

# Abrasion Resistant Repair of Coal Feed Pipes & Elbows

Application by ProCoat Specialities Pvt. Ltd.

## ThistleBond

A Division of E. Wood Ltd., U.K.



### Background

Coal fired power station using coal as major fuel source shipped in by sea direct to power plant. After coal passes through conveyor / ball mill then coal is fed into system via hopper. Coal then goes into crusher / pulveriser. This crushes coal into small particles. Pulverised coal dust is then transported by hot air at around 900°C through pipe system. System pressure is around 2 bar (30psi). Pipes are of typically 470 mm ID and are in sections that vary from 2 to 4 meters. Wall thickness of pipes when new is 22mm. Pipes are of steel construction. Coal dust is entered through the piping system into main furnace. The fuel is 95% coal and 5% recycled waste material.

### Problem

Coal dust (fuel) is very abrasive to all areas, it comes into contact with. This is especially noticeable on elbows of fuel feed pipes. Abrasion is made worse by velocity of the material going through pipes.

### Consequences of Problem

Extreme wear to pipe work by abrasion of coal dust means that pipe work has to be replaced over a two-year working life cycle. Moreover the pipes are also “hung” on supports that hang from roof area. This makes changing the pipe work sections very costly in addition to costly downtime, unplanned outages / shutdowns and other drawbacks.

### ThistleBond Offers

Repair products for extremely aggressive area, high content of ceramic / carbide material with larger particle size, VOC free, hardest polymer carbide materials, extreme abrasion resistance, superior compressive and flexural strengths materials and solvent free products.

### ProCoat Specialities

An effective, durable, economical solution can be done by the following specialized ThistleBond products with proper application method :

- Heavy Duty Ceramic Carbide Compound
- Ceramic Carbide Wearing Compound
- Abrasion Resistant Ceramic Carbide Fluid
- Thinner & Degreasers

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## Application

The pipe sections which are of 2 to 4 meters are removed and pipes grit blasted to SA 2.5 standard with a 75 micron surface profile. Surface area is inspected for damages. Mostly damage is un-even and spreaded to almost entire surface. Clean surface with TAC883 Thinner Degreaser for preventing the traces of any foreign film over the surface. Pipeline internal areas to be first rebuilt with 'Ceramic Carbide Wearing Compound' (which is formulated with complex blend of epoxy resins and a polyamino amide curing system reinforced with carbide and ceramic particles to produce a coating with high level of abrasion & erosion resistance (0.006 ml loss / 1000 cycles CS17 wheel 1kg load) combined with superior compressive strength 1055 kg/cm<sup>2</sup> (15000 psi), flexural strength 700 kg/cm<sup>2</sup> (10000 psi)). The worn out thickness can be rebuilt to the desired accuracy by spatula or trowel. Then two coats of 'Abrasion Resistant Ceramic Carbide Fluid' (a fluid grade engineering resurfacing compound designed to provide outstanding protection against impingement, entrainment and erosion / corrosion conditions) to be applied over the repaired / entire internal surface of pipe sections. This offers a good resistance even at temperatures of 250°C .

Second most important area is Pipe Bends (Elbows) where because of severe impact and abrasion of coal dust results in severe loss of material even "through" damage takes place. These areas are repaired with 'Heavy Duty Ceramic Carbide Compound' (designed specifically where resistance to sliding abrasion is required, it offers superior adhesion (Tensile Shear Adhesion of 140 kg/cm<sup>2</sup>), takes care of compressive loads of 1055 kg/cm<sup>2</sup> with a hardness of 100 Rockwell R) in conjunction with ceramic tiles, ceramic tiles are placed in such a way that these are sandwiched with 'Heavy Duty Ceramic Carbide Compound' over the surface to rebuild the "through" damage areas. After initial set of 'Heavy Duty Ceramic Carbide Compound' a final coating with 'Abrasion Resistant Ceramic Carbide Fluid' to be given to make surface fully protected from abrasion, erosion, sliding, impingement effects of coal dust.

## Distributor catering to your needs



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