LIST OF FIGURES

Figure 2.1 Generalized comparison of grain distribution of repeatedly used Vs original new sand 2.7

Figure 2.2. Layered coats of bond and fines build-up up on the original sand grain altering both its size and ability to be rebonded 2.8

Figure 2.3 Wet Scrubbing sand reclamation system 2.12

Figure 2.4 Schematic outline of the wet method pilot reclamation unit 2.13

Figure 2.5 Dry reclamation system 2.16

Figure 2.6 Pneumatic of an individual pneumatic cell 2.17

Figure 2.7 Vertical mechanical scrubber 2.19

Figure 2.8 Thermal sand reclamation system for shell sand with fluid bed calciner and cooler 2.22

Figure 2.9 Schematic layout of thermal reclamation plants 2.23

Figure 2.10 Compositional diagram of Sodium Silicates 2.38

Figure 4.1 Flow chart of the investigation on for reclamation CO2 sand for re use in CO2 moulding 4.2

Figure 4.2 Flow chart of the investigation on reclamation CO2 sand for re use in green sand moulding. 4.3

Figure 4.3 Schematic of the experimental pneumatic unit 4.12

Figure 4.4 Photograph of Pneumatic Reclamation Unit 4.13

Figure 4.5 schematic diagram of the horizontal centrifugal scrubber 4.15

Figure 4.6 Photograph of the horizontal centrifugal scrubber 4.16

Figure 4.7 Schematic diagram for studies on properties of reclaimed sand ,new sand and used sand 4.23

Figure 4.8 Schematic diagram for studies on properties of reclaimed sand ,new sand and used sand with Sodium silicate binder 4.34

Figure 4.9 (a) SFSA standard test block pattern 4.44

Figure 4.9 (b) SFSA pattern assembly 4.45

Figure 4.10 (a) Step cone casting cross section 4.46
Figure 4.10 (b) Step cone mould assembly
Figure 4.11(a) Penetration 50x 50 mm test casting
Figure 4.11(b) Penetration 50x 50 mm mould assembly
Figure 4.12 The experimental set-up for surface roughness measurement
Figure 4.13 Studies on the properties of reclaimed sand, combined
        reclaimed sand used sand and new sand for use in
        green sand moulding
Figure 5.1 Na₂O Content of chemically reclaimed sand
Figure 5.2 Na₂O Content of HCS sand
Figure 5.3 Na₂O Content of various types of sands
Figure 5.4 AFS Number of chemically reclaimed sand
Figure 5.5 AFS Number of HCS reclaimed sand
Figure 5.6 AFS Number of various types of sands
Figure 5.7 The generalised comparison of grain distribution of original
        sand with reclaimed sand
Figure 5.8 Acid demand value of the HCS + Chem reclaimed sand
Figure 5.9 Acid demand value of the chem + wet reclaimed sand
Figure 5.10 Acid demand value of the various types of sands
Figure 5.11 Base Permeability the chemically reclaimed sand
Figure 5.12 Base Permeability of HCS sand
Figure 5.13 Base Permeability of various types of sands
Figure 5.14 Total clay content of chemically reclaimed sand
Figure 5.15 Total clay content of HCS sand
Figure 5.16 Total clay content of the various types of sands
Figure 5.17 Loss on ignition of chemically reclaimed sand
Figure 5.18 Loss on ignition of HCS sand
Figure 5.19 Loss on ignition of various types of sands
Figure 5.20 Water absorption capacity of chemically reclaimed sand
Figure 5.21 Water absorption capacity of HCS sand
Figure 5.22 Water absorption capacity of various types of sands
Figure 5.23 pH of the chemically reclaimed sand
Figure 5.24 pH of the HCS sand
Figure 5.25 pH of various types of sands 5.44
Figure 5.26 SEM of New Sand 5.47
Figure 5.27 SEM of Used Sand 5.48
Figure 5.28 SEM of reclaimed Sands 5.49

Figure 5.29 Photograph of New Sand and Reclaimed Sand 5.53
Figure 5.30 EDAX Result of Reclaimed Sand 5.54
Figure 5.31 Moisture content of chemically reclaimed sand containing 4.5% sodium silicate 5.57
Figure 5.32 Moisture content of various types of reclaimed sands with 4.5% sodium silicate 5.58
Figure 5.33 Compactability of chemically reclaimed sand with 4.5% sodium silicate 5.62
Figure 5.34 Compactability of various types of reclaimed sands with 4.5% sodium silicate 5.63
Figure 5.35 Permeability of chemically reclaimed sand with 4.5% sodium silicate 5.65
Figure 5.36 Permeability of various types of reclaimed sand with 4.5% sodium silicate 5.66
Figure 5.37 Compression strength of chemically reclaimed sand with 4.5% sodium silicate binder 5.70
Figure 5.38 Compression strength of various types of reclaimed sands with 4.5% sodium silicate 5.71
Figure 5.39 Shear Strength of various types of reclaimed sands with 4.5% sodium silicate 5.72
Figure 5.40 Compression Strength of Mixed sands 5.73
Figure 5.41 Mould hardness of chemically reclaimed sand with 4.5% sodium silicate 5.76
Figure 5.42 Mould hardness various types of sands with 4.5% sodium silicate 5.77
Figure 5.43 Mouldability of various types of reclaimed sand with 4.5% sodium silicate

Figure 5.44 Mouldability of various types of reclaimed sand with 4.5% sodium silicate

Figure 5.45 Extended bench life with 4.5% sodium silicate

Figure 5.46 Extended bench life with 4% sodium silicate

Figure 5.47 Retained Strength with 4.5% sodium silicate

Figure 5.48 Retained Strength with 4% sodium silicate

Figure 5.49 (a) MSS SP 55 Visual inspection Standards
(b) MSS SP 55 Visual inspection Standards
(c) MSS SP 55 Visual inspection Standards

Figure 5.50 SFSA Standard Test Block Castings

Figure 5.51 Step Cone Castings

Figure 5.52 Penetration Test Castings

Figure 5.53 Cost saving for reclaimed sands

Figure 5.55 Permeability of green sand with 90% system sand

Figure 5.56 Permeability of green sand with 80% system sand

Figure 5.57 Loss on ignition of green sand with 90% system sand

Figure 5.58 Loss on ignition of green sand with 80% system sand

Figure 5.59 Compactability of green sand with 90% System sand

Figure 5.60 Compactability of green sand with 80% system sand

Figure 5.61 Shatter index of green sand with 90% system sand

Figure 5.62 Shatter index of green sand with 90% system sand

Figure 5.63 Mouldability of green sand with 90% system sand

Figure 5.64 Mouldability of green sand with 80% system sand

Figure 5.65 Total clay content of green sand with 90% system sand
Figure 5.66 Total clay content of green sand with 80% system sand
Figure 5.67 Active clay of green sand with 90% system sand
Figure 5.68 Active clay of green sand with 80% system sand
Figure 5.69 Green compression strength in N/Sq.cm of green sand
with 90% system sand
Figure 5.70 Green compression strength in N/Sq.cm of green sand
with 80% system sand
Figure 5.71 Green shear strength in N/Sq.cm of green sand with 90%
system sand
Figure 5.72 Green shear strength in N/Sq.cm of green sand with 80%
system sand
Figure 5.73 Active clay content of green sand in a standard mix test
Figure 5.74 Compression Strength in N/Sq.cm of green sand in standard
mix test
Figure 5.75 SFSA standard test block and step cone castings
Figure 5.76 Step cone Casting
Figure 5.77 Surface roughness of test castings
Figure 5.78 Surface roughness of test castings