CONTENTS

		Page		
DEC	ECLARATION			
ACK	CKNOWLEDGEMENTS			
ABS	ABSTRACT			
СНА	PTER 1: INTRODUCTION			
1.1	Types of Corrosion	2		
1.2	Forms of Corrosion			
1.3	Corrosion Control			
1.4	Surface Coatings	18		
	1.4.1 Organic Coatings	18		
	1.4.2 Chemistry of Organic Coatings	19		
	1.4.3 Corrosion control by Organic Coatings	22		
	1.4.4 Barrier Properties and Corrosion Protection	23		
1.5	Principles of Paint Formulation 24			
1.6	Types of Drying Mechanisms 28			
1.7	Evaluation of Organic Coatings	29		
	1.7.1 Laboratory Accelerated Tests	29		
	1.7.2 Electrochemical Techniques	30		
1.8	High Temperature Corrosion 37			
1.9	Why Silicones ? 41			
1.10	Silicones in Coating Industry 42			

CHA	PTER 2: EXPERIMENTAL TECHNIQUES				
2.1	Preparation of Resins and Paints 43				
2.2	Preparation of Painted Specimens 5				
2.3	Testing of Liquid Paints				
2.4	Determination of the Physical Properties of the Coated Metal 54				
2.5	Heat Resistance Test 56				
2.6	Accelerated Test 58				
2.7	Electrochemical methods of Evaluation	59			
	2.7.1 Potential - Time Measurements	60			
	2.7.2 ElectroChemical Impedance Spectroscopy	61			
2.8	EIS Studies for Coating Evaluation 67				
2.9	Non ElectroChemical Test 69				
2.10	SEM and EDAX Studies on Coatings	73			
CHAF	PTER 3: HEAT AND CORROSION RESISTANT PROPERTIES OF SILICONE TITANAT COATING SYSTEM				
3.1	Introduction	74			
3.2	Visual Inspection				
3.3	ElectroChemical techniques to evaluate the heat resistance of the Coating system	76			
	3.3.1 Potential - Time measurements	76			
	3.3.2 EIS Studies	78			
3.4	Scanning Electron Microscope 90				
3.5	Corrosion behavior of the coatings by EIS 92				
3.6	Physical and Mechanical properties 94				

3.7	Salt Spray Test 9		
3.8	Chemical Resistance Test		
3.9	Solvent Resistance test		
СНА	PTER 4:	HEAT AND CORROSION RESISTANT	
		PROPERTIES OF SILICONE - TITANA (PAINT II) AND RHODORSIL SILICON (PAINT III) WITH CERAMIC PIGMENT COATINGS	E
4.1	Introduction		100
4.2	Visual evaluation		
4.3	EIS Studies		105
4.4	SEM Studies 11		
4.5	EDAX Analysis		
4.6	Physical and	Mechanical properties	129
4.7	Corrosion behavior of the coatings by EIS and Salt Spray test methods 132		
4.8	Chemical an	d Solvent Resistance Test	133
CHAPTER 5:		HEAT AND CORROSION RESISTANT PROPERTIES OF EPOXY SILICONE COATING SYSTEM	
5.1	Introduction		135
5.2	Potential Vs.	Time Measurements	136
5.3	EIS Studies		140
5.4	SEM Studies		
5.5	EDAX Analys	sis	150

5.6	Physical properties of the Epoxy Silicone resin and liquid paints	154	
5.7	Mechanical properties of the Epoxy Silicone coating		
5.8	Chemical Resistance Test	157	
5.9	Salt Spray Test	159	
5.10	Solvent Resistant Test	160	
FIELD	TRIALS	162	
SUMMARY AND CONCLUSIONS			
REFERENCES			
LIST OF PUBLICATIONS			