

CHOCKFAST ORANGE

APPLICATION PROCEDURE

RESIN INSTALLED MAIN ENGINE, GENERATOR AND GEAR BOX

CHOCKFAST ON MAIN ENGINE, GENERATOR & GEAR BOX

➤ PREPARATION WORK FOR CHOCKFAST

1. A satisfactory alignment and crankshaft deflection reading should be obtained. Allowance is made for initial chock compression when the foundation bolts are tightened is calculated by multiplying chock height in mm by 0.001 times (e.g. chock height = 50mm x 0.001 = 0.05mm) the Chockfast will compress due to Engine Weight & total bolt tension force. Therefore, the engine's center line is aligned 0.05mm higher than the tail shaft center line to compensate.
2. Welding of side-stoppers & other major welding works should be completed.
3. The engine foundation & bed plate surfaces are cleaned thoroughly to remove all grease, oil, mill scale, rust & paint where in contact with Chockfast Orange.
4. Flexible damming foam is cut to appropriate size and inserted to fit snugly between the bed plate and foundation to a form liquid-tight would according to measurements provided in the approved Chockfast plan.
5. The jacking screws are wrapped around with thin rubber strips to facilitate loosening & removal of the jacking bolts after Chockfast.
6. Rubber tubes are inserted to plug up the bolt holes. Care must be taken after insertion to check rubber tubes are straightened to avoid leaking and bolt hole is clear for insertion of foundation bolts after Chockfast.
7. Spray lightly release agent PR-225 into the prepared moulds. Steel front dams surface in contact with Chockfast Orange should be sprayed heavily with release agent PR-225 or apply high temp grease to facilitate removal after Chockfast.

8. Steel front dams are tack welded in place with a pouring gap of 15mm to 20mm wide for pouring Chockfast into the moulds along the edge of the engine foundation.
9. Bottom edge of the steel front dams are then sealed off with sealing compound to prevent leakage.
10. Final alignment and crankshaft deflection readings are taken for record.

➤ **MIXING AND POURING GUIDE**

1. Sufficient Chockfast Orange material should be prepared in the engine room.
2. Pry open lid from can and add in hardener according to steel temp/chock thickness relationship chart provided in our technical bulletin 692.
3. Attach jiffy mixer blade to a slow speed electric drill (200-500rpm) for mixing of Chockfast. Squeeze can tightly with insides of both feet to avoid spinning of can when starting the drill for mixing. Care must be taken from start to end of mixing Chockfast that the jiffy mixer blade is completely immersed below the top surface of the Chockfast to avoid air bubbles during mixing. Power mix for 2 to 3 minutes until a homogenous mix is ensured before passing on for pouring.
4. Pouring should be done shortly after mixing Chockfast Orange is poured slowly into the moulds through the gap between engine bed plate and steel front dams. To avoid air entrapment, always pour from lowest end of chocks until moulds are filled up the over pour.
5. After pouring is completed checks should be made to ensure all moulds are filled with Chockfast. Any leakages should be plugged up immediately and refill up the mould with Chockfast again.

6. Chockfast Orange is allowed to set and cure for 18 to 48 hrs depending on ambient temp. Heaters can be used to speed up curing as in winter application.
7. Rubber tubing can be removed from the bolt holes for insertion of foundation bolts.
8. Set up dial gauges for monitoring alignment to engine maker's recommendations.
9. Jacking screws are slackened & removed to allow engine to seat on Chockfast. Holding down bolts are inserted & ready for tensioning.
10. All engine foundation bolts are tensioned to required torque and hydraulic pressure according to engine maker's recommendations.
11. Alignment and crankshaft deflection readings are taken for record.
12. Steel front dams can be removed & chocks dressed for fitting of steel side stoppers.
13. During winter application when steel temp is below 13 deg (55 deg F) heating of the engine foundation and Chockfast orange material to approx. 20 deg C to 25 deg C is ideal for application and curing of Chockfast Orange.

CHOCKFAST ORANGE

APPLICATION PROCEDURE

环 氧 树 脂 施 工 工 艺

主 机 发 电 机 齿 轮 箱
 垫 块

GOLTENS SHANGHAICO.,LTD

高尔登船舶工程（上海）有限公司

Chockfast 垫块施工工艺

一、准备工作

1. 轴系对中及曲轴的挠曲度测量数据应符合有关标准和要求。并将船东、船检认可之轴系对中数据提供给 Chockfast 服务商。
2. 由于机器的重量及底脚螺栓的预紧力，Chockfast 会有所压缩，压缩量为垫块厚度的 0.001 倍，即：如果垫块厚度为 50mm，则压缩量为 $50\text{mm} \times 0.001 = 0.05\text{mm}$ ，因此，机器中心线的定位应比尾轴中心线高出 0.05mm，（当垫块厚度为 50mm 时），其他厚度时以此类推。
3. 机器两侧止动块座的焊接及其他主要的焊接工作应该完成。
4. 机器座板底平面及基座面板上平面全部清洗干净，在 Chockfast 接触的表面应无任何油脂、油迹、锈斑、斑剥的油漆和任何应力集中点。
5. 将柔性的泡沫条切割成相应的尺寸，通常泡沫围条的高度应比环氧垫块的厚度要高出 5-6 毫米。根据所批准的图纸尺寸塞入机器座与基座平面之间，并紧密贴合上下平面，形成垫块模壳。
6. 如有定位螺栓的机器，应先把定位螺栓孔及螺栓预配好，然后将螺栓装入到位，在环氧未浇注前不可上紧螺帽。在定位螺栓的表面（仅在机器座与基座之间），包覆一层薄薄的泡沫条或者用 Release Agent 一种专用脱膜剂喷向表面，以便在 Chockfast 固化后能将定位螺栓取出和防止应力集中点。
7. 将泡沫管条插入底脚螺栓孔内，完全插入后检查泡沫管条是否有凹陷不平处（在机器座及基座之间）并纠正，以防泄漏 Chockfast，当 Chockfast 固化后，螺孔内光顺整齐，便于塞入底脚螺栓。
8. 两块垫块之间，机座板边缘处设置测量销，销顶为半球状，顶点距机座下平面约 0.5mm，每边设置约 3 - 5 个，视具体情况而定。
9. 将脱模剂 PR-225 喷入已形成的垫块模壳内，要求是把脱膜剂 PR-225 摇晃均匀后沿着浇注口缓慢的来回喷一遍。并在铁挡板（约 2 - 3mm 厚）与 Chockfast 接触的一面喷两层脱模剂，或者将耐高温牛油均匀抹一层在该表面，Chockfast 固化后便于移去挡板，防止粘结。
10. 将铁挡板点焊在基座表面，沿机器座边缘，距边缘 15-20mm 形成浇注口。
11. 在铁挡板的底边，用 Sealing Compound 密封填料填密缝隙，以防止 Chockfast 渗漏。
12. 将最后的对中、曲轴挠度及下沉间隙测量结果记录在案，便于对照和查证。
13. 供应商提供的都是特殊材料，应妥善保管。一旦遗失，不可以用其它材料代替使用，因此而造成的一切后果将有厂方负责。

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二、浇注

1. 浇注前应备有足够数量的 Chockfast 在机舱里。
在清洁机座，围海绵，混合 Chockfast 及浇注过程中，应保持周围环境无打磨、电焊气割等工作的进行。
2. 先打开桶盖，然后根据技术样本 692 号上的温度/厚度关系曲线图所显示的相应固化剂用量，将固化剂倒入桶内，请注意：必须按图所示的要求准确倒入固化剂的用量，（切记不可将剩余固化剂累积在一起使用，这样将会引起混合比例的错误，导致质量事故）。当垫块厚度和环境温度达到曲线图所示分层浇注处，须在现场服务工程师的指导下进行分层浇注。
3. 将搅拌桨叶装在低速电钻上（200--500RPM），准备搅拌 Chockfast，将已倒入固化剂的桶用两腿紧紧夹住，然后开始用电钻搅拌 Chockfast，搅拌时桨叶必须全部埋入 Chockfast 里面，以防将空气泡混入 Chockfast，用力搅拌 2-3 分钟，直到桶内的 Chockfast 全部均匀混合，然后开始倒入到垫块模壳内。
4. 混合后的 Chockfast 应立即进行浇注，倒入时应选择在浇注槽口的最低点，缓缓倒入，直到液面升至浇口高度为止。浇口高度一般为垫块厚度 +25 - 30mm。同时，做二只 50 x 50 x 50mm 的试样。
5. 在浇注完成后，应确保所有的垫块模壳内均充满 Chockfast，并仔细检查是否有泄漏，若有应及时迅速地补救，并重新填满已泄漏的部分。同时，可适当沿泡沫管圆周用手释放空气，避免由于空气释放不够而产生的空泡和间隙。
6. Chockfast 完全固化的时间为 24 小时 - 48 小时，取决于当时的环境温度，当冬天环境温度低于 13℃ 时，为了加速固化时间，需要使用加热器以提高周围的温度。
7. 将泡沫管条从螺孔中取出，以便放入底脚螺栓。
8. 将定位螺栓放松并取出，机器重量完全由 Chockfast 所承受，将底脚螺栓塞入螺孔并准备上紧。
9. 将所有的底脚螺栓采取扭矩上紧或液压上紧，方法和量值根据机器制造商的推荐或由 Chockfast 供应商提供的计算书推荐值。
10. 测量并记录机器的对中情况及从测量销用厚薄规片测量垫块的压缩量。
11. 移去铁挡板，磨去浇注口的上端尖角，并清除整理垫块四周。如果在机器垫块周围有烧焊工作，应用防火布覆盖环氧垫块表面，以防环氧烧熔。
12. 用试样进行硬度试验并向船东、船检报验。巴氏硬度 > 35 即合格。