | 甲醇、甲醛 |
| G3-3 | 一次减压脱醇：抽真空尾气 | 甲醇、甲醛 |
| G3-4 | 二次醚化：反应挥发气 | 甲醇、甲醛 |
| G3-5 | 二次减压脱醇：抽真空尾气 | 甲醇、甲醛 |
| G3-6 | 精馏塔：精馏不凝气 | 甲醇、甲醛 |
| G3-7 | 过滤：物料挥发气 | 非甲烷总烃 |
| G3-8 | 调配改性：物料挥发气 | 正丁醇、异丁醇（以非甲烷总烃计） |
| G3-9 | 包装：包装挥发气 | 非甲烷总烃 |
| G3-10 | 甲醇、甲醛、正丁醇、异丁醇罐呼吸气 | 甲醇、甲醛、丁醇（以非甲烷总烃计） | 洗涤塔+ECS催化氧化装置+40m高排气筒P1 |
|  | 生产装置区无组织排放 | 甲醇、甲醛、非甲烷总烃 | 设备密闭、LDAR | 连续 |
| 废水 | W3-1 | 精馏塔工艺废水 | 甲醛、甲醇等有机物 | 回用于甲醛吸收，不外排 | 连续 |
| 固体废物 | S3-1 | 过滤：废盐 | 氯化钠、树脂 | 危废安全  处置 | 连续 |
| 噪声 | -- | 生产区 | 真空泵、物料泵 | 减震降噪措施 | 连续 |
| 其他 | / | 催化氧化 | 氮氧化物 | ECS催化氧化装置+40m高排气筒P1 | 连续 |
| / | 职工生活 | 生活垃圾 | 送往新乡县垃圾处理厂填埋 | 间接 |

## 3.7项目变动情况

本项目实际建设情况与《污染影响类建设项目重大变动清单（试行）的通知》（环办环评函[2020]688号）以下简称《通知》的对比分析：

表7-4 本项目与《通知》的对比分析

|  |  |  |  |
| --- | --- | --- | --- |
| **通知内容** | | **本项目情况** | **对比结果** |
| 性质 | 1、建设项目开发、使用功能发生变化的。 | 无变动 | 不属于 |
| 规模 | 2、生产、处置或储存能力增大30%及以上的。 | 无变动 | 不属于 |
| 3、生产、处置或储存能力增大，导致废水第一类污染物排放量增加的。 |
| 4、位于环境质量不达标区的建设项目生产、处置或储存能力增大，导致相应污染物排放量增加的（细颗粒物不达标区，相应污染物为二氧化硫、氮氧化物、可吸入颗粒物、挥发性有机物；臭氧不达标区，相应污染物为氮氧化物、挥发性有机物；其他大气、水污染物因子不达标区，相应污染物为超标污染因子）；位于达标区的建设项目生产、处置或储存能力增大，导致污染物排放量增加10%及以上的。 |
| 地点 | 5、重新选址；在原厂址附近调整（包括总平面布置变化）导致环境防护距离范围变化且新增敏感点的。 | 无变动 | 不属于 |
| 生产工艺 | 6、新增产品品种或生产工艺（含主要生产装置、设备及配套设施）、主要原辅材料、燃料变化，导致以下情形之一：  （1）新增排放污染物种类的（毒性、挥发性降低的除外）；  （2）位于环境质量不达标区的建设项目相应污染物排放量增加的；  （3）废水第一类污染物排放量增加的；  （4）其他污染物排放量增加10%及以上的。 | 无变动 | 不属于 |
| 7、物料运输、装卸、贮存方式变化，导致大气污染物无组织排放量增加10%及以上的。 | 无变动 | 不属于 |
| 环境保护措施 | 8、废气、废水污染防治措施变化，导致第6条中所列情形之一（废气无组织排放改为有组织排放、污染防治措施强化或改进的除外）或大气污染物无组织排放量增加10%及以上的。 | 环评提出以催化氧化+40m高排气筒来处理甲醛装置废气、氨基树脂工艺废气和甲醛成品罐呼吸气；实际建设为新增吸收塔用来处置甲醛吸收尾气和氨基树脂工艺废气，新增洗涤塔处理甲醛成品罐呼吸器，新增一个袋式除尘器+15米高排气筒来处理投料处的废气，环评未识别颗粒物，颗粒物为无组织排放；实际建设中识别颗粒物，并将颗粒物由无组织排放变为有组织排放，优化污染防治措施。 | 不属于 |
| 9、新增废水直接排放口；废水由间接排放改为直接排放；废水直接排放口位置变化，导致不利环境影响加重的。 | 环评提出本项目废水通过管道通入心连心二分公司污水处理站进行处理，处理后再排入新乡县综合污水处理厂，本项目实际建设为废水通过管道通入心连心二分公司污水处理站进行处理，处理后通过心连心化学工业集团股份有限公司总排口排入东孟姜女河，心连心二分公司污水处理站直接排河是暂时的主要原因为心连心与新乡县综合污水处理厂的管道正在铺设，目前尚不具备接通条件，待管网铺设后将按照要求排入新乡县综合污水处理厂。根据《新乡市生态环境局关于河南心连心化学工业集团股份有限公司产业升级项目排放废水去向的意见》（详见附件5），在新乡县综合污水处理厂建成前同意河南心连心化学工业集团股份有限公司的废水经处理后排入东孟姜女河，心连心二分公司的排水方式的变化已经得到环保部门的许可（排污许可证中许可的排放方式为直接排入东孟姜女河），不属于重大变动。 | 不属于 |
| 10、新增废气主要排放口（废气无组织排放改为有组织排放的除外）；主要排放口排气筒高度降低10%及以上的。 | 本项目氨基树脂装置投料口处的废气由无组织废气改为有组织废气进行处理，新增一个袋式除尘器+15米高排气筒来处理氨基树脂装置投料口处产生的废气。 | 不属于 |
| 11、噪声、土壤或地下水污染防治措施变化，导致不利环境影响加重的。 | 无变动 | 不属于 |
| 12、固体废物利用处置方式由委托外单位利用处置改为自行利用处置的（自行利用处置设施单独开展环境影响评价的除外）；固体废物自行处置方式变化，导致不利环境影响加重的。 | 无变动 | 不属于 |
| 13、事故废水暂存能力或拦截设施变化，导致环境风险防范能力弱化或降低的。 | 无变动 | 不属于 |

根据上表对比结果可知，项目不属于重大变动，满足验收要求。

# 4 环境保护设施

## 4.1污染物治理/处置设施

### 4.1.1废水

本次工程产生的废水有工艺废水、生活废水，设备地面冲洗水和循环冷却排污水等，工艺废水全部回用不外排，环评提出本项目废水通过管道通入心连心二分公司污水处理站进行处理，处理后再排入新乡县综合污水处理厂，本项目实际建设为废水通过管道通入心连心二分公司污水处理站进行处理，处理后排入东孟姜女河，本项目排水去向不变，仅心连心二分公司污水处理站排水去向发生变化，不属于重大变动。一期工程废水依托心连心二分公司污水处理站，污水处理站规模150m3/h，采用“A/SBR”处理工艺。经心连心二分公司污水处理站处理后可以满足《省辖海河流域水污染物排放标准》（DB 41/777—2013）、《地表水环境质量标准》（GB3838-2002）Ⅴ类水体COD、氨氮、总磷和总氮≤15mg/L的要求及《合成树脂工业污染排放标准》GB31572-2015）标准要求，可以实现达标排放。

### 4.1.2废气

本项目废气包含：甲醛吸收尾气、氨基树脂工艺废气、甲醛成品罐呼吸气氨基树脂投料废气和催化燃烧废气。

甲醛吸收尾气包含G1-1催化氧化炉尾气；

氨基树脂工艺废气包含G2-2 一次醚化：反应挥发气、G2-3一次减压脱醇：抽真空尾气、G2-4二次醚化：反应挥发气、G2-5二次减压脱醇：抽真空尾气、G2-6精馏塔：精馏不凝气、G2-7过滤：物料挥发气、G2-8包装：包装挥发气；G3-2一次醚化：反应挥发气、G3-3一次减压脱醇：抽真空尾气、G3-4二次醚化：反应挥发气、G3-5二次减压脱醇：抽真空尾气、G3-6精馏塔：精馏不凝气、G3-7过滤：物料挥发气、G3-8调配改性：物料挥发气、G3-9包装：包装挥发气。

甲醛成品罐呼吸气包含G2-9甲醇、甲醛罐呼吸气、G3-10甲醇、甲醛、正丁醇、异丁醇罐呼吸气。

氨基树脂投料废气包含G2-1羟甲基及缩聚：投料排气、G3-1羟甲基及缩聚：投料排气。

（1）甲醛装置废气经管道收集后利用吸收塔+ECS催化氧化后由40米排气筒P1排放。

（2）氨基树脂工艺产生的废气经洗涤塔+ECS催化氧化后由40米排气筒P1排放。

（3）投料废气经袋式除尘器+15m高排气筒排放。

本项目各废气污染物情况及治理措施情况详见下表：

表4-1 项目废气污染物情况及治理措施情况

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **序号** | | **废气名称** | **废气因子** | **产污环节** | **治理措施及排放** | | | **一致性** |
| **环评批复** | **实际建设** | |
| 1 | 有组织废气 | 甲醛吸收尾气 | 甲醛、甲醇、非甲烷总烃 | 甲醛装置 | 管道收集+ECS催化氧化+40m排气筒 | 管道收集+吸收塔 | ECS催化氧化+40m排气筒 | 不一致 |
| 2 | 氨基树脂工艺废气 | 氨基树脂装置 |
| 3 | 甲醛成品罐呼吸气 | 甲醛装置 | 洗涤塔 | 不一致 |
| 4 | 催化燃烧废气 | NOx | ECS催化氧化 | / | 一致 |
| 5 | 投料废气 | 颗粒物 | 粉状物料投料口 | / | 袋式除尘器+ 15 m排气筒 | | 不一致 |
| 6 | 无组织废气 | | 甲醇 | 四周厂界 | 密闭设备、管道，LDAR泄漏检测修复，甲醛罐装采用平衡管，甲醛罐大小呼吸引入ECS催化氧化装置 | 密闭设备、管道，LDAR泄漏检测修复，甲醛罐装采用平衡管，甲醛罐大小呼吸引入ECS催化氧化装置 | | 一致 |
| 7 | 甲醛 |
| 8 | 非甲烷总烃 |
| 9 | 氯化氢 |
| 10 | 颗粒物 |

注：本项目甲醛吸收尾气、氨基树脂工艺废气、甲醛成品罐呼吸气设计使用管道收集+催化氧化+40m排气筒进行处理，实际建设为甲醛吸收尾气和氨基树脂工艺废气新增吸收塔、甲醛成品罐呼吸气新增洗涤塔处理措施，优化了废气处理措施，能更加有效地处理废气 。

本项目在氨基树脂处理装置投料口处新增袋式除尘器+15m高排气筒来处理投料废气，由原来的无组织废气变为有组织废气，减少此处颗粒物的排放。

综上所述，本项目废气污染治理措施都得到了优化，实际建设情况可以满足环评及批复要求。

### 4.1.3噪声

本项目噪声源为设备噪声。经过减振、隔声及距离衰减，可以满足《工业企业厂界环境噪声排放标准》（GB12348-2008）3类标准。

各类主要设备的噪声源强见下表。

表 4-2 项目营运期主要设备噪声源强

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **设备名称** | **数量(台/套)** | | **单机源强dB(A)** | **运行方式** | **防治措施** | | |
| **操作** | **备用** | **环评批复** | **实际建设** | **对比** |
| 加压风机 | 2 | 2 | 100 | 连续 | 消声、减震、室内设置 | 消声、减震、室内设置 | 一致 |
| 循环风机 | 2 | 2 | 100 | 连续 |
| 物料泵 | 3 | 1 | 85 | 连续 | 隔声减震 | 隔声减震 |
| 吸收循环泵 | 3 | 1 | 85 | 连续 |
| 进料泵 | 17 | 5 | 85 | 连续 |
| 真空泵 | 20 | 0 | 85 | 连续 |
| 引风机 | 1 | 1 | 85 | 连续 |
| 循环冷却水装置 | 1 | 0 | 85 | 连续 | 减震 | 减震 |

### 4.1.4固体废物

本项目产生的固体废物为一般固废和危险废物。

一般固废有ECS催化剂与办公生活垃圾，其中ECS催化剂在一般固废间暂存后由催化剂生产厂家回收，不外排。办公生活垃圾送往新乡县垃圾填埋场填埋。

危险废物为甲醛反应废催化剂、甲醚化氨基树脂过滤废盐、混合醚化氨基树脂过滤废盐、废包材。上述危废均委托有资质的单位安全处置。

厂区内设置一般固废暂存间1座60m2，对项目一般固废分类分区存放。一般固废暂存间地面已进行防渗漏、防雨淋、防扬尘，可以满足《一般工业固体废物贮存和填埋污染控制标准》（GB18599-2020）中相应的环境保护要求，可以满足环评文件及批复文件的要求。

厂区内设置危废暂存间1座80m2，危废暂存间的地面已进行防渗漏、防雨淋、防扬尘，可以满足《危险废物贮存污染控制标准》（GB18597-2001）及其2013修改单的要求。

项目产生的固废种类及处置措施情况见下表。

表 4-3 固体废物产生量及处置措施

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **属性** | **固废名称** | **产生量（kg**/d**）** | **项目处置措施** | | |
| **环评批复** | **实际情况** | **一致性** |
| 生活垃圾 | 31.5 | 新乡县垃圾场填埋 | 新乡县垃圾场填埋 | 一致 |
| 甲醛ECS反应器催化剂 | 平均0.3 | 催化剂供应商回收 | 催化剂供应商回收 | 一致 |
| 危险固废 | 甲醛合成催化剂 | 26.7 | 暂存于危废暂存间内，定期委托有资质的危废处理单位安全处置 | 暂存于危废暂存间内，定期委托有资质的危废处理单位安全处置 | 一致 |
| 甲醚化氨基树脂废盐 | 215 | 一致 |
| 混合醚化氨基树脂废盐 | 74 | 一致 |
| 废包装材料 | 1.7 | 一致 |

## 4.2其他环境保护措施

### 4.2.1环境风险防范设施

**1、选址、总图布置和建筑安全防范措施**

（1）总图布置

本项目装置与设备间距满足《建筑设计防火规范》（GB50016）、《石油化工企业设计防火规范》（GB50160）及《工业企业总平面设计规范》（GB50187）的要求。厂区道路宽度、净空高度充分考虑到消防车通行的要求，能够保证消防道路的畅通。

（2）建筑安全措施

本项目已按物料的闪点对厂房进行火灾危险性分类，并符合相关耐火等级和厂房防火防爆等要求；有火灾爆炸危险场所的建（构）筑物的结构形式以及选用的材料，符合防火防爆要求。

**2、工艺设计及机械设备安全措施**

本项目生产系统设备、阀门、管道、仪表、管道密封点，泵密封环均为可靠的密封措施；同时设置隔离区域避免由于受撞击、人为破坏或自然灾害等造成设备、管道破裂。

防火措施：①在易燃易爆场所要使用防爆型电器；②使用合金工具等不产生火花的工具，严禁钢质工具敲打、撞击、抛掷；按规定安装避雷装置，并定期进行检测；③按规定采取防静电措施；④加强门卫，严禁机动车辆进入火灾、爆炸危险区，运送原料及产品的车辆必须配备完好的阻火器，正确行驶，绝对防止发生任何故障和车祸。

本项目管道布置按照《石油化工企业管道布置设计通则》的要求。设备、管道、电器、仪表、电缆桥架已做好防静电、防雷、漏电保护接地或跨接。在生产装置区设置有毒及可燃气体监测报警装置。设备的选型、安装、施工符合有关标准的要求。储罐上配备安全阀。

**3、生产装置事故排放的防范措施**

本项目采用双回路供电、自动联锁装置系统，当一回路出现断电情况时，另一回路立即供电，杜绝停电而导致的风险事故发生，从而保证整个系统安全运转。设备、管道设计留有较大的安全系数，关键设备均考虑备用。

本项目严格执行化工和劳动部门有关安全生产管理条例。实行持证上岗、定期检测维修，及时更换腐蚀受损设备，避免跑、冒、滴、漏所引起废气污染。记录资料保管，岗位责任明确，定期培训职工，提高安全生产和管理能力。企业已设置自动化控制操作系统，减少误操作，避免意外事故发生。

对于可能产生爆炸性混合气体车间要求其生产设备如通风设施、电机均采用防爆型。

生产、使用、储存岗位根据操作工人数配备相应的隔离式面具。操作人员每人配备一套过滤式面具，并定期检查，以防失效。

物料输送过程采用防爆、防静电设备，避免发生事故。

企业已加强厂区生产管理，制定本车间所使用物料泄漏的应急预案并定期演练，特别是甲醛泄漏事故的演练，杜绝事故废气的大量外排，同时在厂区加强绿化，以减少对周围农作物的影响程度。

**4、储存装置事故防范措施**

本项目罐区的防火等级及采取的防范措施、储罐类型及制造材料、各储罐之间的防火间距、围堰等均严格按照国家相关规定进行设计、施工和管理；

储罐区各储罐均采用优质材料制造，管道选用强度高、具有良好的抗碱性能优质材料，并与罐体结合处进行加固处理；物料分开存放，并设置相应的安全距离，同时注意检查这部分物料的存储容器及法兰连接件等，防止跑冒滴漏现象的发生。

由于本项目涉及的危险化学品为甲醇、甲醛，各类有机物已按照有关规范分类储存，同时在存储区设置有毒气体监测报警装置。

易燃、易爆物料贮存：贮罐放空管路装有阻火器，室内贮槽，高位槽放空管线伸出屋顶外4米，并装有阻火器。危险性生产区域有烟雾报警器，以便及时采取措施，消除事故隐患。

对于毒性物质的贮存：已设置防盗措施，实行多道门，安装有毒物质自动报警装置，专人负责看管。

为防止原料泄漏，已在原料区四周专设防渗排水沟至事故水池。每个仓库均需放置足量的灭火器和正压式自給呼吸器。储存区设置引雷及接地设施，防止雷击及静电造成的爆炸。

本项目各储罐物料充装量不超过储罐容积充填系数的要求；罐区已设置围堰，设置的围堰具有一定的倾角，且在围堰外地势较低的一侧设置沟槽，沟槽长度与围堰相同，并在罐区旁边设置事故干砂池和铲车，配备楔子、手锤等应急物品。

**5、生产车间事故排放防范措施**

企业已加强设备管理，能够确保设备完好。同时制订严格的操作规范、管理制度，工作人员都经过培训上岗并熟识各种物料的理化性质及泄漏应急处理措施，经常检查设备及管道连接件，防止跑冒滴漏现象发生。加强容器维护、检测，对破损的容器及时更换，以防气体逸出。

反应过程在投加有毒有害物料时已采用自动化投料装置。在各个车间根据使用物料的不同分别设置相应的有毒及可燃气体监测报警装置。

**6、运输事故防范措施**

本项目涉及的危险化学品由企业委托有相关资质的单位进行运输，司机经过专业培训并有相关的上岗证，还有专人负责押车，押车员能够了解所装载化学品的性质和应急处理方法。在装运前仔细检查车辆状况，发现问题立即整改，绝对不允许病车上路。

运输装载的物料体积有一定的余量，避免夏季因膨胀而溢出。

本项目涉及的危险化学品均按照性质和储运要求分类运输，严禁拼装运输。并根据运输物质的性质准备相应的防火、防腐蚀、堵漏、防毒害等事故处理物资和器材。

危险物品的装运能够做到定车、定人，被装运的危险物品均在其外包装的明显部位按规定粘贴《危险货物包装标志》规定的危险物资标记，粘贴要正确、牢固。

尽可能缩短运货路程，尽可能避开人烟稠密的城镇，选择运输车量较少，途经河流桥梁较少、平坦的道路，减少交通事故发生。

一旦出现运输过程事故排放，一面搞好现场急救和保护，一面与当地公安消防和环保部门联系，启动应急预案，疏散周围居民和过往车辆，最大限度消除或减缓事故造成的影响。如果在高速公路上出现事故，还应报告高速公路管理部门，在距离最近的两个出入口紧急疏散过往车辆。

工程对于原料和产品的运输、储存、使用过程应严格执行《危险化学品安全管理条例》中的相关规定。运输车辆要做好运输记录，行运前做好车辆检查。

运输槽车要定期检修，其卸料阀门、连接软管要定期检漏，做到不带伤、无泄漏运行。卸料操作应穿戴好防护服装，注意定量安全操作。

运输危险品的车辆应选择交通车辆来往少的道路，保持安全车速。驾驶员、随车押送人员要经过相应的培训并取得资格，熟悉拉载危险品的性质和防护和应急措施；车辆严禁超载。危险物品运输车辆配备必要的事故急救设备和器材，如防毒面具，急救箱等。

**7、泄漏应急处理**

（1）甲醇泄漏应急处理

撤离危险区域，通风。将泄漏液收集在可密闭的容器中。用大量水冲净残余物。喷洒雾状水去除蒸气。化学防护服包括自给式呼吸器。

（2）甲醛气体泄漏应急处理

撤离危险区域，向专家咨询。通风。转移全部引燃源。喷洒雾状水去除气体。不要冲入下水道。个人防护用具：全套防护服包括自给式呼吸器。

（3）甲醛溶液泄漏应急处理

通风。移除全部引燃源。不要让该化学品进入环境。个人防护用具：适用于有机气体和蒸气的过滤呼吸器。化学防护服。

（4）CO泄漏应急处理

撤离危险区域，转移全部引燃源。向专家咨询。通风。个人防护用具：自给式呼吸器。

（5）氨泄漏应急处理

撤离危险区域，向专家咨询。切勿将水直接喷在液体上。喷水雾驱除气体。个人防护用具：气密式化学防护服包括自给式呼吸器。

（6）甲酸甲酯泄漏应急处理

撤离危险区域，向专家咨询。通风。转移全部引燃源。将泄漏液收集在可密闭的容器中。用砂土或惰性吸收剂吸收残液，并转移到安全场所。个人防护用具：全套防护服包括自给式呼吸器。

（7）正丁醇泄漏应急处理

将泄漏液收集在可密闭的容器中。用砂土或惰性吸收剂吸收残液，并转移到安全场所。用大量水冲净残余物。个人防护用具：适用于有机气体和蒸气的过滤呼吸器。

（8）异丁醇泄漏应急处理

将泄漏液收集在可密闭的容器中。用砂土或惰性吸收剂吸收残液，并转移到安全场所。用大量水冲净残余物。个人防护用具：适用于有机气体和蒸气的过滤呼吸器。

（9）甲酰胺泄漏应急处理

个人防护：适应于该物质空气中浓度的有机气体和蒸气过滤呼吸器。尽可能将泄漏和遗洒液体收集在可密封的容器中。用干沙或惰性吸收剂吸收残夜。按照当地规定储存和处置。

**8、事故废水及初期雨水收集池**

企业已建设2座有效容积300 m3的水池，分别用于事故废水收集和前期雨水收集，事故废水和前期雨水池有效容积合计600 m3，可满足项目事故废水收集的要求。事故废水和初期雨水收集后，对水质进行分析，根据分析结果确定处理方案，最大限度的减少对污水处理站的水质、水量冲击负荷。

**9、水环境影响防护措施**

企业将东孟姜女河流经厂区的河段两岸均建设拦截围堰，并铺设管线，与南北厂区事故、消防和前期雨水收集管网相连，避免事故和消防废水进入东孟姜女河。因此，本项目事故状态下全厂废水可以得到有效拦截及处置，事故废水不会对地表水体造成影响。

**10、其他事故预防措施**

（1）企业已在有围护结构的厂房及化验室，设置强制机械通风装置、净化设施。使车间空气中有害物质浓度限制在规定最高允许浓度下；在可能造成有毒物质泄漏的设备和工作场所设置应急防护设施，并在有毒作业工作环境中配置急救箱和个人防护用品。

（2）企业在具有毒性危害的作业环境，设计有必要的洗眼器、淋洗器等安全防护措施，并在装置区设置救护箱。

（3）建设单位已根据《生产经营单位安全生产事故应急预案编制指导》（GB/T29639-2013）及河南省《关于印发河南省环境应急预案编制评估现场监察指南和备案管理办法的通知》（豫环文〔2013〕75号）的要求，针对可能发生的各类事故和所有危险源编制突发环境事件应急预案，并按要求在环保行政主管部门备案。

### 4.2.2规范化排污口、监测设施及在线监测装置

1、规范化排污口

本项目在废气、废水、噪声排放口、固体废物堆场进行规范化设计，在各排污口设立相应的环境保护图形标志牌，具备采样、监测条件；同时排污口符合“一明显、二合理、三便于”的要求，环保标志明显，排污口设置合理，排污去向合理，便于采集样品，便于监测计量，便于公众监督管理。本项目使用国家生态环境局统一印刷的《中华人民共和国规范化排污口标志登记证》，并填写相关内容；根据排污口管理档案内容要求，本项目建成投产运营后，将主要污染物种类、数量、浓度、排放去向、立标情况及设施运行情况记录于档案内。同时建设单位已在排气筒P1安装在线检测装置1套（流量、非甲烷总烃、氮氧化物、甲醇、甲醛、氨），废水在线监测装置（流量、COD、氨氮、总氮、总磷）依托于心连心二分公司现有，并进行联网。

### 4.2.3其他设施

无

## 4.3环保设施投资及“三同时”落实情况

### 4.2.1环保设施投资落实情况

本项目一期实际总投资31000万元。实际环保投资813万元，环保投资占实际总投资的2.62%。

环保投资落实情况详见下表。

表4-5 项目环保投资一览表

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 类别 | 污染源 | 环评批复 | | 实际建设 | | | 一致性 |
| 环保措施 | 环保投资 | 环保措施 | | 环保投资 |
| 废气 | 甲醛吸收尾气 | 管道收集+催化氧化+40m排气筒 | 500 | 管道收集+吸收塔 | 催化氧化+40m排气筒 | 503 | 不一致 |
| 氨基树脂工艺废气 |
| 甲醛成品罐呼吸气 | 洗涤塔 | 不一致 |
| 投料废气 | / | / | 袋式除尘器+ 15 m排气筒 | | 2 | 不一致 |
| 无组织排放废气 | LDAR泄漏检测、甲醛、甲醇、氯化氢、工艺废水罐、丁醇储罐配备平衡管 | 15 | LDAR泄漏检测、甲醛、甲醇、氯化氢、工艺废水罐、丁醇储罐配备平衡管 | | 15 | 一致 |
| 废水 | 氨基树脂工艺废水 | 回用于甲醛尾气吸收，不外排 | / | 回用于甲醛尾气吸收，不外排 | | / | 一致 |
| 循环冷却排污水、地面及设备冲洗水、生活实验污水 | 去心连心二分公司污水处理装置，处理后排入新乡县综合污水处理厂，需新建 污水输送管道 | 5 | 去心连心二分公司污水处理装置，处理后排入新乡县综合污水处理厂，需新建 污水输送管道 | | 5 | 一致 |
| 初期雨水 | 雨污分流，设置切换阀门，设置初期雨水池，初期雨水收集后进入心连心二分公司污水处理站 | 3 | 雨污分流，设置切换阀门，设置初期雨水池，初期雨水收集后进入心连心二分公司污水处理站 | | 3 | 一致 |
| 地下水 | 防渗措施 | 按要求进行分区防渗 | 30 | 按要求进行分区防渗 | | 30 | 一致 |
| 固废 | 危险固废 | 危废暂存间80m2，满足《危险废物贮存污染控制标准》的要求 | 10 | 危废暂存间80m2，满足《危险废物贮存污染控制标准》的要求 | | 10 | 一致 |
| 一般固废 | 垃圾箱、原料成品库中划分一般固废暂存区 | 5 | 垃圾箱、原料成品库中划分一般固废暂存区 | | 5 | 一致 |
| 噪声 | 高噪声设备 | 消声、基础减振、隔音 | 20 | 消声、基础减振、隔音 | | 20 | 一致 |
| 生态 | 绿化 | / | 10 | / | | 10 | 一致 |
| 环境  监测 | 催化氧化废气 | 排气筒安装在线检测装置1套（流量、非甲烷总烃、氮氧化物、甲醇、甲醛） | 40 | 排气筒安装在线检测装置1套（流量、非甲烷总烃、氮氧化物、甲醇、甲醛） | | 40 | 一致 |
| 无组织排放 | 非甲烷总烃、甲醛 | 30 | 非甲烷总烃、甲醛 | | 30 | 一致 |
| 废水 | 废水在线监测装置（pH、COD、氨氮、总氮、总磷） | 依托心连心二公公司现有 | 废水在线监测装置（pH、COD、氨氮、总氮、总磷） | | 依托心连心二分公司现有 | 一致 |
| 风险 | 事故和消防废水收集管网、  收集池及输送管道 | 建设一座300m3事故池和一座300m3前期雨水池，铺设管道 | 80 | 建设一座300m3事故池和一座300m3前期雨水池，铺设管道 | | 80 | 一致 |
| 氨基树脂中间罐区、甲醛成品罐围堰、防火堤，罐区防渗工程 | 按要求设计 | 计入工程投资 | 按要求设计 | | 计入工程投资 | 一致 |
| 有害气体泄漏 | 有毒有害气体报警系统（含检测设备、联网系统、监视设备等） | 7.5 | 有毒有害气体报警系统（含检测设备、联网系统、监视设备等） | | 7.5 | 一致 |
| 可燃气体泄漏 | 可燃气体报警系统 | 7.5 | 可燃气体报警系统 | | 7.5 | 一致 |
| 人员防护 | 自给式正压呼吸器、过滤式防毒面具、便携式有毒气体检测仪、消防系统等双回路电源 | 20 | 自给式正压呼吸器、过滤式防毒面具、便携式有毒气体检测仪、消防系统等双回路电源 | | 20 | 一致 |
| 应急救援器材及事故应急预案 | / | 10 | / | | 10 | 一致 |
| 其他防范措施 | 防爆电机、防爆电器、监控等 | 计入工程投资 | 防爆电机、防爆电器、监控等 | | 计入工程投资 | 一致 |
| 环境  管理 |  | 安装电量、视频监控系统 | / | 安装电量、视频监控系统 | | / | 一致 |
| 施工期 | 施工扬尘 | 六个到位、六个100%，两个禁止，六个不准，严控运输扬尘 | 5 | 六个到位、六个100%，两个禁止，六个不准，严控运输扬尘 | | 5 | 一致 |
| 施工废水 | 简易公厕，废水引入现有二期污水处理站处理 | 5 | 简易公厕，废水引入现有  二期污水处理站处理 | | 5 | 一致 |
| 施工噪声 | 合理安排施工作业时间，选择低噪声设备 | / | 合理安排施工作业时间，  选择低噪声设备 | | / | 一致 |
| 施工固废 | 废弃物彻底清除，移至渣场 | 5 | 废弃物彻底清除，移至渣场 | | 5 | 一致 |
| 合计 | | | 808 | / | | 813 | 不一致 |

本项目甲醛吸收尾气、氨基树脂工艺废气、甲醛成品罐呼吸气设计使用管道收集+催化氧化+40m排气筒进行处理，实际建设为甲醛吸收尾气和氨基树脂工艺废气新增吸收塔、甲醛成品罐呼吸气新增洗涤塔处理措施，优化了废气处理措施，能更加有效地处理废气 。

本项目在氨基树脂处理装置投料口处新增袋式除尘器+15m高排气筒来处理投料废气，减少此处颗粒物的排放。

综上所述，本项目废气污染治理措施都得到了优化，实际建设情况可以满足环评及批复要求。

### 4.2.2环保设施“三同时”落实情况

本项目环保设施环评、初步设计、实际建设情况详见下表。

表4-6 工程污染防治措施汇总

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 污染因素 | 产污环节 | | 采取的防治或保护措施 | | | 落实“三同时”情况 |
| 环评批复 | 实际建设 | |
| 废气 | 有组织废气 | 甲醛吸收尾气 | ECS催化氧化处理+40m排气筒P1 | 管道收集+吸收塔 | 催化氧化+40m排气筒 | 已落实 |
| 甲醛罐呼吸气 |
| 氨基树脂工艺废气 | 洗涤塔 |
| 投料废气 | / | 袋式除尘器+ 15 m排气筒 | | 已落实 |
| 无组织排放 | 甲醛装置区 | 密闭设备、管道， LDAR泄漏检测修复，甲醛罐装采用平衡管，甲醛罐大小呼吸引入ECS催化氧化装置 | 密闭设备、管道，LDAR泄漏检测修复，甲醛罐装采用平衡管，甲醛罐大小呼吸引入ECS催化氧化装置 | | 已落实 |
| 甲醛罐区 |
| 氨基树脂装置区 |
| 废水 | 氨基树脂 | 氨基树脂工艺  废水 | 回用于甲醛吸收，不外排 | 回用于甲醛吸收，不外排 | | 已落实 |
| 公辅工程 | 循环冷却废水 | 收集后通过管道依托心连心二分公司污水处理站处理后汇入心连心总排 | 收集后通过管道依托心连心二分公司污水处理站处理后汇入心连心总排 | | / |
| 设备及地面冲洗水 | / |
| 办公生活及化验污水 | / |
| 初期雨水 | / |
| 地下水 | 防渗措施 | / | 按要求进行分区防渗 | 按要求进行分区防渗 | | 已落实 |
| 固废 | 暂存设施 | 一般固废暂存间 | 60m2 | 60m2 | | 已落实 |
| 危险暂存间 | 80m2 | 80m2 | | 已落实 |
| 噪声 | 高噪声设备 | / | 消声、基础减振、隔音 | 消声、基础减振、隔音 | | 已落实 |
| 风险 | 废水防范设施 | 成品甲醛罐区围堰 | | 成品甲醛罐区围堰 | | 已落实 |
| 氨期树脂中间罐区围堰 | | 氨期树脂中间罐区围堰 | | 已落实 |
| 事故收集池300m3、初期雨水池300m3 | | 事故收集池300m3、初期雨水池300m3 | | 已落实 |
| 废气防范设施 | 有毒有害气体报警系统（含检测设备、联网系统、监视设备等） | | 有毒有害气体报警系统（含检测设备、联网系统、监视设备等） | | 已落实 |
| 可燃气体报警系统（含检测设备、联网系统、监视设备等） | | 可燃气体报警系统（含检测设备、联网系统、监视设备等） | | 已落实 |
| 其他消防、安全设施 | 双回路电源，自给式正压呼吸器，橡胶耐酸防护服、手套、防护眼镜，消防系统，防毒面具，滤毒罐，氧气呼吸器，事故柜，消防系统等 | | 双回路电源，自给式正压呼吸器，橡胶耐酸防护服、手套、防护眼镜，消防系统，防毒面具，滤毒罐，氧气呼吸器，事故柜，消防系统等 | | 已落实 |
| 管理措施 | 制定突发环境事件应急预案 | | 制定突发环境事件应急预案 | | 已落实 |
| 制定安全生产管理制度及环境管理制度 | | 制定安全生产管理制度及环境管理制度 | | 已落实 |
| 环境监测仪器及设备 | | 环境监测仪器及设备 | | 已落实 |
| 其他 | 排污口 | 规范化建设，排气筒安装在线检测装置1套（流量、非甲烷总烃、氮氧化物、甲醇、甲醛） | | 规范化建设，排气筒安装在线检测装置1套（流量、非甲烷总烃、氮氧化物、甲醇、甲醛） | | 已落实 |
| 无组织排放非甲烷总烃、甲醛在线检测 | | 无组织排放非甲烷总烃、甲醛在线检测 | | 已落实 |
| 规范化建设，废水在线监测装置1套（pH、COD、氨氮、总氮、总磷），依托心连心二公公司 | | 规范化建设，废水在线监测装置1套（pH、COD、氨氮、总氮、总磷），依托心连心二分公司 | | / |
| 标识标牌 | 规范化设立，涉及罐区、仓库、污水站、排气筒、污水输送管道、危废间 | | 规范化设立，涉及罐区、仓库、污水站、排气筒、污水输送管道、危废间 | | 已落实 |
| 环保管理制度 | 环保巡查记录、规章制度、监测记录等 | | 环保巡查记录、规章制度、监测记录等 | | 已落实 |
| 用电管理 | 安装电量、视频监控系统 | | 安装电量、视频监控系统 | | 已落实 |

# 5 环境影响报告书（表）主要结论与建议及其审批部门审批决定

## 5.1环境影响报告书（表）主要结论与建议

本项目环境影响报告书主要结论与建议见下表。

表13 本项目环评报告书主要结论与建议

|  |  |
| --- | --- |
| **污染要素** | **环评报告结论及建议内容** |
| 废气 | 一期工程有组织废气包括甲醛装置吸收尾气与氨基树脂有机废气。收集后采用ECS催化氧化系统处理，处理效率为99.9%，氧化处理后废气量为25500Nm3/h，废气中污染物排放浓度为甲醛3mg/m3，甲醇7.2mg/m3，非甲烷总烃15 mg/m3、NOx15 mg/m3，由一根40m高排气筒（P1）排放。满足大气污染物综合排放标准（GB16297-1996）表2二级：甲醛25 mg/m3，甲醇190mg/m3，满足《关于河南省开展工业企业挥发性有机物专项治理工作中排放建议值的通知》（豫环攻坚办[2017]162号）：甲醛5 mg/m3，甲醇20mg/m3，同时满足《合成树脂工业污染排放标准》GB31572-2015）表5有组织排放特别排放限值甲醛5 mg/m3，甲醇20mg/m3，非甲烷总烃60 mg/m3、NOx100 mg/m3的相关要求，达标排放。  ①挥发性有机液体储罐污染控制措施要求  本工程甲醇、甲醛、正丁醇、异丁醇、甲酸甲酯，甲酰胺采用固定顶储罐，评价建议根据《挥发性有机物无组织排放控制标准》要求增设气相平衡管，成品甲醛储罐呼吸气气收集进入一期催化氧化装置处理。  ②物料输送转移与装卸无组织排放控制措施  生产中设备尽量采用密闭设备，同时液态VOCs物料转移输送要求：应采用密闭管道输送，如采用非管道输送方式转移液态VOCs 物料时，应采用密闭容器、罐车。液态VOCs物料装载要求：应采用底部装载方式；若采用顶部浸没式装载，出料管口距离槽（罐）底部高度应小于200 mm。物料泵采用无泄漏泵，  ③生产过程无组织排放控制措施  根据《挥发性有机物无组织排放控制标准》等相关要求，本工程使用先进生产工艺，生产过程采用全密闭、连续化、自动化等生产技术，以及高效工艺与设备等减少工艺过程无组织排放。含VOCs物料应储存于密闭容器、包装袋，高效密封储罐，封闭式储库、料仓等。含VOCs物料转移和输送，应采用密闭管道或密闭容器、罐车等。氨基树脂废水采用储罐暂存，罐装采用自动化灌装设备。  生产过程提高废气收集率。遵循“应收尽收、分质收集”的原则，科学设计废气收集系统，将无组织排放转变为有组织排放进行控制。如生产过程尾气采用冷凝处理后全收集，氨基树脂灌装采用密闭空间，保持微负压状态，并根据相关规范合理设置通风量。采用局部集气罩的，距集气罩开口面最远处的VOCs无组织排放位置，控制风速应不低于0.3米/秒，有行业要求的按相关规定执行。  ④设备与管线组件泄漏污染控制要求  建议企业加强设备管理和维护，按照要求对涉VOCs设备和管线定期进行LDAR（泄漏检测与修复工作）；要加强对含VOCs废水在集输、储存、处理过程中应密闭管道输送，加盖密封；对于冷却VOCs物料的冷却循环水系统，应该每6 个月对流经换热器进口和出口的循环冷却水中的总有机碳（TOC）浓度进行检测，若出口浓度大于进口浓度10%，则认定发生了泄漏，应进行泄漏源修复与记录  ⑤减少氨等无组织排放措施  本工程生产过程采用全密闭、连续化、自动化等生产技术与设备，减少工艺过程无组织氨排放。氨由心连心公司液氨罐通过密闭管道输送，生产装置区设置氨泄漏气体报警装置，定期开展LDAR泄漏检测与修复工作，发现问题及时处理。  本项目粉尘产污环节较少，仅有三聚氰胺是白色结晶类物质，不易产生粉尘，建议三聚氰胺采用管道自动计量或投料器密闭投加粉体物料。  厂区、车辆管理：厂区道路硬化，平整无破损，无积尘，厂区无裸露空地，闲置裸露空地绿化。对厂区道路定期洒水清扫。  采取上述措施后，厂界非甲烷总烃、甲醇满足《关于全省开展工业企业挥发性有机物专项治理工作中排放建议值的通知》（豫环攻坚办[2017]162号）中相关限值2.0 mg/m3与1.0 mg/m3，NH3满足《恶臭污染物排放标准》（GB14554-93）表1二级限值1.5 mg/m3，甲醛、氯化氢均满足《大气污染物综合排放标准》（GB16297-1996）表2二级0.2 mg/m3。控制厂房外监控点非甲烷总烃浓度满足《挥发性有机物无组织排放控制标准》（GB37822-2019）1小时平均浓度满足6mg/m3标准要求，任意一次浓度值满足20mg/m3标准要求。 |
| 废水 | 一期工程氨基树脂工艺废水回用于甲醛吸收，无工艺废水排放。外排废水包括循环冷却废水、车间地面冲洗水与办公生活污水，水量13.58m3/h，废水中污染物COD、氨氮，废水易生化处理。一期工程、二期工程废水均依托现有河南心连心化学工业集团有限责任公司二分公司现有污水处理站处理。该污水处理站处理规模150m3/h，现有处理水量114.71m3/h，富余35.29 m3/h，总体工程废水量23.39 m3/h，依托可行。  本项目全部污水经处理后排水水质为COD26.46mg/L，BOD57.73mg/L，SS20mg/L，氨氮 0.837mg/L，总氮1.424 mg/L，总磷0.272 mg/L，甲醛0.0027mg/L，能够满足新乡县综合污水处理厂进水水质及《化工行业水污染物间接排放标准》（DB41/1135-2016）、《合成树脂工业污染排放标准》（GB31572-2015）标准要求，可以实现达标排放。  本项目完成后，心连心全部厂区内共有二分公司废水处理站、四分公司废水处理站和产业升级废水处理站三套，合并一个排放口，可满足《合成氨工业水污染物排放标准》（DB41/538-2017）表1间接排放标准和新乡县综合污水处理厂进水指标要求，达标排入新乡县综合污水处理厂二次处理，最终进入东孟姜女河。 |
| 噪声 | 本次工程主要噪声设备压缩机、风机、各类泵等，噪声源强为85～100 dB(A)。工程拟采取加设减震基础、消声器、厂房隔音、吸声材料等措施，噪声源强降为70～80dB(A)。经预测，各厂界贡献值均可以满足《工业企业厂界噪声排放标准》（GB12348-2008）3类标准要求。 |
| 固废 | 本次工程产生的固体废物固废包括一般固废和危险固废。  一般固废中废气催化氧化装置中废催化剂0.1t/a、CO提纯废分子筛1.5t（5年产生）一次由厂家回收综合利用。生活垃圾25.35t/a送新乡县垃圾填埋场。  危险固废合计711.04t/a，主要为甲醛合成废催化剂，氨基树脂过滤废盐、甲酸甲酯合成废催化剂、甲酰胺塔釜残液、废包材，交有资质单位安全处置。一期建设80m2危废间。 |
| 环保投资 | 工程总投资55000万元，其中一期工程环保投资为808万元，二期工程环保投资509万元，整体工程环保投资1317万元，约占总投资的2.4%。 |
| 总量控制指标 | 经新乡市生态环境局初步核定，该项目总量指标来源如下：  该项目新增总量指标为COD6.7372t/a，氨氮0.3369t/a，NOX4.158t/a，VOCS9.167t/a，经双倍替代后所需替代量为COD13.4744t/a，氨氮0.6738t/a，NOX8.316t/a，VOCS18.334t/a。其中COD从贾屯污水处理厂可用削减量35.6778t中扣除；氨氮从新乡县翟坡污水处理厂1.6314t中扣除；NOX从新乡县新乡市红绿蓝颜料有限公司导热油炉拆改削减量12.83t中扣除；VOCS从新乡县康健化工有限公司等9家企业削减量9.3653t和平原示范区河南欧伦包装印刷有限公司等5家企业削减量17.35t中扣除。 |

## 5.2审批部门审批决定

新乡市生态环境局文件

新环书审[2021]8号

关于《河南心兴化学材料有限公司甲醇下游深加工项目环境影响报告书》的批复

河南心兴化学材料有限公司：

你单位上报的由河南省化工研究所有限责任公司环评工程师王晓毅主持编制完成的《河南心兴化学材料有限公司甲醇下游深加工项目环境影响报告书》(以下简称《报告书》)、新乡县环境保护局的审查意见均收悉，并已在我局网站公示期满。根据《中华人民共和国环境保护法》《中华人民共和国行政许可法》、《中华人民共和国环境影响评价法》、《建设项目环境保护管理条例》等法律法规规定，经研究，批复如下：

一、该《报告书》内容符合建设项目环境管理规定，评价结论可信。我局批准该《报告书》，原则同意你公司按照《报告书》所列项目的性质、规模、地点、采用的原料、生产工艺和环境保护对策措施进行项目建设。项目总投资55000万元，在新乡经济技术产业集聚区建设甲醇下游深加工项目，项目分为两期。

二、你单位应向社会公众主动公开已经批准的《报告书》，并接受相关方的咨询。

三、你单位应全面落实《报告书》提出的各项环保对策措施及环保设施投资概算，确保各项环境保护设施与主体工程同时设计、同时施工、同时投入使用，确保各项污染物达标排放。

（一）向设计单位提供《报告书》和本批复文件，确保项目设计按照环境保护设计规范要求，落实防治环境污染和生态破坏的措施以及环保设施投资概算。

（二）依据《报告书》和本批复文件，对项目建设过程中产生的废水、废气、固体废物、噪声等污染，采取相应的防治措施。

（三）项目运行时，外排污染物应满足以下要求：

1、废水：一期和二期的循环冷却废水、车间地面冲洗废水、生活污水收集后排入河南心连心化学工业集团股份有限公司二分公司污水处理站处理，采用A/SBR工艺处理后，外排水质须满足《化工行业水污染物间接排放标准》(DB41/1135-2016)和《合成树脂工业污染物排放标准》(GB31572-2015)要求。外排废水再与河南心连心化学工业集团股份有限公司四分公司废水处理站、产业升级废水处理站外排废水合并经一个排污口排入新乡县综合污水处理厂处理，水质须满足《合成氨工业水污染物排放标准》(DB41/538-2017)表1间接排放和新乡县综合污水处理厂进水水质要求。

2、废气：一期工程工艺废气为甲醛装置工艺废气和氨基树脂装置工艺废气。工艺废气采用ECS催化氧化系统处理，甲醛、甲醇、非甲烷总烃、氮氧化物须满足《大气污染物综合排放标准》(GB16297-1996)表2、《关于河南省开展工业企业挥发性有机物专项治理工作中排放建议值的通知》(豫环攻坚办[2017]162号)和《合成树脂工业污染排放标准》(GB31572-2015)表5要求。

二期工艺废气有氨基树脂装置工艺废气、甲酸甲酯装置工艺废气和甲酰胺装置工艺废气。甲酸甲酯工艺废气的CO提纯废气收集后经河南心连心化学工业集团股份有限公司的二甲醚装置地面火炬进行燃烧处理。甲酰胺工艺废气收集后采用水洗塔+除湿处理后与氨基树脂工艺废气混合排入二期新建催化氧化处理装置处理，甲醇、甲醛、氨、非甲烷总烃、氮氧化物须满足《大气污染物综合排放标准》(GB16297-1996)表2、《关于河南省开展工业企业挥发性有机物专项治理工作中排放建议值的通知》(豫环攻坚办[2017]162号)和《合成树脂工业污染排放标准》(GB31572-2015)表5要求:氢气须满足《恶臭污染物排放标准》(GD14554-1993)要求。

项目甲醇、甲醛、正丁醇、异丁醇、甲酸甲酯和甲酰胺等储罐采用气相平衡管。成品甲醛储罐呼吸气收集后排入一期ECS催化氧化装置处理。

对各污染物产生环节采取有效的废气收集和治理措施，减少废气无组织排放。严格按照《挥发性有机物无组织排放控制标准》(GB37288-2019)、《河南省2019年工业企业无组织排放治理方案》以及环评要求全过程控制废气无组织排放。

3、噪声：厂界噪声须满足《工业企业厂界环境噪声排放标准》(GB12348-2008)3类标准要求。

4、固废：固体废物须按照《报告书》提出的措施进行处置，各类固体废物贮存、处置应满足《危险废物贮存污染控制标准》(GB18597-2001)及修改单、《一般工业固体废物贮存、处置场污染控制标准》(GB18599-2001)及修改单要求。危险废物收集后委托有资质单位进行安全处置，避免对环境造成二次污染。

（四）落实《报告书》提出的环境风险防范措施，严防环境污染事故发生。

（五）按照国家、省、市有关规定设置规范的污染物排放口，安装污染物在线监测及监控设施、用电量在线监控装置，并按要求与环保部门联网。

四、项目完成后新增总量控制指标为:COD6.7372t/a、氨氮0.3369t/a、NO4.158t/a，V0Cs 9.167t/a.

五、项目建成后，须按照《固定污染源排污许可分类管理名录》规定的时限及时申报办理排污许可证，按规定程序和标准实施竣工环境保护验收，当地生态环境主管部门负责本项目的“三同时”监督检查和日常监督管理工作。

六、如果今后国家或我省颁布新标准，你单位应按新标准执行。

七、本批复有效期为5年，如该项目逾期方开工建设，其环境影响报告书应报我局重新审核。

新乡市生态环境局

2021年5月10日

# 6 验收执行标准

本项目执行的污染物排放标准见下表：

表6-1 污染物排放标准

| 污染类别 | 执行标准 | 级(类)别 | 污染因子 | 标准限值 | |
| --- | --- | --- | --- | --- | --- |
| 大气污染物 | 《大气污染物综合排放标准》（GB16297-1996） | 表2 | 甲醛 | 有组织  （40m高排气筒） | 25mg/m3、2.6kg/h |
| 无组织 | 0.20mg/m3 |
| 甲醇 | 有组织  （40m高排气筒） | 190mg/m3、50kg/h |
| 无组织 | 12mg/m3 |
| 氯化氢 | 无组织 | 0.2mg/m3 |
| 《新乡市生态环境局关于进一步规范工业企业颗粒物排放限值的通知》 | / | 颗粒物 | 有组织（15m高排气筒） | 10mg/m3 |
| 无组织 | 0.5 mg/m3 |
| 《关于全省开展工业企业挥发性有机物专项治理工作中排放建议值的通知》（豫环攻坚办（2017）162号） | 附件2 | 甲醛 | 工业企业边界 | 0.2mg/m3 |
| 甲醇 | 1.0mg/m3 |
| 非甲烷总烃 | 2.0 mg/m3 |
| 《合成树脂工业污染排放标准》GB31572-2015） | 表5 | 甲醛 | 表5有组织排放特别排放限值 | 5mg/m3 |
| 非甲烷总烃 | 60mg/m3 |
| NOX | 100 mg/m3 |
| 水污染物 | 《省辖海河流域水污染物排放标准》（DB 41/777—2013） | 表2 | TN | 15 mg/m3 | |
| BOD5 | 10 mg/m3 | |
| SS | 30 mg/m3 | |
| 《地表水环境质量标准》（GB3838-2002）Ⅳ类水体COD、氨氮和总P的要求 | 表1 | COD | 40 mg/m3 | |
| NH3-N | 2 mg/m3 | |
| TP | 0.4 mg/m3 | |
| 《合成树脂工业污染排放标准》GB31572-2015） | 表2 | 甲醛 | 5.0 mg/m3 | |
| 噪声 | 《工业企业厂界环境噪声排放标准》（GB12348-2008） | 3类 | 噪声 | 昼65dB(A) | |
| 夜55dB(A) | |
| 固体废物 | 《一般工业固体废物贮存和填埋污染控制标准》（GB18599-2020）中的“防渗漏、防雨淋、防扬尘”要求 | | | | |
| 《危险废物贮存污染控制标准》GB18597-2001及2013修改单 | | | | |

# 7 验收监测内容

## 7.1环境保护设施调试运行效果

### 7.1.1废气

#### 7.1.1.1有组织排放

本项目废气有组织监测内容见下表：

表7-1 废气有组织排放监测内容

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **污染源** | **设施名称** | | **监测位置** | **监测因子** | **监测频次** | **监测要求** |
| 甲醛装置 | 管道收集+吸收塔 | ECS催化氧化+40m高排气筒 | 处理设施出口 | 甲醛、甲醇、非甲烷总烃 | 连续检测2天，每周期检测3次 | 按照竣工验收要求进行监测 |
| 氨基树脂车间 |
| 甲醛成品罐 | 洗涤塔 |
| 废气治理设施 | ECS催化氧化装置 | NOx |
| 氨基树脂投料口 | 袋式除尘器+15m高排气筒 | | 处理设施出口 | 颗粒物 | 连续检测2天，每周期检测3次 |

#### 7.1.1.2无组织排放

本项目废气无组织监测内容见下表：

表7-2 废气无组织监测内容

|  |  |  |
| --- | --- | --- |
| **监测位置** | **监测因子** | **监测频次** |
| 项目厂区上风向设1个参照点1#，厂区下风向设3个监控点2#、3#、4# | 颗粒物、非甲烷总烃、甲醇、甲醛、HCl，同时测定风向、风速、气温、气压、天气状况。 | 连续检测2天，  每天检测3次 |

### 7.1.2废水

本项目废水监测内容见下表：

表7-3 废水监测内容

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **污染源** | **监测位置** | **监测因子** | **监测频次** | **监测要求** |
| 心连心二分公司污水处理站进口、出口 | 心连心二分公司污水处理站进口、出口 | COD、BOD5、SS、NH3-N、TN、TP、甲醛 | 连续检测2天，每天检测4次 | 按照竣工验收要求进行监测 |

### 7.1.3厂界噪声监测

表7-4 厂界噪声监测内容

|  |  |  |
| --- | --- | --- |
| **监测点位** | **监测项目** | **监测频次** |
| 东、南、西、北厂界外1m  各布设1个监测点位，共4个监测点 | 等效声级 | 每天昼、夜各1次，连续2天 |

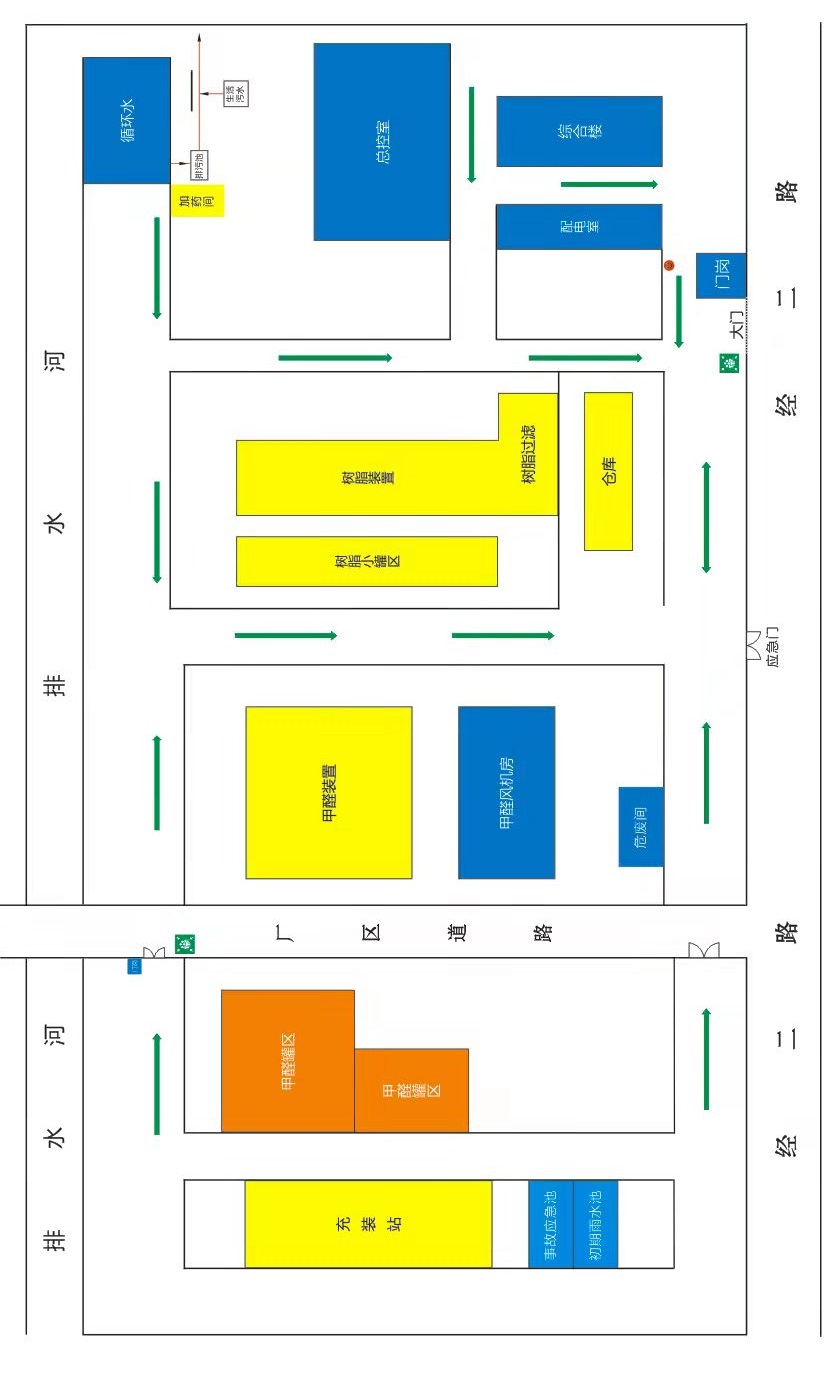


图7-1 本项目厂区平面及检测点位图

![形状

中度可信度描述已自动生成](data:image/png;base64,iVBORw0KGgoAAAANSUhEUgAAAK8AAABqCAYAAADKtwFyAAAACXBIWXMAAA7EAAAOxAGVKw4bAAAgAElEQVR4AQCzgEx/AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA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AAAABAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAEAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAP8AAAABAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAABAAAA/wAAAAEAAAAAAAAAAAAAAP8AAAAAAAAAAAAAAP8AAAAAAAAAAAAAAAAAAAAAAAAA/wAAAAAAAAABAAAAAQAAAP8AAAABAAAAAAAAAAAAAAAAAAAA/wAAAAEAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAEAAAD/AAAAAQAAAAAAAAAAAAAAAAAAAP8AAAABAAAAAAAAAAAAAAD/AAAAAAAAAAEAAAAAAAAAAQAAAP8AAAABAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAABAAAA/wAAAAAAAAAAAAAA/wAAAAAAAAAAAAAA/wAAAAAAAAAAAAAA/wAAAAAAAAAAAAAAAAAAAP8AAAAAAAAAAAAAAP8AAAAAAAAAAQAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA/wAAAAEAAAAAAAAAAAAAAAEAAAAAAAAA/wAAAAEAAAAAAAAAAAAAAAAAAAAAAAAA/wAAAAEAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAP8AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAD/AAAAAAAAAAAAAAAAAAAAAQAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAP8AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAP8AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAP8AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAP8AAAAAAAAA/wAAAAAAAAAAAAAAAAAAAAAAAAD/AAAA/wAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAP8AAAD/AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA/wAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAP8AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA/wAAAAAAAAAAAAAAAAAAAP8AAAAAAAAAAAAAAAAAAA33wCEAACAASURBVAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAD/AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAD/AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA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# 8 质量保证和质量控制

## 8.1监测分析方法及监测仪器

本次检测分析方法、使用仪器及检出限见表8-1：

表8-1 检测分析方法、使用仪器及检出限

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **类别** | **检测因子** | **检测分析方法** | **仪器型号及编号** | **检出限** |
| 废气 | 非甲烷总烃 | 固定污染源废气 总烃、甲烷和非甲烷总烃的测定  气相色谱法 HJ 38-2017 | 气相色谱仪  GC9790II | 0.07mg/m3  （以碳计） |
| 甲醇 | 固定污染源排气中 甲醇的测定  气相 色谱法 HJ/T 33-1999 | 气相色谱仪  GC9790II | 2mg/m3 |
| 甲醛 | 空气质量 甲醛的测定  乙酰丙酮分光 光度法  GB/T 15516-1995 | 紫外可见分光光  度计 T6 新世纪 | 0.5mg/m3 |
| 颗粒物 | 固定污染源废气 低浓度颗粒物的测定  重量法 HJ 836-2017 | 分析天平  AUW120D | 1.0mg/m3 |
| 污染源  颗粒物 | 固定污染源排气中颗粒物测定与气态 污染物采样方法及修改单GB/T16157-1996 | 分析天平  AUW120D | / |
| 氮氧化物 | 固定污染源废气 氮氧化物的测定  定电位电解法 HJ 693-2014 | 自动烟尘(气)测试  仪 EM-3088-3.0 | 3mg/m3 |
| 环境空气 | 环境空气  氯化氢 | 环境空气和废气 氯化氢的测定  离子色谱法 HJ 549-2016 | 离子色谱  CIC-D100 | 0.02mg/m3 |
| 环境空气  氯化氢 | 环境空气和废气 氯化氢的测定  离子色谱法 HJ 549-2016 | 离子色谱  CIC-D100 | 0.02mg/m3 |
| 环境空气  颗粒物 | 环境空气 总悬浮颗粒物的测定 重量法及修改单  GB/T 15432-1995 | 电子天平  FA1004 | 0.001mg/m3 |
| 环境空气  非甲烷总烃 | 环境空气 总烃、甲烷和非甲烷总烃的测定  直接进样-气相色谱法  HJ 604-2017 | 气相色谱仪  GC9790II | 0.07mg/m3  （以碳计） |
| 甲醇 | 甲醇 气相色谱法(B)《空气和废气监测分析方法》(第四版)国家环境保护总局(2007 年) (6.1.6.1) | 气相色谱仪  GC9790II | 0.1mg/ |
| 甲醛 | 空气质量 甲醛的测定  乙酰丙酮分光光度法  GB/T 15516-1995 | 紫外可见分光光  度计 T6 新世纪 | 0.5mg/m3 |
| 废水 | 化学需  氧量 | 水质 化学需氧量的测定 重铬酸盐法 HJ 828-2017 | 滴定管 | 4mg/L |
| 五日生化需氧量 | 水质 五日生化需氧量(BOD5)的测定 稀释与接种法 HJ 505-2009 | 恒温恒湿培养箱  WS150III | 0.5mg/L |
| 悬浮物 | 水质 悬浮物的测定 重量法  GB/T 11901-1989 | 电子天平  FA1004 | 4mg/L |
| 氨氮 | 水质 氨氮的测定 纳氏试剂分光光度  法 HJ 535-2009 | 紫外可见分光光度计 T6 新世纪 | 0.025mg/L |
| 总氮 | 水质 总氮的测定 碱性过硫酸钾消解  紫外分光光度法  HJ 636-2012 | 紫外可见分光光度计 T6 新世纪 | 0.05mg/L |
| 总磷 | 水质 总磷的测定 钼酸铵分光光度法  GB/T 11893-1989 | 紫外可见分光光度计 T6 新世纪 | 0.01mg/L |
| 甲醛 | 水质 甲醛的测定 乙酰丙酮分光光度  法 HJ 601-2011 | 紫外可见分光光度计 T6 新世纪 | 0.05mg/L |
| 噪声 | 厂界噪声 | 工业企业厂界环境噪声排放标准 GB12348-2008 | 多功能声级计AWA5688 | / |

## 8.2质量控制措施

1、检测分析方法采用国家有关部门颁布的标准（或推荐）分析方法，检测人员经考试合格后持证上岗，所有检测仪器经计量部门检定合格并在有效期内。

2、分析采样前进行流量、仪器校准等质控措施。现场采样合理布设检测点位，保证各采样点布设的科学性和可比性。

3、样品交接与分析过程严格按照监测技术规范进行。

4、检测数据严格执行三级审核制度。

# 9 验收监测结果

## 9.1生产工况

本项目为“河南心兴化学材料有限公司甲醇下游深加工项目（一期）”，年工作天数为300天。生产工况见下表。

表9-1 验收期间工况负荷表

|  |  |
| --- | --- |
| **监测日期** | **生产负荷（%）** |
| 2022.10.21 | 85 |
| 2022.10.22 | 87 |
| 备注：年工作300天，生产负荷由河南心兴化学材料有限公司提供。 | |

由表9-1可知：验收监测期间，生产负荷达到85%~87%，主体工程调试工况稳定、环境保护设施运行正常。符合验收监测期间对生产工况的要求

## 9.2环保设施调试运行效果

### 9.2.1污染物排放监测结果

#### 9.2.1.1废水

本次工程产生的废水有工艺废水、生活废水，设备地面冲洗水和循环冷却排污水等，工艺废水回用不外排，其余废水收集后进入心连心二分公司污水处理站处理，处理后直接排入东孟姜女河。

污染物排放监测结果见下表。

表9-2 废水监测结果一览表

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **采样**  **点位** | **采样时间** | **监测频次** | **COD（mg/L）** | **BOD5（mg/L）** | **SS**  **(mg/L)** | **NH3-N**  **(mg/L)** | **TN**  **(mg/L)** | **TP**  **(mg/L)** | **甲醛**  **(mg/L)** |
| 心连心二分公司污水处理站进口 | 2022.10.21 | 1 | 183 | 25.3 | 151 | 16.6 | 26.6 | 1.73 | 0.62 |
| 2 | 179 | 24.6 | 147 | 17.8 | 27.1 | 1.81 | 0.62 |
| 3 | 188 | 25.8 | 145 | 18.0 | 26.9 | 1.88 | 0.58 |
| 4 | 172 | 27.1 | 149 | 16.9 | 25.5 | 1.96 | 0.63 |
| 2022.10.22 | 1 | 174 | 23.8 | 159 | 16.2 | 27.1 | 1.84 | 0.61 |
| 2 | 188 | 26.2 | 162 | 16.7 | 26.6 | 1.62 | 0.59 |
| 3 | 197 | 24.9 | 167 | 17.1 | 25.4 | 1.76 | 0.63 |
| 4 | 186 | 25.7 | 156 | 17.4 | 27.2 | 1.67 | 0.64 |
| 心连心二分公司污水处理站出口 | 2022.10.21 | 1 | 18 | 4.9 | 19 | 0.651 | 1.03 | 0.23 | 未检出 |
| 2 | 15 | 5.1 | 17 | 0.683 | 1.11 | 0.25 | 未检出 |
| 3 | 13 | 4.6 | 18 | 0.662 | 0.95 | 0.24 | 未检出 |
| 4 | 17 | 4.8 | 19 | 0.650 | 1.12 | 0.22 | 未检出 |
| 2022.10.22 | 1 | 12 | 5.0 | 18 | 0.641 | 0.80 | 0.23 | 未检出 |
| 2 | 14 | 4.7 | 17 | 0.632 | 1.01 | 0.25 | 未检出 |
| 3 | 16 | 4.3 | 19 | 0.660 | 0.93 | 0.24 | 未检出 |
| 4 | 13 | 4.5 | 18 | 0.624 | 0.72 | 0.26 | 未检出 |

由上表可知，心连心二分公司污水处理站处理后废水污染物排放浓度为COD 12~18mg/L、BOD54.3~5.1、SS 17~19mg/L、NH3-N 0.624~0.683mg/L、TN 0.72~1.11mg/L、TP 0.22~0.26mg/L，甲醛未检出，满足《省辖海河流域水污染物排放标准》（DB 41/777—2013）、《地表水环境质量标准》（GB3838-2002）Ⅴ类水体COD、氨氮和总磷的要求及《合成树脂工业污染排放标准》GB31572-2015）标准要求，可以实现达标排放。

#### 9.2.1.2废气

**1、有组织废气**

项目有组织废气包含甲醛装置有组织废气、氨基树脂装置有组织废气和投料废气。

（1）甲醛吸收尾气和氨基树脂工艺废气经管道收集+吸收塔、甲醛成品罐呼吸气经洗涤塔一起送入ECS催化氧化系统中集中处理，尾气经一根40m高排气筒有组织排放。

（2）投料废气经集气罩收集后送入袋式除尘器进行处理，尾气经一根15m高排气筒进行处理。

**注：因为催化氧化排气筒进口和袋式除尘器进口不具备监测条件，因此不再计算催化氧化排气筒进口和袋式除尘器进口污染物排放浓度及排放速率。**

污染物排放监测结果见下表。

表9-3 有组织废气监测结果1

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **采样日期** | **采样点位** | **频次** | **废气流量（m3/h）** | **甲醛** | | **甲醇** | | **非甲烷总烃** | | **氮氧化物** | |
| **排放浓度(mg/m3)** | **排放速率(kg/h)** | **排放浓度(mg/m3)** | **排放速率(kg/h)** | **排放浓度(mg/m3)** | **排放速率(kg/h)** | **排放浓度(mg/m3)** | **排放速率(kg/h)** |
| 2022.  10.21 | 催化氧化排气筒出口 | 1 | 28569 | 1.12 | 3.20×10-2 | 未检出 | / | 7.35 | 0.210 | 9 | 0.257 |
| 2 | 28327 | 0.97 | 2.75×10-2 | 未检出 | / | 7.69 | 0.218 | 8 | 0.227 |
| 3 | 28931 | 1.30 | 3.74×10-2 | 未检出 | / | 7.23 | 0.208 | 10 | 0.287 |
| 平均值 | 28609 | 1.13 | 3.23×10-2 | 未检出 | / | 7.42 | 0.212 | 10 | 0.286 |
| 2022.  10.22 | 催化氧化排气筒出口 | 1 | 28060 | 1.46 | 4.10×10-2 | 未检出 | / | 7.60 | 0.213 | 7 | 0.196 |
| 2 | 27953 | 1.41 | 3.94×10-2 | 未检出 | / | 7.22 | 0.202 | 11 | 0.307 |
| 3 | 28634 | 1.20 | 3.44×10-2 | 未检出 | / | 8.03 | 0.230 | 11 | 0.315 |
| 平均值 | 28216 | 1.36 | 3.83×10-2 | 未检出 | / | 7.62 | 0.215 | 10 | 0.273 |

由上表可知，甲醛装置和氨基树脂装置产生的甲醛排放浓度范围为0.97~1.46mg/m3，排放速率为2.75×10-2~4.10×10-2kg/h；甲醇排放浓度未检出；非甲烷总烃排放浓度范围为7.22~8.03mg/m3，排放速率为0.202~0.230kg/h；氮氧化物排放浓度范围为7~11mg/m3，排放速率为0.196~0.307kg/h。因此甲醛装置和氨基树脂装置产生的废气排放浓度能够满足《大气污染物综合排放标准（GB16297-1996）表2二级：甲醛25 mg/m3，甲醇190mg/m3，满足《关于河南省开展工业企业挥发性有机物专项治理工作中排放建议值的通知》

（豫环攻坚办[2017]162号）有机化工：甲醛5 mg/m3，甲醇20mg/m3，同时满足《合成树脂工业污染排放标准》GB31572-2015）表5有组织排放特别排放限值甲醛5 mg/m3，非甲烷总烃60 mg/m3、NOx100 mg/m3的相关要求，能够达标排放。

表9-3 有组织废气监测结果2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **采样日期** | **采样点位** | **频次** | **废气流量（m3/h）** | **颗粒物** | |
| **排放浓度(mg/m3)** | **排放速率(kg/h)** |
| 2022.  10.21 | 袋式除尘器排气筒出口 | 1 | 1737 | 6.9 | 1.20×10-2 |
| 2 | 1529 | 7.3 | 1.12×10-2 |
| 3 | 1684 | 7.1 | 1.20×10-2 |
| 平均值 | 1650 | 7.1 | 1.17×10-2 |
| 2022.  10.22 | 袋式除尘器排气筒出口 | 1 | 1991 | 6.6 | 1.31×10-2 |
| 2 | 1568 | 6.9 | 1.08×10-2 |
| 3 | 1754 | 7.0 | 1.23×10-2 |
| 平均值 | 1771 | 6.8 | 1.21×10-2 |

由上表可知，投料废气产生的颗粒物排放浓度范围为6.6~7.3mg/m3，排放速率为1.08×10-2~1.31×10-2kg/h，满足《新乡市生态环境局关于进一步规范工业企业颗粒物排放限值的通知》中颗粒物10mg/m3的标准限值。

**2、无组织废气**

厂界无组织废气排放情况如下：

表9-4 厂界无组织废气监测结果

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **采样时间** | | **检测项目采样点位** | **颗粒物(mg/m3)** | **非甲烷总烃(mg/m3)** | **甲醇(mg/m3)** | **甲醛(mg/m3)** | **氯化氢(mg/m3)** | **天气** | **气温** | **气压** | **风向** | **风速** |
| 2022.10.21 | 第一次 | 厂界外上风向1# | 0.187 | 0.43 | 未检出 | 未检出 | 未检出 | 多云 | 20.4 | 99.86 | 西南 | 1.6 |
| 厂界外下风向2# | 0.206 | 0.64 | 未检出 | 未检出 | 未检出 | 多云 | 20.4 | 99.86 | 西南 | 1.6 |
| 厂界外下风向3# | 0.232 | 0.75 | 未检出 | 未检出 | 未检出 | 多云 | 20.4 | 99.86 | 西南 | 1.6 |
| 厂界外下风向4# | 0.235 | 0.77 | 未检出 | 未检出 | 未检出 | 多云 | 20.4 | 99.86 | 西南 | 1.6 |
| 第二次 | 厂界外上风向1# | 0.162 | 0.35 | 未检出 | 未检出 | 未检出 | 多云 | 21.8 | 99.73 | 西南 | 1.5 |
| 厂界外下风向2# | 0.235 | 0.58 | 未检出 | 未检出 | 未检出 | 多云 | 21.8 | 99.73 | 西南 | 1.5 |
| 厂界外下风向3# | 0.227 | 0.63 | 未检出 | 未检出 | 未检出 | 多云 | 21.8 | 99.73 | 西南 | 1.5 |
| 厂界外下风向4# | 0.247 | 0.84 | 未检出 | 未检出 | 未检出 | 多云 | 21.8 | 99.73 | 西南 | 1.5 |
| 第三次 | 厂界外上风向1# | 0.175 | 0.47 | 未检出 | 未检出 | 未检出 | 多云 | 22.9 | 99.62 | 西南 | 1.8 |
| 厂界外下风向2# | 0.248 | 0.60 | 未检出 | 未检出 | 未检出 | 多云 | 22.9 | 99.62 | 西南 | 1.8 |
| 厂界外下风向3# | 0.246 | 0.81 | 未检出 | 未检出 | 未检出 | 多云 | 22.9 | 99.62 | 西南 | 1.8 |
| 厂界外下风向4# | 0.218 | 0.79 | 未检出 | 未检出 | 未检出 | 多云 | 22.9 | 99.62 | 西南 | 1.8 |
| 2022.10.22 | 第一次 | 厂界外上风向1# | 0.166 | 0.39 | 未检出 | 未检出 | 未检出 | 多云 | 23.8 | 99.53 | 东北 | 3.2 |
| 厂界外下风向2# | 0.217 | 0.64 | 未检出 | 未检出 | 未检出 | 多云 | 23.8 | 99.53 | 东北 | 3.2 |
| 厂界外下风向3# | 0.226 | 0.60 | 未检出 | 未检出 | 未检出 | 多云 | 23.8 | 99.53 | 东北 | 3.2 |
| 厂界外下风向4# | 0.220 | 0.75 | 未检出 | 未检出 | 未检出 | 多云 | 23.8 | 99.53 | 东北 | 3.2 |
| 第二次 | 厂界外上风向1# | 0.175 | 0.42 | 未检出 | 未检出 | 未检出 | 多云 | 24.6 | 99.44 | 东北 | 2.8 |
| 厂界外下风向2# | 0.235 | 0.55 | 未检出 | 未检出 | 未检出 | 多云 | 24.6 | 99.44 | 东北 | 2.8 |
| 厂界外下风向3# | 0.251 | 0.76 | 未检出 | 未检出 | 未检出 | 多云 | 24.6 | 99.44 | 东北 | 2.8 |
| 厂界外下风向4# | 0.218 | 0.82 | 未检出 | 未检出 | 未检出 | 多云 | 24.6 | 99.44 | 东北 | 2.8 |
| 第三次 | 厂界外上风向1# | 0.182 | 0.45 | 未检出 | 未检出 | 未检出 | 多云 | 26.1 | 99.28 | 东北 | 3.1 |
| 厂界外下风向2# | 0.243 | 0.59 | 未检出 | 未检出 | 未检出 | 多云 | 26.1 | 99.28 | 东北 | 3.1 |
| 厂界外下风向3# | 0.243 | 0.84 | 未检出 | 未检出 | 未检出 | 多云 | 26.1 | 99.25 | 东北 | 3.1 |
| 厂界外下风向4# | 0.243 | 0.66 | 未检出 | 未检出 | 未检出 | 多云 | 26.1 | 99.25 | 东北 | 3.1 |

根据上表的监测结果，厂界无组织废气排放浓度为：颗粒物排放浓度范围为0.162~0.248mg/m3，可以满足《新乡市生态环境局关于进一步规范工业企业颗粒物排放限值的通知》中其他渉气工业企业厂界0.5mg/m3的限值要求。非甲烷总烃排放浓度范围为0.35~0.84mg/m3，可以满足《合成树脂工业污染物排放标准》（GB31572-2015）中边界大气污染物浓度限值4.0mg/m3的限值要求，同时满足《关于全省开展工业企业挥发性有机物专项治理工作中排放建议值的通知》（豫环攻坚办（2017）162号）中厂界监测点浓度限值：其他企业2.0mg/m3限值要求。甲醇、甲醛、氯化氢均未检出，满足《大气污染物综合排放标准》（GB16297-1996）中无组织甲醛0.20 mg/m3、甲醇0.20 mg/m3、氯化氢0.20 mg/m3的标准限值。

**3、环境空气**

|  |  |  |
| --- | --- | --- |
| **采样点位** | **监测频次** | **监测项目** |
| 龙泉村 | 连续监测3天，4次/天（小时均值） | 非甲烷总烃、氯化氢、甲醇、 |
| 连续监测3天，1次/天（日均值） |

表9-5 环境空气监测结果

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **采样日期** | **监测频次** | **非甲烷总烃（mg/m3）** | **甲醇（mg/m3）** | **甲醛（mg/m3）** | **氯化氢（mg/m3）** |
| 2022.10.21 | 第一次 | 0.22 | 未检出 | 未检出 | 未检出 |
| 第二次 | 0.36 | 未检出 | 未检出 | 未检出 |
| 第三次 | 0.35 | 未检出 | 未检出 | 未检出 |
| 第四次 | 0.31 | 未检出 | 未检出 | 未检出 |
| 日均值 | 0.30 | 未检出 | 未检出 | 未检出 |
| 2022.10.22 | 第一次 | 0.27 | 未检出 | 未检出 | 未检出 |
| 第二次 | 0.23 | 未检出 | 未检出 | 未检出 |
| 第三次 | 0.25 | 未检出 | 未检出 | 未检出 |
| 第四次 | 0.28 | 未检出 | 未检出 | 未检出 |
| 日均值 | 0.26 | 未检出 | 未检出 | 未检出 |
| 2022.10.23 | 第一次 | 0.25 | 未检出 | 未检出 | 未检出 |
| 第二次 | 0.32 | 未检出 | 未检出 | 未检出 |
| 第三次 | 0.28 | 未检出 | 未检出 | 未检出 |
| 第四次 | 0.26 | 未检出 | 未检出 | 未检出 |
| 日均值 | 0.28 | 未检出 | 未检出 | 未检出 |
| **环境空气监测参数** | | | | | |
| 采样日期 | 采样时间 | 气温℃ | 气压kPa | 风向 | 风速m/s |
| 2022.10.21 | 02:00-03:00 | 18.6 | 99.94 | 西南 | 1.6 |
| 02:00-03:00 | 21.9 | 99.61 | 西南 | 1.3 |
| 02:00-03:00 | 23.5 | 99.46 | 西南 | 1.5 |
| 02:00-03:00 | 22.7 | 99.53 | 西南 | 1.7 |
| 2022.10.22 | 02:00-03:00 | 18.1 | 99.98 | 东北 | 3.3 |
| 02:00-03:00 | 25.6 | 99.24 | 东北 | 3.5 |
| 02:00-03:00 | 24.3 | 99.36 | 东北 | 3.1 |
| 02:00-03:00 | 22.5 | 99.54 | 东北 | 3.2 |
| 2022.10.23 | 02:00-03:00 | 17.2 | 100.08 | 东 | 1.5 |
| 02:00-03:00 | 19.6 | 99.85 | 东 | 1.7 |
| 02:00-03:00 | 23.7 | 99.43 | 东 | 1.5 |
| 02:00-03:00 | 21.8 | 99.61 | 东 | 1.4 |

根据上表的监测结果，环境空气中非甲烷总烃的浓度为0.22~0.36mg/L，甲醛、甲醇、氯化氢均未检出，非甲烷总烃和甲醇满足《执行关于全省开展工业企业挥发性有机物专项治理工作中排放建议值的通知》（豫环攻坚办[2017]162 号），甲醛和氯化氢满足《大气污染物综合排放标准》（GB16297-1996）表2二级中的限值要求，可以达标排放。

**4、大气环境防护距离和卫生防护距离**

环评中评价项目无需设置大气环境防护距离。结合本次工程情况和平面布置特点，本次项目一期工程完成后，东厂界外255m，西厂界外265m，北厂界外90m，南厂界不设防。经过现场踏勘，该防护距离内没有环境保护目标。

#### 9.2.1.3噪声

本项目厂噪声监测结果见下表。

表9-5 噪声监测结果

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **检测时间** | **检测点位**  **测量时段** | | **东厂界** | **南厂界** | **北厂界** | **《工业企业厂界环境噪声排放标准》**  **(GB12348-2008)3类** |
| 2022.10.21 | 昼间噪声  dB(A) | 检测值 | 56 | 55 | 53 | 65 |
| 夜间噪声  dB(A) | 检测值 | 46 | 45 | 44 | 55 |
| 2022.10.22 | 昼间噪声  dB(A) | 检测值 | 53 | 57 | 54 | 65 |
| 夜间噪声  dB(A) | 检测值 | 43 | 45 | 42 | 55 |

由上表可知，东厂界噪声监测值昼间53~56dB(A)、夜间43~46dB(A)，南厂界噪声监测值昼间55~57dB(A)、夜间45dB(A)，西厂界为其他企业，不具备检测条件，北厂界噪声监测值昼间53~54dB(A)、夜间42~44dB(A)，能够达到《工业企业厂界环境噪声排放标准（GB12348-2008）3类标准要求。

#### 9.2.1.4固体废物

本项目产生的固体废物为一般固废和危险废物。

一般固废为ECS催化剂与办公生活垃圾，其中ECS催化剂由催化剂生产厂家回收，不外排。办公生活垃圾送往新乡县垃圾填埋场填埋。

危险废物为甲醛反应废催化剂、甲醚化氨基树脂过滤废盐、混合醚化氨基树脂过滤废盐、废包材。上述危废均委托有资质的单位安全处置。

各固体废物全部得到妥善处理。

#### 9.2.1.5污染物排放总量核算

根据监测数据与环评报告，本项目废气实际排放量与环评批复量见下表。

表9-6 本工程污染物排放量 单位：t/a

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **污染物** | **实际排放总量** | **工况** | **满负荷情况下实际排放量** | **环评批复排放总量** |
| COD | 1.7604 | /\* | 1.7604 | 2.171 |
| NH3-N | 0.0665 | 0.0665 | 0.0739 |
| TP | 0.0245 | 0.0245 | 0.0714 |
| TN | 0.1076 | 0.1076 | 0.1183 |
| NOx | 2.2104 | 86% | 2.57 | 2.754 |
| 颗粒物 | 0.0943 | / | / |
| VOCs | 1.656 | 1.9256 | 2.754（有组织排放量） |

注：\*本项目外排废水为生活废水，设备地面冲洗水和循环冷却排污水，均由管道直接通入心连心二分公司污水处理站进行处理，出口水量和进口水量不具备检测条件，因此未对生活废水，设备地面冲洗水和循环冷却排污水进口浓度、进口流量、出口流量、出口浓度进行检测，仅对心连心二分公司污水处理站出口及厂区污水总排口水质进行检测。故废水污染物实际排放量按照环评水量和浓度进行核算。

### 9.2.2环保设施处理效率监测结果

#### 9.2.2.1废水治理设施

环评提出本项目废水通过管道通入心连心二分公司污水处理站进行处理，处理后再排入新乡县综合污水处理厂，本项目实际建设为废水通过管道通入心连心二分公司污水处理站进行处理，处理后通过心连心化学工业集团股份有限公司总排口排入东孟姜女河，心连心二分公司污水处理站直接排河是暂时的主要原因为心连心与新乡县综合污水处理厂的管道正在铺设，目前尚不具备接通条件，待管网铺设后将按照要求排入新乡县综合污水处理厂。根据《新乡市生态环境局关于河南心连心化学工业集团股份有限公司产业升级项目排放废水去向的意见》（详见附件5），在新乡县综合污水处理厂建成前同意河南心连心化学工业集团股份有限公司的废水经处理后排入东孟姜女河，心连心二分公司的排水方式的变化已经得到环保部门的许可（排污许可证中许可的排放方式为直接排入东孟姜女河），不属于重大变动。

本项目外排废水为生活废水，设备地面冲洗水和循环冷却排污水，均由管道直接通入心连心二分公司污水处理站进行处理，出口水量和进口水量不具备检测条件，因此未对生活废水，设备地面冲洗水和循环冷却排污水进口浓度、进口流量、出口流量、出口浓度进行检测，仅对心连心二分公司污水处理站出口及厂区污水总排口水质进行检测。根据监测数据，生活废水，设备地面冲洗水和循环冷却排污水经心连心二分公司污水处理站处理后废水污染物排放浓度为COD 12~18mg/L、BOD54.3~5.1、SS 17~19mg/L、NH3-N 0.624~0.683mg/L、TN 0.72~1.11mg/L、TP 0.22~0.26mg/L，甲醛未检出，满足《省辖海河流域水污染物排放标准》（DB 41/777—2013）、《地表水环境质量标准》（GB3838-2002）Ⅴ类水体COD、氨氮和总磷的要求及《合成树脂工业污染排放标准》GB31572-2015）标准要求，可以实现达标排放。

#### 9.2.2.2废气治理设施

**1、有组织废气**

**（1）甲醛装置废气和氨基树脂装置废气**

甲醛吸收尾气和氨基树脂工艺废气经管道收集+吸收塔、甲醛成品罐呼吸气经洗涤塔一起送入ECS催化氧化系统中集中处理，尾气经一根40m高排气筒有组织排放。

因为排气筒进口不具备监测条件，因此不再计算催化氧化排气筒进口和袋式除尘器进口污染物排放浓度及排放速率。根据实际生产监测结果，甲醛装置废气和氨基树脂装置废气排放浓度能够满足大气污染物综合排放标准（GB16297-1996）表2二级：甲醛25 mg/m3，甲醇190mg/m3，满足《关于河南省开展工业企业挥发性有机物专项治理工作中排放建议值的通知》（豫环攻坚办[2017]162号）：甲醛5 mg/m3，甲醇20mg/m3，同时满足《合成树脂工业污染排放标准》GB31572-2015）表5有组织排放特别排放限值甲醛5 mg/m3，非甲烷总烃60 mg/m3、NOx100 mg/m3的相关要求，能够达标排放。

**（2）投料废气**

投料废气经集气罩收集后送入袋式除尘器进行处理，尾气经一根15m高排气筒进行处理。

环评报告及其审批部分审批决定、相关标准等均未对颗粒物去除效率做要求。根据监测结果，投料废气经集气罩收集后送入袋式除尘器进行处理后废气污染物排放浓度能够满足《新乡市生态环境局关于进一步规范工业企业颗粒物排放限值的通知》中颗粒物10mg/m3的标准限值。

**3、无组织废气**

厂界无组织废气监测结果显示，颗粒物排放浓度可以满足《新乡市生态环境局关于进一步规范工业企业颗粒物排放限值的通知》中其他渉气工业企业厂界0.5mg/m3的限值要求。非甲烷总烃排放浓度可以满足《合成树脂工业污染物排放标准》（GB31572-2015）表5边界大气污染物浓度限值4.0mg/m3的要求，同时满足《关于全省开展工业企业挥发性有机物专项治理工作中排放建议值的通知》（豫环攻坚办（2017）162号）中厂界监测点浓度限值：其他企业2.0mg/m3的要求。甲醇、甲醛、氯化氢均未检出，满足《大气污染物综合排放标准》（GB16297-1996）中无组织甲醛0.20 mg/m3、甲醇0.20 mg/m3、氯化氢0.20 mg/m3的标准限值。

根据本项目的监测结果，本项目颗粒物、非甲烷总烃、甲醛、甲醇、氯化氢排放能达标排放，且无组织排放达标。

#### 9.2.2.3噪声治理设施

环境影响报告书及其审批部门审批决定未对去除效率做出要求，根据监测结果，厂界噪声能够达到《工业企业厂界环境噪声排放标准》（GB12348-2008）3类标准要求。

#### 9.2.2.4固体废物治理设施

环境影响报告书及其审批部门审批决定未对去除效率做出要求，各固体废物全部得到妥善处理。

### 9.2.3环境管理检查

1、环保手续与“三同时”执行情况

建设单位开工建设前进行了环境影响评价，建设过程中落实了“三同时”制度。

2、环境管理制度及执行情况

建设单位按照有关规定建立了相关环境保护管理制度，由专人负责公司环境管理工作。

3、环保设施运转情况

检测期间各项环保设施运转正常。

4、与建设项目竣工环境保护验收暂行办法（国环规环评【2017】4号）以下简称（暂行办法）对比分析

表9-7 本项目与暂行办法第八条对比分析

|  |  |  |
| --- | --- | --- |
| **内容** | **本项目情况** | **对比结果** |
| 未按环境影响报告书（表）及其审批部门审批决定要求建成环境保护设施，或者环境保护设施不能与主体工程同时投产或者使用的，建设单位不得提出验收合格的意见。 | 本项目建成环境保护设施能与主体工程同时投产使用。 | 相符 |
| 污染物排放不符合国家和地方相关标准、环境影响报告书（表）及其审批部门审批决定或者重点污染物排放总量控制指标要求的，建设单位不得提出验收合格的意见。 | 本项目污染物排放符合国家和地方相关标准、环境影响报告表及其审批部门审批决定。 | 相符 |
| 环境影响报告书（表）经批准后，该建设项目的性质、规模、地点、采用的生产工艺或者防治污染、防止生态破坏的措施发生重大变动，建设单位未重新报批环境影响报告书（表）或者环境影响报告书（表）未经批准的，建设单位不得提出验收合格的意见。 | 根据本项目实际建设情况与《污染影响类建设项目重大变动清单（试行）的通知》（环办环评函[2020]688号）的对比分析（见表8）可知：本项目环境影响报告表经批准后，该建设项目的性质、规模、地点、采用的生产工艺或者防治污染、防止生态破坏的措施未发生重大变动。 | 不涉及 |
| 建设过程中造成重大环境污染未治理完成，或者造成重大生态破坏未恢复的，建设单位不得提出验收合格的意见。 | 本项目建设过程中未造成重大环境污染和重大生态破坏。 | 不涉及 |
| 纳入排污许可管理的建设项目，无证排污或者不按证排污的，建设单位不得提出验收合格的意见。 | 本项目已办理排污许可证。 | 相符 |
| 分期建设、分期投入生产或者使用依法应当分期验收的建设项目，其分期建设、分期投入生产或者使用的环境保护设施防治环境污染和生态破坏的能力不能满足其相应主体工程需要的，建设单位不得提出验收合格的意见。 | 本项目属于分期建设、分期验收项目，环境保护设施按照要求进行建设。 | 相符 |
| 建设单位因该建设项目违反国家和地方环境保护法律法规受到处罚，被责令改正，尚未改正完成的，建设单位不得提出验收合格的意见。 | 本建设单位不涉及违反国家和地方环境保护法律法规。 | 不涉及 |
| 验收报告的基础资料数据明显不实，内容存在重大缺项、遗漏，或者验收结论不明确、不合理的，建设单位不得提出验收合格的意见。 | 本项目验收报告的基础资料数据真实，内容不存在重大缺项、遗漏，验收结论明确、合理。 | 不涉及 |
| 其他环境保护法律法规规章等规定不得通过环境保护验收的，建设单位不得提出验收合格的意见。 | 本项目符合其他环境保护法律法规规章的规定。 | 不涉及 |

## 10验收监测结论

## 10.1环保设施调试运行效果

### 10.1.1环保设施处理效率监测结果

**1、废水**

环评提出本项目废水通过管道通入心连心二分公司污水处理站进行处理，处理后再排入新乡县综合污水处理厂，本项目实际建设为废水通过管道通入心连心二分公司污水处理站进行处理，处理后通过心连心化学工业集团股份有限公司总排口排入东孟姜女河，心连心二分公司污水处理站直接排河是暂时的主要原因为心连心与新乡县综合污水处理厂的管道正在铺设，目前尚不具备接通条件，待管网铺设后将按照要求排入新乡县综合污水处理厂。根据《新乡市生态环境局关于河南心连心化学工业集团股份有限公司产业升级项目排放废水去向的意见》（详见附件5），在新乡县综合污水处理厂建成前同意河南心连心化学工业集团股份有限公司的废水经处理后排入东孟姜女河，心连心二分公司的排水方式的变化已经得到环保部门的许可（排污许可证中许可的排放方式为直接排入东孟姜女河），不属于重大变动。

本项目外排废水为生活废水，设备地面冲洗水和循环冷却排污水，均由管道直接通入心连心二分公司污水处理站进行处理，出口水量和进口水量不具备检测条件，因此未对生活废水，设备地面冲洗水和循环冷却排污水进口浓度、进口流量、出口流量、出口浓度进行检测，仅对心连心二分公司污水处理站出口及厂区污水总排口水质进行检测。根据监测数据，生活废水，设备地面冲洗水和循环冷却排污水经心连心二分公司污水处理站处理后废水污染物排放浓度为COD 12~18mg/L、BOD54.3~5.1、SS 17~19mg/L、NH3-N 0.62~0.68mg/L、TN 0.7~1.1mg/L、TP 0.22~0.26mg/L，甲醛未检出，满足《省辖海河流域水污染物排放标准》（DB 41/777—2013）、《地表水环境质量标准》（GB3838-2002）Ⅴ类水体COD、氨氮和总磷的要求及《合成树脂工业污染排放标准》GB31572-2015）标准要求，可以实现达标排放。

**2、废气**

甲醛吸收尾气和氨基树脂工艺废气经管道收集+吸收塔、甲醛成品罐呼吸气经洗涤塔一起送入ECS催化氧化系统中集中处理，尾气经一根40m高排气筒有组织排放。

因为排气筒进口不具备监测条件，因此不再计算催化氧化排气筒进口和袋式除尘器进口污染物排放浓度及排放速率。根据实际生产监测结果，甲醛装置废气和氨基树脂装置废气排放浓度能够满足大气污染物综合排放标准（GB16297-1996）表2二级：甲醛25 mg/m3，甲醇190mg/m3，满足《关于河南省开展工业企业挥发性有机物专项治理工作中排放建议值的通知》（豫环攻坚办[2017]162号）：甲醛5 mg/m3，甲醇20mg/m3，同时满足《合成树脂工业污染排放标准》GB31572-2015）表5有组织排放特别排放限值甲醛5 mg/m3，甲醇20mg/m3，非甲烷总烃60 mg/m3、NOx100 mg/m3的相关要求，能够达标排放。

投料废气经集气罩收集后送入袋式除尘器进行处理，尾气经一根15m高排气筒进行处理。

环评环境影响报告书中未识别投料废气，未对投料废气进行处理，投料废气经集气罩收集后送入袋式除尘器进行处理后废气污染物排放浓度能够满足《新乡市生态环境局关于进一步规范工业企业颗粒物排放限值的通知》中颗粒物10mg/m3的标准限值。

厂界无组织废气监测结果显示，颗粒物排放浓度可以满足《新乡市生态环境局关于进一步规范工业企业颗粒物排放限值的通知》中其他渉气工业企业厂界0.5mg/m3的限值要求。非甲烷总烃排放浓度可以满足《合成树脂工业污染物排放标准》（GB31572-2015）表5边界大气污染物浓度限值4.0mg/m3的要求，同时满足《关于全省开展工业企业挥发性有机物专项治理工作中排放建议值的通知》（豫环攻坚办（2017）162号）中厂界监测点浓度限值：其他企业2.0mg/m3的要求。甲醇、甲醛、氯化氢均未检出，满足《大气污染物综合排放标准》（GB16297-1996）中无组织甲醛0.20 mg/m3、甲醇0.20 mg/m3、氯化氢0.20 mg/m3的标准限值。

因为排气筒进口不具备监测条件，因此不再计算催化氧化排气筒进口和袋式除尘器进口污染物排放浓度及排放速率，因此不再计算污染物去除效率。且环境影响专题报告及其审批部门审批决定未对颗粒物、甲醇、甲醛、氯化氢去除效率做出要求，根据本项目的监测结果，本项目颗粒物、非甲烷总烃、甲醇、甲醛、氯化氢排放能达标排放，且无组织排放达标。

**3、噪声**

根据监测结果，厂界噪声能够达到《工业企业厂界环境噪声排放标准》（GB12348-2008）3类标准要求。

**4、固废**

本项目各固体废物全部得到妥善处理。

### 10.1.2污染物排放监测结果

#### 10.1.2.1 废水

生活废水，设备地面冲洗水和循环冷却排污水经心连心二分公司污水处理站处理后废水污染物排放浓度为COD 12~18mg/L、BOD54.3~5.1、SS 17~19mg/L、NH3-N 0.62~0.68mg/L、TN 0.7~1.1mg/L、TP 0.22~0.26mg/L，甲醛未检出，满足《省辖海河流域水污染物排放标准》（DB 41/777—2013）、《地表水环境质量标准》（GB3838-2002）Ⅴ类水体COD、氨氮和总磷的要求及《合成树脂工业污染排放标准》GB31572-2015）标准要求，可以实现达标排放。

**10.1.2.2废气**

（1）有组织废气

①甲醛装置废气和氨基树脂装置废气

甲醛装置和氨基树脂装置产生的甲醛排放浓度范围为0.97~1.46mg/m3，排放速率为2.75×10-2~4.10×10-2kg/h；甲醇排放浓度未检出；非甲烷总烃排放浓度范围为7.22~8.03mg/m3，排放速率为0.202~0.230kg/h；氮氧化物排放浓度范围为7~12mg/m3，排放速率为0.196~0.343kg/h。因此甲醛装置和氨基树脂装置产生的废气排放浓度能够满足《大气污染物综合排放标准（GB16297-1996）表2二级：甲醛25 mg/m3，甲醇190mg/m3，满足《关于河南省开展工业企业挥发性有机物专项治理工作中排放建议值的通知》（豫环攻坚办[2017]162号）有机化工：甲醛5 mg/m3，甲醇20mg/m3，同时满足《合成树脂工业污染排放标准》GB31572-2015）表5有组织排放特别排放限值甲醛5 mg/m3，非甲烷总烃60 mg/m3、NOx100 mg/m3的相关要求，能够达标排放。

②投料废气

投料废气产生的颗粒物排放浓度范围为6.6~7.3mg/m3，排放速率为1.08×10-2~1.31×10-2kg/h，满足《新乡市生态环境局关于进一步规范工业企业颗粒物排放限值的通知》中颗粒物10mg/m3的标准限值。

（2）无组织废气

根据厂界无组织废气监测结果显示，厂界无组织废气排放浓度为：颗粒物排放浓度范围为0.162~0.248mg/m3，可以满足《新乡市生态环境局关于进一步规范工业企业颗粒物排放限值的通知》中其他渉气工业企业厂界0.5mg/m3的限值要求。非甲烷总烃排放浓度范围为0.35~0.84mg/m3，可以满足《合成树脂工业污染物排放标准》（GB31572-2015）中边界大气污染物浓度限值4.0mg/m3的限值要求，同时满足《关于全省开展工业企业挥发性有机物专项治理工作中排放建议值的通知》（豫环攻坚办（2017）162号）中厂界监测点浓度限值：其他企业2.0mg/m3限值要求。甲醇、甲醛、氯化氢均未检出，满足《大气污染物综合排放标准》（GB16297-1996）中无组织甲醛0.20 mg/m3、甲醇0.20 mg/m3、氯化氢0.20 mg/m3的标准限值。

（3）大气环境防护距离和卫生防护距离

结合本次工程情况和平面布置特点，本次项目一期工程完成后，东厂界外255m，西厂界外265m，北厂界外90m，南厂界不设防。经过现场踏勘，该防护距离内没有环境保护目标。

#### 10.1.2.3 噪声

根据监测结果显示，本项目东厂界噪声监测值昼间53~56dB(A)、夜间43~46dB(A)，南厂界噪声监测值昼间55~57dB(A)、夜间45dB(A)，西厂界为其他企业，不具备检测条件，北厂界噪声监测值昼间53~54dB(A)、夜间42~44dB(A)，能够达到《工业企业厂界环境噪声排放标准（GB12348-2008）3类标准要求。

#### 10.1.2.4固体废物

本项目产生的固体废物为一般固废和危险废物。

一般固废为ECS催化剂与办公生活垃圾，其中ECS催化剂由催化剂生产厂家回收，不外排。办公生活垃圾送往新乡县垃圾填埋场填埋。

危险废物为甲醛反应废催化剂、甲醚化氨基树脂过滤废盐、混合醚化氨基树脂过滤废盐、废包材。上述危废均委托有资质的单位安全处置。

厂区内设置一般固废暂存间1座60m2，对项目一般固废分类分区存放。一般固废暂存间地面已进行防渗漏、防雨淋、防扬尘等环境保护要求，可以满足《一般工业固体废物贮存和填埋污染控制标准》（GB18599-2020）中相应要求，可以满足环评文件及批复文件的要求。

厂区内设置危废暂存间1座80m2，危废暂存间的地面已进行防渗漏、防雨淋、防扬尘等环境保护要求，满足《危险废物贮存污染控制标准》（GB18597-2001）及其2013修改单的要求。

#### 10.1.2.5总量

本项目一期污染物排放总量为：COD 1.7604t/a、NH3-N 0.0665t/a、非甲烷总烃 1.9256t/a、NOx 2.57t/a，能够满足环评批复的COD2.171t/a，氨氮0.0739t/a，NOX2.754t/a，VOCS2.754t/a（有组织排放量）的总量要求。

## 10.2 环境管理检查结论

项目执行了环保“三同时”制度；按照有关规定建立了相关环境保护管理制度；由专人负责公司环境管理工作。

## 10.3 总结论

河南心兴化学材料有限公司甲醇下游深加工项目（一期）符合国家产业政策，具有一定的环境经济效益。项目选址位于新乡经济技术产业集聚区青龙路东段，选址符合规划，各项污染物经治理后能够实现达标排放，固废处置措施可行，对周围环境影响较小，满足验收要求。

**11 建设项目竣工环境保护“三同时”验收登记**

建设项目工程竣工环境保护“三同时”验收登记表

填表单位（盖章）：河南心兴化学材料有限公司 填表人（签字）： 项目经办人（签字）：

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **建 设 项 目** | **项目名称** | | **甲醇下游深加工项目（一期）** | | | | | | | | | | **建设地点** | | **新乡经济技术产业集聚区青龙路东段** | | | | | | | | | | |
| **行业类别** | | **C26化学原料和化学制品制造业** | | | | | | | | | | **建设性质** | | **√新 建（迁建） 改 扩 建 技 术 改 造** | | | | | | | | | | |
| **设计生产能力** | | **甲醛20万t/a，氨基树脂1万t/a** | | | | **建设项目开工日期** | | | | **2021年6月** | | **实际生产能力** | | **甲醛17.2万t/a，氨基树脂0.86万t/a** | | | | | **投入试运行日期** | | | | **2022年6月** | |
| **投资总概算（万元）** | | **55000（一期31000万元）** | | | | | | | | | | **环保投资总概算（万元）** | | **808** | | | | | **所占比例（%）** | | | | **2.53%** | |
| **环评审批部门** | | **新乡市生态环境局** | | | | | | | | | | **批准文号** | | **新环书审[2021]8号** | | | | | **批准时间** | | | | **2021年5月10日** | |
| **初步设计审批部门** | | **/** | | | | | | | | | | **批准文号** | | **/** | | | | | **批准时间** | | | | **/** | |
| **环保验收审批部门** | | **/** | | | | | | | | | | **批准文号** | | **/** | | | | | **批准时间** | | | | **/** | |
| **环保设施设计单位** | | **河南心兴化学材料有限公司** | | | | | **环保设施施工单位** | | | | | **河南心兴化学材料有限公司** | | **环保设施监测单位** | | | | | **河南心兴化学材料有限公司** | | | | | |
| **实际总投资（万元）** | | **一期31000** | | | | | | | | | | **实际环保投资（万元）** | | **813** | | | | | **所占比例（%）** | | | | **2.62%** | |
| **废水治理（万元）** | | **8** | | **废气治理（万元）** | | **520** | | **噪声治理（万元）** | | | **20** | **固废治理（万元）** | | **15** | | **绿化及生态（万元）** | | | | **10** | | | **其它（万元）** | **240** |
| **新增废水处理设施能力** | | **/** | | | | | | | | | | **新增废气处理设施能力** | | **/** | | | | **年平均工作时间** | | | | | **300天** | |
| **建设单位** | | | **河南心兴化学材料有限公司** | | | | | | | **邮政**  **编码** | | **453700** | **联系电话** | | **19837315180** | | | **环评单位** | | | | **河南省化工研究所有限责任公司** | | | |
| **污染物排放达标与总量控制（工业建设项目详填）** | | **污染物** | **原有排放量(1)** | **本期工程实际排放浓度(2)** | | **本期工程允许排放浓度(3)** | | | | **本期工程产生量(4)** | | **本期工程自身削减量(5)** | **本期工程实际排放量(6)** | **本期工程核定排放总量(7)** | | **本期工程“以新带老”削减量(8)** | | **全厂实际排放总量(9)** | | | **全厂核定排放总量(10)** | | **区域平衡替代削减量(11)** | | **排放增减量(12)** |
| **废水（万吨）** | **/** | **/** | | **/** | | | | **/** | | **/** | **9.78** | **9.78** | | **/** | | **9.78** | | | **9.78** | | **/** | | **+9.78** |
| **化学需氧量** | **/** | **18** | | **22.2** | | | | **/** | | **/** | **1.7604** | **2.171** | | **/** | | **1.7604** | | | **2.171** | | **/** | | **+1.7604** |
| **氨 氮** | **/** | **0.68** | | **0.756** | | | | **/** | | **/** | **0.0665** | **0.0739** | | **/** | | **0.0665** | | | **0.0739** | | **/** | | **+0.0665** |
| **石油类** | **/** | **/** | | **/** | | | | **/** | | **/** | **/** | **/** | | **/** | | **/** | | | **/** | | **/** | | **/** |
| **废气** | **/** | **/** | | **/** | | | | **/** | | **/** | **/** | **/** | | **/** | | **/** | | | **/** | | **/** | | **/** |
| **二氧化硫** | **/** | **/** | | **/** | | | | **/** | | **/** | **/** | **/** | | **/** | | **/** | | | **/** | | **/** | | **/** |
| **烟 尘** | **/** | **/** | | **/** | | | | **/** | | **/** | **/** | **/** | | **/** | | **/** | | | **/** | | **/** | | **/** |
| **工业粉尘** | **/** | **/** | | **/** | | | | **/** | | **/** |  |  | | **/** | |  | | |  | | **/** | | **+** |
| **氮氧化物** | **/** | **11** | | **15** | | | | **/** | | **/** | **2.57** | **2.754** | | **/** | | **2.57** | | | **2.754** | | **/** | | **+2.57** |
| **工业固体废物** | **/** | **/** | | **/** | | | | **/** | | **/** | **/** | **/** | | **/** | | **/** | | | **/** | | **/** | | **/** |
| **与项目有关的其他特征污染物\*** | **/** | **/** | | **/** | | | | **/** | | **/** | **0.2953** | **1.8872** | | **/** | | **0.2952** | | | **1.8872** | | **/** | | **+0.2952** |

**注**：1、排放增减量：（+）表示增加，（-）表示减少。2、(12)=(6)-(8)-(11)，（9）= (4)-(5)-(8)- (11) +（1）。3、计量单位：废水排放量——万吨/年；废气排放量——万标立方米/年；工业固体废物排放量——万吨/年；水污染物排放浓度——毫克/升。\*：此处特征污染物均为有组织排放量。