IDEAS in GLASS

Impact Safety Glass Works Pvt. Ltd.

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IDEAS in GLASS

Automotive

IMPACT

AtulTemp
automotive glass

Philosophy

Impact believes in **continuous innovation**.
the same extends to what we do, how we do, when we do,
and most importantly innovating ideas for you.

Mission

As an indian company, to become the most efficient and trusted glass company in the world, continuously reinvesting in people, processes and plant

Strive to be the lowest cost manufacturer globally, relentlessly eliminating waste

Creating lasting customer satisfaction with the goal of building relationships for life

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IMPACT

Impact does **IDEAS in GLASS**
for the comfort and quality experience of automotives, architectural spaces, speciality areas and everyday life. Impact has been at the fore-front of the glass processing industry, since inception in 1991. Today we are at the threshold of being a global player in glass solutions. The change is driven in line with the strategy to move up the value chain from being a glass-processing company to a

creative solution provider

group architecture

Impact Safety Glass	The flagship business, that has the most modern glass-processing in India.
AtulTemp **automotive glass**	Atul Temp offers laminated windscreens, sidelites and backlites for Cars, Buses & LCV's, as also for speciality applications.
ECIEIMPACT	The glazing solutions Joint Venture that offers cutting-edge Unitized System and has an in-house DesignCell for Custom Engineering.
VIVEK ENTERPRISES	Retail face of the group with 7 showrooms, in Bangalore.
IDC	Impact's Design Cell (IDC) extends design, development and custom glass engineering solutions for special and unique architectural projects.

group**fact**file

- Since 1989
- Employees : 500
- Turnover 2005-2006 : INR 1100 Million
- Surface of Factories, Warehouses and Offices : 55,000 sq.mts.
- Built-up Area : 25,000 sq.mtr.
- Head Office / 7 Retail Outlets in Bangalore
- Sales Office in Chennai, Pune, Delhi, Kolkata & Mumbai
- Investments in 2006 : New Plant for Automotive Bent Tempering
- Capability of manufacturing Jumbo Sizes
- Exports : US, UK, EU, Middle East & SAARC Countries

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Product Family

Passenger Cars

WINDSHILED
DOOR GLASS
QUARTER GLASS
BACKLITE
SUNROOFS

Capacity - 180,000 full sets per annum
365,000 door sets per annum

Trucks & Commercial Vehicles

WINDSHILED
DOOR GLASS
BACKLITE

Capacity - 150,000 full sets per annum

Earth Moving Equipment

10 Bend Tempered parts / Equipment

Capacity - 56,000 full sets per annum

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Buses

WINDSHILED
LARGE SIDE GLASSES
DRIVRE'S DOOR GLASSES
BACKLITE

Capacity - 27,400 full sets
per annum

Impact automotive glass products offer tighter specifications for

optics, shape, windshieldwiper performance, water management and noise control.

We works closely with stylists and engineers in the very earliest stages of new vehicle development. We help customers ensure that their vehicle glass reflects the unique design characteristics they seek, whilst at the same time helping to define optimal performance and manufacturing specifications for the glass components, helping car designers bring concepts involving complex shaping to reality.

Speciality

Hi Tech Trains
Bullet Proof Cars
Ships
Aircrafts

Our IDEAS in GLASS
For You

- Light Energy Control
- Thermal Reduction
- Noise Reduction
- UV Protection
- Low Visible Distortion
- Safety & Security
- Design Versatility
- Weather Resistance

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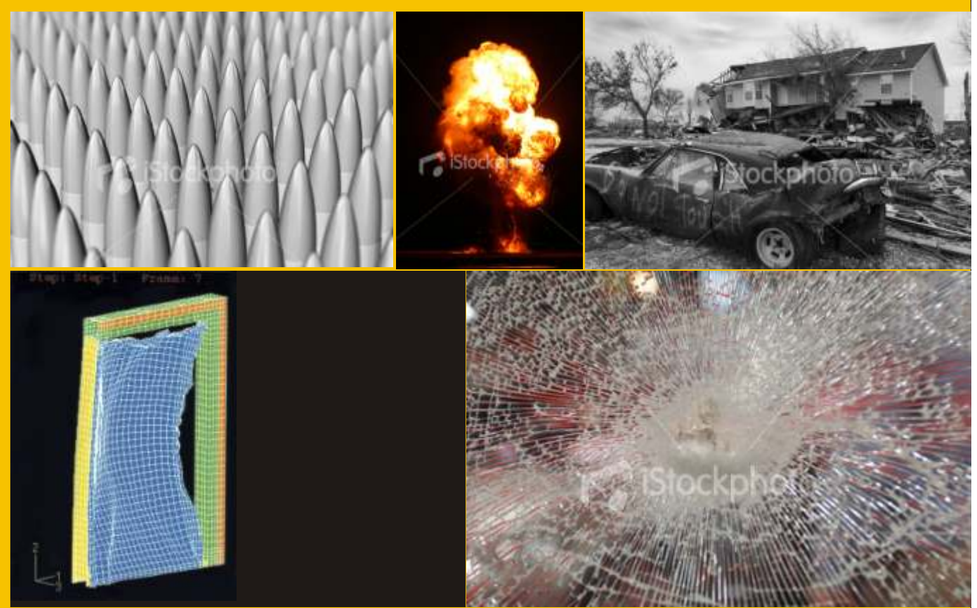
newautomotiveideas

- HUD Windshields
- Bullet / Bomb Resistant Glass
- Wraparound windshield & backlites
- Composite windshields - Glass/Acrylic/Polycarbonate (Flat & Curved)
- Privacy Glass
- Anti-spall windshield
- Laminated Sidelites
- Noise Reduction
- Solar reflective automotive glazing
- Full vehicle encapsulated glazing systems
- Electrically heated filament windshields
- De-icing and de-misting capabilities
- Integrated antennas for radio, TV, cell phone, navigation etc.;
- Integrated rain sensors for automatic wiper activation, as well as other sensors and hydrophobic coatings for improved visibility.

IMPACTARMOUR

Bullet . Bomb . Hurricane . Vandalism Resistant Glass

Armour is a specialist laminated glass from Impact, that offers protection from bullets, bombs, hurricanes and vandalism. Its a combination of high-performance glazing and framing systems, capable of offeringnecessary resistance to the severe stresses / impacts
Armour is Impact's Toughened Glass used in combination with Dupont's Butacyte PVB interlayer to make available in 20mm to 69 mm thicknesses, for the appropriate application.



Finite Element Modeling (FEM)

helps predict glass performance in advance of actual blast / bullet testing. The same is used to optimize research output, design, selection of material specifications and technology

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Type & Caliber of Weapon		BS 5051 : Part 1:1988	BS EN 1063 : 2000	Glass Glass BRG	Glass PC BRG Composite	Ammunition	Test Range (m)	Bullet Velocity (m/s)	No. of Shots	Strike Distance (mm)	"NIJ 0108.01 STANDARDS" Threat Level Rating	No. of Shots
.22 RIFLE		-	Br1	19	*	Lead, round nosed bullet, 2.6g ± 0.1	3 ± 0.5	360 ±10	3	120 ±10	I	5
HANDGUN 9mm Parabellum		GO	-	23	*	9mm Mk 2Z Standard bullet	3	390 +30,-0	3	100 +10,-0		
HANDGUN 9mm Luger		-	BR2	23	31	Full metal jacket (Steel plated) round nosed soft core bullet, 8.0g ±0.1	3 ±0.5	400 ±10	3	120 ±10	II	5
HANDGUN 357 MAGNUM		G1	-	36	31	Soft point semi-jacketed flat nose bullet, 10.2g	3	435 +30, -0	3	100 +10	II	5
		-	BR3	36	*	Full metal jacket (Steel plated), Soft core coned bullet, 10.2g ±0.1	3 ±0.5	430 +30, -0	3	120 ±10		
HANDGUN 44 MAGNUM		G2	-	42	35	Soft point semi-jacketed flat nose bullet, 15.6g	3	456 +30, -0	3	100 +10, -0	IIIA	5
		-	BR4	42	*	Full metal jacket (copper alloy), soft core flat nosed bullet, 15.6g ±0.1	3 ±0.51	440 ±10	3	120 ±10		
RIFLE 5.56	1-7 Twist	R1	-	42	35	NATO standard 5.56mm ball (SS 109)	10	919 +30, -0	3	100 +20, -0		
	Twist length 178mm ±10	-	BR5	42	35	Full metal jacket (steel plated), soft core and steel penetrator (type SS 109) pointed bullet, 4.0g ±0.1	10 ±0.5	950 ±10	3	120 ±10		
RIFLE 7.62	1-7 Twist	R2	-	52	40	NATO standard 7.62mm ball		815 +30, -0	3	100 +20, -0		
		-	BR6	52	40	Full metal jacket (steel plated), soft core pointed bullet, 9.5g ±0.1	10 ±0.5	830 ±10	3	120 ±10	III	5
	Twist length 178mm ±10	-	BR7	60	*	Full metal jacket (copper alloy), steel hard core (mass 3.7g 0.1, hardness more than 63 HRC) pointed bullet, 9.8g ±0.1	10 ±0.5	820 ±10	3	120 ±10		
12 BORE SHOTGUN		S86	-	42	*	12 bore solid slug, mass 28.35g	10	406 +40, -0	1	Center of test piece		
		-	SG1	42	*	12 bore solid slug, mass 28.35g	10 ±0.5	420 ±20	1	Center of test piece		
		-	Sg2	71	*	12 bore solid slug, mass 28.35g	10 ±0.5	420 ±20	3	125 ±10		

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Infrastructure

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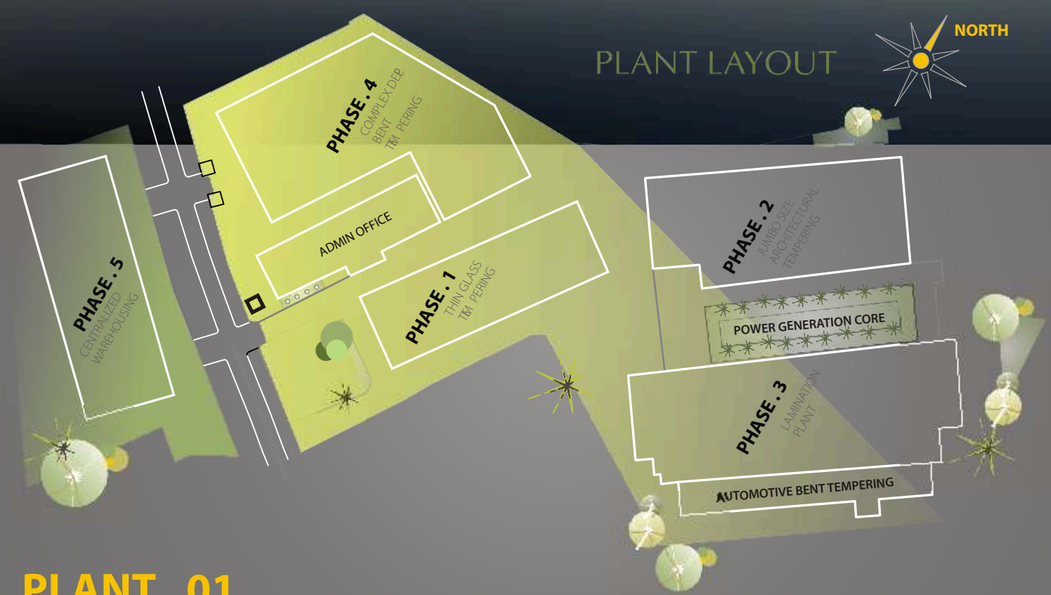
PLANT . 02

PLANT LAYOUT



PLANT . 01

	RESOURCE	MAKE	ORIGIN	RESOURCE CODE	SPECIFICATIONS	FUNCTION
1	H.T. F. HORIZONTAL TOUGHEN PLANT	TAMGLASS	FINLAND	FT.1.1	1.7 X 2.9 mts	Glass Tempering
2	HOAF SPEED BURN IV	HOAF	HOLLAND	GB.1.1	1.6 X 3.6 mts	Glass Bending
3	BEND PLANT AUTOMOTIVE GLASS	CHANDA	INDIA	VBT.1.1	1.5 X 2.0 mts	Glass Bend Tempering
4	DOUBLE EDGE GRINDING M/C	BOTTERO	ITALY	PEDE.1.1		Glass Edge Grinding & Polishing
5	HORIZONTAL WASHING	TRILUZI	ITALY	HWI.1.2	2.0 X 1.68 mts	Horizontal Washing

PLANT . 02

	RESOURCE	MAKE	ORIGIN	RESOURCE CODE	SPECIFICATIONS	FUNCTION
1	C N C CUTTING	PETER LISEC	AUSTRIA	AC.2.1	2.6 X 3.7 mts	Glass Cutting
2	AUTOMATIC GLASS LOADER	PETER LISEC	AUSTRIA		2.6 x 4.8 mts	Glass Loading
3	CUTTING LINE	BOTTERO	ITALY	AC.2.2	3.0 X 6.0 mts	Glass Cutting
4	DOUBLE EDGEGRINDING M/C	BOTTERO	ITALY	FADE.2.1	3.0 X 6.0 mts	Glass Edge Grinding & Polishing
5	ALPA 320/4 EDGE POLISHING M/C	Z.BAVELLONI	ITALY	AWC.2.1	3.2 X 2.3 mts	Glass Edge Grinding & Polishing
6	PRO E MAGNUM HORIZONTAL TOUGHEN PLANT	TAMGLASS	FINLAND	FT.2.2	3.3 X 7.2 mts	Glass Tempering
7	C N C MILLING, DRILLING, COUNTERSUNK, POLISHING	FORVET	ITALY	DM.2.1	2.5 X 4.8 mts	Glass Drilling & Cutout Making
8	HORIZONTAL GLASS WASHING	TRIULZI	ITALY	HWI.2.1	2.6 X 6.0 mts	Glass Washing
9	H. T. F. PRO E HORIZONTAL TOUGHEN PLANT	TAMGLASS	FINLAND	FT.2.1	2.4 X 4.8 mts	Glass Tempering
10	DOUBLE GLAZING COMPACT UNIT	LISEC	AUSTRIA	DG.2.1	5.0 X 2.44 mts	
11	SAND BLASTING MACHINE	FRATELLI PEZZA	ITALY	SB.2.1	2.5 X 4.0 mts	Frosting

UTILITY

	RESOURCE	MAKE	ORIGIN	SPECIFICATIONS
1	Utility POWER			5,000 KVA Capacity
2	8 DG SETS	CUMMINS	INDIA	7,000 KVA Capacity
3	5 COMPRESSORS	ELGI	INDIA	1,918 CFM Capacity

Appropriate Handling and other Supporting Equipment to facilitate all the 3 plants

New Infrastructure

for Deep Bending

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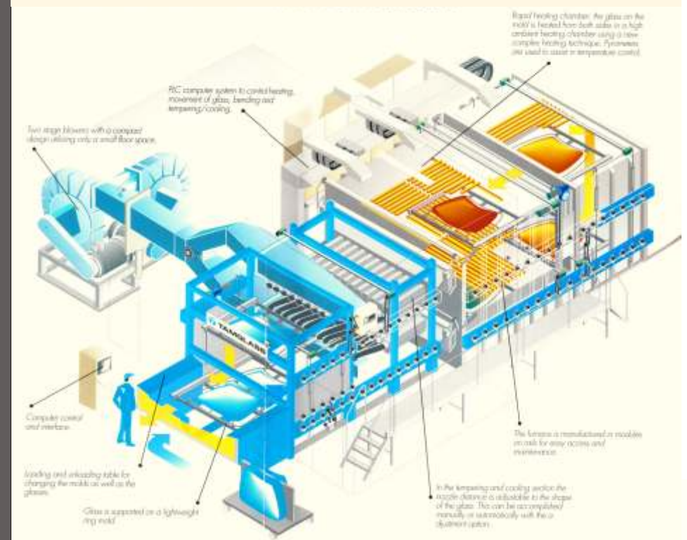
PLANT . 03

	RESOURCE	MAKE	ORIGIN	RESOURCE CODE	SPECIFICATIONS	FUNCTION
1	CNC CUTTING	PETER LISEC	AUSTRIA	AC.3.1	2.6 X 3.7 mts	GLASS CUTTING
2	COLIBRI EDGE POLISHING M/C	Z.BAVELLONI	ITALY	APE.3A1	1.2 X 1.8 mts	EDGE GRINDING & POLISHING
3	GLASS WASHING M/C	TRIULZI	ITALY	HWI.3.3	2.6 X 6.0 mts	GLASS WASHING
4	FLAT LAMINATING LINE	TAMGLASS	FINLAND	FL.3.1	2.5 X 3.5 mts	GLASS LAMINATION
5	DE-AIRING UNIT	TAMGLASS	FINLAND	VDC3.1	2.5 X 3.5 mts	VACUMING UNIT
6	BEND LAMINATING LINE	TAMGLASS	FINLAD	BL3.1	2.0 X 3.2 mts	PVB ASSEMBLING
7	AUTOMATIC SCREEN PRINTING	A.G. ENGG .	ITALY	SP3.2	2.4 X 4.5 mts	GLASS SCREEN PRINTING
8	AUTOCLAVE	TAMGLASS	FINLAD	AK3.1	4.4 X 2.44 mts	GLASS BONDING
9	CNC GLASS BENDING M/C ESU-ECO MAX	TAMGLASS	FINLAD	SB3.2	1.4 X 2.7 mts	GLASS BENDING
10	CNC GLASS BENDING M/C SCREEN MAX	TAMGLASS	FINLAD	SB3.1	2.4 X 3.4 mts	GLASS BENDING
11	HORIZONTAL BEND TEMPERING LINE			HBT.3A1	1.5 X 0.85 mts	GLASS TEMPERING

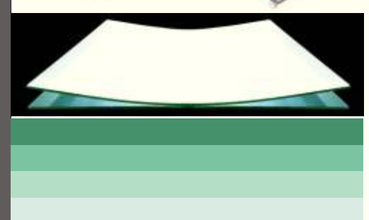
TAMGLASS CBTS

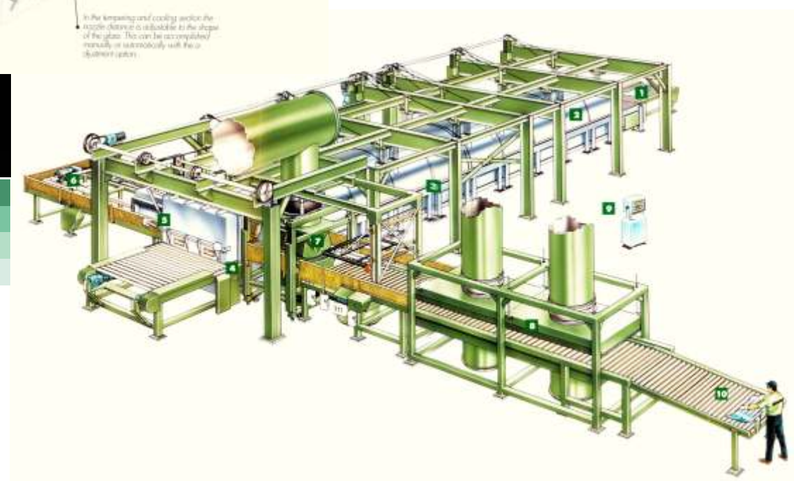
Complex Tempering & Bending System



GLASSTECH

Advanced Bending & Tempering System





I N P R O G R E S S

PLANT . 04
Complex Deep Bending & Tempering System

PLANT . 05
Centralized Cutting & Warehouse

Implementation of Single Piece Flow
The transition from batch and queue to lean manufacturing

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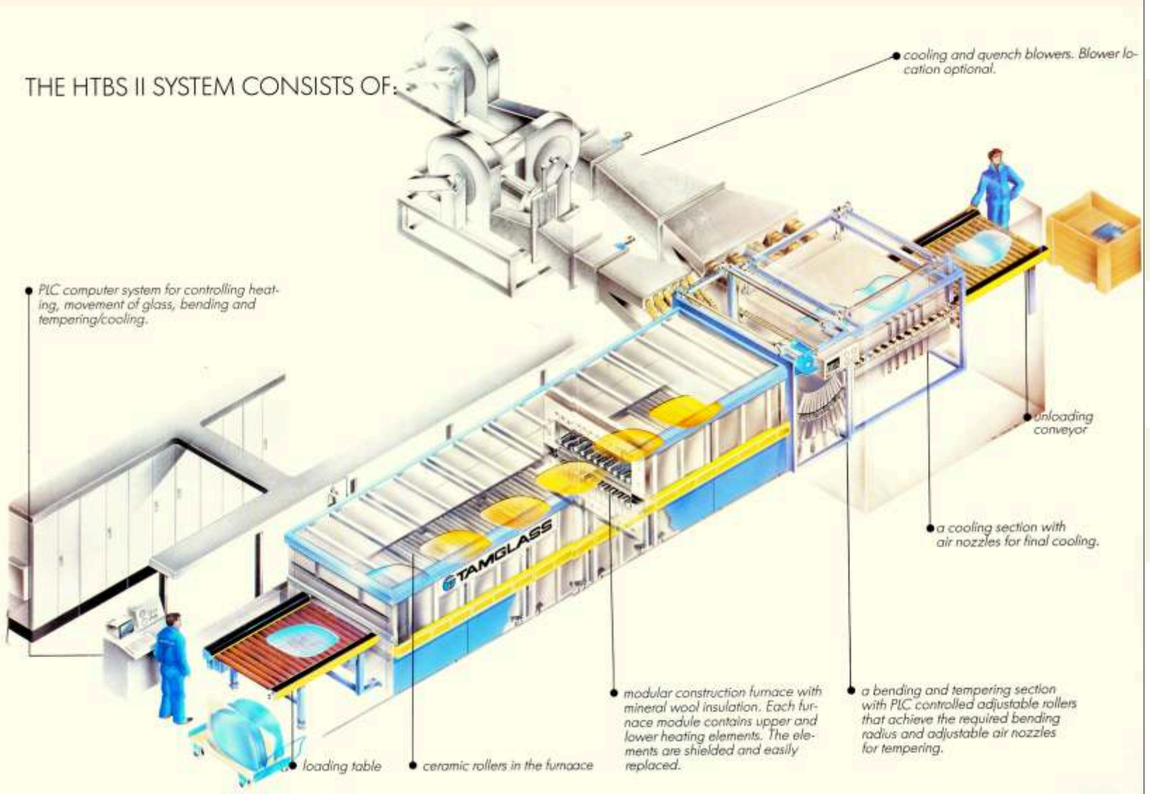
New Infrastructure
for Deep Bending

TAMGLASS HBTS

Horizontal Tempering & Bending System

THE HTBS II SYSTEM CONSISTS OF:



Development Process

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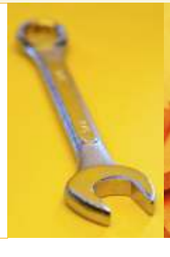
PLAN AND DEFINE PROGRAM	Formation of Cross Functional Team (CFT) * Review of customer drawing / specifications * Review of historical warranty and quality information * Product / process assumptions * Government requirements and regulations * Contract review * Preliminary Bill of material * Preliminary process flow chart * Preliminary List of special product and process characteristics
PRODUCT DESIGN AND DEVELOPMENT	* Prototype control plan * Material specifications * Drawing and specification changes * New equipment, tooling and facilities requirements * Special product and process characteristics * Team feasibility commitment
PROCESS DESIGN AND DEVELOPMENT	* Packing details * Product / process quality system review * Process flow chart * Floor plan layout * Characteristics matrix * Process FMEA * Pre-launch control plan * Process instructions * MSA Plan * Preliminary process capability study plan
PRODUCT & PROCESS VALIDATION	* Production trial run * Measurement system evaluation * Preliminary process capability study * Production part approval (PPAP submission) * Production control plan * Quality planning sign off
FEEDBACK, ASSESSMENT & CORRECTIVE ACTIONS	* Customer feed back

technical capabilities
shaping
optics
design feasibility
& simulation



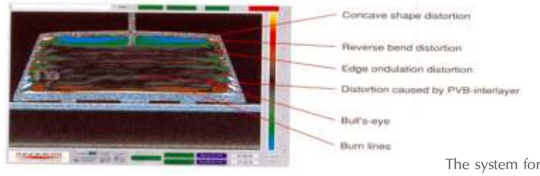
Quality

Quality Policy

Impact's Policy is to meet Customer Requirements of Quality, Price & Service by employing latest technology, improving productivity through continuous improvement & focusing on customer satisfaction.

Quality Standards Followed

- ASTM Std C-1048
- JIS Std R 3206 1989
- BIS Std 858
- IS : 2553 Part II 1992
- DIN Std 1249



Colour-coded map for full surface display

Final Inspection

The system for the final inspection of automotive glass is designed for the inline inspection of car glass in the production line and consists of three independent modules that detect and objectively evaluate all important production defects. Recognized defects are gathered centrally and are evaluated and visualized in an integrated user interface. It is possible to define different zones and quality levels for each screen. The system inspects the glass edges, the massive silk print area, the fade out band and the pure glass area.

Quality

Impact Production System (IPS)

IPS constitutes of a hard working & continuously learning organization focused towards customer delight, eliminating waste, best safety and total productive maintenance using **lean thinking**.

Quality Certifications

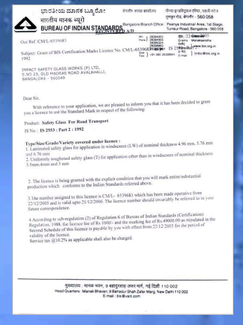
ISO 9001 — System Certification

ISI Mark — Product Certification

DOT Mark

E Mark

Working Towards TS Certification



Test Lab

Our lab is setup to comply the test requirements as per
ECE – R43
DOT – 856
ANSI – Z.26
IS:2553 P-1 & P-2
covering mechanical, optical and environmental requirements

Tests Conducted

IMPACT RESISTANCE TEST
PENETRATION RESISTANCE TEST
HEAD FORM IMPACT TEST
RESISTANCE TO SHOCK TEST

OPTICAL DISTORTION TEST
SECONDARY IMAGE TEST

HIGH TEMPERATURE TEST
LIGHT STABILITY TEST

STRESS PATTERN IN TOUGHENED GLASS
PVB MOISTURE TEST

SAMPLE CONDITIONING TESTS
HOT AIR OVEN (0º - 200º C)
DEEP FREEZER(- 28º TO 0ºC)

Organization Structure

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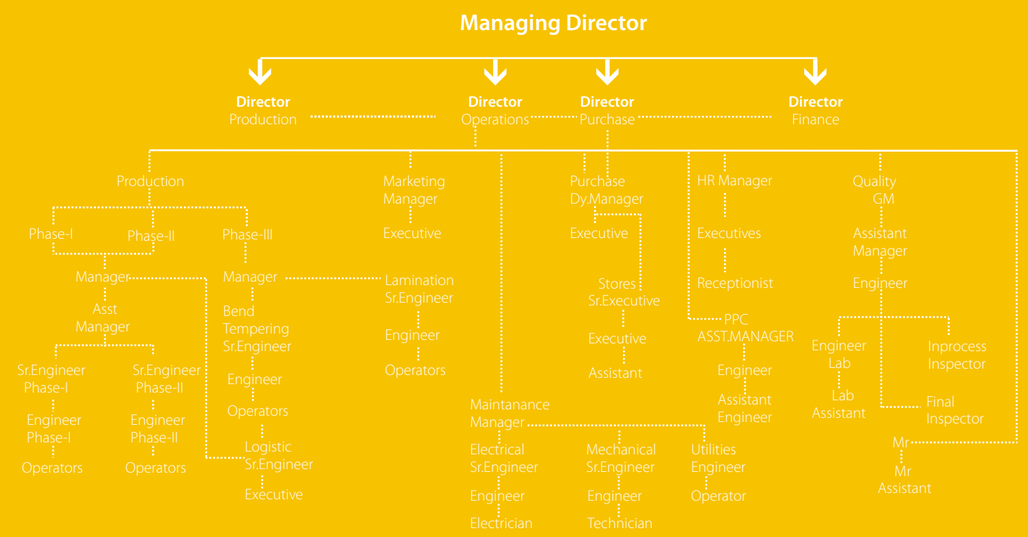

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"Travel and change of place impart new vigour to the mind."
— SENECA