ENGINEERING SPECIALISTS INCORPORATED

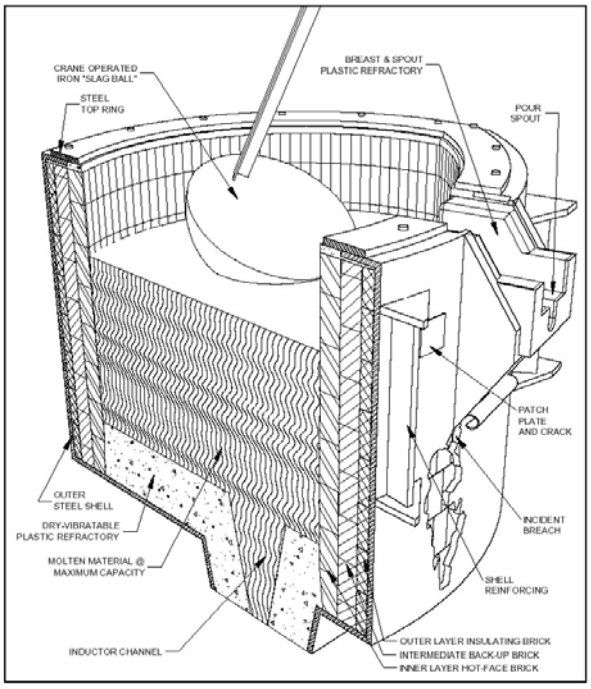
877-559-4010
Contact ESI for more information on Product Failure Analysis

Case Study – Molten Furnace

Product Failure Analysis in the Manufacturing Industry

ESI was contacted by a steel refinery to determine why a molten steel induction furnace had cracked and spilled its contents. It was estimated that an upwards of 30 tons of material was drained within a 25 to 35 minute time frame.

The obvious cause seemed to be a previously patched spot in the furnace shell. If the cause of failure was at the repaired spot, molten metal should have originated from the repaired section and discharged out with distinct traces of material remaining through the area of breach. The cutout section and the actual area of the patch are usually the least likely location for a breach due to the overall extended section of the steel patch outwards, which stays at a cooler temperature and contains more insulating refractory material.



ESI determined the spill resulted from a fracture in the refractory lining. The crack initiated from an accidental impact from the slag ball in a routine process to remove slag/debris from the molten material surface. The separation crack in the refractory lining was located within an immediate area of the point of impact from the slag ball. The continued discharge of molten metal through the lining enlarged the opening directly below the initial point of origin. All insulating layers of the refractory in the path of discharge downwards were destroyed due to the inability to withstand higher than 2,000° F temperatures of molten metal.

Engineering Specialists Inc. can answer your questions on Product Failure. Call **877-559-4010** for more information or email us at **office@esinationwide.com**.