













Vision

DESU has the 'vision' to become a leading manufacturer in medical sector with regard to the following principles; customer satisfaction, continuous development, quality, competitive pricing, team work, social responsibility, professional management, conformity to technological developments.

Mission

DESU has the mission to work in alignment with our vision and create resources and value for our customers, our staff and our country; in order to become a model in the medical sector.

Quality Certificates

Quality Certificates

Certificate of Full Quality Assurance

EC Design Examination Certificate

ISO 13485 Certificate

Hacettepe University Technopark Safir E Blok, Zemin Kat, No: 02-03, Beytepe Kampusu, Ankara info@desumedical.com









DESU Medical manufacturing and R & D activities are performed in Class 10,000 and 1,000 clean room facilities within the Hacettepe University Technopark establishment.







- Shunt Systems •
- Catheter Systems •
- Drainage Systems •
- Collagen Based Implant Systems •



Shunt Systems

- Silicone Based Shunt Systems

A) DEFIT Shunts

- 1. Defit Ultra Small (pediatric/infant) shunts (standard valve body / antibiotic impregnated valve body)
 - 2. Defit Small shunts (standard valve body / antibiotic impregnated valve body)
- 3. Defit Regular (adult) shunts (standard valve body / antibiotic impregnated valve body)

B) DECURVE Shunts

- 1. Decurve Pediatric shunts (standard valve body / antibiotic impregnated valve body)
- 2. Decurve Adults shunts (standard valve body / antibiotic impregnated valve body)

C) SILICONE BASED SHUNT KITS

1. Defit Shunt Kits (standard / semi antibiotic impregnated / full antibiotic impregnated)

- Polysulphone Based Shunt Systems

A) DEPUS Quick Response Shunts (standard valve body / antibiotic impregnated valve body)

B) DEPUS Quick Response Shunt Kits

- 1. Standart Depus Quick Response Shunt Kits
- 2. Semi antibiotic impregnated Depus Quick Response Shunt Kits
- 3. Full antibiotic impregnated Depus Quick Response Shunt Kits

- Shunt Accessories

1. Desiphon Antisiphon Device



^{*} All shunt systems are supplied sterile (method: EO-Ethylene Oxide).

SILICONE BASED SHUNT SYSTEMS

All the silicone based valves are designed and manufactured using polypropylene and silicone elastomer, which decreases the possibility of deformation of the valves due to sticking. None of the valves contain any metal parts, which gives them the uniqueness of non-interference with MRI or CT scans. The radiopaque barium marks on the valves indicate pressure, flow direction and valve-to-catheter approximation. Moreover, all the valves are built in with a membrane valve mechanism and incorporated with reservoirs for percutaneous cerebrospinal fluid (CSF) access.

Moreover all the DESU valves have high technology version that contains antibiotics in the silicone body of the valves. Antibiotic impregnation of the silicone body is a one of a kind quality that none of the other valves in the market has. Controlled release of the impregnated antibiotics from the silicone body for a duration of 28 days is also the ultimate method for infection prevention, which is one of the main problems of shunt surgery.

DESU Medikal silicone shunt systems are manufactured and supplied in three pressure categories: low pressure, medium pressure, high pressure.

| Pressure Levels | Standard Shunt Pressure Range (mm H ₂ O) | Shunt Marking |
|-----------------|---|---------------|
| High pressure | 110 - 180 | ••• |
| Medium pressure | 50 - 110 | •• |
| Low pressure | 10 - 50 | • |



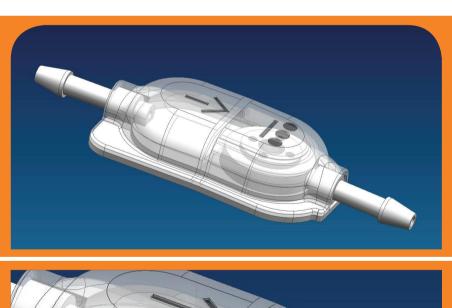
A) DEFIT SHUNTS

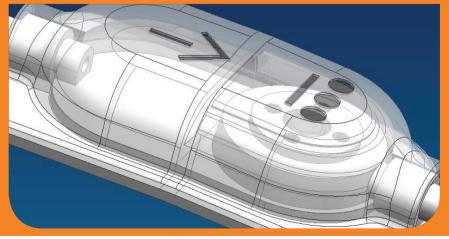
The shunt valve is a mechanical device that regulates flow. Regulation of flow, is attained through the simple fluid dynamics which requires a pressure drop of fluid while flowing through the obstacles like orifices and change of flow cross sectional area placed intentionally on the flow passage.

1. Defit Ultra Small (pediatric/infant) shunts (standard valve body / antibiotic impregnated valve body)

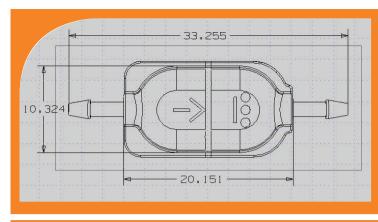
Defit Ultra Small shunts are used in infants and small children during treatment of hydrocephalus, where controlled drainage of CSF is required.

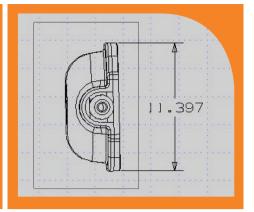


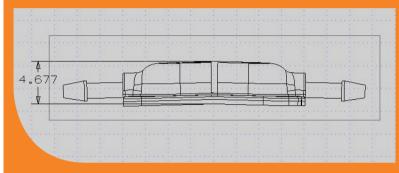


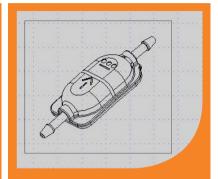












Standard Defit Ultra Small Shunts – Reference Codes according to Pressure Levels

| ● | ●● | ●●● |
|--------------------------|--------------------------|--------------------------|
| DFUS-L-PEB | DFUS-M-PEB | DFUS-H-PEB |
| Defit UltraSmall pediat- | Defit UltraSmall pediat- | Defit UltraSmall pediat- |
| ric silicone shunt with | ric silicone shunt with | ric silicone shunt with |
| reinforced base | reinforced base | reinforced base |
| LOW PRESSURE | MEDIUM PRESSURE | HIGH PRESSURE |



Antibiotic Impregnated Defit Ultra Small Shunts -Reference Codes according to Pressure Levels

| ● | ●● | ●●● |
|--|------------------|---|
| ADFUS-L-PEB | ADFUS-M-PEB | ADFUS-H-PEB |
| Antibiotic Impregnate Defit UltraSmall pediatric silicone shur with reinforced base LOW PRESSURE | Defit UltraSmall | Antibiotic Impregnated Defit UltraSmall pediatric silicone shunt with reinforced base HIGH PRESSURE |



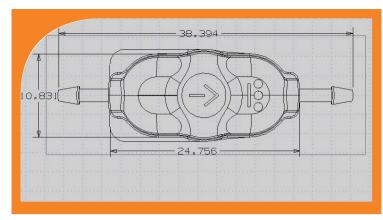


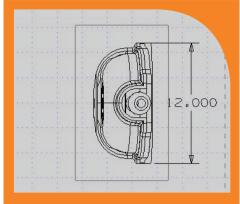
2. Defit Small shunts (standard valve body / antibiotic impregnated valve body)

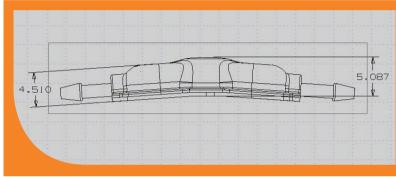
Defit Small shunts are used in children and adults during treatment of hydrocephalus, where controlled drainage of CSF is required.

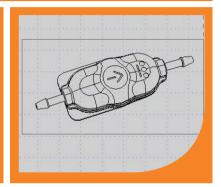












Standard Defit Small Shunts – Reference Codes according to Pressure Levels

| ● | ●● | ●●● |
|-----------------------|-----------------------|-----------------------|
| DFS-L-PEB | DFS-M-PEB | DFS-H-PEB |
| Defit Small pediatric | Defit Small pediatric | Defit Small pediatric |
| silicone shunt with | silicone shunt with | silicone shunt with |
| reinforced base | reinforced base | reinforced base |
| LOW PRESSURE | MEDIUM PRESSURE | HIGH PRESSURE |



Antibiotic Impregnated Defit Small Shunts – Reference Codes according to Pressure Levels

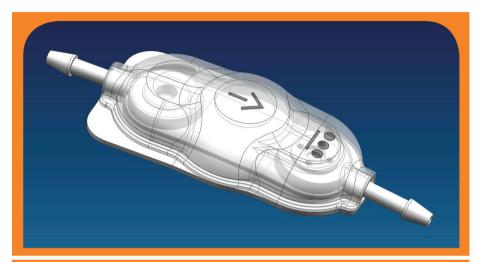
| • | •• | ••• |
|---|--|--|
| ADFS-L-PEB | ADFS-M-PEB | ADFS-H-PEB |
| Antibiotic Impregnated Defit Small pediatric silicone shunt with reinforced base LOW PRESSURE | Antibiotic Impregnated Defit Small pediatric silicone shunt with reinforced base MEDIUM PRESSURE | Antibiotic Impregnated Defit Small pediatric silicone shunt with reinforced base HIGH PRESSURE |

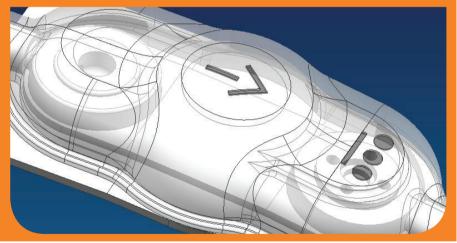


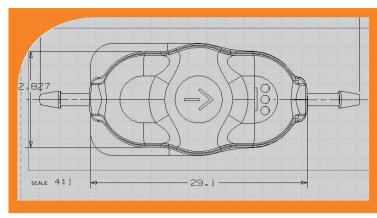


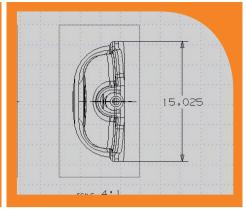
3. Defit Regular (Adult) shunts (standard valve body / antibiotic impregnated valve body)

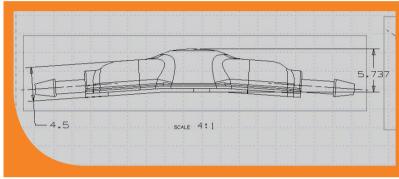
Defit Regular shunts are used in adults during treatment of hydrocephalus, where controlled drainage of CSF is required.

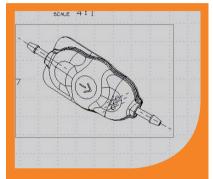












Standard Defit Regular Shunts – Reference Codes according to Pressure Levels

| • | •• | ••• |
|---|--|--|
| DFR-L-PEB | DFR-M-PEB | DFR-H-PEB |
| Defit Regular pediatric silicone shunt with reinforced base LOW PRESSURE | Defit Regular pediatric silicone shunt with reinforced base MEDIUM PRESSURE | Defit Regular pediatric silicone shunt with reinforced base HIGH PRESSURE |



Antibiotic Impregnated Defit Small Shunts – Reference Codes according to Pressure Levels

| • | •• | ••• |
|---|--|--|
| ADFR-L-PEB | ADFR-M-PEB | ADFR-H-PEB |
| Antibiotic Impregnated Defit Regular pediatric silicone shunt with reinforced base LOW PRESSURE | Antibiotic Impregnated Defit Regular pediatric silicone shunt with reinforced base MEDIUM PRESSURE | Antibiotic Impregnated Defit Regular pediatric silicone shunt with reinforced base HIGH PRESSURE |
| | | |

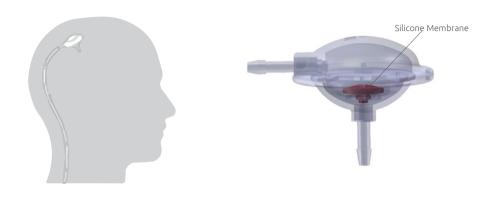




B) DECURVE SHUNTS

1. Decurve Pediatric Shunts (standard valve body / antibiotic impregnated valve body)

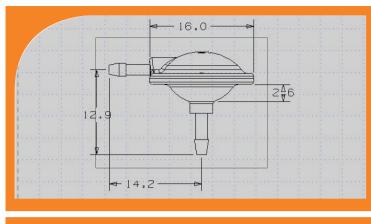
Decurve Pediatric shunts are used in infants and small children during treatment of hydrocephalus, where controlled drainage of CSF is required.

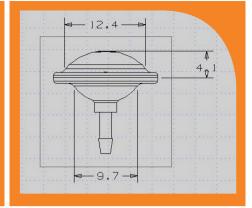


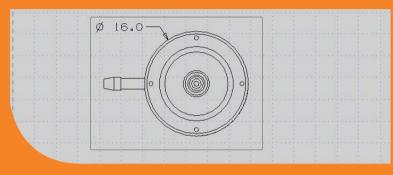


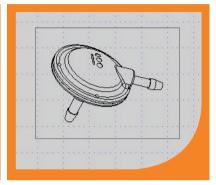










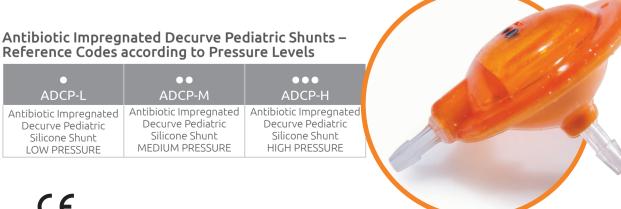


Standard Decurve Pediatric Shunts – Reference Codes according to Pressure Levels

| ● | ●● | ●●● |
|-------------------|-------------------|-------------------|
| DCP-L | DCP-M | DCP-H |
| Decurve Pediatric | Decurve Pediatric | Decurve Pediatric |
| Silicone Shunt | Silicone Shunt | Silicone Shunt |
| LOW PRESSURE | MEDIUM PRESSURE | HIGH PRESSURE |



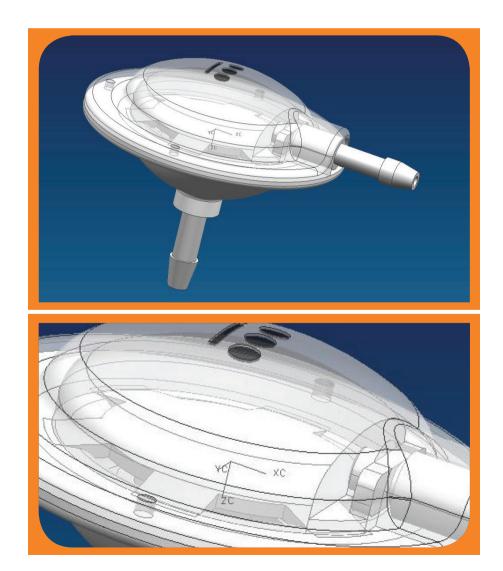
| ● | ●● | ●●● |
|------------------------|------------------------|------------------------|
| ADCP-L | ADCP-M | ADCP-H |
| Antibiotic Impregnated | Antibiotic Impregnated | Antibiotic Impregnated |
| Decurve Pediatric | Decurve Pediatric | Decurve Pediatric |
| Silicone Shunt | Silicone Shunt | Silicone Shunt |
| LOW PRESSURE | MEDIUM PRESSURE | HIGH PRESSURE |



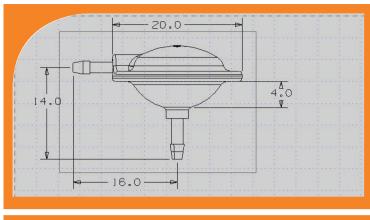


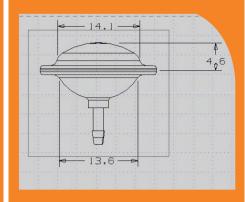
2. Decurve Adult Shunts (standard valve body / antibiotic impregnated valve body)

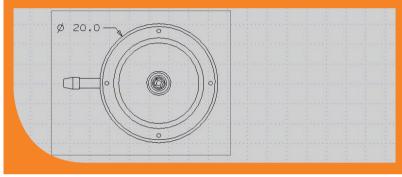
Decurve Adult shunts are used in adults during treatment of hydrocephalus, where controlled drainage of CSF is required.

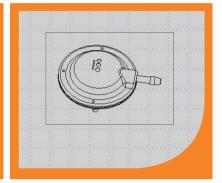












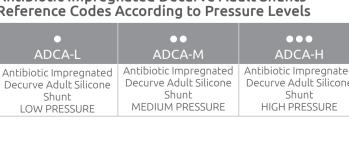
Standard Decurve Adult Shunts Reference Codes According to Pressure Levels

| • | ●● | ●●● |
|----------------|-----------------|----------------|
| DCA-L | DCA-M | DCA-H |
| Decurve Adult | Decurve Adult | Decurve Adult |
| Silicone Shunt | Silicone Shunt | Silicone Shunt |
| LOW PRESSURE | MEDIUM PRESSURE | HIGH PRESSURE |



Antibiotic Impregnated Decurve Adult Shunts Reference Codes According to Pressure Levels

| ● | ●● | ●●● |
|------------------------|------------------------|------------------------|
| ADCA-L | ADCA-M | ADCA-H |
| Antibiotic Impregnated | Antibiotic Impregnated | Antibiotic Impregnated |
| Decurve Adult Silicone | Decurve Adult Silicone | Decurve Adult Silicone |
| Shunt | Shunt | Shunt |
| LOW PRESSURE | MEDIUM PRESSURE | HIGH PRESSURE |







C) SILICONE BASED SHUNT KITS

1. Defit Shunt Kits (standard / semi antibiotic impregnated / full antibiotic impregnated)

| Standard Defit Shunt Kit | Semi Antibiotic İmpregnated Defit Shunt Kit | Full Antibiotic İmpregnated Shunt Kit |
|---|---|---|
| • Silicone outer shell and polyproplene inner body design | Major advantage compared to Standard Defit Shunt kits, with antibiotic impregnated catheter content | Major advantage compared to Standard and Semi impregnated Defit Shunt kits, with antibiotic impregnated catheter and shunt body content |
| MRI and CT compatible design that does not contain metal parts Radiopaque markings that show | Wide spectrum of protection through joint impregnation of Clindamycin HCl and Rifampicin | • Wide spectrum of protection through joint impregnation of Clindamycin HCl and Rifampicin |
| direction of flow and pressure level Reservoir design that allows CSF (crania | Prevention of bacteria colonization up to 28 years | Prevention of bacteria colonization up to 28 years |
| spinal fluid) sampling • Ultrasmall, Small and Regular valve types | • Low obstruction risk due to hydrophilic nature of catheters | • Low obstruction risk due to hydrophilic nature of catheters |
| . 3 | Ultrasmall, Small and Regular valve types | • Ultrasmall, Small and Regular valve types |



Defit Ultrasmall Shunt Kits Reference Codes According To Pressure Levels

| STANDARD | SEMI ANTIBIOTIC IMPREGNATED | FULL ANTIBIOTIC IMPREGNATED |
|--|--|--|
| DFUS-L-VCK-PEB DFUS-M-VCK-PEB DFUS-H-VCK-PEB | DFUS-L-VACK-PEB DFUS-M-VACK-PEB DFUS-H-VACK-PEB | ADFUS-L-VACK-PEB ADFUS-M-VACK-PEB ADFUS-H-VACK-PEB |
| Defit Ultrasmall pediatric silicone shunt with reinforced base with Ventriculoperitoneal catheter kit LOW-MEDIUM-HIGH PRESSURE | Defit Ultrasmall pediatric silicone shunt with reinforced base with Antibiotic impregnated Ventriculoperitoneal catheter kit LOW-MEDIUM-HIGH PRESSURE | Antibiotic impregnated Defit Ultrasmall pediatric silicone shunt with reinforced base with Antibiotic impregnated Ventriculoperitoneal catheter kit LOW-MEDIUM-HIGH PRESSURE |

Defit Small Shunt Kits Reference Codes According To Pressure Levels

| STANDARD | SEMI ANTIBIOTIC IMPREGNATED | FULL ANTIBIOTIC IMPREGNATED |
|---|---|---|
| DFS-L-VCK-PEB DFS-M-VCK-PEB DFS-H-VCK-PEB | DFS-L-VACK-PEB DFS-M-VACK-PEB DFS-H-VACK-PEB | ADFS-L-VACK-PEB ADFS-M-VACK-PEB ADFS-H-VACK-PEB |
| Defit Small pediatric silicone shunt with reinforced base with Ventriculoperitoneal catheter kit LOW-MEDIUM-HIGH PRESSURE | Defit Small pediatric silicone shunt with reinforced base with Antibiotic impregnated Ventriculoperitoneal catheter kit LOW-MEDIUM-HIGH PRESSURE | Antibiotic impregnated Defit Small pediatric silicone shunt with reinforced base with Antibiotic impregnated Ventriculoperitoneal catheter kit LOW-MEDIUM-HIGH PRESSURE |



Defit Regular Shunt Kits Reference Codes According To Pressure Levels

| STANDARD | SEMI ANTIBIOTIC IMPREGNATED | FULL ANTIBIOTIC IMPREGNATED |
|---|---|---|
| DFR-L-VCK-PEB DFR-M-VCK-PEB DFR-H-VCK-PEB | DFR-L-VACK-PEB DFR-M-VACK-PEB DFR-H-VACK-PEB | ADFR-L-VACK-PEB ADFR-M-VACK-PEB ADFR-H-VACK-PEB |
| Defit Regular pediatric silicone shunt with reinforced base with Ventriculoperitoneal catheter kit LOW-MEDIUM-HIGH PRESSURE | Defit Regular pediatric silicone shunt with reinforced base with Antibiotic impregnated Ventriculoperitoneal catheter kit LOW-MEDIUM-HIGH PRESSURE | Antibiotic impregnated Defit Regular pediatric silicone shunt with reinforced base with Antibiotic impregnated Ventriculoperitoneal catheter kit LOW-MEDIUM-HIGH PRESSURE |





2. Decurve Shunt Kits (standard / semi antibiotic impregnated / full antibiotic impregnated)

| Standard Defit Shunt Kit | Semi Antibiotic Impregnated Defit Shunt Kit | Full Antibiotic Impregnated Shunt Kit |
|---|---|--|
| Silicone outer shell and polyproplene inner body design | Major advantage compared to Standard Defit Shunt kits, with antibiotic impregnated catheter content | Major advantage compared to Standard and Semi impregnated Defit Shunt kits, with antibiotic impregnated catheter and shunt body content |
| MRI and CT compatible design that does not contain metal parts Radiopaque markings that show | Wide spectrum of protection through joint impregnation of Clindamycin HCl and Rifampicin | Wide spectrum of protection through joint impregnation of Clindamycin HCl and Rifampicin |
| direction of flow and pressure level Reservoir design that allows CSF (crania | Prevention of bacteria colonization up to 28 years | Prevention of bacteria colonization up to 28 years |
| spinal fluid) sampling • 12 mm Pediatric and 16 mm Adult valve | Low obstruction risk due to hydrophilic nature of catheters | Low obstruction risk due to hydrophilic nature of catheters |
| types | • 12 mm Pediatric and 16 mm Adult valve types | • 12 mm Pediatric and 16 mm Adult valve types |



Decurve Pediatric Shunt Kits – Reference Codes According To Pressure Levels

| STANDARD | SEMI ANTIBIOTIC IMPREGNATED | FULL ANTIBIOTIC IMPREGNATED |
|---|---|--|
| DCP-L-VCK DCP-M-VCK DCP-H-VCK | DCP-L-VACK DCP-M-VACK DCP-H-VACK | ADCP-L-VACK ADCP-M-VACK ADCP-H-VACK |
| Decurve Pediatric silicone shunt with Ventriculoperitoneal catheter kit LOW-MEDIUM-HIGH PRESSURE | Decurve Pediatric silicone shunt with Antibiotic impregnated Ventriculoperitoneal catheter kit LOW-MEDIUM-HIGH PRESSURE | Antibiotic impregnated Decurve Pediatric silicone shunt with Antibiotic impregnated Ventriculoperitoneal catheter kit LOW-MEDIUM-HIGH PRESSURE |



Decurve Adult Shunt Kits – Reference Codes According To Pressure Levels

| STANDARD | SEMI ANTIBIOTIC IMPREGNATED | FULL ANTIBIOTIC IMPREGNATED |
|---|---|--|
| DCA-L-VCK DCA-M-VCK DCA-H-VCK | DCA-L-VACK DCA-M-VACK DCA-H-VACK | ADCA-L-VACK ADCA-M-VACK ADCA-H-VACK |
| Decurve Adult silicone shunt with Ventriculoperitoneal catheter kit LOW-MEDIUM-HIGH PRESSURE | Decurve Adult silicone shunt with Antibiotic impregnated Ventriculoperitoneal catheter kit LOW-MEDIUM-HIGH PRESSURE | Antibiotic impregnated Decurve Adult silicone shunt with Antibiotic impregnated Ventriculoperitoneal catheter kit LOW-MEDIUM-HIGH PRESSURE |



Polysulphone Based Shunt Systems

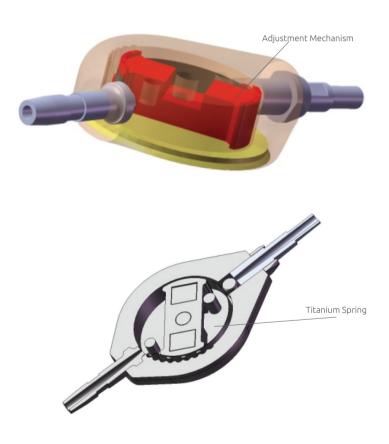
DESU DEPUS Quick Response shunt is designed to regulate and sustain the intraventricular pressure (IVP) of the patient via controlled drainage of the CSF (cerebrospinal fluid). The shunt has two versions according to intention of use: ventriculoperitoneal and lumboperitoneal.

The mechanism within the shunt is triggered by positive ventricular pressure and the valve opens immediately. The ruby ball and the titanium spring valve are the essentials of this adjustable system that works on the theory of hydrodynamic leverage.

The shunt body is designed as to have uniquely smaller dimensions than its competitors.

Inner diameter of the valve is 10 mm, outer diameter is 13,5 mm and the length is 16 mm.

DESU DEPUS Quick Response shunt is also designed with an infection-preventing version, which includes an antibiotic impregnated silicone cover. This antibiotic impregnated body design of the DEPUS valve is unique in the current shunt market. Controlled release of the impregnated antibiotics from the silicone body for 28 days is also the ultimate method for infection prevention, which is one of the main problems of shunt surgery.





A) DEPUS QUICK RESPONSE SHUNTS (STANDARD VALVE BODY / ANTIBIOTIC IMPREGNATED SILICONE COVER)

Polysulphone shunts are manufactured using radiopaque titanium, ruby ball and polysulphone (long term implantable) and are supplied sterile (ETO). The shunt pressure levels are marked with tantalum, which allows MRI visibility.



Standard Depus Quick Response Shunts Reference Codes According To Pressure Levels

| ● | ●● | ●●● |
|----------------------|----------------------|----------------------|
| DP-L | DP-M | DP-H |
| Depus Quick Response | Depus Quick Response | Depus Quick Response |
| Shunt | Shunt | Shunt |
| LOW PRESSURE | MEDIUM PRESSURE | HIGH PRESSURE |



Depus Quick Response Shunt With Antibiotic Imrpregnated Silicone Cover – Reference Codes According to Pressure Levels

| • | •• | ••• |
|--|---|---|
| AADP-L | ADP-M | ADP-H |
| Depus Quick Response Shunt with Antibiotic impregnated silicone cover LOW PRESSURE | Depus Quick Response Shunt with Antibiotic impregnated silicone cover MEDIUM PRESSURE | Depus Quick Response Shunt with Antibiotic impregnated silicone cover HIGH PRESSURE |

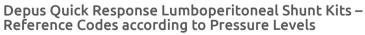


B) DEPUS QUICK RESPONSE SHUNT KITS

Standard Depus Quick Response Shunt Kits Semi Antibiotic impregnated De-Full Antibiotic Impregnated Depus Quick Response Shunt Kits pus Quick Response Shunt Kits • Antibiotic impregnated catheters and • Major advantage compared to Standard Depus Quick Response shunts due to antibiotic impregnated silicone cover on • Polysulphone body design enhanced antibiotic impregnated catheters valve body with titanium spring and ruby ball • Wide spectrum of protection through • Wide spectrum of protection through • MRI and CT compatible design that does joint impregnation of Clindamycin HCl and joint impregnation of Clindamycin HCl and not contain metal parts Rifampicin Rifampicin • Tantalum markings to indicate direction • Prevention of bacteria colonization up Prevention of bacteria colonization up of flow to 28 days to 28 days • Low obstruction risk due to hydrophilic • Low obstruction risk due to hydrophilic nature of catheters nature of catheters and shunt body

Depus Quick Response Shunt Kits – Reference Codes according to pressure levels

| STANDARD | SEMI ANTIBIOTIC IMPREGNATED | FULL ANTIBIOTIC IMPREGNATED |
|---|--|--|
| DP-L-VCK DP-M-VCK DP-H-VCK | DP-L-VACK DP-M-VACK DP-H-VACK | ADP-L-VACK ADP-M-VACK ADP-H-VACK |
| Depus Quick Response Shunt with Ventriculoperitoneal Catheter Kit LOW-MEDIUM-HIGH PRESSURE | Depus Quick Response Shunt with Antibiotic impregnated Ventriculoperioneal catheter kit LOW-MEDIUM-HIGH PRESSURE | Depus Quick Response Shunt with Antibiotic Impregnated silicone cover and Antibiotic impregnated Ventriculoperioneal catheter kit LOW-MEDIUM-HIGH PRESSURE |



| STANDARD | LUMBOPERITONEAL DEPUS QUICK RESPONSE SHUNT KIT | |
|--|--|--|
| LPDP-L-LPCK LPDP-M-LPCK LPDP-H-LPCK | LPDP-L-LPACK LPDP-M-LPACK LPDP-H-LPACK | |
| Depus Quick Response Lumboperitoneal shunt with Lumboperitoneal catheter kit and Polyproplene connector LOW – MEDIUM – HIGH PRESSURE | Depus Quick Response Shunt Lumbar Catheter Peritoneal Catheter | |







Shunt Accessories

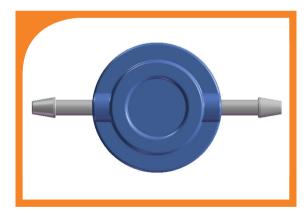
1. Desiphon Anti-siphon Device

Antisiphon is used to prevent the siphon effect, which might occur during hydrocephalus treatment when the CSF requires drainage or shunting and the peritoneal catheter's position suddenly changes from horizontal to vertical.

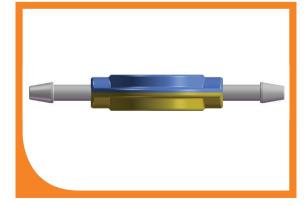
Major principle is to create a sudden closure effect in order to overcome the over-drainage that occurs under siphon effect.

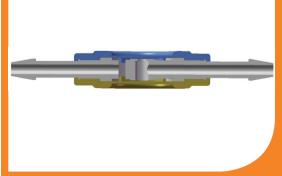
Difference in Shunt pressure levels during antisiphon device use

| CATEGORY | STANDARD SHUNT PRESSURE LEVELS (mmH ₂ O) | SHUNT PRESSURE LEVELS WHEN SHUNT IS USED TOGETHER WITH THE ANTISIPHON DEVICE (mmH ₂ O) |
|-----------------|---|---|
| HIGH PRESSURE | 110 – 180 | 135 – 210 |
| MEDIUM PRESSURE | 50 – 110 | 65 – 135 |
| LOW PRESSURE | 10 – 50 | 25 – 65 |











CATHETER SYSTEMS

- Catheters Types

- A) VENTRICULAR CATHETER (STANDARD / ANTIBIOTIC IMPREGNATED)
- B) PERITONEAL CATHETER (STANDARD / ANTIBIOTIC IMPREGNATED)
- C) VENTRICULOPERITONEAL CATHETER KIT (STANDARD / ANTIBIOTIC IMPREGNATED)
- D) EXTERNAL VENTRICULAR DRAINAGE CATHETER (STANDARD / ANTIBIOTIC IMPREGNATED)
- E) EXTERNAL LUMBAR DRAINAGE CATHETER (STANDARD / ANTIBIOTIC IMPREGNATED)
- F) LUMBAR CATHETER

- Catheter Accessories

- A) STILET
- **B) TROCAR**
- C) FIXATION TAB
- **D) CONNECTORS**
 - 1. Luer connector
 - 2. Right angle connector
 - 3. Straight connector
 - 4. L type connector
 - 5. Y type connector

 $^{^{\}star}$ All catheter systems are supplied sterile (method: EO-Ethylene Oxide).



CATHETER TYPES

DESU® Catheter systems are used as a component of shunt systems indicated for use to drain or shunt the cerebrospinal fluid (CSF) in treatment of hydrocephalus. All DESU Catheters are manufactured with barium impregnated silicone raw material to allow radiopacity. In addition, tantalum is used to mark the length measurements on the catheters, which allows visibility during magnetic resonance imaging (MRI).

Antibiotic impregnated catheters (barium impregnated) are manufactured using long-term implantable grade silicone tubing. The catheters, which are impregnated with Rifampicin and Clindamycin HCl, are shown to decrease gram-positive bacteria colonization.

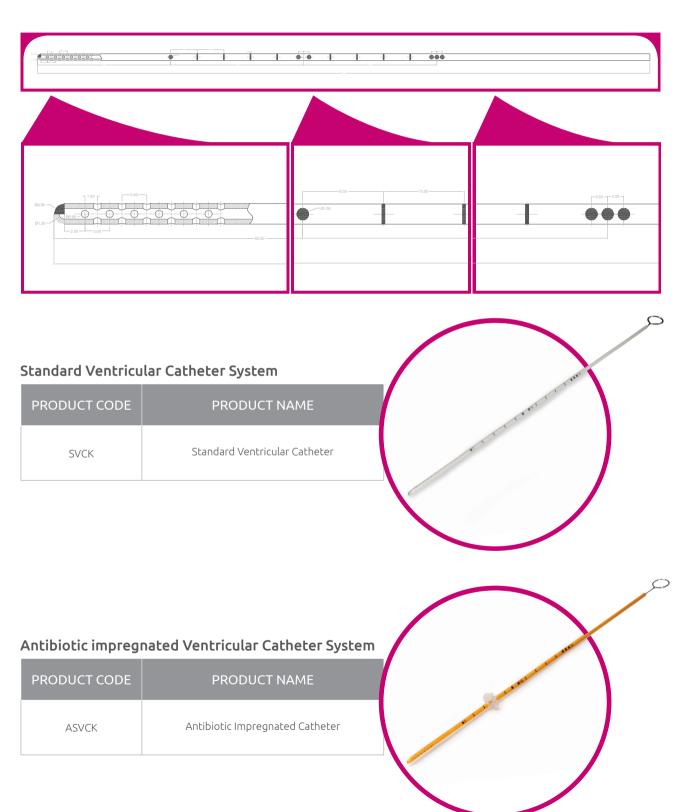
Length and Inner and Outer Diameter Measurements of the Catheters

| CATHETER TYPE | LENGTH (CM) | İNNER DIAMETER / OUTER DIAMETER (MM) |
|-------------------------------|-------------|---|
| VENTRICULAR CATHETER | 23 | 1.3 / 2.5 |
| PERITONEAL CATHETER | 120 | 1.1/ 1.3 |
| EXTERNAL VENTRICULAR CATHETER | 31 | 1.5 / 3 |
| EXTERNAL LUMBAR CATHETER | 80 | 0.8 / 1.6 |
| LUMBAR CATHETER | 105 | 0.8 / 1.6 |



A) VENTRICULAR CATHETER (STANDARD / ANTIBIOTIC)

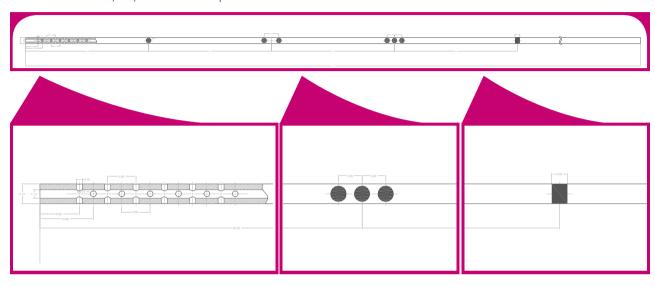
Ventricular catheter is used to transfer excess CSF (cerebrospinal fluid) from the brain ventricles to the shunt. Ventricular catheter length is 23 cm. Inner diameter of the catheter is 1.3 mm and outer diameter is 2.5 mm. Tantalum is used to mark the length measurements on the catheters on 5, 10 and 15 cm points.



B) PERITONEAL CATHETER (STANDARD / ANTIBIOTIC IMPREGNATED)

Peritoneal catheter is used to transfer excess CSF, that is drained with a controlled pressure from the ventricles by the use of ventriculoperitoneal shunt.

Peritoneal catheter length is 120 cm. Inner diameter of the catheter is 1.1 mm and outer diameter is 1.3 mm. Tantalum is used to mark the length measurements on the catheters on 5, 10,15 and 20 cm points.





Standard Peritoneal Catheter System

| PRODUCT CODE | PRODUCT NAME |
|--------------|---|
| SPCK | Peritoneal distal catheter – closed tip |



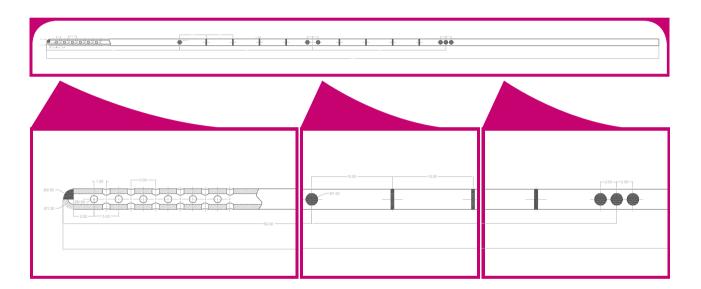
Antibiotic Impregnated Peritoneal Catheter System

| PRODUCT CODE | PRODUCT NAME |
|--------------|---|
| ASPCK | Antibiotic impregnated distal catheter – closed tip |



C) VENTRICULOPERITONEAL CATHETER KIT (STANDARD / ANTIBIOTIC IMPREGNATED)

Antibiotic Impregnated Ventriculoperitoneal Catheter Kit Standard Ventriculoperitoneal Catheter Kit • Barium impregnated radiopaque silicone material • Magnetic Resonance Imaging (MRI) visibility through the use • Barium impregnated radiopaque silicone material of tantalum markings • Magnetic Resonance Imaging (MRI) visibility through the use • 24 entry holes at the proximal tip to avoid obstruction of tantalum markings • Antibacterial protection for 28 days, through impregnation of • 24 entry holes at the proximal tip to avoid obstruction Rifampicin and Clindamycin HCl. • Colonization and obstruction preventing inner and outer surface through hydrophilic characteristic • (0.054%) Rifampicin and (0.15%) Clidamycin HCl content • Antibiotic dose suitable for pediatric use

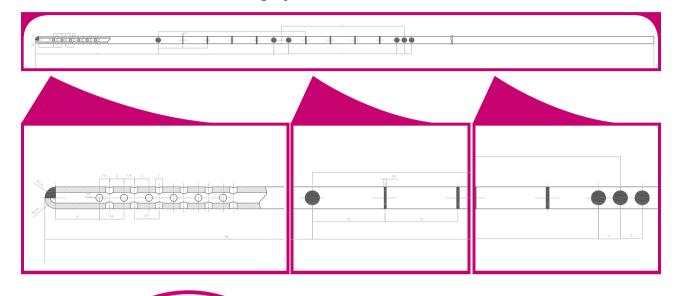






D) EXTERNAL VENTRICULAR DRAINAGE CATHETER KIT (STANDARD / ANTIBIOTIC IMPREGNATED)

External Ventricular Drainage Catheter is the main component of the External Neurological Drainage System and is used to drain excess CSF from the brain ventricles and transfer it to the drainage system.





Standard EVD Catheter System

PRODUCT PRODUCT

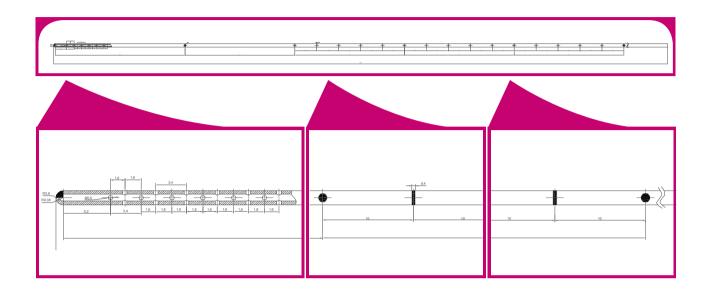
| PRODUCT CODE | PRODUCT NAME | PRODUCT PROPERTIES |
|-----------------|---|--|
| EVDCK | External Ventricular Drainage Catheter System | Barium impregnated radiopaque silicone material Magnetic Resonance Imaging (MRI) visibility through the use of tantalum markings 24 entry holes at the proximal tip to avoid obstruction Kit system including trocar, stylet, luer connector and fixation tab |

Antibiotic Impregnated EVD Catheter System

| Antibiotic Impregnated EVDACK EVDACK Antibiotic Impregnated External Ventricular Drainage Catheter System Magnetic Resonance Imaging (MRI) visibility through the use of tantalum markings • 24 entry holes at the proximal tip to avoid obstruction • Antibacterial protection for 28 days, through impregnation of Rifampicin and Clindamycin HCl on the catheter • Colonization and obstruction preventing inner and outer surface through hydrophilic characteristic • (0.054%) Rifampicin and (0.15%) Clidamycin HCl content | CODE | NAME | PRODUCT PROPERTIES |
|--|--------|--|--|
| | EVDACK | Impregnated External Ventricular Drainage Catheter | Magnetic Resonance Imaging (MRI) visibility through the use of tantalum markings 24 entry holes at the proximal tip to avoid obstruction Antibacterial protection for 28 days, through impregnation of Rifampicin and Clindamycin HCl on the catheter Colonization and obstruction preventing inner and outer surface through hydrophilic characteristic (0.054%) Rifampicin and (0.15%) Clidamycin HCl content Antibiotic dose suitable for pediatric use Kit system including trocar, stylet, luer |

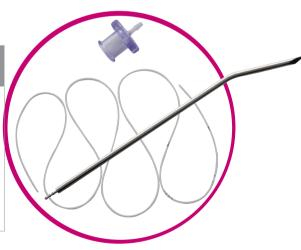
E) EXTERNAL LUMBAR DRAINAGE CATHETER

External Lumbar Drainage Catheter is the main component of the External Neurological Drainage System and is used to drain excess CSF from the lumbar subarachnoid cavity and transfer it to the drainage system.



Standard Lumbar Drainage Catheter System

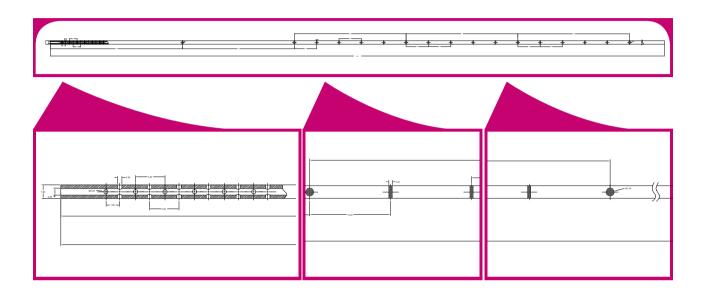
| PRODUCT CODE | PRODUCT NAME | PRODUCT PROPERTIES |
|-----------------|--|--|
| ELCK | External Lumbar Drainage Catheter System | Barium impregnated radiopaque silicone material Magnetic Resonance Imaging (MRI) visibility through the use of tantalum markings 24 entry holes at the proximal tip to avoid obstruction Kit system including trocar, stylet, luer connector and fixation tab |

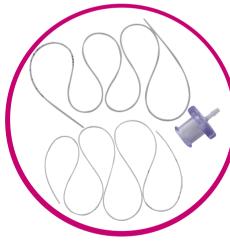




F) LUMBAR CATHETER (STANDARD)

Lumbar catheter is one of the components of the lumboperitoneal catheter kit within the lumboperitoneal shunt system. Lumboperitoneal catheter kit consists of lumbar catheter and peritoneal catheter. Lumbar catheter is used to transfer excess CSF from the subarachnoid cavity to the shunt; while the shunt delivers the CSF with a pre-arranged pressure level to the peritoneal cavity.





Standard Lumboperitoneal Catheter System

| CODE | NAME | PRODUCT PROPERTIES |
|------|---|--|
| LPCK | Lumbo Peritoneal Catheter System | Barium impregnated radiopaque silicone material Magnetic Resonance Imaging (MRI) visibility through the use of tantalum markings 24 entry holes at the proximal tip to avoid obstruction Lumboperitoneal catheter system with lumbar catheter and peritoneal catheter |



CATHETER ACCESSORIES

A) STYLET

Stylet is used to transfer the catheter to the brain ventricle during catheterization of the ventricular shunt catheter or external ventricular drainage catheter.

Stylet used for Ventricular Catheter



Stylet used for External Ventricular Drainage Catheter





B) TROCAR

Trocar is used for the transfer of the external ventricular catheter under the tissue during catheterization.



Note: trocar with the thinner connection tip is used with the external lumbar drainage system; while trocar with the thicker connection tip is used with the external ventricular drainage system.

C) FIXATION TAB

Fixation tab is an aiding device that is used to fix the External Ventricular Drainage Catheter and the External Lumbar Drainage Catheter.



Fixation Tab Use



D) CONNECTORS

1. Luer Connector

• Luer connector is an aiding device that is used to connect the External Ventricular Drainage Catheter / External Lumbar Catheter to the External Neurological Drainage System (ENDS).

Lumbar Drainage Luer Connector



EVD Luer Connector



2 Right Angle Connector

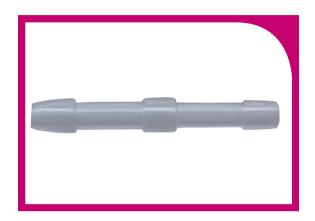
Right angle connector is an aiding device that is used to change the direction of the Ventricular catheter, when needed during surgery, without causing bending or obstruction.





3. Straight Connector

Straight connector is an aiding device that is used to connect different catheter pieces to each other during surgery.



4. L Type Connector

L type connector is used to change the direction of the Ventricular / Peritoneal Catheter and/or connect different catheter pieces to each other, during surgery when needed, without causing bending or obstruction.





5. Y Type Connector

Y connector is used in one of the following conditions: to connect two shunts to one peritoneal catheter; to have 2 peritoneal catheter outlets from one shunt or to have two ventricular catheter inlets to one shunt.



DRAINAGE SYSTEMS*

- Drainage System Types

A) EXTERNAL VENTRICULAR DRAINAGE SYSTEM (ENDS AND EVD CATHETER KIT)
B) EXTERNAL LUMBAR DRAINAGE SYSTEM (ENDS AND LUMBAR DRAINAGE
CATHETER KIT)

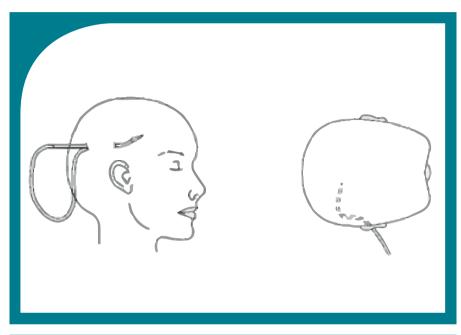
^{*} All drainage systems are supplied sterile (method: EO-Ethylene Oxide).

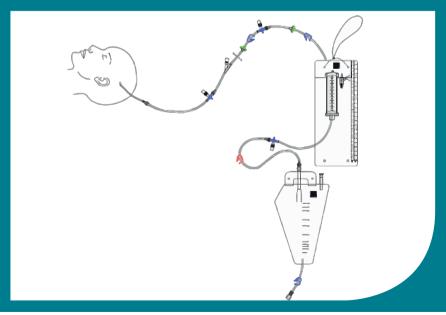


Drainage System Types

A) EXTERNAL VENTRICULAR DRAINAGE SYSTEM (ENDS AND EVD CATHETER KIT)

DESU® External Ventricular Drainage System consists of 1 ENDS (External Neurological Drainage System) and 1 External Ventricular Drainage Catheter kit. The External Ventricular Drainage System is used when use of permanent shunt implant is not necessary or suitable to reduce the intra-cranial pressure by means of CSF drainage. The system is available with 2 options: with a standard EVD catheter kit or an antibiotic impregnated EVD catheter kit.







ENDS (External Neurological Drainage System) consists of the following parts:,

- 1, female luer connector and luer cap (to connect the catheter to the distal outlet)
- 1, 60 cm reinforced rope with locking mechanism
- 1, 30 cm measurement scale (to adjust the CSF level according to mm Hg level)
- 1, 100 ml drip chamber with anti-microbial filter
- 1, 250 cm patient line that consists of: 1 male luer connector with cap, 3 three-way connectors, 1 y-connector with injection port, 4 clamps
- 1, 700 ml sterile drainage bag that has: an air filter, 1 outlet and level indicators at every 100 ml and has an air-filter
- 1 ventricular (standard/antibiotic impregnated) or lumbar drainage catheter (standard), according to intended use

EVD (External Ventricular Drainage) Catheter kit consists of the following parts:

- 1 External Ventricular Drainage Catheter
- 1, 32 cm stainless steel stylet (for insertion of the catheter)
- 1, stainless steel trocar needle with bended tip to allow catheter passage under the skin during catheterization
- 1 luer connector
- 1 silicone fixation tab





B) EXTERNAL LUMBAR DRAINAGE SYSTEM (ENDS AND LUMBAR DRAINAGE CATHETER KIT)

DESU® External Lumbar Drainage System consists of 1 ENDS (External Neurological Drainage System) and 1 External Lumbar Drainage Catheter kit. The External Lumbar Drainage System is used when use of permanent shunt implant is not necessary or suitable to reduce the CSF pressure by means of CSF drainage through the subarachnoid cavity.

ENDS (External Neurological Drainage System) consists of the following parts:

- 1, female luer connector and luer cap (to connect the catheter to the distal outlet)
- 1, 60 cm reinforced rope with locking mechanism
- 1, 30 cm measurement scale (to adjust the CSF level according to mm Hg level)
- 1, 100 ml drip chamber with anti-microbial filter
- 1, 250 cm patient line that consists of: 1 male luer connector with cap, 3 three-way connectors, 1 y-connector with injection port, 4 clamps
- 1, 700 ml sterile drainage bag that has: an air filter, 1 outlet and level indicators at every 100 ml and has an air-filter
- 1 ventricular (standard/antibiotic impregnated) or lumbar drainage catheter (standard), according to intended use

External Lumbar Drainage Catheter kit consists of the following parts:

- 1 External Lumbar Drainage Catheter
- 1, stainless steel trocar needle with bended tip to allow catheter passage under the skin during catheterization
- 1 luer connector
- 1 silicone fixation tab





COLLAGEN BASED IMPLANT SYSTEMS

COLLAGEN BASED IMPLANT SYSTEMS

- A) DECOLL COLLAGEN BASED DURAL GRAFT
- B) DEBONE COLLAGEN BASED BONE GRAFT







COLLAGEN BASED IMPLANT SYSTEMS

A) DECOLL COLLAGEN BASED DURAL GRAFT

DECOLL graft is used for the repair of dura mater defects and is manufactured using the purest source of collagen in the market, which is bovine collagen.

DECOLL is supplied in sponge form and sterilized using Gamma irradiation.

Currently available sizes of DECOLL are as follows:

| Sizes | |
|-----------------|-------------------|
| 2,5 cm x 2,5 cm | 10 cm x 10 cm |
| 5 cm x 5 cm | 10 cm x 12,5 cm |
| 6 cm x 6 cm | 12,5 cm x 12,5 cm |
| 7.5 cm x 7.5 cm | 12,5 cm x 15 cm |
| 8 cm x 8 cm | 15 cm x 15 cm |



B) DEBONE COLLAGEN BASED BONE GRAFT

DEBONE graft is used to decrease the healing time and enhance the repair process of bone defects mainly in the spinal area but can also be used in other areas of the body as well. DECOLL is manufactured using the purest source of collagen in the market, which is bovine collagen. DECOLL is supplied in both sponge form granules form and sterilized using Gamma irradiation.

Currently available sizes of sponge form DECOLL are as follows:

| Sizes | |
|-----------------|-------------------|
| 2,5 cm x 2,5 cm | 10 cm x 10 cm |
| 5 cm x 5 cm | 10 cm x 12,5 cm |
| 6 cm x 6 cm | 12,5 cm x 12,5 cm |
| 7.5 cm x 7.5 cm | 12,5 cm x 15 cm |
| 8 cm x 8 cm | 15 cm x 15 cm |



Currently available sizes of granule form DECOLL are as follows:

| Sizes |
|-------|
| 5 cc |
| 10 cc |
| 15 cc |
| 20 cc |
| 25 cc |
| 30 cc |



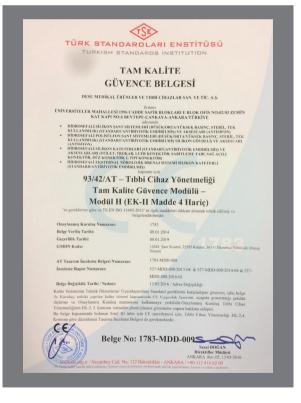


QUALITY CERTIFICATES











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