

PATENT ASSIGNMENT COVER SHEET

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SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	RELEASE OF SECURITY INTEREST IN PATENTS RECORDED AT R/F 041736/0178
CONVEYING PARTY DATA	
Name	Execution Date
PNC BANK NATIONAL ASSOCIATION, AS COLLATERAL AGENT	04/21/2022
RECEIVING PARTY DATA	
Name:	FERRO CORPORATION
Street Address:	6060 PARKLAND BIVD
Internal Address:	SUITE 250
City:	MAYFIELD HEIGHTS
State/Country:	OHIO
Postal Code:	44124
PROPERTY NUMBERS Total: 153	
Property Type	Number
Application Number:	08801978
Application Number:	08876426
Application Number:	08882022
Application Number:	08882707
Application Number:	08884829
Application Number:	08884995
Application Number:	08922705
Application Number:	08951411
Application Number:	08964267
Application Number:	08995584
Application Number:	09022477
Application Number:	09075965
Application Number:	09145112
Application Number:	09178957
Application Number:	09190032
Application Number:	09205287
Application Number:	09228702
Application Number:	09303683
Application Number:	09305357

PATENT

Property Type	Number
Application Number:	09399546
Application Number:	09408568
Application Number:	09429126
Application Number:	09456612
Application Number:	09526286
Application Number:	09658250
Application Number:	09658251
Application Number:	09658252
Application Number:	09692729
Application Number:	09692730
Application Number:	09745291
Application Number:	09906177
Application Number:	09916302
Application Number:	09928972
Application Number:	09953063
Application Number:	09977623
Application Number:	09992485
Application Number:	10161315
Application Number:	10192471
Application Number:	10192815
Application Number:	10255136
Application Number:	10266169
Application Number:	10274835
Application Number:	10408737
Application Number:	10423492
Application Number:	10431346
Application Number:	10434426
Application Number:	10434435
Application Number:	10440051
Application Number:	10441137
Application Number:	10444104
Application Number:	10452845
Application Number:	10531008
Application Number:	10531160
Application Number:	10534665
Application Number:	10536330
Application Number:	10541292
Application Number:	10541909

Property Type	Number
Application Number:	10552008
Application Number:	10585526
Application Number:	10597781
Application Number:	10599370
Application Number:	10599925
Application Number:	10602533
Application Number:	10617510
Application Number:	10649317
Application Number:	10749726
Application Number:	10789422
Application Number:	10864304
Application Number:	10864309
Application Number:	10917829
Application Number:	10932559
Application Number:	11078554
Application Number:	11102555
Application Number:	11131919
Application Number:	11201278
Application Number:	11211133
Application Number:	11235656
Application Number:	11283530
Application Number:	11380980
Application Number:	11420035
Application Number:	11462729
Application Number:	11468798
Application Number:	11609998
Application Number:	11623905
Application Number:	11678248
Application Number:	11681796
Application Number:	11689543
Application Number:	11748095
Application Number:	11758273
Application Number:	11781982
Application Number:	11995001
Application Number:	12017399
Application Number:	12124518
Application Number:	12368331
Application Number:	12434752

Property Type	Number
Application Number:	12464980
Application Number:	12532424
Application Number:	12567876
Application Number:	12673834
Application Number:	12681113
Application Number:	12768213
Application Number:	12853097
Application Number:	12858623
Application Number:	12908927
Application Number:	12945932
Application Number:	13100399
Application Number:	13174891
Application Number:	13377183
Application Number:	13575630
Application Number:	13579057
Application Number:	13608022
Application Number:	13641046
Application Number:	13642553
Application Number:	13661174
Application Number:	13795116
Application Number:	13808422
Application Number:	13808571
Application Number:	13865440
Application Number:	13911107
Application Number:	13947301
Application Number:	14110926
Application Number:	14118557
Application Number:	14240399
Application Number:	14296401
Application Number:	14307736
Application Number:	14333559
Application Number:	14353557
Application Number:	14363885
Application Number:	14370102
Application Number:	14375475
Application Number:	14391423
Application Number:	14405193
Application Number:	14535516

Property Type	Number
Application Number:	14647557
Application Number:	14797384
Application Number:	14905838
Application Number:	14907590
Application Number:	14911035
Application Number:	14931957
Application Number:	15007364
Application Number:	15024166
Application Number:	15075250
Application Number:	15126674
Application Number:	15227136
Application Number:	15286610
Application Number:	15300821
Application Number:	15301737
Application Number:	15317545
Application Number:	15320910
Application Number:	62297339
Application Number:	62312756
Application Number:	62370294
Application Number:	62379916

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DATE SIGNED:	04/21/2022

Total Attachments: 13

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RELEASE OF SECURITY INTEREST IN PATENTS

This RELEASE OF FIRST LIEN SECURITY INTEREST IN PATENTS (this "Release"), dated as of April 21, 2022 (the "Effective Date"), is made by PNC BANK NATIONAL ASSOCIATION, as collateral agent for each of the Secured Parties (in such capacity, the "Collateral Agent"), in favor of FERRO ELECTRONIC MATERIALS, INC., a Delaware corporation, ELECTRO-SCIENCE LABORATORIES, LLC, a Pennsylvania limited liability company, and FERRO CORPORATION, an Ohio corporation (each a "Grantor" and collectively, the "Grantors"). All capitalized terms used but not otherwise defined herein shall have the respective meanings ascribed to them in the Patent Security Agreement (whether defined therein or by reference to another agreement).

WHEREAS, pursuant to that certain Pledge and Security Agreement by and among the Grantors, the Collateral Agent, and certain other parties, dated as of February 14, 2017 (as may have been amended, restated, amended and restated, supplemented or otherwise modified from time to time, the "Security Agreement"), the Grantors executed and delivered a Patent Security Agreement, dated as of February 14, 2017 (the "Patent Security Agreement"), which was recorded in the United States Patent and Trademark Office ("USPTO") on February 16, 2017 at Reel/Frame 041276/0124 (with respect to Ferro Electronic Materials, Inc.), at Reel/Frame 041276/0040 (with respect to Electro-Science Laboratories, LLC), and at Reel/Frame 041736/0178 (with respect to Ferro Corporation);

WHEREAS, pursuant to the Security Agreement and the Patent Security Agreement, each Grantor assigned, pledged, hypothecated, charged, mortgaged, delivered, transferred and granted to the Collateral Agent, for the benefit of the Collateral Agent and the ratable benefit of the other Secured Parties, a continuing security interest (the "Security Interest") in: (a) all of its letters patent and applications for letters patent throughout the world, including all patent applications in preparation for filing and each patent and patent application referred to in Item A of Schedule I attached hereto; (b) all reissues, divisions, continuations, continuations-in-part, extensions, renewals and reexaminations of any of the items described in clause (a); (c) all of its patent licenses, and other agreements providing such Grantor with the right to use any items of the type referred to in clauses (a) and (b) above, including each patent license referred to in Item B of Schedule I attached hereto; and (d) all Proceeds of, and rights associated with, the foregoing (including license royalties and Proceeds of infringement suits), the right to sue third parties for past, present or future infringements of any patent or patent application, and for breach or enforcement of any patent license (collectively, the "Patent Collateral");

WHEREAS, the Grantors have requested the Collateral Agent to discharge, terminate, cancel, and release the Security Interest in all of each Grantor's right, title, and interest in, to, and under the Patent Collateral.

NOW, THEREFORE, in consideration of the foregoing and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Collateral Agent, hereby (i) terminates and cancels the Patent Security Agreement, (ii) releases, discharges, terminates and cancels the Security Interest in all of each Grantor's right, title, and interest in, to, and under the Patent Collateral, and (iii) re-assigns to each Grantor any right, title or interest it may have in the Patent Collateral of such Grantor, in each case without recourse to the Collateral Agent and without representation or warranty of any kind.


Each Grantor, and any successor to such Grantor (including any person or entity hereafter holding any right, title or interest in or to the Patent Collateral of such Grantor), is hereby authorized to record this Release in the USPTO.

This Release and the rights and obligations of the parties hereto shall be governed by, and construed and interpreted in accordance with, the laws of the State of New York.

[Signature Page Follows]

IN WITNESS WHEREOF, the Collateral Agent has caused this Release to be executed and delivered by its duly authorized officer as of the Effective Date.

PNC BANK NATIONAL ASSOCIATION, as
Collateral Agent

By: 
Name: SPENCER DECKER
Title: SENIOR VICE PRESIDENT

SCHEDULE I

Item A. Issued Patents, Pending Patent Applications and Patent Applications in Preparation

Patent Title	Application Number Application Date	Registration Number Grant Date	Status	Owner
SILICON NITRIDE COATING COMPOSITIONS	09381494 9/21/1999	6214754 4/10/2001	Issued	Electro-Science Laboratories, LLC
MATERIALS SYSTEM FOR LOW COST, NON WIRE-WOUND, MINIATURE, MULTILAYER MAGNETIC CIRCUIT COMPONENTS	10288940 11/6/2002	6914513 7/5/2005	Issued	Electro-Science Laboratories, LLC
MULTILAYER CERAMIC CHIP CAPACITOR WITH HIGH RELIABILITY COMPATIBLE WITH NICKEL ELECTRODES	09288079 4/8/1999	6185087 2/6/2001	Issued	Ferro Electronics Materials, Inc.
THICK FILM HAVING ACID RESISTANCE	08801978 2/19/1997	5792716 8/11/1998	Issued	Ferro Corporation
PARTIALLY CRYSTALLIZING ENAMEL CONTAINING CRYSTALLINE ZINC BORATE SEED MATERIAL	08876426 6/16/1997	5753685 5/19/1998	Issued	Ferro Corporation
MIXING SYSTEM FOR PROCESSES USING SUPERCRITICAL FLUIDS	08882022 6/25/1997	5993747 11/30/1999	Issued	Ferro Corporation
MIXING SYSTEM FOR PROCESSES USING SUPERCRITICAL FLUIDS	08882707 6/25/1997	6054103 4/25/2000	Issued	Ferro Corporation
SCREEN PRINTABLE THERMALLY CURING CONDUCTIVE GEL	08884829 6/30/1997	6020424 2/1/2000	Issued	Ferro Corporation
SCREEN PRINTABLE UV CURABLE CONDUCTIVE MATERIAL COMPOSITION	08884995 6/30/1997	5968606 10/19/1999	Issued	Ferro Corporation
METHOD OF MAKING CONDUCTIVE ELECTRODES FOR USE IN MULTILAYER CERAMIC CAPACITORS OR INDUCTORS USING ORGANOMETALLIC INK	08922705 9/3/1997	5897912 4/27/1999	Issued	Ferro Corporation
LASER MARKING METHOD AND APPARATUS	08951411 10/16/1997	6238847 5/29/2001	Issued	Ferro Corporation
PARTIALLY CRYSTALLIZING CERAMIC ENAMEL COMPOSITION CONTAINING BISMUTH SILICATE, AND USE THEREOF	08964267 11/4/1997	5968659 10/19/1999	Issued	Ferro Corporation
PORCELAIN ENAMEL COMPOSITION FOR ELECTRONIC APPLICATIONS	08995584 12/22/1997	5998037 12/7/1999	Issued	Ferro Corporation

Patent Title	Application Number Application Date	Registration Number Grant Date	Status	Owner
PARTIALLY CRYSTALLIZING ENAMEL CONTAINING CRYSTALLINE ZINC BORATE SEED MATERIAL	09022477 2/12/1998	5900319 5/4/1999	Issued	Ferro Corporation
POWDER COATING COMPOSITION COMPRISING UNSATURATED POLYESTERS AND USES THERE OF	09075965 5/11/1998	6194525 2/27/2001	Issued	Ferro Corporation
HIGH TEMPERATURE SEALING GLASS	09145112 9/2/1998	6124224 9/26/2000	Issued	Ferro Corporation
INFRARED REFLECTIVE COLOR PIGMENT	09178957 10/26/1998	6174360 1/16/2001	Issued	Ferro Corporation
RESETTABLE FUSE	09190032 11/11/1998	5963121 10/5/1999	Issued	Ferro Corporation
LEAD-FREE ALKALI METAL-FREE GLASS COMPOSITIONS	09205287 12/4/1998	6255239 7/3/2001	Issued	Ferro Corporation
GLASS ENAMEL FOR AUTOMOTIVE APPLICATIONS	09228702 1/12/1999	6105394 8/22/2000	Issued	Ferro Corporation
PARTIALLY CRYSTALLIZING LEAD-FREE ENAMEL COMPOSITION FOR AUTOMOBILE GLASS	09303683 5/3/1999	6022624 2/8/2000	Issued	Ferro Corporation
PARTIALLY CRYSTALLIZING CERAMIC ENAMEL COMPOSITION CONTAINING BISMUTH SILICATE, AND USE THEREOF	09305357 5/5/1999	6207285 3/27/2001	Issued	Ferro Corporation
SCREEN PRINTABLE THERMALLY CURING CONDUCTIVE GEL	09399546 9/22/1999	6210520 4/3/2001	Issued	Ferro Corporation
SCREEN PRINTABLE CURABLE CONDUCTIVE MATERIAL COMPOSITION	09408568 9/28/1999	6204303 3/20/2001	Issued	Ferro Corporation
DECORATIVE GLASS ENAMELS	09429126 10/27/1999	6346493 2/12/2002	Issued	Ferro Corporation
SLURRY FOR CHEMICAL MECHANICAL POLISHING SILICON DIOXIDE	09456612 12/8/1999	6468910 10/22/2002	Issued	Ferro Corporation
SLURRY FOR CHEMICAL MECHANICAL POLISHING SILICON DIOXIDE	09526286 3/15/2000	6491843 12/10/2002	Issued	Ferro Corporation
MANUFACTURING ORTHOPEDIC PARTS USING SUPERCRITICAL FLUID PROCESSING TECHNIQUES	09658250 9/8/2000	6506213 1/14/2003	Issued	Ferro Corporation
POLYMER MATRICES PREPARED BY SUPERCRITICAL FLUID PROCESSING TECHNIQUES	09658251 9/8/2000	6521258 2/18/2003	Issued	Ferro Corporation

Patent Title	Application Number Application Date	Registration Number Grant Date	Status	Owner
ORTHOPEDIC MIXTURES PREPARED BY SUPERCRITICAL FLUID PROCESSING TECHNIQUES	09658252 9/8/2000	6579532 6/17/2003	Issued	Ferro Corporation
SLURRY FOR CHEMICAL- MECHANICAL POLISHING COPPER DAMASCENE STRUCTURES	09692729 10/19/2000	6508953 1/21/2003	Issued	Ferro Corporation
CHEMICAL-MECHANICAL POLISHING SLURRY AND METHOD	09692730 10/19/2000	6702954 3/9/2004	Issued	Ferro Corporation
INFRARED REFLECTIVE COLOR PIGMENT	09745291 12/20/2000	6454848 9/24/2002	Issued	Ferro Corporation
EASY-TO-CLEAN MATTE ACID RESISTANT GROUND COAT	09906177 7/16/2001	6511951 1/28/2003	Issued	Ferro Corporation
HIGH DURABILITY LOW TEMPERATURE LEAD-FREE GLASS AND ENAMEL COMPOSITIONS WITH LOW BORON CONTENT	09916302 7/30/2001	6624104 9/23/2003	Issued	Ferro Corporation
CONTINUOUS CALCINATION OF MIXED METAL OXIDES	09928972 8/13/2001	6652829 1/25/2003	Issued	Ferro Corporation
CERAMIC SUBSTRATE FOR NONSTICK COATING	09953063 9/14/2001	6638600 10/28/2003	Issued	Ferro Corporation
SILVER INK FOR FORMING ELECTRODES	09977623 10/15/2001	6517931 2/11/2003	Issued	Ferro Corporation
METHOD OF FORMING PARTICLES FOR USE IN CHEMICAL-MECHANICAL POLISHING SLURRIES AND THE PARTICLES FORMED BY THE PROCESS	09992485 11/16/2001	6596042 7/22/2003	Issued	Ferro Corporation
HIGH SELECTIVITY CMP SLURRY	10161315 6/3/2002	6616514 9/9/2003	Issued	Ferro Corporation
SLURRY FOR CHEMICAL MECHANICAL POLISHING SILICON DIOXIDE	10192471 7/10/2002	6627107 9/30/2003	Issued	Ferro Corporation
SLURRY FOR CHEMICAL MECHANICAL POLISHING SILICON DIOXIDE	10192815 7/10/2002	6544892 4/8/2003	Issued	Ferro Corporation
PROCESS FOR PRODUCING ABRASIVE PARTICLES AND ABRASIVE PARTICLES PRODUCED BY THE PROCESS	10255136 9/25/2002	6818030 11/16/2004	Issued	Ferro Corporation
METHOD OF FABRICATING A COPPER DAMASCENE STRUCTURE	10266169 10/7/2002	6660639 12/9/2003	Issued	Ferro Corporation
PORCELAIN ENAMEL HAVING METALLIC APPEARANCE	10274835 10/21/2002	6831027 12/14/2004	Issued	Ferro Corporation
DURABLE GLASS ENAMEL COMPOSITION	10408737 4/7/2003	6936556 8/30/2005	Issued	Ferro Corporation

Patent Title	Application Number Application Date	Registration Number Grant Date	Status	Owner
PARTICLES FROM SUPERCRITICAL FLUID EXTRACTION OF EMULSION	10423492 4/25/2003	6998951 2/14/2006	Issued	Ferro Corporation
ELECTRONIC DEVICE HAVING LEAD AND CADMIUM FREE ELECTRONIC OVERGLAZE APPLIED THERETO	10431346 5/7/2003	7740899 6/22/2010	Issued	Ferro Corporation
METHOD AND APPARATUS FOR CONTINUOUS PARTICLE PRODUCTION USING SUPERCRITICAL FLUID	10434426 5/8/2003	7083748 8/1/2006	Issued	Ferro Corporation
LYOPHILIZATION METHOD AND APPARATUS FOR PRODUCING PARTICLES	10434435 5/8/2003	6931888 8/23/2005	Issued	Ferro Corporation
X7R DIELECTRIC COMPOSITION	10440051 5/16/2003	6828266 12/7/2004	Issued	Ferro Corporation
COMPOSITE PARTICLES AND METHOD FOR PREPARING	10441137 5/19/2003	6966990 11/22/2005	Issued	Ferro Corporation
SLURRY COMPOSITION AND METHOD OF USE	10441104 5/22/2003	7300478 11/27/2007	Issued	Ferro Corporation
METHOD OF MICRO AND NANO TEXTURING GLASS	10452845 6/2/2003	6997018 2/14/2006	Issued	Ferro Corporation
METHOD AND APPARATUS FOR PRODUCING COMPOSITE PARTICLES USING SUPERCRITICAL FLUID AS PLASTICIZING AND EXTRACTING AGENT	10531008 4/12/2005	7449136 11/11/2008	Issued	Ferro Corporation
NANOPARTICLES FROM SUPERCRITICAL FLUID ANTISOLVENT PROCESS USING PARTICLE GROWTH AND AGGLOMERATION RETARDANTS	10531160 4/12/2005	7767118 8/3/2010	Issued	Ferro Corporation
METHOD FOR PREPARATION OF PARTICLES FROM SOLUTION-IN- SUPERCRITICAL FLUID OR COMPRESSED GAS EMULSIONS	10534665 11/21/2005	7279181 10/9/2007	Issued	Ferro Corporation
METHOD OF FORMING PARTICLES	10536330 11/3/2005	7208106 4/24/2007	Issued	Ferro Corporation
METHOD AND APPARATUS FOR SUPERCRITICAL FLUID ASSISTED PARTICLE PRODUCTION	10541292 2/23/2006	8142814 3/27/2012	Issued	Ferro Corporation
METHOD AND APPARATUS FOR ENHANCED SIZE REDUCTION OF PARTICLES	10541999 12/12/2005	8535720 9/17/2013	Issued	Ferro Corporation
PRODUCTION OF POROUS MATERIALS BY SUPERCRITICAL FLUID PROCESSING	10552008 3/13/2007	7901606 3/8/2011	Issued	Ferro Corporation
PORCELAIN ENAMEL HAVING A METALLIC APPEARANCE	10585526 10/25/2006	7763557 7/27/2010	Issued	Ferro Corporation
METHODS OF FORMING AND DETECTING NON-VISIBLE MARKS AND ARTICLES MARKED	10597781 8/8/2006	8006909 8/30/2011	Issued	Ferro Corporation

Patent Title	Application Number Application Date	Registration Number Grant Date	Status	Owner
IN ACCORDANCE WITH THE METHODS				
EXTENDED FIRING RANGE ENAMELS TO PRODUCE FROST EFFECTS	10599370 9/27/2006	8092911 1/10/2012	Issued	Ferro Corporation
COG DIELECTRIC COMPOSITION FOR USE WITH NICKEL ELECTRODES	10599925 12/13/2006	7858548 12/28/2010	Issued	Ferro Corporation
CHROMIUM BEARING FOREHEARTH COLOR CONCENTRATE	10602533 6/24/2003	6984597 1/10/2006	Issued	Ferro Corporation
SLURRY FOR CHEMICAL MECHANICAL POLISHING SILICON DIOXIDE	10617510 7/11/2003	7091164 8/15/2006	Issued	Ferro Corporation
INORGANIC PIGMENTS	10649317 8/27/2003	7014701 3/21/2006	Issued	Ferro Corporation
CHEMICAL-MECHANICAL POLISHING SLURRY AND METHOD	10749726 12/30/2003	7101800 9/5/2006	Issued	Ferro Corporation
METHOD AND APPARATUS FOR PRODUCING PARTICLES USING SUPERCRITICAL FLUID	10789422 2/27/2004	7455797 11/25/2008	Issued	Ferro Corporation
LEAD-FREE AND CADMIUM-FREE CONDUCTIVE COPPER THICK FILM PASTES	10864304 6/9/2004	7176152 2/13/2007	Issued	Ferro Corporation
COPPER TERMINATION INKS CONTAINING LEAD FREE AND CADMIUM FREE GLASSES FOR CAPACITORS	10864309 6/9/2004	6982864 1/3/2006	Issued	Ferro Corporation
METHOD OF REMOVING SPECTATOR IONS FROM AQUEOUS SUSPENSION OF SOLID PARTICLES	10917829 8/13/2004	7318897 1/15/2008	Issued	Ferro Corporation
METHOD AND APPARATUS FOR ENHANCED SIZE REDUCTION OF PARTICLES USING SUPERCRITICAL FLUID LIQUEFACTION OF MATERIALS	10932559 9/2/2004	6986846 1/17/2006	Issued	Ferro Corporation
LYOPHILIZATION METHOD AND APPARATUS FOR PRODUCING PARTICLES	11078554 3/11/2005	7073349 7/11/2006	Issued	Ferro Corporation
SLURRY COMPOSITION AND METHOD FOR POLISHING ORGANIC POLYMER-BASED OPHTHALMIC SUBSTRATES	11102555 4/8/2005	7294044 11/13/2007	Issued	Ferro Corporation
METHOD OF MAKING MULTILAYER GLASS STRUCTURES	11131919 5/18/2005	7832233 11/16/2010	Issued	Ferro Corporation
COPPER TERMINATION INKS CONTAINING LEAD FREE AND CADMIUM FREE GLASSES FOR CAPACITORS	11201278 8/10/2005	7339780 3/4/2008	Issued	Ferro Corporation

Patent Title	Application Number Application Date	Registration Number Grant Date	Status	Owner
FOREHEARTH CONCENTRATE AND METHOD FOR OPALIZATION OF GLASS	11211133 8/24/2005	7265069 9/4/2007	Issued	Ferro Corporation
COG DIELECTRIC COMPOSITION FOR USE WITH COPPER ELECTRODES	11235656 9/26/2005	7161795 1/9/2007	Issued	Ferro Corporation
HYDROTHERMAL SYNTHESIS OF CERIUM-TITANIUM OXIDE FOR USE IN CMP	11283530 11/18/2005	7666239 2/23/2010	Issued	Ferro Corporation
SUBSTANTIALLY SPHERICAL COMPOSITE CERIA/TITANIA PARTICLES	11380980 5/1/2006	7687401 3/30/2010	Issued	Ferro Corporation
BUTYL LACTATE EMULSIONS FOR THE PRECIPITATION OF WATER-INSOLUBLE DRUG NANOPARTICLES	11420035 5/24/2006	7595348 9/29/2009	Issued	Ferro Corporation
SYNTHESIS OF NICKEL NANOPOWDERS	11462729 8/7/2006	7819939 10/26/2010	Issued	Ferro Corporation
METHOD OF MAKING MULTILAYER STRUCTURES USING TAPES ON NON-DENSIFYING SUBSTRATES	11468798 8/31/2006	7547369 6/16/2009	Issued	Ferro Corporation
LEAD-FREE AND CADMIUM-FREE CONDUCTIVE COPPER THICK FILM PASTES	11609998 12/13/2006	7504349 3/17/2009	Issued	Ferro Corporation
X8R DIELECTRIC COMPOSITION FOR USE WITH NICKEL ELECTRODES	11623905 1/17/2007	7541306 6/2/2009	Issued	Ferro Corporation
AUTO-STOPPING SLURRIES FOR CHEMICAL-MECHANICAL POLISHING OF TOPOGRAPHIC DIELECTRIC SILICON DIOXIDE	11678248 2/23/2007	7696095 4/13/2010	Issued	Ferro Corporation
ULTRA LOW TEMPERATURE FIXED X7R AND BX DIELECTRIC CERAMIC COMPOSITION AND METHOD OF MAKING	11681796 3/5/2007	7521390 4/21/2009	Issued	Ferro Corporation
SLURRY COMPOSITION AND METHOD FOR POLISHING ORGANIC POLYMER-BASED OPHTHALMIC SUBSTRATES	11689543 3/22/2007	7467988 12/23/2008	Issued	Ferro Corporation
METHOD FOR THE PRODUCTION OF POROUS PARTICLES	11748095 5/14/2007	8207236 6/26/2012	Issued	Ferro Corporation
FOREHEARTH CONCENTRATE AND METHOD FOR OPALIZATION OF GLASS	11758273 6/5/2007	7737062 6/15/2010	Issued	Ferro Corporation
ULTRA LOW-EMISSIVITY (ULTRA LOW E) SILVER COATING	11781982 7/24/2007	7833439 11/16/2010	Issued	Ferro Corporation
SPECIAL EFFECT PIGMENTS	11995001 2/23/2008	8172935 5/8/2012	Issued	Ferro Corporation
METHODS FOR THE PURIFICATION OF POLYMERS	12017399 1/22/2008	7745566 6/29/2010	Issued	Ferro Corporation
METHOD FOR PRODUCING SOLID-LIPID COMPOSITE DRUG PARTICLES	12124518 5/21/2008	8642091 2/4/2014	Issued	Ferro Corporation

Patent Title	Application Number Application Date	Registration Number Grant Date	Status	Owner
ZINC CONTAINING GLASSES AND ENAMELS	12368331 2/10/2009	8007930 8/30/2011	Issued	Ferro Corporation
X8R DIELECTRIC COMPOSITION FOR USE WITH NICKEL ELECTRODES	12434752 5/4/2009	7727922 6/1/2010	Issued	Ferro Corporation
METHOD OF MAKING MULTILAYER STRUCTURES USING TAPES ON NON- DENSIFYING SUBSTRATES	12464980 5/13/2009	8043721 10/25/2011	Issued	Ferro Corporation
HOT-MELT SEALING GLASS COMPOSITIONS AND METHODS OF MAKING AND USING THE SAME	12532424 12/8/2009	8307674 11/13/2012	Issued	Ferro Corporation
METHOD OF DECORATING LAMINATED GLASS	12567876 9/28/2009	7955470 6/7/2011	Issued	Ferro Corporation
CHEMICAL-MECHANICAL POLISHING COMPOSITIONS AND METHODS OF MAKING AND USING THE SAME	12673834 3/25/2010	8409990 4/2/2013	Issued	Ferro Corporation
LEAD AND CADMIUM FREE, LOW TEMPERATURE FIRED X7R DIELECTRIC CERAMIC COMPOSITION AND METHOD OF MAKING	12681113 4/1/2010	8305731 11/6/2012	Issued	Ferro Corporation
ENAMEL AND GROUND COAT COMPOSITIONS	12768213 4/27/2010	8778455 7/15/2014	Issued	Ferro Corporation
EASY RINSING POLISHING COMPOSITION FOR POLYMER- BASED SURFACES	12853097 8/9/2010	8449636 5/28/2013	Issued	Ferro Corporation
CURABLE ACRYLATE BASED PRINTING MEDIUM	12858623 8/18/2010	8816012 8/26/2016	Issued	Ferro Corporation
ULTRA LOW-EMISSIVITY (ULTRA LOW E) SILVER COATING	12908927 10/21/2010	8691332 4/8/2014	Issued	Ferro Corporation
COG DIELECTRIC COMPOSITION FOR USE WITH NICKEL ELECTRODES	12945932 11/15/2010	8114801 2/14/2012	Issued	Ferro Corporation
GLASS FRIT COMPOSITIONS FOR ENAMELS	13160399 5/4/2011	8772189 7/8/2014	Issued	Ferro Corporation
ZINC CONTAINING GLASSES AND ENAMELS	13174891 7/1/2011	8202812 6/19/2012	Issued	Ferro Corporation
COPPER RED FRITS AND PIGMENTS COMPRISING SILICA AND AT LEAST ONE OF CUPRIC OXIDE AND CUPROUS OXIDE	13377183 4/18/2012	8946102 2/3/2015	Issued	Ferro Corporation
PIGMENT ADDITIVE FOR IMPROVING SOLAR REFLECTANCE	13575630 9/5/2012	8580028 11/12/2013	Issued	Ferro Corporation
MATERIALS FOR IMPROVED ADHESION RELATING TO FUNCTIONAL COLD END COATINGS (CECS) AND METHODS OF DETECTING SAME	13579057 10/29/2012	---	Pending	Ferro Corporation

Patent Title	Application Number Application Date	Registration Number Grant Date	Status	Owner
HOT-MELT SEALING GLASS COMPOSITIONS AND DEVICES USING THE SAME	13608022 9/10/2012	8786034 7/22/2014	Issued	Ferro Corporation
LOW-MELTING LEAD-FREE BISMUTH SEALING GLASSES	13641046 12/12/2012	9540274 1/10/2017	Issued	Ferro Corporation
HERMETIC SEALING OF GLASS PLATES	13642553 12/28/2012	9156735 10/13/2015	Issued	Ferro Corporation
DARK COLORED EASY-TO-CLEAN ENAMEL	13661174 10/26/2012	9072400 7/7/2015	Issued	Ferro Corporation
HIGH PERFORMANCE ORGANIC, INORGANIC OR HYBRID SEALS	13795116 3/12/2013	---	Pending	Ferro Corporation
HERMETICALLY SEALED ELECTRONIC DEVICE USING COATED GLASS FLAKES	13808422 3/6/2013	9272497 3/1/2016	Issued	Ferro Corporation
HERMETICALLY SEALED ELECTRONIC DEVICE USING SOLDER BONDING	13808571 4/18/2013	9205505 12/8/2015	Issued	Ferro Corporation
LOW MELTING GLASS COMPOSITIONS	13865440 4/18/2013	---	Pending	Ferro Corporation
INKJET COMPOSITIONS FOR FORMING FUNCTIONAL GLAZE COATINGS	13911107 6/6/2013	---	Pending	Ferro Corporation
FORMATION OF GLASS-BASED SEALS USING FOCUSED INFRARED RADIATION	13947301 7/22/2013	9499428 11/22/2016	Issued	Ferro Corporation
COPPER CONTAINING INFRARED REFLECTIVE PIGMENT COMPOSITIONS	14110926 11/6/2013	9238735 1/19/2016	Issued	Ferro Corporation
LOW VOLATILE ORGANIC COMPONENT MEDIUM	14118557 1/6/2014	8889778 11/18/2014	Issued	Ferro Corporation
INDUCTION SEALING OF INORGANIC SUBSTRATES	14240399 5/19/2014	---	Pending	Ferro Corporation
NICKEL-FREE GREEN PIGMENT	14296401 6/4/2014	9187617 11/17/2015	Issued	Ferro Corporation
ENAMEL AND GROUND COAT COMPOSITIONS	14307736 6/18/2014	8962162 2/24/2015	Issued	Ferro Corporation
CURABLE ACRYLATE BASED PRINTING MEDIUM	14333559 7/17/2014	9150750 10/6/2015	Issued	Ferro Corporation
MICROWAVE SEALING OF INORGANIC SUBSTRATES USING LOW MELTING GLASS SYSTEMS	14353557 4/23/2014	---	Pending	Ferro Corporation
LASER ABSORBING COMPOUNDS	14363885 6/9/2014	9321130 4/26/2016	Issued	Ferro Corporation
GLASS ENAMEL FOR AUTOMOTIVE APPLICATIONS	14370102 7/1/2014	9315413 4/19/2016	Issued	Ferro Corporation
HEAVY-METAL-FREE, ION EXCHANGEABLE GLASS ENAMELS	14375475 7/30/2014	9487439 11/8/2016	Issued	Ferro Corporation
LASER MARKING COMPOSITIONS AND RELATED	14391423 10/9/2014	9487435 11/8/2016	Issued	Ferro Corporation

Patent Title	Application Number Application Date	Registration Number Grant Date	Status	Owner
METHODS				
LIGHT INFLUENCING NANO LAYER	14405193 12/3/2014	---	Pending	Ferro Corporation
COPPER RED FRITS AND PIGMENTS COMPRISING SILICA AND AT LEAST ONE OF CUPRIC OXIDE AND CUPROUS OXIDE	14535516 11/7/2014	9334189 5/10/2016	Issued	Ferro Corporation
METHOD OF MAKING MULTILAYER GLASS STRUCTURE	14647557 5/27/2015	---	Pending	Ferro Corporation
SLURRY COMPOSITION AND ADDITIVES AND METHOD FOR POLISHING ORGANIC POLYMER-BASED OPHTHALMIC SUBSTRATES	14797384 7/13/2015	---	Pending	Ferro Corporation
METHOD OF FORMING DURABLE GLASS ENAMEL	14905838 1/18/2016	---	Pending	Ferro Corporation
METHOD OF FORMING CONDUCTIVE TRACE	14907590 1/26/2016	9565772 2/7/2017	Issued	Ferro Corporation
DIELECTRIC PASTES FOR ALUMINUM SUBSTRATES	14911035 2/9/2016	---	Pending	Ferro Corporation
HERMETICALLY SEALED ELECTRONIC DEVICE USING SOLDER BONDING	14931957 11/4/2015	9545682 1/17/2017	Issued	Ferro Corporation
GLASS COMPOSITIONS AND GLASS FRIT COMPOSITES FOR USE IN OPTICAL APPLICATIONS	15007364 1/27/2016	---	Pending	Ferro Corporation
COG DIELECTRIC COMPOSITION FOR USE WITH NICKEL ELECTRODES	15024166 3/24/2016	---	Pending	Ferro Corporation
LASER ABSORBING COMPOUNDS	15075250 3/21/2016	---	Pending	Ferro Corporation
CONDUCTIVE PASTE WITH IMPROVED PERFORMANCE IN GLASS STRENGTH	15126674 9/16/2016	---	Pending	Ferro Corporation
NICKEL-FREE AND CHROMIUM-FREE FOREHEARTH COLORS FOR GLASS TANKS	15227136 8/3/2016	---	Pending	Ferro Corporation
HEAVY-METAL-FREE, ION EXCHANGEABLE GLASS ENAMELS	15286610 10/6/2016	---	Pending	Ferro Corporation
COPPER OXIDE INFRARED PIGMENT	15300821 9/30/2016	---	Pending	Ferro Corporation
MID-K LTCC COMPOSITIONS AND DEVICES	15301737 10/4/2016	---	Pending	Ferro Corporation
COG DIELECTRIC COMPOSITION FOR USE WITH NICKEL ELECTRODES	15317545 12/9/2016	---	Pending	Ferro Corporation
SLURRY COMPOSITION AND METHOD OF USE	15320910 12/21/2016	---	Pending	Ferro Corporation

Patent Title	Application Number Application Date	Registration Number Grant Date	Status	Owner
NICKEL-FREE AND CHROMIUM-FREE FOREHEARTH COLORS FOR GLASS TANKS	16182518 8/3/2016	---	Pending	Ferro Corporation
SINTERING AID GLASSES FOR MACHINABLE PHYLLOSILICATE BASED STRUCTURES	62297339 3/19/2016	---	Pending	Ferro Corporation
FAST CONDUCTIVITY POLYMER SILVER	62312756 3/24/2016	---	Pending	Ferro Corporation
PASSIVATION GLASSES FOR SEMICONDUCTOR DEVICES	62370294 8/3/2016	---	Pending	Ferro Corporation
SLURRY COMPOSITION AND METHOD OF SELECTIVE SILICA POLISHING	62379916 8/26/2016	---	Pending	Ferro Corporation

Item B. Patent Licenses

1. Licensor: Eastman Kodak Company and Clarkson University
Licensee: Ferro Corporation
Territory: Worldwide
Effective Date: November 15, 1999
Expiration Date: Expiration of applicable patents
Subject Matter: Royalty bearing license under patents and technology corresponding to U.S. Patent Nos. 6,468,910; 6,491,843; 6,544,892 and 6,627,107
Latest possible expiration December 8, 2019