

## Appendix A. ACRONYMS AND ABBREVIATIONS

A/SP	Auto/Steel Partnership
ALRC	Albany Research Center
ABS	acrylonitrile-butadiene-styrene
ACC	Automotive Composites Consortium
AES	Auger electron spectroscopy
AFS	American Foundry Society
AHSS	advanced high-strength steel
AIChE	American Institute of Chemical Engineers
AISI	American Iron and Steel Institute
AKDQ	aluminum-killed draw-quality
Al	aluminum
ALCOA	Aluminum Company of America
ALM	Automotive Lightweighting Materials
AMD	Automotive Metals Division
ANL	Argonne National Laboratory
ANSI	American National Standards Institute
APC	American Plastics Council
APGE	Association of Petroleum Geochemical Explorationists
ARC	Automotive Research Consortium
ARL	Army Research Laboratory
AS	adaptive simulation
ASME	American Society of Mechanical Engineers
ASNT	American Society for Nondestructive Testing
ASTM	American Society for Testing and Materials
ATC	American Tooling Corporation
AWS	American Welding Society
BCC	body-centered cubic
BEM	boundary element method
BH	blankholder
BHF	blankholder force
BIW	body-in-white
BLR	bolt load retention
BN	boron nitride
BTU	British thermal unit
CAABS	Crash Analysis of Adhesively Bonded Structures
CAD	computer-aided design
CAE	computer-aided engineering
CAFE	Corporate Average Fuel Economy
CAVS	Center for Advanced Vehicular Systems
CD	compact disk
CI	confidence interval
CLiMRI	Canadian Lightweight Materials Research Initiative
COV	coefficient of variation
CP Ti	cold-pressed titanium

CP	cold-pressed
CPMT	Center for Powder Metallurgy Technology
CRADA	Collaborative Research and Development Agreement
CRTM	compression resin transfer molding
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CT	computed tomography
CWT	Changing World Technologies
CY	calendar year
CZ	cohesive zones
DAQ	data acquisition
DB	decibel
DCB	double-cantilever beam
DCX	DaimlerChrysler
DCZM	discrete cohesive zone mode
DEG	diethylene glycol
DEM	discrete element methods
DFEP	Die Face Engineering Project
DMA	dynamic mechanical analyzer/analysis
DOE	Department of Energy
DoE	design of experiment
DP	dual-phase
DPF	denier/filament
DPG	dipropylene glycol
DQSK	drawing quality special-killed
DRIFT	Direct Reinforcement Fabrication Technology or Directly Reinforced Fiber Technology
DSC	differential scanning calorimeter/calorimetry
DTUL	deflection temperature under load
EAM	embedded atom method
EBSD	electron back-scattered diffraction
ECD	electron capture detector
E-COAT	electrophoretic primer
EDAG	Engineering Design, Inc.
E-GLASS	electrical glass
ELS	end-load-split
ELV	end-of-life vehicle
EM	electrode materials
EMF	electromagnetic forming
EPA	Environmental Protection Agency
ESN	environmental stability number
ETA	Engineering Technology Associates
EWI	Edison Welding Institute

FCVT	FreedomCAR and Vehicle Technologies
FE	finite element
FEA	finite element analysis
FEM	finite element method
FFC	Fray-Farthing-Chen
FGPC	future generation passenger compartment
FLCA	front-lower control arm
FLD	forming limit diagram
FMVSS	Federal Motor Vehicle Safety Standards
FP2	Focal Project 2
FP3	Focal project 3
FSSW	friction-stir spot-welded
FSW	friction-stir-welded
FTC	Federal Trade Commission
FY	fiscal year
GA	galvannealed
GC/MS	gas chromatography/mass spectroscopy
GENOA	Generalized Optimization and Analysis
GM	General Motors
GMT	glass mat thermoplastic
GPEC	Global Plastics Environmental Conference
GPM	grams per minute
GTAW	gas tungsten arc-welded
HAZ	heat-affected zone
HDG	hot dip galvanized
HDPE	high-density polyethylene
HIP	hot isostatic pressing
HPDC	high-pressure die-casting
HSB	hot-stamped boron
HSLA	high-strength low-alloy
HSS	high-strength steel
IF	interstitial free
IFU	University of Stuttgart
IIHS	Insurance Institute for Highway Safety
IR	infrared
ISO	International Standards Organization
ISRI	Institute of Scrap Recycling Industries
ISV	internal state variable
ITP	International Titanium Powders, Inc.
JCI	Johnson Controls, Inc.
KOH	potassium hydroxide
LabVIEW	Laboratory Virtual Instrumentation Engineering Workbench
LANL	Los Alamos National Laboratory
LBNL	Lawrence Berkeley National Laboratory
LCM	liquid composite molding
LDPE	low-density polyethylene

LFI	long-fiber injection
LFT	long-fiber-reinforced thermoplastic
LIMS	liquid injection molding simulation
LLNL	Lawrence Livermore National Laboratory
LMT	Light Metals Technology
LPPM	low-pressure permanent mold
LSTC	Livermore Software Technology Corporation
LVDT	linear variable displacement transducer
LWB	laser-welded blanks
LWFES	lightweight front end structures
LWFS	lightweight front structure
MAP	microwave-assisted plasma
MC	Monte Carlo procedure
MEL	Magnesium Elektron
MET	Management & Engineering Technologies
MFR	Melt flow rate
MHD	magnetohydrodynamics
MIG	metal inert gas
MIT	Massachusetts Institute of Technology
M-K	Marciniak-Kuczynski method
MPCC	Magnesium Powertrain Cast Components
MS&T	Materials Science and Technology
MSU	Michigan State University
MT	metric tons
MWV	MeadWestvaco
NADCA	North American Die Casting Association
NCAP	New Car Assessment Program
NCC	National Composite Center
NCC	National Composites Consortium
NDE	non-destructive evaluation
NIST	National Institute of Standards and Technology
NM	Newton-meters
NMR	nuclear magnetic resonance spectroscopy
NSF	National Science Foundation
NTRC	National Transportation Research Center
NVH	noise-vibration-harshness
OBD	offset deformable barrier
OD	outer diameter
OEM	original equipment manufacturer
OFCVT	Office of FreedomCAR and Vehicle Technologies
OPT	optimization
ORNL	Oak Ridge National Laboratory
OSU	Ohio State University
P4	programmable powdered preform process
PAN	polyacrylonitrile
PAR	POL Annual Report
PBDE	polybrominated diphenyl ether

PCB	polychlorinated biphenyl
PCBN	polycrystalline boron nitrate
PE	polyethylene
PI	principal investigator
PID	proportional integral derivative
PM	powder metallurgy
PMC	polymer matrix composite
PNNL	Pacific Northwest National Laboratory
PP	polypropylene
PPM	parts per million
PPO	polyphenylene oxide
PPS	polyphenylene sulfide or post-peak softening
PS	polystyrene
PSI	pounds per square inch
PSIA	pounds per square inch absolute
PUF	polyurethane foams
PUR	polyurethane
PURCC	Polyurethane Recycle and Recovery Council
PVB	polyvinylbutyral
PVC	polyvinyl chloride
R&D	research and development
RAM	random access memory
RFQ	request for quotation
RIS	radiographic inspection standards
RMS	rheometrics mechanical spectrometer
RPM	revolutions per minute
RRIM	reinforced reaction injection molding
RSW	resistance spot welding
RTM	resin transfer molding
RUC	representative unit cell
SAE	Society of Automotive Engineers
SAMPE	Society for the Advancement of Material and Process Engineering
SCMD	Structural Cast Magnesium Development
SCP	Springback Compensation Project
SDAS	secondary dendrite arm spacing
SDSM&T	South Dakota School of Mines and Technology
SEA	specific energy absorption
SEM	scanning electron microscopy
SFT	short-fiber thermoplastic composites
SG	specific gravity
SLC	sub-liquidus casting
SMC	sheet-molding compound
SMC	sheet-molding-component
SNL	Sandia National Laboratory
SOC	substance of concern
SOD	Slurry on Demand
SOW	statement of work
SPH	smoothed particle hydrodynamics
SRI	Southern Research Institute

SRIM	structural reaction injection molding
SSM	semi-solid metal
ST	Schapery-like, thermodynamically-based theory
STL	sound transmission losses
SUV	sport utility vehicle
SWSG	structural weld sub-group
TCP	tool center point
TDM	Troy Design and Manufacturing, Co.
TFF	thread-forming fastener
TGA	thermogravimetric
TMAC	Test Machine for Automotive Crashworthiness
TPI	Troy Polymers, Inc
TPO	thermoplastic olefins
TP-P4	thermoplastic P4
TPY	tons per year
TR	technical report
TRC-NCMS	Technologies Research Corp.of the National Center for Manufacturing Sciences
TRIP	transformation-induced plasticity
TTSP	time-temperature superposition principle
TWB	taylor-welded blanks
TYE	tensile, yield, and elongation
UAB	University of Alabama-Birmingham
UDRI	University of Dayton Research Institute
UHMW	ultra-high-molecular-weight
ULC	ultra-large castings
ULSAB	ultra-light steel auto body
UM	University of Michigan
UMAT	user material
USAMP	U.S. Automotive Materials Partnership
USCAR	United States Council for Automotive Research
UT	University of Tennessee
UTK	University of Tennessee at Knoxville
UTS	ultimate tensile strength
UV	ultra-violet
VCCT	virtual crack closure technique
VDA	visualization and data analysis
VPB	viscous pressure bulge
VROOM	Virtual Reality Room
VRP	Vehicle Recycling Partnership
VUMAT	vectorized user material
VW	Volkswagen
WF	warm-forming
WT%	weight percent
XPS	x-ray photoelectron spectroscopy
XRD	x-ray diffraction
YS	yield strength