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关于实施 IACS PR34 Rev. 1 版的通知

国际船级社协会（IACS）于 2008 年 1 月 21 日通过 PR34—“关于在 IACS 散货船和油船结构共同规范中实施 MSC.215(82)决议通过的 IMO 保护涂层性能标准（PSPC）的 IACS 程序要求”的 Rev.1 版。

Rev.1 版主要是根据 PR34 实施以来所取得的经验和工业界的要求而修改的。主要修改了 IACS 关于涂层系统认可的程序、关于涂层检验员资格评估的程序、关于检验协议的程序。新增了 IACS 关于自动化车间底漆工厂质量控制审查的程序、关于涂层技术条件审查的程序和三个附录。

该版要求的适用日期和范围：2008 年 1 月 1 日起收到的涂层系统和涂料生产商的认可申请，以及对 2008 年 1 月 1 日至 2008 年 7 月 1 日（经 MSC.216(82)决议通过的 SOLAS 第 II-1 章 A-1 部分第 3-2.1 条要求的适用日期^①之前签订建造合同的）前签订建造合同的，按 IACS 散货船和油船结构共同规范建造的船舶（船长等于或大于 90 米的散货船和船长等于或大于 150 米的油轮）。

具体检验要求见我社随后发布的《船舶结构防腐检验指南》。

【注：本通函在本社网站（www.ccs.org.cn）上发布，并由各分社转发所辖区域内的相关船厂、船舶设计单位、船东和油漆商】

附件 1：PR34 Rev.1 中、英文文本

^① SOLAS 第 II-1/3-2.1 条的适用为 500 总吨及以上且为：1、2008 年 7 月 1 日及以后签订建造合同的船舶；或 2、2009 年 1 月 1 日及以后铺设龙骨或处于类似建造阶段的船舶；或 3、2012 年 7 月 1 日或以后交船的船舶。

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关于在 IACS 散货船和油船结构共同规范中实施 MSC.215(82)决议通过的 IMO 保护涂层性能标准（PSPC）的 IACS 程序要求^注

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注：

1. “建造合同”日期系指未来船东和船厂签订建造合同之日的日期。有关“建造合同”日期的更多细节，参照 IACS No.29 程序要求（PR）。
2. 各成员社和预备成员社应对自 2008 年 1 月 1 日起收到的涂层系统和涂料生产商的认可申请，以及对 2008 年 1 月 1 日或以后、在经 MSC.216(82)决议通过的 SOLAS 第 II-1 章 A-1 部分第 3-2.1 条要求的适用日期之前签订建造合同并按 IACS 散货船和油船结构共同规范（CSR）建造的船舶实施 Rev. 1。

引言

IACS 各船级社应对 2006 年 12 月 8 日或以后、在经 MSC.216(82)决议通过的 SOLAS 第 II-1 章 A-1 部分第 3-2.1 条要求的适用日期之前签订建造合同并按 IACS 散货船和油船结构共同规范（CSR）建造的船舶应用 IMO PSPC 时实施本程序要求。

本程序要求的目的是确保 IMO PSPC 要求的统一理解和应用。

涉及的“IACS 船级社”或“船级社”应理解为包括 IACS 成员社和预备成员社。

本程序要求包括：

- 所有 IACS 船级社应实施的统一要求，和
- IACS 涂层专家组（EG/涂层）编制与 IMO PSPC 相关的一致答复和共同解释的工作程序（参见附件 1）。

本程序要求须与 IMO 的 PSPC (由 MSC.215(82) 号决议通过) 联同阅读，且后者的脚注中引用的国际标准在本程序要求下为强制性要求。

1. IACS 关于涂层系统认可的程序

如果船级社认为 A+D 方法或 B+D 方法或 C+D 方法的结果是合格的，则应签发型式认可证书以示符合 PSPC 第 5 节的要求。

型式认可证书应标明试验的产品和车间底漆。证书应同时标明产品可能使用的、在满足本程序 1.1 节要求的实验室已进行交叉试验的其他型式认可的车间底漆。

要求提交的文件在以下各节标示，此外对所有型式认可还需提供以下文件：

PSPC 3.4.2.2 要求的所有信息的涂层技术案卷。

冬季和夏季型式涂层视为不同，除非红外（IR）鉴定和比重（SG）证实两者相同。

方法 A：实验室试验

1.1 涂层预认可试验应由经船级社认可的实验室进行，且实验室应满足 IACS UR Z17 的要求。

1.2 应将涂层系统预认可试验的合格结果（PSPC 表 1 的 1.3）以书面形式提交给船级社。

1.3.1 应按 PSPC 的附件 1 对带有所述车间底漆的环氧基系统进行型式认可试验。如果试验合格，将签发型式认可证书以包括环氧和车间底漆。型式认可证书允许在指定的车间底漆或经处理的裸钢板上使用环氧。

1.3.2 环氧基系统可与原先未与其试验的车间底漆一起使用，但是其他车间底漆须按 PSPC 表 1.2.3 和表 1.3.2 认可为系统的一部分，且已按附件 1、附录 1 的 1.7 进行试验（称为交叉试验）。如果试验合格，将签发型式认可证书。在此情况下，型式认可证书应包括环氧的详细资料，以及与其试验的并符合要求的所有车间底漆的清单。型式认可证书允许在所有指定的车间底漆或经处理的裸钢板上使用环氧。

1.3.3 作为替代，环氧可按 PSPC 附件 1 的要求在经处理的裸钢板上不带车间底漆进行试验。如果试验合格，将签发型式认可证书。型式认可证书将仅记录环氧。证书只允许在经处理的裸钢板上使用环氧。此外，如果认可为系统一部分的车间底漆的交叉试验合格，型式认可证书应包括合格通过交叉试验的车

间底漆的详细资料。在此情况下，型式认可证书允许在所有指定的车间底漆或经处理的裸钢板上使用环氧基系统。

1.3.4 如果环氧或车间底漆的配方有变化，型式认可证书即失效。生产商负责把配方的任何变化立即通知船级社。

1.3.5 在PR 34最新修订版实施日期前由先前版本准予的认可按各证书所述保持有效。证书的更新须按PR 34的最新版本进行。

方法B：5年现场暴露

1.4 应对涂料生产商的记录（应至少包括 1.4.1 所述的信息）进行检查，以确认涂层系统经历了 5 年现场暴露，且当前产品与评估的产品相同。

1.4.1 生产商的记录

- 原始涂装记录
- 原始涂层技术条件
- 原始涂层技术案卷
- 当前配方的唯一标识（代码或编号）
- 如果基料和固化剂的混合率发生变化，生产商的声明以确认混合物的成分与原始成分相同，并应附有所做修改的解释。
- 当前产地的当前涂层技术案卷
- 原始产品的 SG 和 IR 鉴定
- 当前产品的 SG 和 IR 鉴定
- 如果不能提供原始的 SG 和 IR 鉴定值，生产商的声明以确认当前产品的读数与原始的相同。

1.5 应由船级社提供船级检验记录或对选定船舶的所有压载舱（由涂料生产商和船级社）进行联合检验，以验证其符合 1.3 和 1.7 的要求。两种情况中涂层状况的报告应符合 IACS 第 87 号建议案第 2 节的要求。

1.6 选定的船舶的压载舱应是正常使用的舱，其中：

- 至少有一个舱的容积约为 2000 m³ 或以上；
- 至少有一个舱与加热液舱相邻；以及
- 至少有一个舱包括一露天甲板。

1.7 如果选定的船舶不满足 1.6 的要求，则应在型式认可证书上作出明确的限制。例如，相应的涂料不能用于与加热液舱相邻的舱或甲板下的舱或容积大于受检尺寸的舱。

1.8 在方法 B 的所有认可情况下，应在涂装认可的环氧基系统涂层前去除车间底漆，除非能够确认在建造时使用的车间底漆的配方与作为认可基础的选定船舶使用的相同。

1.9 所有压载舱均应处于“良好”状况，并且在之前 5 年中没有对涂层进行修补或修理。

1.9.1 “良好”状况的定义为：仅有点状锈迹，其分布少于所计及面积的 3%，且无可见的涂层破坏。边缘或焊缝处的锈蚀，其分布须小于所计及面积内的边缘或焊缝的 20%。

1.9.2 所计及面积内的涂层状况的报告范例应参照 IACS REC. 87*。

1.10 如果使用的 NDFT 大于 PSPC 的要求，NDFT 应是建造时使用的最小厚度。这应在型式认可证书上显著标明。

1.11 如果检验结果合格，应签发型式认可证书以包括环氧基系统和车间底漆。型式认可证书允许在指定的车间底漆或经处理的裸钢板上使用环氧基系统。型式认可证书应参照作为涂层技术案卷一部分的检验报告。

1.12 如果环氧基系统或车间底漆的配方有变化，型式认可证书即失效。生产商负责把配方的任何变化立即通知船级社。

方法 C：现有 Marintek B1* 认可

1.13 2006 年 12 月 8 日前签发的、Marintek 试验不低于 B1 等级合格报告的环氧基系统涂层系统（包括相关的 IR 鉴定和 SG）可予接受。如果不能提供原始的 SG 和 IR 文件，生产商应作出声明以确认当前产品的读数与原始的相同。

1.14 应审查包含 IR 和 SG 信息的 Marintek 试验报告，如果合格应签发型式认可证书。证书应记录报告参考和使用的车间底漆。型式认可证书允许在指定的车间底漆（除非有证据表明不合适）或经处理的裸钢板上使用环氧基系统。

1.15 如果与认可为系统一部分的车间底漆的交叉试验合格，由此方法认可的环氧基系统可与其他车间底漆一起使用，参见 1.3.2。在此情况下，型式认可证书应包括环氧基系统的详细资料，以及符合要求的所有车间底漆的清单。型式认可证书允许在所有指定的车间底漆或经处理的裸钢板上使用环氧基系统。

1.16 这类涂料应按 PSPC 的表 1 进行涂装，而不能用进行认可试验时所采用的不同于 PSPC 的涂装条件，除非型式认可试验的涂装条件比 PSPC 表 1 更严格（如 NDFT 更高）。

1.17 如果环氧基系统或车间底漆的配方有变化，型式认可证书即失效。生产商负责把配方的任何变化立即通知船级社。

方法 D：涂料生产商

1.18 涂料/车间底漆生产商应满足 IACS UR Z17 4, 5, 6, 7（除 4.6 外）和 PR 34 附件 3 的要求，并经船级社验证。

1.19 如果生产商希望在不同的地点生产相同名称的涂料，则应使用 IR 分析和 SG 以证明其为相同的涂料，或要求对每一地点生产的涂料进行单独的认可试验。

* IACS 87 号建议案为非强制性要求。

1.20 如果环氧基系统或车间底漆的配方有变化，型式认可证书即失效。生产商负责把配方的任何变化立即通知船级社。未能把配方的变化通知船级社将导致生产商产品证书的撤销。

2. IACS 关于涂层检验员资格评估的程序

2.1 按 IMO PSPC 第 6 节进行检验的涂层检验员应具有 NACE II 级涂层检验员资格, FROSIO III 级检验员资格或等效资格。等效资格见以下 2.3 的说明。

2.2 但是，涂层检验员至少要有 2 年涂层检验经历并具有 NACE II 级检验员资格或 FROSIO III 级检验员资格，或等效资格，才可以编写和/或批准检验程序，或决定对不合格项进行纠正的措施。

2.3 等效资格

2.3.1 **等效**资格系指由培训教师确认已修完一门认可的课程且成绩合格。

2.3.1.1 **培训教师**应具有至少 2 年相关经历并具有 NACE II 级涂层检验员资格或 FROSIO III 级检验员资格，或等效资格。

2.3.1.2 **认可的课程**：一门具有基于 PSPC 相关问题教学大纲的课程，其内容包括：

- 健康环境 and 安全
- 腐蚀
- 材料和设计
- PSPC 引用的国际标准
- 固化机理
- 检验员的作用
- 检测仪器
- 检验程序
- 涂层技术条件
- 涂装程序
- 涂层损坏
- 施工前会议
- MSDS 和产品数据表审核
- 涂层技术案卷
- 表面处理
- 除湿
- 水喷射冲洗
- 涂层类型和检验衡准
- 专用涂装设备
- 破坏性检测和非破坏性检测仪器的检验程序使用
- 检验仪器和试验方法
- 涂层检验技术

- 阴极保护
- 实际操作，案例学习。

认可的课程可以是涂料生产商或船厂开设的内部培训课程。

2.3.1.3 这种课程应有一个可以接受的衡量成绩的方式，例如包括理论要素和实践要素的考试。课程及考试应由船级社认可。

2.3.2 由实际经历所取得的等效资格：个人可不参加课程而获得资格，如果可表明该个人：

- 在最近 10 年的新造船舶经历中，至少有 5 年的压载舱涂层检验员的实际工作经验，和
- 通过了 2.3.1.3 所规定的考试。

2.4 助理检验员

2.4.1 如果涂层检验员要求其他人员的协助，以在涂层检验员的监督下完成部分检验工作，这些人员的培训应使涂层检验员满意。

2.4.2 培训应由检验员、船厂培训机构或检验设备生产商记录和签署，以确认使用测量设备的能力和 PSPC 要求的测量知识。

2.4.3 如要求，应能获得培训记录进行验证。

3. IACS 关于检验协议的程序（PSPC 3.2）

3.1 船东、船厂、涂料生产商之间应就表面处理和涂装的检验程序达成协议。该协议宜由船厂呈交船级社审查并应至少符合 PSPC。涂层检验员的资格证明应收入涂层技术案卷。如果有一个以上涂层检验员，则应明确其职责范围（如多个建造场所）。

3.2 审查过程中发现该程序与 PSPC 的任何偏差均应向船厂提出，船厂负责纠正措施的确认和实施。

3.3 在所要求的全部纠正措施结束并使船级社满意后，才能签发船级证书。

4. IACS 验证 PSPC 执行情况的程序

4.1 PSPC 第 7 节的验证要求将由船级社实施。

4.1.1 PSPC 第 7.5 节所要求的涂层检验要求贯彻的监控，其意为对检验员使用经船级社审查过的检验程序中所述的正确的设备、技术和报告方法的情况进行抽样检查。

4.2 按 4.1.1 发现的任何偏差应向涂层检验员提出，该检验员负责纠正措施的确认和实施。

4.3 如果纠正措施未被船级社接受或纠正措施没有结束，则应通知船厂。

4.4 在所要求的全部纠正措施结束并使船级社满意后，才能签发船级证书。

5. IACS 关于涂层技术案卷审查的程序

5.1 船厂负责以纸面或电子格式或二者结合的方式编制涂层技术案卷。

5.2 涂层技术案卷应包括 PSPC 3.4 所要求的全部资料。

5.3 涂层技术案卷的内容应按 PSPC 3.4.2 进行审查。

5.4 按 5.3 发现的任何偏差应向船厂提出，船厂负责纠正措施的确认和实施。

5.5 在所要求的全部纠正措施结束并使船级社满意后，才能签发船级证书。

6. IACS 关于自动化车间底漆工厂质量控制审查的程序

6.1 认识到对自动化车间底漆工厂应用 PSPC 6.2 节的检验要求可能有困难，质量控制方法是确保符合 PSPC 要求的更实际的方法。

6.2 PSPC 要求，确认质量控制程序以确保符合 PSPC 是涂层检验员的责任。

6.3 在审查自动化车间底漆工厂的质量控制时应包括下列程序。

6.3.1 喷砂管理程序，包括盐分和污染测量。

6.3.2 记录程序：钢板表面温度、相对湿度、露点。

6.3.3 控制或监测表面清洁度、表面粗糙度、油、油脂、灰尘和其他污染的程序。

6.3.4 记录/测量水溶性盐的程序。

6.3.5 验证车间底漆厚度和固化符合技术条件规定值的程序。

7. IACS 关于涂层技术条件审查的程序

7.1 船厂应按 PSPC 的要求提供详述 PSPC 表 1 所有要求的涂层技术条件。

7.2 涂层技术条件应包括 PSPC 附件 1 第 2 段规定的涂装程序、验收衡准和检验等。

7.3 在审查技术条件是否符合 PSPC 的要求时，应使用附件 2 的共同解释。

附件 1 EG/涂层统一实施 IMO PSPC 的工作程序

本程序描述 EG/涂层的成员处理与 IMO PSPC 和 IACS PR34 相关事项的问/答和解释请求的方式。

1 定义

Q&A 问题和答复

共同解释 (CI) 取得对 IMO PSPC 要求共同理解的解释

统一解释 (UI) 按 IACS 程序 15.2.3 节定义

CSR KC DB 知识中心 (KC) 数据库, 包括问题和答复、共同解释和 CSR 规范修改建议 (RCP) (不适用于 IMO PSPC 的相关问/答和共同解释)

提问者 提出涉及 IMO PSPC 和 PR 34 解释的问题、意见或要求的 IACS 以外的个人、组织、IACS 船级社或 EG/涂层本身。

主控文档 包括 EG/涂层提出问题的所有结果的数据表 (IMO PSPC 的问/答和共同解释)

其他定义参见 IACS 程序要求 (PR) No.32。

2 EG/涂层和 CSR 秘书处的职责

EG/涂层应:

- 提供技术专家意见, 准备技术答复和解释;
- 向提问者提供一致同意的技术答复, 并把副本提交给 CSR 秘书处;
- 评审和修改 IACS/行业涂层联合工作组的范围和授权调查范围, 并在必要时和联合工作组进行讨论;
- 配合 CSR 秘书处管理网站的问/答和共同解释;
- 使 PR 34 保持更新, 必要时纳入同意的问/答和共同解释 (参见 PR 34 的附件 2);
- 监控涂层联合工作组的进展并在必要时采取行动; 和
- 把涉及政策问题的议题提交给综合政策小组 (GPG)。

CSR 秘书处应向 EG/涂层的工作提供行政协助, 确保以透明和迅速的方式编写和发布问/答和共同解释。

3 使用 CSR KC DB 的一般程序

虽然 EG/涂层维护结构共同规范 (CSR) 要求的职责相对有限, 但是每个成员能够完全使用 KC DB, 这样 CSR 项目组 (PT) 和 EG/涂层之间能保持紧密的关系。

对于可能影响 CSR 实施的、有关 IMO PSPC 的问/答和共同解释请求, 如 CSR 中 IMO PSPC 的适用范围, 应录入 KC DB 并以适当的工作程序处理。

处理此类请求的主要职责由相应的 CSR PT1 和 CSR PT2 承担, 但是秘书处应在必要时和 EG/涂层协调以确保信息在 CSR 项目组 (PT) 和 EG/涂层之间交换。

4 工作程序

和 CSR 项目组 (PT) 不同, EG/涂层通过电子邮件通信执行日常业务。CSR 秘书处应在数据录入和发布方面和 EG/涂层协调。

4.1 录入点

4.1.1 收到问题和共同解释请求后, IACS 各船级社应和各自的 EG/涂层成员直接沟通。

4.1.2 请求答复或共同解释的提问者可把其请求发给 IACS 各船级社或 CSR 秘书处。

4.1.3 EG/涂层的成员和 CSR 秘书处收到请求后, 应通过电子邮件通信进行 EG/涂层的讨论。

4.2 类别

4.2.1 专家组的每位成员在开始讨论时, 应确认请求所属的类别。应使用下述类别:

- Q&A 问题和答复
- CI 共同解释
- UI 组成 IMO PSPC 统一解释的共同解释。应注意 IACS 程序附件 4.3 要求的所有过程结束后, 应及时把 UI 提交给 IMO 审议
- PR 34 修正案: 应纳入 PR 34 的结果

4.2.2 随着时间推移, 可能要对结果重新分类。CSR 秘书处负责确保主控文档中每项结果的类别保持更新。

4.3 决策

4.3.1 EG/涂层的主席应努力在讨论议题上取得一致意见, 并尽可能避免投票。然而, 应避免在小组内不太可能达成一致的事务上重复讨论。在此情况下, EG/涂层的主席应在取得小组三分之二多数同意后定案并提交 GPG, 连同成员保留意见的标识和解释 (参见 IACS 程序, 13.6 节)。

4.3.2 GPG 收到专家组的解决请求后, 应在 10 个工作日内评审请求并予以解决。

4.3.3 EG/涂层和 CSR 秘书处应把涉及政策问题的议题提交给 GPG, 并在 GPG 要求时在政策问题上提供建议。

4.4 通知和定案

4.4.1 议题解决后, EG/涂层应通知提问者, 并把副本提交给 CSR 秘书处。CSR 秘书处应立即更新主控文档并在网站上发布。

4.4.2 从提问到通知的整个过程一般应在 10 个工作日内完成。

5 PR 34 和 UI

EG/涂层应在必要时定期更新 PR 34 以纳入同意的问/答和共同解释。

如果 EG/涂层认为有必要制定 IMO PSPC 的 UI, EG/涂层应搜集资料并制定一系列 UI 供 GPG 审议。制定完成的 UI 应提交 GPG 批准。(参见 IACS 程序, 附件 4.3)

6 主控文档和公共信息

CSR 秘书处负责每日维护 IACS 网站的主控文档, 以纳入定案的问/答和共同解释。

附件 2 统一解释（参见 PR 34，7.3 和 PR 34，附件 1 的第 2 段）

以下是 IMO PSPC 规定的统一解释。

表 1-1.3，涂层合格预试验

第 1 段：在本标准生效日之前，依据附件 1 的试验程序或等效的方法进行实验室试验的环氧基系统，如至少满足对锈蚀和鼓泡的要求或有文件记录经现场暴露试验 5 年后涂层的最终状况不低于“良好”，可以接受。

统一解释

1. 要求对冬季型式环氧进行单独的合格预试验，包括依据附件 1 的车间底漆兼容试验。冬季和夏季型式涂层视为不同，除非红外（IR）鉴定和比重（SG）证实两者相同。

表 1-1.4，涂层系统选择

第 1 段：应至少进行两道预涂和两道喷涂。仅在焊缝区能证明涂层可满足 NDFT 要求的范围内，可减少第二道预涂，以避免不必要的涂层过厚。任何减少第二道预涂的范围都应详细地全部记录在 CTF 中。

统一解释：

1. 应对所有边缘和不规则焊道进行两道预涂。如果 PSPC 允许免除第二道预涂，接受邻近焊缝的干膜厚度测量（离焊缝不超过 15mm）。接受类似于附件 3 的平坦表面的统计取样测量用以验证 NDFT。
2. 可在平滑的自动焊道处进行一道预涂，但须确认在第二道喷涂后的涂层测厚已达到 NDFT。

表 1-1.5，NDFT

第 3 段：应小心避免涂膜过厚。涂装中应定期检查湿膜厚度。

统一解释：

1. 船厂应在涂装中定期检查湿膜厚度进行质量控制。PSPC 没有规定谁应检查 WFT，在此认为是船厂。DFT 应作为第 6 节检查的一部分。

表 1-3.3，合拢后的表面处理

对大接缝为 St 3，或更好，或可行时为 Sa 2½。小破坏面积的总和不大于总面积的 2%时为 St3。相邻接的涂层损坏总面积超过 25 m²或超过舱室总面积 2%、应为 Sa2½。

涂层搭接处表面要处理成斜坡状。

统一解释

1. 通常液舱界限水密舱壁的角接焊缝在分段阶段无涂层（因为未进行渗漏试验），在此情况下可归为合拢接缝，动力加工至 St 3。

表 1-3.6，喷砂/打磨后水溶性盐限制（相当于氯化钠）

“≤50 mg/m² NaCl”

统一解释

1. 从试验方法 8502-9 获得的 mg/m^2 值不应折算，基于的原理是：所有可溶性盐或多或少对涂层产生有害影响。8502-9 未提供 NaCl 的实际浓度。NaCl 在可溶性盐中的百分比随地点不同而变化。最少读数为涂装前每段/剖面/单元 1 个读数，如果是手工涂装车间底漆则每块板 1 个读数。如果使用车间底漆涂装自动化过程，应有方式通过质量控制系统证明符合 PSPC（应包括月度试验）。

表 1-4.3，涂层检验

为了质量控制，每道涂层干膜厚度都要进行测量。最后一道涂层涂装后应使用适当的测厚计测定总干膜厚度。

统一解释

1. 应测量和记录所有干膜厚度。有资格的涂层检验员只需记录最终的干膜厚度并报告是否符合 PSPC。涂层技术案卷可包括所有干膜厚度测量的概要，通常由最小/最大干膜厚度、测量次数、要求干膜厚度之上和之下的百分比组成。最终的干膜厚度是否符合 90/10 规则应予以计算和确认，参见 PSPC 2.8。

附件 3 涂料生产商（参见 PR 34，方法 D，1.18）

1 涂料生产商

1.1 业务范围—按 IMO MSC.215(82)决议和 IACS PR 34 生产涂层系统。

1.2 这些要求适用于主涂层生产商和车间底漆生产商，两种涂层均构成整个系统的一部分。

1.3 涂料生产商应向船级社提供以下资料：

- 生产设施的详细清单
- 应明确标明原材料供应商的名称和位置
- 使用的试验标准和设备的详细清单（认可范围）
- 使用的质量控制程序的详细资料
- 分包协议的详细资料
- 质量手册、试验程序和须知、记录等的清单
- 相关证书（连同签发编号和/或日期）的副本，如质量管理体系认证

1.4 生产商设施的检验和审核应基于 IMO MSC.215(82)决议的要求。

1.5 除了从实验室到全面生产的早期“按比例增加”，除非由涂层系统编制程序的试验或后续试验证实合理，否则不接受下述 QC 须知所列限制以外的调整。任何调整须由配方技术中心同意。

1.6 如果生产过程中预期到配方调整，最大许用限制应由配方技术中心认可，并在 QC 工作程序中明确标明。

1.7 生产商的质量控制系统应确保所有当前生产的配方与型式认可证书规定的相同。只有按 IMO MSC.215(82)决议的试验程序进行试验并由船级社签发型式认可证书，才允许配方的改变。

1.8 成批记录，包括所有 QC 试验结果如粘度、比重和无空气喷涂特性应予以精确记录。同时应包括任何添加剂的详细资料。

1.9 可能时，涂料批次的原材料供应和批量细节应可追溯。例外情况是如果散装品如溶剂和预先溶解的固态环氧储存在箱中，可只记录供应商的配料。

1.10 每份涂料合同所供应的日期、批号和数量应予以明确记录。

2 所有原材料供应须附有供应商“符合证书”。该证书应包括涂料生产商 QC 系统列出的所有要求。

3 如果没有原材料供应商符合证书，涂料生产商须验证符合涂料生产商 QC 系统列出的所有要求。

4 圆筒须明确标有“型式认可证书”所述的细节。

5 产品技术规格书须符合所有 PSPC 要求。QC 系统应确保所有产品技术规格书保持更新。

6 制定 QC 程序的技术中心应验证所有生产装置符合上述规定，且所有原材料供应由技术中心认可。

No. 34 IACS Procedural Requirement on Application of the IMO Performance Standard for Protective Coatings (PSPC), Resolution MSC.215(82), under IACS Common Structural Rules for Bulk Carriers and Oil Tankers

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Note:

1. ~~This Procedural Requirement is to be applied by IACS Societies to ships subject to the IACS CSR for Bulk Carriers and for Oil Tankers which are contracted for construction on or after 8 December 2006 and until the date of application referred to in para.1 of SOLAS Chapter II-1, Part A-1, Reg.3-2, as adopted by resolution MSC.216(82).~~
21. The "contracted for construction" date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of "contract for construction", refer to IACS Procedural Requirement (PR) No. 29.
2. Changes introduced in Revision 1 shall be applied by Members and Associate to requests for approvals of coating systems and coating manufacturers received from 1 January 2008 and on ships subject to the IACS Common Structural Rules (CSR) for Bulk Carriers and for Oil Tankers which are contracted for construction on or after 1 January 2008 and until the date of application referred to in para.1 of SOLAS Chapter II-1, Part A-1, Reg.3-2, as adopted by resolution MSC.216(82).

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Introduction

This Procedural Requirement shall be applied by IACS Societies for application of the IMO PSPC to ships subject to the IACS Common Structural Rules (CSR) for Bulk Carriers and for Oil Tankers which are contracted for construction on or after 8 December 2006 and until the date of application referred to in para.1 of SOLAS Chapter II-1, Part A-1, Reg.3-2, as adopted by resolution MSC.216(82).

The objective of this Procedural Requirement is to ensure uniform understanding and application of the requirements of the IMO PSPC.

References made to "IACS Society" or "Society" should be read as including IACS Members and Associate.

This Procedural Requirement contains:

- uniform requirements that shall be applied by all IACS Societies, and
- work procedures for the IACS Expert Group on Coating (EG/Coating) in developing consistent answers and common interpretations relating to the IMO PSPC. Refer to Annex 1.

This IACS Procedural Requirement ~~is to~~ shall be read in conjunction with the IMO Performance Standard for Protective Coatings (PSPC), Resolution MSC.215(82). Application of the referenced international standards footnoted therein is mandatory under this Procedural Requirement.

1. IACS Procedure for Coating System Approval

Type Approval Certificate showing compliance with the PSPC section 5 shall be issued if the results of either method A+D, or B+D, or C+D are found satisfactory by the Society.

The Type Approval Certificate shall indicate the Product and the Shop Primer tested. The certificate shall also indicate other type approved shop primers with which the product may be used which have under gone the cross over test in a laboratory meeting the requirements in section 1.1 of this procedure.

The documents required to be submitted are identified in the following sections, in addition for all type approvals the following documentation is required:

Technical Data Sheet showing all the information required by PSPC 3.4.2.2.

Winter and summer type coating are considered different unless infrared (IR) identification and specific gravity (SG) demonstrates that they are the same.

Method A: Laboratory Test

1.1 Coating pre-qualification test shall be carried out by the test laboratory which is recognized by the Society and the test laboratory shall meets the requirements set out in IACS UR Z17 ~~paragraphs 4, 5, 6 and 7 (except for 4.6 & 5.3) as below.~~

1.2 Results from satisfactory pre-qualification tests (PSPC table 1, paragraph 1.3 of the PSPC) of the coating system shall be documented and submitted to the Society.

1.3.1 Type Approval tests shall be carried out for the epoxy based system with the stated shop primer in accordance with the PSPC Annex 1. If the tests are satisfactory, a Type

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Approval Certificate will be issued to include both the epoxy and the shop primer. The Type Approval Certificate will allow the use of the epoxy either with the named shop primer or on bare prepared steel.

1.3.2 An epoxy based system may be used with shop primers other than the one with which it was originally tested provided that, the other shop primers are approved as part of a system, PSPC Table 1.2.3 and Table 1.3.2, and have been tested to Annex 1, Appendix 1, 1.7, which is known as the "Crossover Test". If the test or tests are satisfactory, a Type Approval Certificate will be issued. In this instance the Type Approval Certificate will include the details of the epoxy and a list of all shop primers with which it has been tested that have passed these requirements. The Type Approval Certificate will allow the use of the epoxy with all the named shop primers or on bare prepared steel.

1.3.3 Alternatively the epoxy can be tested without shop primer on bare prepared steel to the requirements of the PSPC Annex 1. If the test or tests are satisfactory, a Type Approval Certificate will be issued. The Type Approval Certificate will just record the epoxy. The certificate will allow the use of the epoxy on bare prepared steel only. If in addition, crossover tests are satisfactorily carried out with shop primers which are approved as part of a system, the Type Approval Certificate will include the details of shop primers which have satisfactorily passed the crossover test. In this instance the Type Approval Certificate will allow the use of the epoxy based system with all the named shop primers or on bare prepared steel.

1.3.4 The Type Approval Certificate is invalid if the formulation of either the epoxy or the shop primer is changed. It is the responsibility of the manufacturer to inform class immediately of any changes to the formulation.

1.3.5 Approvals granted according to previous versions of PR 34, before the date of implementation of the latest revision, remain valid as stated in the respective certificate. Renewal of certificates must be done in compliance with the latest version of PR 34.

Method B: 5 years field exposure

1.34 Coating manufacturer's records, which shall at least include the information indicated in 1.4.1, shall ~~are to~~ be examined to confirm coating system has 5 years field exposure, and the current product is the same as that being assessed.

1.4.1 Manufacturer's Records

- Original application records
- Original coating specification
- Original technical data sheet,
- Current formulation's unique identification (Code or number)
- If the mixing ratio of base and curing agent has changed, a statement from the manufacturer confirming that the composition mixed product is the same as the original composition. This shall be accompanied by an explanation of the modifications made.
- Current technical data sheet for the current production site
- SG and IR identification of original product
- SG and IR identification of the current product
- If original SG and IR cannot be provided then a statement from the manufacturer confirming the readings for the current product are the same as those of the original.

1.45 Either class survey records from a class society or a A joint (coating manufacturer / Society) survey of all ballast tanks of a selected vessel is to be carried out for the purpose of

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verification of compliance with the requirements of sections 1.3 and 1.7. ~~The coating manufacturer's representative is to be qualified as defined in 2.2.~~ The reporting of the coating condition in both cases shall be in accordance with the IACS Recommendation 87, section 2.

1.56 The selected vessel is to have ballast tanks in regular use, of which:

- At least one tank is approximately 2000 m³ or more in capacity
- At least one tank shall be adjacent to a heated tank and
- At least one tank contains an underdeck exposed to the sun.

1.67 In the case that the selected vessel does not meet the requirements in 1.56 then the limitations shall be clearly stated on the type approval certificate. For example, the coating cannot be used in tanks adjacent to heated tanks or underdeck or tanks with volume greater than the size surveyed.

1.8 In all cases of approval by Method B, the shop primer shall be removed prior to application of the approved epoxy based system coating, unless it can be confirmed that the shop primer applied during construction, is identical in formulation to that applied in the selected vessel used as a basis of the approval.

1.79 All ballast tanks shall ~~are to~~ be in "GOOD" condition, without touch up or repair in the prior 5 years.

1.79.1 "Good" is defined as: *Condition with spot rusting on less than 3% of the area under consideration without visible failure of the coating. Rusting at edges or welds, must be on less than 20% of edges or welds in the area under consideration.*

1.79.2 Examples of how to report coating conditions with respect to areas under consideration should be as those given in IACS Recommendation 87 ^{*} ~~Appendix 4.~~

1.10 If the applied NDFT is greater than required by the PSPC, the applied NDFT will be the minimum to be applied during construction. This will be reported prominently on the Type Approval Certificate.

1.11 If the results of the inspection are satisfactory, a Type Approval Certificate shall be issued to include both the epoxy based system and the shop primer. The Type Approval Certificate shall allow the use of the epoxy based system either with the named shop primer or on bare prepared steel. The Type Approval Certificate shall reference the inspection report which will also form part of the Coating Technical File.

1.12 The Type Approval Certificate is invalid if the formulation of either the epoxy based system or the shop primer is changed. It is the responsibility of the manufacturer to inform class immediately of any changes to the formulation.

Method C: Existing Marintek B1* Approvals.

1.813 Epoxy based system Coatings Systems with existing satisfactory Marintek test reports minimum level B1 including relevant IR identification and SG, issued before Dec 8th 8 December 2006 can be accepted. If original SG and IR documentation cannot be provided, then a statement shall be provided by the manufacturer confirming that the readings for the current product are the same as those of the original.

* IACS Recommendation 87 is not mandatory.

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1.14 The Marintek test report with IR and SG information shall be reviewed and if satisfactory, a Type Approval certificate shall be issued. The certificate shall record the report reference and the shop primer used. The Type Approval Certificate shall allow the use of the epoxy based system either with the named shop primer, unless there is evidence to indicate that it is unsuitable, or on bare prepared steel.

1.15 The epoxy based system approved by this method may be used with other shop primers if satisfactory crossover tests are carried out with shop primers which are approved as part of a system, see 1.3.2. In this instance, the Type Approval Certificate will include the details of the epoxy based system and a list of all shop primers which have passed these requirements. The Type Approval Certificate will allow the use of the epoxy based system with all the named shop primers or on bare prepared steel.

1.16 Such coatings shall be applied in accordance with Table 1 of the PSPC rather than the application conditions used during the approval test which may differ from the PSPC, unless these are more stringent than Table 1 of the PSPC, for example if the NDFT is higher.

1.17 The Type Approval Certificate is invalid if the formulation of either the epoxy based system or the shop primer is changed. It is the responsibility of the manufacturer to inform class immediately of any changes to the formulation.

Method D: Coating Manufacturer

1.18 The coating/shop primer manufacturer shall meet the requirements set out in IACS UR Z17 paragraphs 4, 5, 6 and 7, (except for 4.6) and Annex 3 of PR34, which shall be verified by the Society.

1.19 In the case that a manufacturer wishes to have products which are manufactured in different locations under the same name, then infrared (IR) identification and specific gravity SG shall be used to demonstrate that they are the same coating, or individual approval tests will be required for the paint manufactured in each location.

1.20 The Type Approval Certificate is invalid if the formulation of either the epoxy based system or the shop primer is changed. It is the responsibility of the manufacturer to inform class immediately of any changes to the formulation. Failure to inform class of an alteration to the formulation will lead to cancellation of the certificates for that manufacturer's products.

2. IACS Procedure for Assessment of Coating Inspectors' Qualifications

2.1 Coating inspectors required to carry out inspections in accordance with the IMO PSPC section 6 shall be qualified to NACE Coating Inspector Level 2, FROSIO Inspector Level III, or an equivalent qualification. Equivalent qualifications are described in 2.3 below.

2.2 However, only coating inspectors with at least 2 years relevant coating inspector experience and qualified to NACE Coating Inspector Level 2 or FROSIO Inspector Level III, or with an equivalent qualification, can write and/or authorise procedures, or decide upon corrective actions to overcome non-compliances.

2.3 Equivalent Qualification:

2.3.1 **Equivalent** qualification is the successful completion, as determined by course tutor, of an approved course.

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2.3.1.1 The **course tutors** shall be qualified with at least 2 years relevant experience and qualified to NACE Coating Inspector Level 2 or FROSIO Inspector Level III, or with an equivalent qualification.

2.3.1.2 **Approved Course:** A course that has a syllabus based on the issues associated with the PSPC including the following:

- Health Environment and Safety
- Corrosion
- Materials and design
- International standards referenced in PSPC
- Curing mechanisms
- Role of inspector
- Test instruments
- Inspection Procedures
- Coating specification
- Application Procedures
- Coating Failures
- Pre-job conference
- MSDS and product data sheet review
- Coating technical file
- Surface preparation
- Dehumidification
- Waterjetting
- Coating types and inspection criteria
- Specialized Application Equipment
- Use of inspection procedures for destructive testing and non destructive testing instruments.
- Inspection instruments and test methods
- Coating inspection techniques
- Cathodic protection
- Practical exercises, case studies.

Examples of approved courses may be internal courses run by the coating manufacturers or shipyards etc.

2.3.1.3 Such a course shall have an acceptable measurement of performance, such as an examination with both theoretical and practical elements. The course and examination shall be approved by the Society.

2.3.2 Equivalent qualification arising from practical experience: An individual who may be qualified without attending a course where it can be shown that the individual:

- has a minimum of 5-years practical work experience as a coating inspector of ballast tanks during new construction within the last 10 years, and
- has successfully completed the examination given in 2.3.1.3.

2.4 Assistant Inspectors

2.4.1 If the coating inspectors requires assistance from other persons to do the part of the inspections under the coating inspector's supervision, those persons shall be trained to the coating inspector's satisfaction.

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2.4.2 Such training should be recorded and endorsed either by the inspector, the yard's training organisation or inspection equipment manufacturer to confirm competence in using the measuring equipment and confirm knowledge of the measurements required by the PSPC.

2.4.3 Training records shall be available for verification if required.

3. IACS Procedure for Inspection Agreement (the PSPC 3.2)

3.1 The procedure for inspection of surface preparation and coating processes shall be agreed upon, between the shipowner, the shipyard and coating manufacturer. It should be presented by the shipyard to the Society for review and as a minimum shall comply with the PSPC. It is to shall be included in the Coating Technical File, the qualifications of the coating inspector(s). Where more than one coating inspector will be used then their areas of responsibility shall be identified. (For example multiple construction sites).

3.2 Any deviations in the procedure relative to the PSPC noted during the review shall be raised with the shipyard, which is responsible for identifying and implementing the corrective actions.

3.3 A class certificate ~~is~~ shall not ~~to~~ be issued until all required corrective actions have been closed out to the satisfaction of the Society.

4. IACS Procedure for Verification of Application of the PSPC

4.1 The verification requirements of section 7 of the PSPC ~~are to~~ shall be carried out by the Society.

4.1.1 Monitoring implementation of the coating inspection requirements, as called for in section 7.5 of the PSPC means checking, on a sampling basis, that the inspectors are using the correct equipment, techniques and reporting methods as described in the inspection procedures reviewed by the Society.

4.2 Any deviations found under 4.1.1 ~~are to~~ shall be raised initially with the coating inspector, who is responsible for identifying and implementing the corrective actions.

4.3 In the event that corrective actions are not acceptable to the Society or in the event that corrective actions are not closed out then the shipyard shall be informed.

4.4 A class certificate ~~is~~ shall not ~~to~~ be issued until all required corrective actions have been closed out to the satisfaction of the Society.

5. IACS Procedure for Coating Technical File Review

5.1 The shipyard is responsible for compiling the Coating Technical File (CTF) either in paper or electronic format, or a combination of the two.

5.2 The CTF is to contain all the information required by the PSPC section 3.4.

5.3 The CTF shall be reviewed for content in accordance with the PSPC section 3.4.2.

5.4 Any deviations found under 5.3 ~~are to~~ shall be raised with the shipyard, which is responsible for identifying and implementing the corrective actions.

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5.5 A class certificate ~~is~~ shall not ~~to~~ be issued until all required corrective actions have been closed out to the satisfaction of the Society.

6. IACS Procedure for review of Quality Control of Automated Shop Primer plants

6.1 It is recognised that the inspection requirements of section 6.2 of the PSPC may be difficult to apply to an automated shop primer plant and a Quality Control approach would be a more practical way of enabling compliance with the requirements of PSPC.

6.2 As required in PSPC it is the responsibility of the coating inspector to confirm that the quality control procedures are ensuring compliance with PSPC.

6.3 When reviewing the Quality Control for automated shop primer plants the following procedures should be included.

6.3.1 Procedures for management of the blasting grit including measurement of salt and contamination.

6.3.2 Procedures recording the following: steel surface temperature, relative humidity, dewpoint.

6.3.3 Procedures for controlling or monitoring surface cleanliness, surface profile, oil, grease, dust and other contamination.

6.3.4 Procedures for recording/measuring soluble salts.

6.3.5 Procedures for verifying thickness and curing of the shop primer conforms to the values specified in the Technical Specification.

7. IACS Procedure for Review of Coating Technical Specifications

7.1 The coating technical specification should be provided by the shipyard in accordance with the requirements of PSPC detailing all the requirements of Table 1 of the PSPC.

7.2 The Coating Technical Specification should contain application procedure, acceptance criteria and inspection etc. as specified in paragraph 2 of Annex 1 of the PSPC.

7.3 When reviewing the technical specification for compliance with the requirements of PSPC the common interpretations in Annex 2 shall be used.

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Annex 1 Work Procedures for Uniform Implementation of IMO PSPC by the EG/Coating

This procedure describes how members of the EG/Coating should deal with Q&As and requests for interpretations on matters relating to the IMO PSPC and IACS PR 34.

1. Definitions

Q&A Questions and Answers

Common Interpretation (CI) Explanation to achieve a common understanding of the requirements of the IMO PSPC

Unified Interpretation (UI) As defined in IACS Procedures, section 15.2.3.

CSR KC DB Knowledge Centre (KC) database consisting of Q&As, CIs and CSR Rule Change Proposals(RCP) (N.A. for the relevant Q&A and CI for IMO PSPC)

Initiator Person, organization outside of the IACS, IACS Society or the EG/Coating itself who has raised questions, comments or requests for interpretation on the IMO PSPC and PR 34

Master file A spreadsheet containing all the outcomes of questions raised by the EG/Coating (Q&A and CI for IMO PSPC)

For other definitions, refer to IACS Procedural Requirement (PR) No.32.

2. Roles of the EG/Coating and the CSR Secretariat

The EG/Coating is:

- To provide technical expertise and prepare technical answers and interpretations;
- To reply to the initiator with unanimously agreed technical answers, with a copy to the CSR Secretariat;
- To review and revise the scope and terms of reference of the IACS/Industry JWG/Coating and discuss with the JWG as necessary;
- To interact with the CSR Secretariat in administering Q&As and CIs on the web site;
- To keep PR 34 up-to-date incorporating the agreed Q&As and CIs as necessary (Ref.: Annex 2 to PR 34);
- To monitor the progress within the JWG/Coating and act as necessary; and
- To refer issues involving policy matters to GPG.

The CSR Secretariat is to provide administrative assistance to the work of the EG/Coating with a view to ensuring that Q&As and CIs are developed and published in a transparent and expeditious manner.

3. General Procedures for using the CSR KC DB

Despite the fact that the EG/Coating has a relatively limited role in maintaining the requirements of the Common Structural Rules (CSRs), full access to the KC DB is given to each member of the EG/Coating, so that a close link between the CSR PTs and the EG/Coating is established.

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For Q&As and requests for CIs on the IMO PSPC that may affect the CSR implementation, e.g. scope of application of IMO PSPC under the CSR, they shall be entered into the KC DB and dealt with by appropriate work procedures.

The primary responsibility of dealing with this type of requests rests upon CSR PT 1 and PT 2 as appropriate, however, Permsec is to coordinate with the EG/Coating, when necessary, and ensure that information is exchanged between CSR PTs and the EG/Coating.

4. Work procedures

Unlike the CSR PTs, the EG/Coating is to conduct its day-to-day business via e-mail correspondence. The CSR Secretariat is to coordinate with the EG/Coating in data entry and publication.

4.1 Entry point

4.1.1 IACS Societies are to communicate directly with their respective EG/Coating members upon receipt of Questions and requests for CIs.

4.1.2 An initiator requesting Answer or CI may forward his/her request to IACS Societies or the CSR Secretariat.

4.1.3 Each member of the EG/Coating and the CSR Secretariat, upon receipt of a request, is to initiate discussion by the EG/Coating by e-mail correspondence.

4.2 Categorization

4.2.1 Each member of the EG, when initiating discussion, is to identify which category the request belongs to. The following categorization shall be used:

- Q&A: Question/Answers
- CI: Common Interpretation
- UI: Common interpretations that constitute Unified Interpretations on the requirements of the IMO PSPC. It shall be borne in mind that UIs shall be submitted, after completion of all processes as required by Annex 4.3 of the IACS Procedures, to IMO for consideration in due course.
- Amendments to PR 34: Outcomes that shall be incorporated into PR 34.

4.2.2 As time evolves, outcomes may need to be re-categorized from one to the other. The CSR Secretariat is responsible of ensuring that categorization of each outcome in the Master File is kept up-to-date.

4.3 Decision making

4.3.1 The Chair the EG/Coating is to strive for unanimous conclusions on the subjects under consideration and is to avoid voting wherever possible. However, repeated discussion shall be avoided on matters, where unanimous conclusions within the group is unlikely. In such cases the Chair of the EG/Coating is to finalize an issue on a two third majority basis at their level and forward it to GPG, together with identification and explanation of members' reservations (Ref: IACS Procedures, section 13.6).

4.3.2 GPG, upon receipt of a request from the EG for resolution, is to review and resolve the request within 10 working days.

4.3.3 The EG/Coating and the CSR Secretariat are to refer issues involving policy matters to GPG, and advise GPG on such policy issues when requested by GPG.

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4.4 Notification and finalization

4.4.1 Upon resolution of an issue, the EG/Coating is to notify the initiator with a copy to the CSR secretariat. The CSR Secretariat is then to update the Master file and post on the web site without delay.

4.4.2 The whole process from initiation to notification is, in general, to be completed within 10 working days.

5. PR 34 and UIs

The EG/Coating is to periodically update PR 34 incorporating the agreed Q&As and CIs as they deem it necessary.

In case where the EG/Coating finds it necessary to develop a UI on the IMO PSPC, the EG/Coating is to compile the information and develop a set of UIs for consideration by GPG. The UIs, when completed, shall be submitted to GPG for approval. (Ref: IACS Procedures, Annex 4.3)

6. Master file and public information

The CSR Secretariat is responsible for maintaining the Master file on the IACS web site on a daily basis incorporating the finalized Q&As and CIs.



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Annex 2 Unified Interpretations (Ref.: PR 34, 7.3, PR 34, Annex 1, para.2)

Unified Interpretations are listed hereunder in the order of the IMO PSPC Provisions.

Table 1-1.3. Coating pre-qualification test

1st para. reads: Epoxy-based system tested prior to the date of entry of this standard in a laboratory by a method corresponding to the test procedure in Annex 1 or equivalent, which as a maximum meets the requirements for rusting and blistering; or which have documented field exposure for 5 years with a final coating condition of not less than "GOOD" may be accepted.

Unified Interpretation

1. Winter type epoxy is required separate prequalification test including shop primer compatibility test according to Annex 1. Winter and summer type coating are considered different unless IR identification and SG demonstrates that they are the same.

Table 1-1.4. Selection of the coating system

1st para. reads: There shall be a minimum of two stripe coats and two spray coats, except that the second stripe coat, by way of welded seams only, may be reduced in scope where it is proven that the NDFT can be met by the coats applied in order to avoid unnecessary over thickness. Any reduction in scope of the second stripe coat shall be fully detailed in the CTF.

Unified Interpretations

1. Two stripe coats are also to be applied to all edges and all irregular welding beads. Where PSPC allows the second stripe coat to be dispensed with, the DFT measurement adjacent to the welds, not further than 15 mm from the welds, is acceptable. Statistical sampling measurement similar to Annex 3 for flat surface is acceptable for the verification of NDFT.
2. One stripe coat may also be applied in way of smooth automatic weld beads subject to confirmation that the NDFT has been achieved by thickness measurement of the coating after the second spray coat

Table 1-1.5. NDFT

3rd para reads: Care shall be taken to avoid increasing the thickness in an exaggerated way. Wet film thickness shall be checked during application.

Unified Interpretation

1. Wet film thickness shall be regularly checked during application for quality control by the Builder. PSPC does not state who should check WFT, it is accepted for this to be the Builder. DFT shall be done as part of the inspection section 6.

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Table 1-3.3, Surface treatment after erection

It reads: Butts St 3 or better or Sa 2 ½ where practicable. Small damages up to 2% of total area: St 3. Contiguous damages over 25 m² or over 2% of the total area of the tank, Sa 2 ½ shall be applied.

Coating in overlap shall be feathered.

Unified Interpretation

1. Usually, the fillet welding on tank boundary watertight bulkhead is left without coating on block stage (because not yet be leakage tested), in which case it can be categorized as erection joint ("butt") to be power tooling to St3.

Table 1-3.6, Water soluble salts limit equivalent to NaCl after blasting / grinding

It reads: "<= 50 mg/m² of sodium chloride"

Unified Interpretation

1. The value in mg/m² obtained from the test method 8502-9 shall be used without conversion, on the basis; All soluble salts have a detrimental effect on coatings to a greater or lesser degree. 8502-9 does not provide the actual concentration of NaCl. The % NaCl in the total soluble salts will vary from site to site. Minimum readings to be taken are one (1) reading per block/section/unit prior to applying coating or one (1) per plate in the case of manually applied shop primer. In cases where an automatic process for application of shop primer is used, there should be means to demonstrate compliance with PSPC through a Quality Control System, which should include a monthly test.

Table 1-4.3, Testing of coating

It reads: Dry film thickness shall be measured after each coat for quality control purpose and the total dry film thickness shall be confirmed after completion of final coat, using appropriate thickness gauges.

Unified Interpretation

1. All DFT measurements shall be measured and recorded. Only the final DFT measurements need to be measured and reported for compliance with the PSPC by the qualified coating inspector. The Coating Technical File may contain a summary of the DFT measurements which typically will consist of min / max DFT measurements, number of measurements taken and percentage above and below required DFT. The final DFT compliance with the 90/10 practice shall be calculated and confirmed, see PSPC 2.8.

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Annex 3 Coating Manufacturer (Ref: PR 34, Method D, 1.18)

1. Coating Manufacturers

1.1 Extent of Engagement – Production of coating systems in accordance with IMO Resolution MSC.215 (82) and IACS PR 34.

1.2 These requirements apply to both the main coating manufacturer and the shop primer manufacturer where both coatings form part of the total system.

1.3 The coating manufacturer should provide to the Society the following information:

- A detailed list of the production facilities.
- Names and location of raw material suppliers will be clearly stated.
- A detailed list of the test standards and equipment to be used, (Scope of approval).
- Details of quality control procedures employed.
- Details of any sub-contracting agreements.
- List of quality manuals, test procedures and instructions, records, etc.
- Copy of any relevant certificates with their issue number and/or date e.g. Quality Management System certification.

1.4 Inspection and audit of the manufacturer's facilities will be based on the requirements of the IMO Resolution MSC.215(82).

1.5 With the exception of early 'scale up' from lab to full production, adjustment outside the limitations listed in the QC instruction referred to below is not acceptable, unless justified by trials during the coating system's development programme, or subsequent testing. Any such adjustments must be agreed by the formulating technical centre.

1.6 If formulation adjustment is envisaged during the production process the maximum allowable limits will be approved by the formulating technical centre and clearly stated in the QC working procedures.

1.7 The manufacturer's quality control system will ensure that all current production is the same formulation as that supplied for the Type Approval Certificate. Formulation change is not permissible without testing in accordance with the test procedures in the IMO Resolution MSC.215(82) and the issue of a Type Approval Certificate by the Society.

1.8 Batch records including all QC test results such as viscosity, specific gravity and airless spray characteristics will be accurately recorded. Details of any additions will also be included.

1.9 Whenever possible, raw material supply and lot details for each coating batch will be traceable. Exceptions may be where bulk supply such as solvents and pre-dissolved solid epoxies are stored in tanks, in which case it may only be possible to record the supplier's blend.

1.10 Dates, batch numbers and quantities supplied to each coating contract will be clearly recorded.

2. All raw material supply must be accompanied the supplier's 'Certificate of Conformance'. The certificate will include all requirements listed in the coating manufacturer's QC system.

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3. In the absence of a raw material supplier's certificate of conformance, the coating manufacturer must verify conformance to all requirements listed in the coating manufacturer's QC system.
4. Drums must be clearly marked with the details as described on the 'Type Approval Certificate'.
5. Product Technical Data Sheets must comply with all the PSPC requirements. The QC system will ensure that all Product Technical Data Sheets are current.
6. QC procedures of the originating technical centre will verify that *all* production units comply with the above stipulations and that all raw material supply is approved by the technical centre.

End of Document
